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Occupational Outlook Handbook, 1978-79 Edition

U.S. Department of Labor
Bureau of Labor Statistics
1978

Bulletin 1955



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Occupational Outlook Handbook, 1978-79 Edition

U.S. Department of Labor
Ray Marshall, Secretary

Bureau of Labor Statistics
Julius Shiskin, Commissioner
1978

Bulletin 1955

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For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402

(Cloth Cover) Stock No. 029-001-02067-8
(Paper Cover) Stock No. 029-001-02059-7

☆ U.S. GOVERNMENT PRINTING OFFICE : 1978 O—248-024

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Foreword

The difficulties young people experience when making the transition from school to work has been recognized by leaders in government and education as a serious national problem. One way to help ease this transition is to provide young people with accurate and comprehensive career guidance information. By acquiring specific knowledge of the various occupations in our economy, they can become aware of the opportunities and alternatives that are available to them, and can plan for careers suited to their abilities and aspirations.

The *Occupational Outlook Handbook* is a major source of vocational guidance information for hundreds of occupations. For each occupation, the *Handbook* describes what workers do on the job, the training or education needed, and most importantly, some idea of the availability of jobs in the years ahead.

Although many people who need career guidance information are young, such as students facing the transition from school to work, the *Handbook* also is a useful resource for those entering or reentering the work force at later stages in their lives. The process of vocational choice and preparation may be accompanied by anxiety and uncertainty regardless of when in the life cycle it occurs. Our hope in the Department of Labor is that this publication will continue to offer valuable assistance to all persons seeking satisfying and productive employment.

Ray Marshall, Secretary of Labor

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Prefatory Note

In our constantly changing economy, information on future career opportunities and educational requirements is necessary if workers are to be prepared for tomorrow's jobs. For more than 30 years, the Bureau of Labor Statistics has conducted research on occupations and industries for the purpose of providing this information for use in vocational guidance.

The major product of this research is the *Occupational Outlook Handbook*, which contains information on job duties, educational requirements, employment outlook, and earnings for several hundred occupations and 35 industries. The *Handbook* information is based on data received from a variety of sources, including business firms, trade associations, labor unions, professional societies, educational institutions, and government agencies, and represents the most current and comprehensive information available.

This edition of the *Handbook* has been revised to enhance its usefulness. Many statements contain expanded information on occupational training; some include information on the movement of workers from one occupation to another and typical paths of advancement within a career field. The new *Handbook* also contains a *Dictionary of Occupational Titles* index, referenced to the third edition of the *Dictionary* and cross referenced to the fourth, and most recent edition.

Julius Shiskin, Commissioner, Bureau of Labor Statistics

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Letter of Endorsement

Work can be one of life's most rewarding experiences. A job can offer pride in achievement and an opportunity for personal growth, as well as the security of an adequate income. But finding work that is satisfying seldom is easy. Many individuals make several different career choices over time as their job needs and aspirations change. Career planning with the advice of trained counselors can help a great deal.

To assist individuals with their educational and vocational choices, counselors must have occupational information that is current, accurate, and comprehensive. The *Occupational Outlook Handbook* is a primary source of the information needed for sound career planning. For several hundred occupations and 35 major industries, the *Handbook* describes what workers do on the job, the training and education required, advancement possibilities, employment outlook, and earnings and working conditions. Most statements also list professional societies, trade associations, unions, and other organizations that can supply additional career information.

Counselors in all work settings will find the new edition of the *Occupational Outlook Handbook* an invaluable tool for helping clients plan a satisfying future in the working world.

Dr. Norman C. Gysbers, President
American Personnel and
Guidance Association

William B. Lewis
Administrator
U.S. Employment Service
U.S. Department of Labor

Thomas W. Carr
Director, Defense Education
U.S. Department of Defense

Max Cleland
Administrator
Veterans Administration

Dr. Ernest Boyer
Commissioner of Education
Office of Education
U.S. Department of Health,
Education, and Welfare

Robert A. Derzon
Administrator
Health Care Financing and
Administration
U.S. Department of Health,
Education, and Welfare

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Contributors

The *Handbook* was prepared in the Bureau of Labor Statistics, Division of Occupational Outlook, under the supervision of Russell B. Flanders and Neal H. Rosenthal. General direction was provided by Dudley E. Young, Assistant Commissioner for Employment Structure and Trends.

The planning and coordination of the *Handbook* was done by Michael J. Pilot.

Constance B. DiCesare, Alan Eck, Susan C. Gentz, Daniel E. Hecker, and Anne Kahl supervised the research and preparation of individual *Handbook* sections. Max L. Carey supervised work on special projects connected with the *Handbook*.

Members of the Division's staff who contributed sections were Vance H. Anthony, Douglas J. Braddock, Charles A. Byrne III, Donald Clark, Lisa S. Dillich, Conley Hall Dillion, Jr., Lawrence C. Drake, Jr., John P. Griffin, Emily B. Hartnell, David B. Herst, H. Philip Howard, Chester Curtis Levine, Thomas Nardone, James V. Petrone, John E. Reiber, Jr., Debra E. Rothstein, Shirley G. Rudney, Jon Q. Sargent, Joan M. Slowitsky, and Patrick Wash.

Lois P. Terlizzi coordinated the compilation and editing of charts. The gathering and editing of photographs was done by Kevin Kasunic. Jean F. Whetzel prepared the Index to Occupations and Industries.

Word processing was handled by Gloria D. Blue, Brenda Marshall, and Beverly A. Williams. Other typing support was provided by Sarah A. Biddix, Karen E. Harper, and Vidella H. Hubbard.

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Government Sources

Federal. Administration on Aging; Bureau of the Census; Bureau of Land Management; Bureau of Mines; Bureau of Prisons; Department of Agriculture; Department of Health, Education, and Welfare; Department of Labor; Department of the Navy; Employment and Training Administration; Energy Research and Development Administration; Federal Aviation Administration; Federal Bureau of Investigation; General Services Administration; Geological Survey; Government Printing Office; National Aeronautics and Space Administration; National Highway Traffic Safety Administration; National Institutes of Health; National Oceanographic and Atmospheric Administration; National Park Service; Office of Safety and Health Administration; U.S. Postal Service; and Veterans Administration.

State and Local. District of Columbia—Department of Human Resources, Fire Department, Police Department, and Public Library; Montgomery County Public Schools (Md.); Virginia—Department of State Police; and Washington (D.C) Metropolitan Area Transit Authority.

Private Sources

Membership Groups. Aluminum Association; American Chemical Society; American Chiropractors Association; American Dental Assistants Association; American Dental Hygienists Association; American Personnel and Guidance Association; American Home Economics Association; American Institute of Architects; American Medical Record Association; American Occupational Therapy Association; American Optometric Association; American Osteopathic Association; American Physical Therapy Association; American Psychological Association; American Society of Planning Officials; American Textile Manufacturers Institute; American Trucking Associations; Associated General Contractors of America; Association of American Geographers; Association of American Railroads; Association of Operating Room Technicians; Forging Industry Association; Gypsum Drywall Contractors, International; Motor Vehicle Manufacturer's Association; Music Educators National Conference; National Association of Barber Schools; National Association of Social Workers; National Electric Sign Association; Public Relations Society of America; Society of American Florists and Ornamental Horticulturists; Tile Contractors Association of America, Inc.; and United Auto Workers.

Industry and Business. Acacia Mutual Life Insurance Co.; American Airlines, Inc.; American Telephone and Telegraph Co.; Armco Steel Corp.; Associated Truck Lines, Inc.; Atlantic Richfield Co.; Bemar Service Pharmacy; Blake Construction Co.; Cannelton Industries, Inc.; Canteen Corp.; Captain Stan's Boat Center; Chessie System, Inc.; Cinderella Shoe Shop; Clarendon Bank and Trust; Consolidated Edison Co. of N.Y., Inc.; Deere and Co.; Del Monte Corp.; Garfinkle, Brooks Bros., Miller and Rhoades, Inc.; General Dynamics Corp.; General Electric Co.; General Motors Corp.; Getty Oil Co. (Eastern Operations), Inc.; Georgia-Pacific Co.; Girard Bank; Goodyear Tire and Rubber Co.; Grand Union Co.; Greyhound Corp.; Grumman Corp.; Hilton Hotels Corp.; Hoffman Interiors, Inc.; Household Finance Corp.; Hyatt-Regency, Washington, D.C.; Industrial Publishing Co.; ITT Sheraton Corp.; Inland Steel Co.; International Business Machines Corp.; Jones Opticians; Jordon Kitt Co.; Kaiser Industries Corp.; Lebow Bros. Co.; Lynchburg Foundry Co.; Marine Midland Bank, Inc.; Marriott Corp.; McDonnell Douglas Corp.; McNally Pittsburg Mfg. Co.; Melart Jewelers; Merck and Co., Inc.; Merkle Press, Inc.; Monsanto Co.; NCR Corp.; National Broadcasting Corp. Inc.; Northwest Ford Co.; Ober Travel Agency; Orkin Exterminating Co.; Oster Corp.; Ottenberg's Bakery; Philadelphia Electric Co.; Rochester Gas and Electric Corp.; Royce TV Repair Services; Santa Fe Industries, Inc.; Southern Railway Co.; Sun Co., Inc.; Thompson and Litton, Inc.; T. I. Swartz Co.; Unilux, Inc.; United Air Lines, Inc.; Ventura Jewelers Co.; Washington Post Co.; Weber's White Trucks, Inc.; Weyerhaeuser Co.; and Woodward and Lothrop, Inc.

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Publications. *Baltimore Jewish Times; Catholic Standard; Contractor Magazine; Farm and Power Magazine; Marketing News; and Women's Wear Daily.*

Schools. California Institute of Technology; California College of Pediatric Medicine; Cape Fear Technical Institute (N.C.); Carnegie-Mellon University; Georgetown University Medical Center; Kansas State University; Miami-Dade Junior College (Fla.); Montgomery County Public Schools (Md.); Towson State University (Md.); University of Delaware; and University of Maryland.

Other. Children's Memorial Hospital of Chicago; Holy Cross Hospital (Silver Spring, Md.); Lutheran Council in the United States of America; Peggy Kauders; United Nations; Washington Hospital Center (D.C.); and WMAR-TV (Baltimore, Md.).

Note

A great many trade associations, professional societies, unions, and industrial organizations are able to provide career information that is valuable to counselors and job seekers. For the convenience of *Handbook* users, some of these organizations are listed at the end of the statements on individual occupations and industries. Although these references were assembled carefully, the BLS has neither authority nor facilities for investigating the organizations listed. Also, because the Bureau does not preview all the information or publications that may be sent in response to a request, it cannot guarantee the accuracy of such information. *The listing of an organization, therefore, does not constitute in any way an endorsement or recommendation by the Bureau or the U.S. Department of Labor, either of the organization and its activities or of the information it may supply.* Each organization has sole responsibility for whatever information it may issue.

The occupational information contained in the *Handbook* presents a general, composite description of jobs and industries and cannot be expected to reflect work situations in specific establishments or localities. *The Handbook, therefore, is not intended and should not be used as a guide for determining wages, hours, the right of a particular union to represent workers, appropriate bargaining units, or formal job evaluation systems.*

Comments about the contents of this publication and suggestions for improving it are welcome. Please address them to Chief, Division of Occupational Outlook, Bureau of Labor Statistics, U.S. Department of Labor, Washington, D.C. 20212.

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Contents

	Page
Guide to the Handbook	
HOW TO USE THE HANDBOOK	3
WHERE TO GO FOR MORE INFORMATION	9
ASSUMPTIONS AND METHODS USED IN PREPARING THE EMPLOYMENT PROJECTIONS	17
TOMORROW'S JOBS	19
The Outlook for Occupations	
INDUSTRIAL PRODUCTION AND RELATED OCCUPATIONS	31
Foundry occupations	33
Patternmakers	33
Molders	35
Coremakers	36
Machining occupations	38
All-round machinists	38
Instrument makers (mechanical)	40
Machine tool operators	42
Setup workers (machine tools)	44
Tool-and-die makers	45
Printing occupations	47
Compositors	47
Lithographers	50
Photoengravers	51
Electrotypers and stereotypers	52
Printing press operators and assistants	53
Bookbinders and bindery workers	55
Other industrial production and related occupations	57
Assemblers	57
Automobile painters	58
Blacksmiths	60
Blue-collar worker supervisors	62
Boilermaking occupations	63
Boiler tenders	65
Electroplaters	66
Forge shop occupations	68
Furniture upholsterers	70
Inspectors (manufacturing)	71
Millwrights	73
Motion picture projectionists	74
Ophthalmic laboratory technicians	76
Photographic laboratory occupations	77
Power truck operators	79
Production painters	81
Stationary engineers	82
Waste water treatment plant operators	84
Welders	85
OFFICE OCCUPATIONS	89
Clerical occupations	90
Bookkeeping workers	91
Cashiers	92
Collection workers	94
File clerks	95
Hotel front office clerks	97
Office machine operators	98
Postal clerks	99
Receptionists	101
Secretaries and stenographers	102
Shipping and receiving clerks	104
Statistical clerks	106
Stock clerks	108
Typists	109
Computer and related occupations	111
Computer operating personnel	111
Programmers	113
Systems analysts	115
Banking occupations	118
Bank clerks	118
Bank officers and managers	120
Bank tellers	121
Insurance occupations	123
Actuaries	123
Claim representatives	125
Underwriters	128
Administrative and related occupations	130
Accountants	130
Advertising workers	133
Buyers	135
City managers	137
College student personnel workers	139
Credit managers	141
Hotel managers and assistants	142
Industrial traffic managers	143
Lawyers	145
Marketing research workers	148
Personnel and labor relations workers	150
Public relations workers	153
Purchasing agents	156
Urban planners	158
SERVICE OCCUPATIONS	160
Cleaning and related occupations	162

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	Page
Building custodians	162
Hotel housekeepers and assistants	163
Pest controllers	164
Food service occupations	167
Bartenders	167
Cooks and chefs	168
Dining room attendants and dishwashers	170
Food counter workers	172
Meatcutters	173
Waiters and waitresses	174
Personal service occupations	177
Barbers	177
Bellhops and bell captains	178
Cosmetologists	179
Funeral directors and embalmers	181
Private household service occupations	183
Private household workers	183
Protective and related service occupations	186
Correction officers	186
FBI special agents	188
Firefighters	189
Guards	191
Police officers	193
State police officers	195
Construction inspectors (Government)	197
Health and regulatory inspectors (Government)	199
Occupational safety and health workers	202
Other service occupations	206
Mail carriers	206
Telephone operators	207
EDUCATION AND RELATED OCCUPATIONS	210
Teaching occupations	211
Kindergarten and elementary school teachers	211
Secondary school teachers	213
College and university teachers	215
Teacher aides	217
Library occupations	220
Librarians	220
Library technicians and assistants	223
SALES OCCUPATIONS	226
Automobile parts counter workers	227
Automobile sales workers	229
Automobile service advisors	231
Gasoline service station attendants	232
Insurance agents and brokers	234
Manufacturers' sales workers	236
Models	238
Real estate agents and brokers	240
Retail trade sales workers	242
Route drivers	244
Securities sales workers	246
Travel agents	248
Wholesale trade sales workers	250
CONSTRUCTION OCCUPATIONS	252
Bricklayers, stonemasons, and marble setters	255
Carpenters	257
Cement masons and terrazzo workers	259
Construction laborers	261
Drywall installers and finishers	262
Electricians (construction)	264
Elevator constructors	266
Floor covering installers	268
Glaziers	269
Insulation workers	271
Ironworkers	273
Lathers	274
Operating engineers (construction machinery operators)	276
Painters and paperhangers	278
Plasterers	280
Plumbers and pipefitters	281
Roofers	284
Sheet-metal workers	285
Tilesetters	286
OCCUPATIONS IN TRANSPORTATION ACTIVITIES	289
Air transportation occupations	290
Air traffic controllers	290
Airplane mechanics	292
Airplane pilots	294
Flight attendants	297
Reservation, ticket, and passenger agents	298
Merchant marine occupations	301
Merchant marine officers	301
Merchant marine sailors	304
Railroad occupations	309
Brake operators	309
Conductors	311
Locomotive engineers	312
Shop trades	314
Signal department workers	315
Station agents	316
Telegraphers, telephoners, and tower operators	317
Track workers	317
Driving occupations	319
Intercity busdrivers	319
Local transit busdrivers	321
Local truckdrivers	323
Long distance truckdrivers	325
Parking attendants	328
Taxicab drivers	329
SCIENTIFIC AND TECHNICAL OCCUPATIONS	331
Conservation occupations	334
Foresters	334
Forestry technicians	336
Range managers	337
Soil conservationists	339
Engineers	342
Aerospace	345
Agricultural	345
Biomedical	346

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	Page
Ceramic	346
Chemical	347
Civil	348
Electrical	348
Industrial	350
Mechanical	351
Metallurgical	351
Mining	352
Petroleum	353
Environmental scientists	355
Geologists	355
Geophysicists	357
Meteorologists	359
Oceanographers	361
Life science occupations	364
Biochemists	364
Life scientists	365
Soil scientists	368
Mathematics occupations	370
Mathematicians	370
Statisticians	372
Physical scientists	375
Astronomers	375
Chemists	377
Food scientists	379
Physicists	380
Other scientific and technical occupations	383
Broadcast technicians	383
Drafters	384
Engineering and science technicians	386
Surveyors	390
MECHANICS AND REPAIRERS	393
Telephone craft occupations	395
Central office craft occupations	395
Central office equipment installers	397
Line installers and cable splicers	398
Telephone and PBX installers and repairers	400
Other mechanics and repairers	403
Air-conditioning, refrigeration, and heating mechanics	403
Appliance repairers	405
Automobile body repairers	407
Automobile mechanics	408
Boat-engine mechanics	411
Bowling-pin-machine mechanics	412
Business machine repairers	414
Computer service technicians	416
Diesel mechanics	419
Electric sign repairers	420
Farm equipment mechanics	422
Industrial machinery repairers	424
Instrument repairers	426
Jewelers	428
Locksmiths	429
Maintenance electricians	431
Motorcycle mechanics	433
Piano and organ tuners and repairers	435
Shoe repairers	437
Television and radio service technicians	439
Truck mechanics and bus mechanics	440
Vending machine mechanics	442
Watch repairers	445
HEALTH OCCUPATIONS	447
Dental occupations	449
Dentists	449
Dental assistants	451
Dental hygienists	453
Dental laboratory technicians	455
Medical practitioners	458
Chiropractors	458
Optometrists	459
Osteopathic physicians	461
Physicians	463
Podiatrists	466
Veterinarians	467
Medical technologist, technician, and assistant occupations	470
Electrocardiograph technicians	470
Electroencephalographic technologists and technicians	472
Emergency medical technicians	473
Medical laboratory workers	476
Medical record technicians and clerks	478
Operating room technicians	480
Optometric assistants	482
Radiologic (X-ray) technologists	483
Respiratory therapy workers	485
Nursing occupations	488
Registered nurses	488
Licensed practical nurses	490
Nursing aides, orderlies, and attendants	492
Therapy and rehabilitation occupations	495
Occupational therapists	495
Occupational therapy assistants	497
Physical therapists	498
Physical therapist assistants and aides	500
Speech pathologists and audiologists	502
Other health occupations	505
Dietitians	505
Dispensing opticians	506
Health services administrators	508
Medical record administrators	510
Pharmacists	512
SOCIAL SCIENTISTS	516
Anthropologists	517
Economists	519
Geographers	521
Historians	524
Political scientists	526
Psychologists	528
Sociologists	531
SOCIAL SERVICE OCCUPATIONS	534
Counseling occupations	536
School counselors	536

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	Page
Employment counselors	538
Rehabilitation counselors	539
College career planning and placement counselors	541
Clergy	544
Protestant ministers	544
Rabbis	545
Roman Catholic priests	547
Other social service occupations	550
Cooperative extension service workers	550
Home economists	551
Homemaker-home health aides	553
Park, recreation, and leisure service workers	556
Social service aides	560
Social workers	562
ART, DESIGN, AND COMMUNICATIONS-RELATED OCCUPATIONS	566
Performing artists	567
Actors and actresses	567
Dancers	569
Musicians	571
Singers	573
Design occupations	575
Architects	575
Commercial artists	577
Display workers	579
Floral designers	581
Industrial designers	583
Interior designers	585
Landscape architects	587
Photographers	588
Communications-related occupations	591
Interpreters	591
Newspaper reporters	593
Radio and television announcers	596
Technical writers	597
The Outlook for Industries	
AGRICULTURE	603
MINING AND PETROLEUM	612
Coal mining	614
Petroleum and natural gas production and gas processing	618
CONSTRUCTION	622
MANUFACTURING	624
Aircraft, missile, and spacecraft	626
Aluminum	632
Apparel	637
Baking	642
Drug	646
Electronics	652
Foundries	657
Industrial chemical	661
Iron and steel	665
Logging and lumber mills	674
Motor vehicle and equipment	679
Nuclear energy field	685
Office machine and computer	692
Paper and allied products	696
Petroleum refining	701
Printing and publishing	705
Textile mill products	709
TRANSPORTATION, COMMUNICATIONS, AND PUBLIC UTILITIES	714
Civil aviation	716
Electric power	719
Merchant marine	727
Radio and TV broadcasting	730
Railroads	735
Telephone	738
Trucking	742
WHOLESALE AND RETAIL TRADE	746
Restaurants	748
Retail food stores	752
FINANCE, INSURANCE, AND REAL ESTATE	756
Banking	758
Insurance	761
SERVICE AND MISCELLANEOUS INDUSTRIES	765
Hotels	767
Laundry and drycleaning	770
GOVERNMENT	773
Federal civilian government	775
Postal Service	779
State and local governments	782
Armed Forces	784
DICTIONARY OF OCCUPATIONAL TITLES (D.O.T.) INDEX	789
ALPHABETICAL INDEX TO OCCUPATIONS AND INDUSTRIES	800
OCCUPATIONAL OUTLOOK HANDBOOK REPRINTS	819
BLS MATERIALS USEFUL TO HANDBOOK READERS	824

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Guide to the Handbook

What's in the Handbook?

- Introductory sections that tell how to use the Handbook, where to go for more career information, how employment projections are made, and where tomorrow's jobs will be.
- 300 occupational briefs, grouped into 13 clusters of related jobs
- 35 industry briefs
- Index of job titles by *Dictionary of Occupational Titles* code
- Instructions for ordering Handbook reprints, the *Occupational Outlook Quarterly*, and other BLS publications that will keep you informed about the economy and the job market.

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HOW TO USE THE HANDBOOK

How many kinds of jobs are there?

Several hundred occupations are described in the *Handbook*, although the total number of occupations in the U.S. economy may be counted in the thousands. Most occupations requiring long periods of education or training are discussed, as are a number of small but growing fields of employment. Altogether, the occupations in the *Handbook* account for about 95 percent of all salesworkers; about 90 percent of professional, craft, and service workers; 80 percent of clerical workers; 50 percent of all operatives; and smaller proportions of managerial workers and laborers. The main types of agricultural occupations are described in the *Handbook*. The long-term job outlook for the Nation as a whole is discussed, too.

Where should I look first?

Start with what you know about your own interests and abilities. Do you like frequent contact with other people or do you prefer to spend a lot of time alone? Are you a good follower or someone whose greatest rewards come from directing others in a work effort? The answers to these and similar questions can help you assess the personal traits and individual aptitudes that influence your job satisfaction and performance. It may be useful to discuss your personal needs and abilities with a counselor trained in exploring human behavior. He or she is familiar with tests and other methods for making this unique, personal assessment.

The next step is to match your individual talents and goals with those demanded by various fields of work. You may have discovered, for example, that one of your strong needs is frequent interaction with people so that social service work seems appealing. To find out what kind of jobs there are in that field, consult the *Handbook's* Table of Contents under Social Service Occupations. All of the occupations in the *Handbook* are arranged in "clusters" of related jobs. There are 13 clusters altogether: Industrial production, office, service, education, sales, construction, transportation, scientific and technical, mechanics and repairers, health, social science, social service, and art, design, and communications occupations. Most career clusters in the *Handbook* describe a variety of jobs in a single field of work. Training and skill requirements within a particular cluster often vary a great deal. If you are thinking about a future in health work, for example, you will find that a few jobs in the health occupations cluster require only a high school diploma; others require a degree from a 2-year community college or junior college; still others require a bachelor's degree; and a few require 4 years or more of formal training following college graduation.

If you know initially that the length or type of career training open to you is restricted by your own financial limitations or family obligations, you may want to narrow your job choices to those requiring high school or 2-year college preparation. The Bureau of Labor Statistics has prepared several pamphlets, based on information in the *Handbook*, that classify and describe selected jobs by the type and length of training required. Looking first at the appropriate pamphlet from this series, such as *Jobs for Which a High School Education is Required*, may be an efficient way to narrow your career choices to those that are realistic for you. See the section on BLS Publications Useful to Handbook Readers for a list of the pamphlets in the *Jobs for Which* Series and information on how to obtain them.

You may already have a specific job or industry in mind. Or, if an important industry is located in your area, you may find it useful to read the *Handbook* industry statement to learn about the different jobs in that industry and their varied training requirements and earnings potential. To find out where it is described, turn to the Index of Occupations and Industries at the back of the book. There are 36 industry statements in the *Handbook*, grouped according to major divisions in the economy: Agriculture, mining, and petroleum; construction; manufacturing; transportation, communications, and public utilities; wholesale and retail trade; finance, insurance, and real estate; services; and government.

What will I learn?

Once you have chosen a place to begin—an occupation or industry you'd like to learn more about—you can use the *Handbook* to find out what the job is like, what education and training are necessary, and what the advancement possibilities, earnings, and employment outlook are likely to be. Each section of the *Handbook* follows a standard format, making it easier to compare different jobs. What follows is a description of the type of information presented in each *Handbook* statement, with a few words of explanation.

The numbers in parentheses that appear just below the title of most *Handbook* statements are *D.O.T.* code numbers. D.O.T. stands for *Dictionary of Occupational Titles*, now in its fourth edition, a U.S. Department of Labor publication which "defines" each of about 20,000 jobs according to a system that uses numbers to classify each job by the type of work performed, training required, physical demands, and working conditions. Because many *Handbook* users have not yet received the recent fourth edition of the D.O.T,

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the D.O.T number accompanying each statement in this Handbook refers to the previous, third edition of that volume. A conversion table showing the fourth edition number that corresponds to that from the third edition, used in the *Handbook*, appears in an Appendix. An index listing *Handbook* occupations by D.O.T. number precedes the alphabetical Index of Industries and Occupations. D.O.T. numbers are used primarily by public employment service agencies for classifying applicants and job openings, and for reporting and other operating purposes. They are included in the *Handbook* because career information centers and libraries frequently use them for filing occupational information.

The **Nature of the Work** section describes the major duties of workers in the occupation. It tells what workers do on the job and how they do it. Although each job description is typical of the occupation, duties are likely to vary by employer and size of employing organization, geographic location, and other factors. In some occupations, individual workers specialize in certain tasks. In others they perform the entire range of work in the occupation. Of course, job duties continually change as technology advances, new industrial processes are developed, and products or services change.

The **Places of Employment** section provides information on the number of workers in an occupation and tells whether they are concentrated in certain industries or geographic areas. Whether an occupation is large or small is important to a jobseeker because large occupations, even those growing slowly, offer more openings than small ones because of the many workers who retire or die each year.

Some occupations are concentrated in particular industries. Most cooks and chefs, for example, are employed in the restaurant and hotel industries while secretaries are employed in almost every industry. If an occupation is found primarily in certain industries, this section lists them.

A few occupations are concentrated in certain parts of the country. Actors and actresses, for example, usually work in California or New York. This information is included for the benefit of people who have strong preferences about where they live—because they do not wish to be separated from their families and friends, for example. For most occupations, however, employment is widely scattered and generally follows the same pattern as the distribution of the population.

In addition, information on part-time employment is included because it is important to students, homemakers, retired persons, and others who may want to work part time. Knowing which occupations offer good opportunities for part-time work can be a valuable lead.

The **Training, Other Qualifications, and Advancement** section should be read carefully because the decisions you make concerning preparation for an occupation represent a considerable investment of time and money. Early and wise planning toward a career goal can save you unwarranted expenditures later. If you currently are in school, it's a good idea to look closely at the list of high school and college courses regarded as useful preparation for the career you have in mind. Nearly all *Handbook* statements list such courses.

Workers can qualify for jobs in a variety of ways, including college study leading to a certificate or associate degree; programs offered by postsecondary vocational schools, both public and private; home study courses; government training programs; experience or training obtained in the Armed Forces; apprenticeship and other formal training offered on the job or in the classroom by employers; and high school courses. For each occupation, the *Handbook* identifies which of these routes of entry is preferred. In many cases, alternative ways of obtaining training are listed as well. It is worth remembering that the level at which you enter an occupation and the speed with which you advance often are determined by the amount of training you have.

Many occupations are natural stepping stones to others. After working for a time as a programmer, for example, many people advance to jobs as systems analysts. The world of work is dynamic and few workers spend their lives in one or even two occupations. Some have several jobs over a lifetime, changing careers when it is advantageous to do so. Frequently observed patterns of movement from one occupation to another, such as advancement from programmer to systems analyst, are discussed in the *Handbook*. This type of information can be useful in several ways.

It is helpful to know, for example, that skills gained working at one job can make you more employable in another—perhaps a job that is more desirable in terms of earnings, working conditions, or scope for self-expression. On the other hand, it also is useful to know which jobs offer the most opportunity for transferring to other work of a similar nature. Persons trained in electrical or chemical engineering, for example, frequently can transfer to another engineering specialty where they can apply general engineering knowledge in different ways.

In some cases moving from one occupation to another takes more than the training or experience acquired on the job. Before a hospital aide can advance to licensed practical nurse, for example, ye or she must complete the year of specialized training required for licensing. Many *Handbook* statements describe the possibilities for advancement after additional training, and note any in-service programs that allow employees to gain needed skills while continuing to work part time. Certain occupations offer employment opportunities to persons with little or no previous work experience. The *Handbook* includes many statements on such entry level jobs, many in the office and service clusters.

It usually is wise, however, to discuss the patterns of job transfer and advancement described in the *Handbook* with counselors, local employers, and others who know about the particular job market where you want to work. Typical patterns of movement from one occupation to

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another may not apply in every employment setting.

All States have certification or licensing requirements for some occupations. Physicians and nurses, elementary and secondary school teachers, barbers and cosmetologists, electricians and plumbers are examples of occupations that are licensed. If you are considering occupations that require State licensing, be sure to check the requirements in the State in which you plan to work.

An important factor in career choice is the extent to which a particular job suits your personality. Although it often is difficult for people to assess themselves, your counselor undoubtedly is familiar with tests that can help. Each statement in the *Handbook* provides information which allows you to match your own unique personal characteristics—your likes and dislikes—with the characteristics of the job. For a particular job, you may need the ability to:

—make responsible decisions.

—motivate others.

—direct and supervise others.

—work under close supervision.

—work in a highly competitive atmosphere.

—enjoy working with ideas and solving problems.

—enjoy working with people.

—enjoy working with things—good coordination and manual dexterity are necessary.

—work independently—initiative and self-discipline are necessary.

—work as part of a team.

—enjoy working with detail, either numbers or technical written material.

—enjoy helping people.

—use creative talents and ideas and enjoy having an opportunity for self-expression.

—derive satisfaction from seeing the physical results of your work.

—work in a confined area.

—perform repetitious work.

—enjoy working outside, regardless of the weather.

The **Employment Outlook** section discusses prospective job opportunities. Knowing whether or not the job market is likely to be favorable is important in deciding whether to pursue a specific career. While your interests, your abilities, and your career goals are significant, you also need to know something about the availability of jobs in the fields that interest you most.

Figure I

Description	*Projected 1976–85 change in employment requirements*
Much faster than the average for all occupations	50.0 percent or greater
Faster than the average for all occupations	25.0 to 49.9 percent
About as fast as the average for all occupations [1]	15.0 to 24.9 percent
More slowly than the average for all occupations	5.0 to 14.9 percent
Little change is expected	4.9 to −4.9 percent
Expected to decline	−5.0 percent or greater

[1] The average increase projected for all occupations for the 1976–85 period is 19.2 percent.

The employment outlook section of most *Handbook* statements begins with a sentence about expected employment growth through 1985. The occupation or industry is described as likely to grow about as fast as the average for all occupations or industries; faster than the average; or more slowly than the average (figure I). *Job opportunities in a particular occupation or industry usually are favorable if employment increases at least as rapidly as in the economy as a whole. Occupations or industries in which employment stays about the same or declines generally offer less favorable job prospects than those that are growing because the only openings are those due to deaths, retirements, and other separations from the labor force.*

Some *Handbook* statements take note 6f the effect of fluctuations in economic activity. This information is valuable to people looking into long-range career possibilities at a time when the economy is in a recession. Persons understandably wonder: What will the economy be like when I enter the labor market? Will it be harder to find a job 5 or 10 years from now than it is today? The *Handbook* gives information, wherever feasible, on occupations and industries whose levels of employment fluctuate in response to shifts in the economic climate. It is important to bear in mind that employment in many—but not all—occupations and industries is directly affected by an economic downturn. A sharp improvement in the outlook for these occupations and industries is likely as the economy picks up. However, other occupations and industries are less affected by short-term changes in economic activity. Other factors influence their growth or decline. These matters are explored in a number of *Handbook* statements.

For some occupations, information is available on the supply of workers--that is, the number of people pursuing the type of education or training needed and the number subsequently entering the occupation. When such information is available, the *Handbook* describes prospective job opportunities in terms of the expected demand-supply relationship. The prospective job situation is termed "excellent" when demand is likely to greatly exceed supply; "keen competition" when supply is likely to exceed demand. Other terms used in *Handbook* statements are shown in Figure II.

Workers who transfer in to one occupation from another sometimes are a significant component of supply; similarly, those who transfer out may have a substantial effect on de-

Figure II

Job opportunities	*Prospective demand-supply relationship*
Excellent	Demand much greater than supply
Very good	Demand greater than supply
Good or favorable	Rough balance between demand and supply
May face competition	Likelihood of more supply than demand
Keen competition	Supply greater than demand

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mand because their leaving usually creates a job opening. Although the information currently available on transfers among occupations is limited, some statements in the *Handbook* discuss transfer patterns and their effect on the supply for certain occupations. The employment outlook for engineers, for example, notes that transfers into the field are likely to constitute a substantial portion of supply if past trends continue.

The information in this section should be used carefully. Getting a job may be difficult if the field is so small that openings are few (actuaries and blacksmiths are examples) or so popular that it attracts many more jobseekers than there are jobs (radio and television broadcasting, journalism, the performing arts, and modeling). Getting a job also can be difficult in occupations and industries in which employment is declining (merchant sailors, photoengravers, typesetters), although this is not always the case. But even occupations that are small or overcrowded provide some jobs. So do occupations in which employment is growing very slowly or even declining, for there is a need to replace workers who leave the occupation. If the occupation is large, the number of job openings arising from replacement needs can be quite substantial. Bookkeepers, telephone operators, and machinists are examples of large occupations that provide a significant number of job openings each year because workers leave. On the average, openings resulting from replacement needs are expected to account for nearly two-thirds of all job openings.

How reliable is the information on the outlook for employment over the next 10 years? No one can predict future labor market conditions with perfect accuracy. In every occupation and industry, the number of jobseekers and the number of job openings constantly changes. A rise or fall in the demand for a product or service affects the number of workers needed to produce it. New inventions and technological innovations create some jobs and eliminate others. Changes in the size or age distribution of the population, work attitudes, training opportunities, or retirement programs determine the number of workers available. As these forces interact in the labor market, some occupations experience a shortage, some a surplus, some a balance between jobseekers and openings. Methods used by economists to develop information on future occupational prospects differ, and judgments that go into any assessment of the future also differ. Therefore, it is important to understand what underlies each statement on outlook.

For every occupation and industry covered in the *Handbook*, an estimate of future employment needs is developed. These estimates are consistent with a set of assumptions about the future of the economy and the country. For more detail, see the section entitled, Assumptions and Methods Used In Preparing the Employment Projections.

Finally, you should remember that job prospects in your community or State may not correspond to the description of the employment outlook in the *Handbook*. For the particular job you are interested in, the outlook in your area may be better, or worse.The *Handbook* does not discuss the outlook in local areas because the analysis is far too much for a centralized staff to handle. Such information has been developed, however, by many States and localities. The local office of your State employment service is the best place to ask about local-area employment projections. Names and addresses of these State and local information sources and suggestions for additional information on the job market are given in the following section, Where to Go for More Information.

The **Earnings** section helps answer many of the questions that you may ask when choosing a career. Will the income be high enough to maintain the standard of living I want and justify my training costs? How much will my earnings increase as I gain experience? Do some areas of the country or some industries offer better pay than others for the same type of work?

Like most people, you probably think of earnings as money. But money is only one type of financial reward for work. Paid vacations, health insurance, uniforms, and discounts on clothing or other merchandise also are part of total earnings.

About 9 out of 10 workers receive money income in the form of a *wage or salary*. A wage usually is an hourly or daily rate of pay, while a salary is a weekly, monthly, or yearly rate. Most craft workers, operatives, and laborers are wage earners, while most professional, technical, and clerical workers are salary earners.

In addition to their regular pay, wage and salary workers may receive extra money for working overtime, or on a night shift or irregular schedule. In some occupations, workers also may receive tips or be paid a commission based on the amount of sales or services they provide to customers. Factory workers are sometimes paid a piece rate, which is an extra payment for each item they produce. For many workers, these types of pay amount to a large part of their total earnings.

The remaining 10 percent of all workers are in business for themselves and earn *self-employment income* instead of wages or salaries. This group includes workers in a wide variety of occupations:Physicians, shopkeepers, barbers, writers, photographers, and farmers are examples of workers who frequently are self-employed.

Workers in some occupations earn self-employment income in addition to their wages or salaries. For example, electricians and carpenters often do small repair or remodeling jobs during evenings or weekends, and college professors frequently are paid for publishing articles based on independent research.

Besides money income, most wage and salary workers receive a variety of *fringe benefits* as part of their earnings on the job. Several are required by Federal and State law, including social security, workers' compensation, and unemployment insurance. These benefits provide income to persons when they are not working because of old age, work-related injury or disability, or lack of suitable jobs.

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Among the most common fringe benefits are paid vacations, holidays, and sick leave. In addition, many workers are covered by life, health, and accident insurance; participate in retirement plans; and are entitled to supplemental unemployment benefits. All of these benefits are provided—in part or in full—through their employers. Some employers also offer stock options and profit-sharing plans, savings plans, and bonuses.

Workers in many occupations receive part of their earnings in the form of goods and services, or *payments in kind*. Sales workers in department stores, for example, often receive discounts on merchandise. Workers in other jobs may receive free meals, housing, business expense accounts, or free transportation on company-owned planes.

Which jobs pay the most? This is a difficult question to answer because good information is available for only one type of earnings—wages and salaries—and for some occupations even this is unavailable. Nevertheless, the *Handbook* does include some comparisons of earnings among occupations. Most statements indicate whether earnings in an occupation are greater than or less than the average earnings of workers who are not supervisors and work in private industry, but not in farming. This group represented about 60 percent of all workers in 1976 and had the most reliable earnings data currently available for comparison purposes.

Besides differences among occupations, many levels of pay exist within each occupation. Beginning workers almost always earn less than those who have been on the job for some time because pay rates increase as workers gain experience or do more responsible work.

Earnings in an occupation also vary by geographic location. The average weekly earnings of beginning computer programmers, for example, vary considerably from city to city. (See table 1.) The highest earnings of the nine cities listed occurred in Detroit, Mich., and the lowest in Chattanooga, Tenn. Although it is generally true that earnings are higher in the North Central and Northeast regions than in the West and South, there are exceptions. You also should remember that those cities which offer the highest earnings are often those in which it is most expensive to live.

Table 1. Average weekly earnings of beginning computer programmers, 1976, by selected city

City	Average weekly earnings
Detroit	$239.50
New York	239.00
Cleveland	238.00
Chicago	230.00
San Francisco-Oakland	229.50
Greenville-Spartanburg, S.C.	201.50
Baltimore	193.00
Salt Lake City-Ogden	190.00
Chattanooga	185.50

SOURCE: Bureau of Labor Statistics.

In addition, workers in the same occupation may have different earnings depending on the industry in which they work. For example, senior accounting clerks in 1975 averaged $206.50 a week in public utilities, $181 a week in manufacturing, $169.50 a week in wholesale trade, and $164 a week in services, but only $150.50 in retail trade and $154 in finance, insurance, and real estate.

Salaries also vary by the type of work a person performs. The salaries of Ph. D. chemists, for example, vary considerably depending on the specific nature of the job, as shown in table 2. In 1976, chemists in management jobs earned $7,000 a year more than those in marketing and technical services. Chemists in research and development, however, earned $4,200 less than those in marketing, but $4,800 more than chemistry professors.

Because of these variations in earnings, you should check with a counselor or with local employers if you are interested in specific earnings information for occupations in your area.

The **Working Conditions** section provides information on factors that can affect job satisfaction because preferences for working conditions vary considerably among individuals. Some people, for example, prefer outdoor work while others prefer working in an office. Some people like the variety of shift work, and others want the steadiness of a 9-to-5 job. Following is a list of several working conditions that apply to some of the occupations in the *Handbook*.

Overtime work. When overtime is required on a job, employees must give up some of their free time and need to be flexible in their personal lives. Overtime, however, does provide the opportunity to increase earning power.

Shift work. Evening or night work is part of the regular work schedule in some jobs. Employees who work on these shifts usually are working while most other people are off. Some per-

Table 2. Average annual salaries of chemists, with Ph.D. degrees, by type of work, 1976

Type of work	Annual salaries
Management	$36,500
Marketing and technical services	29,500
Research and development	25,300
Teaching	20,500
Other	26,900

SOURCE: American Chemical Society.

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sons prefer shift work, however, because they can pursue certain daytime activities, such as hunting, fishing, or gardening.

Environment. Work settings vary from clean, air-conditioned offices to places that are dirty, greasy, or poorly ventilated. By knowing the setting of jobs you find interesting, you can avoid an environment that you may find particularly unpleasant.

Outdoor work. Persons who work outdoors are exposed to all types of weather. This may be preferred to indoor work, however, by those who consider outdoor work more healthful.

Hazards. In some jobs employees are subject to possible burns, cuts, falls, and other injuries and must be careful to follow safety precautions.

Physical demands. Some jobs require standing, stooping, or heavy lifting. You should be sure that you have the physical strength and stamina required before seeking one of these jobs.

Considering working conditions when you make up your mind about a career can help you choose a job that brings you satisfaction and enjoyment.

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WHERE TO GO FOR MORE INFORMATION

Whether you have questions about a particular job or are trying to compare various fields, the *Occupational Outlook Handbook* is a good place to begin. The *Handbook* will introduce you to some of the important aspects of an occupation and answer many of your initial questions. But the *Handbook* is only one of many sources of information about jobs and careers. After reading a few *Handbook* statements, you may decide that you want more detailed information about a particular occupation. Or you may want to find out where you can find this kind of work in your community or where you can go for appropriate training. If you are willing to make an effort, you will discover a wealth of occupational information—much of it available at little or no cost.

Sources of Career Information

Much information on careers is put out by government, industry, trade unions, schools, professional associations, private guidance services, and other organizations. You should be careful in assessing any single piece of career guidance material. Keep in mind the date and source, in particular. Material that is too old may contain obsolete or even misleading information. Be especially cautious about accepting information on employment outlook, earnings, and training requirements if it is more than 5 years old. You also need to consider the source—and thus the intent—of the career guidance material you obtain.

Although some occupational materials are produced solely for the purpose of objective vocational guidance, others are produced for recruitment purposes. You should be wary of biased information, which may tend to leave out important items, overglamorize the occupation, overstate the earnings, or exaggerate the demand for workers.

School counselors can be a very important source of guidance information. Counselors should be able to refer you to the different types of career materials available in your school or community. They are likely to be familiar with the job market. They also can discuss entry requirements and costs of the schools, colleges, or training programs that offer preparation for the kind of work in which you are interested. Most important of all, your counselor can help you consider the occupational information you obtain in relation to your own abilities, personal aspirations, and career goals.

Guidance offices usually have collections of career information. In fact, the copy of the *Handbook* that you're reading now may have come from the guidance office. Find out what else the office has to offer.

Some schools have **career centers**; often, these are located in or near the library or media center. Career centers provide a sampling of printed and audiovisual career information materials, and also may offer individual counseling, group discussions, guest speakers, and field trips.

Libraries have books, brochures, magazines, and audiovisual materials that contain information about jobs and careers. Check your school library or media center, of course—but don't forget the public library. Many libraries have pamphlet files devoted to specific occupations. Some libraries also have collections of filmstrips, records and tapes, and microfilms with occupational information. The reference shelf undoubtedly contains one directory or more that you will find useful if you want to get the names of specific schools, colleges, or business concerns. The library staff can direct you to the information best suited to your needs.

Trade unions, business firms, trade associations, professional societies, and educational institutions all publish career information, and much of this is available for the asking.

The Sources of Additional Information section at the end of most *Handbook* statements lists organizations you can write to. This is a good way to begin. For the names and addresses of other organizations, consult the directories on your library's reference shelf. There, you are likely to find directories that list:

—trade associations.

—professional associations.

—business firms.

—junior and community colleges.

—colleges and universities.

—home study and correspondence programs.

—business, trade, and technical schools.

—sources of scholarships and financial aid.

Your school library or career center may have one directory or more put out by commercial publishers that list sources of career information by occupation.

Another useful directory is the U.S. Office of Education's *Directory of Postsecondary Schools with Occupational Programs, 1973-74*, which lists schools offering specific occupational training programs. The directory lists private business, trade, and technical schools as well as community and junior colleges and 4-year colleges and universities.

Computer-assisted occupational information systems have been installed in some schools and career centers. These systems allow users to obtain career information stored in a computer by entering specific requests and receiving immediate answers. Through the occupational information systems, users are able to examine the ways in which different personal abilities, interests, and preferences are related to different occu-

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pations. The U.S. Department of Labor is currently providing funds for such systems in eight States.

Don't overlook the importance of **personal contacts**. An interview with someone in a particular job can often tell you much more than a booklet or brochure can. By asking the right questions, you find out what kind of training is really important, how workers got their first jobs as well as the one they're in now, and what they like and dislike about the work.

State employment security agencies in many States publish career briefs for dozens of different occupations and industries. These briefs usually describe earnings and job outlook information for a particular State—and sometimes for a city or metropolitan area. By contrast, the *Handbook* gives information for the Nation as a whole. In addition, a number of States publish brochures on writing resumes, finding job openings, preparing for interviews, and other aspects of a job search. To find out what materials are available for your State, consult the U.S. Employment and Training Administration's1976 *Guide to Local Occupational Information*. Or write directly to the chief information officer in your State employment security agency. Following is a list of their titles and addresses:

Alabama

Public Information Officer, Department of Industrial Relations, Industrial Relations Bldg., 649 Monroe St., Montgomery, Ala. 36130.

Alaska

Information Officer, Employment Security Division, Department of Labor, P.O. Box 3-7000, Juneau, Alaska 99811.

Arizona

Chief of Information and Education, Arizona State Employment Security Commission, P.O. Box 6123, Phoenix, Ariz. 85005.

Arkansas

Public Information Officer, Employment Security Division, P.O. Box 2981, Little Rock, Ark. 72203.

California

Public Information Section, Employment Development Department, 800 Capitol Mall, Sacramento, Calif. 95814.

Colorado

Public Information Officer, Division of Employment, Department of Labor and Employment, 251 East 12th Ave., Denver, Colo. 80203.

Connecticut

Public Information Supervisor, Connecticut Employment Security Division, 200 Folly Brook Blvd., Weatherfield, Conn. 06109.

Delaware

Secretary, Department of Labor, 801 West 14th St., Wilmington, Del. 19899.

District of Columbia

Chief, Community Relations and Information Office, D.C. Department of Manpower, Room 601, 500 C St. NW., Washington, D.C. 20212.

Florida

Information Director, Florida Department of Commerce, Collins Bldg., Tallahassee, Fla. 32304.

Georgia

Chief of Public Relations and Information, Georgia Department of Labor, 254 Washington St. SW., Atlanta, Ga. 30334.

Hawaii

Information Specialist, Department of Labor and Industrial Relations, 825 Mililani St., Honolulu, Hawaii 96813.

Idaho

Public Information Coordinator, Department of Employment, P.O. Box 35, Boise, Idaho 83707.

Illinois

Director, Communications and Public Information, Illinois Department of Labor, State Office Bldg., Room 705, Springfield, Ill. 62706.

Indiana

Director of Information and Education, Employment Security Division, 10 North Senate Ave., Indianapolis, Ind. 46204.

Iowa

Chief of Information Services, Employment Security Commission, 1000 East Grand Ave., Des Moines, Iowa 50319.

Kansas

Public Relations Director, Department of Human Resources, 401 Topeka Ave., Topeka, Kans. 66603.

Kentucky

Supervisor, Public Information, Department of Human Resources, 592 East Main St., Frankfort, Ky. 40601.

Louisiana

Public Relations Director, Department of Employment Security, P.O. Box 44094, Baton Rouge, La. 70804.

Maine

Chairman, Employment Security Commission, 20 Union St., Augusta, Maine 04330.

Maryland

Director of Public Relations, Department of Employment and Social Services, Room 601, 1100 North Eutaw St., Baltimore, Md. 21201.

Massachusetts

Supervisor of Information, Division of Employment Security, Hurley Bldg., Government Center, Boston, Mass. 02114.

Michigan

Director, Information Services Division, Employment Security Commission, Department of Labor Bldg., 7310 Woodward Ave., Detroit, Mich. 48202.

Minnesota

Director of Public Information, Department of Employment Services, 390 North Robert St., St. Paul, Minn. 55101.

Mississippi

Public Relations Representative, Employment Security Commission, P.O. Box 1699, Jackson, Miss. 39205.

Missouri

Information Supervisor, Division of Employment Security, Department of Labor and Industrial Relations, P.O. Box 59, Jefferson City, Mo. 65101.

Montana

Information Officer, Employment Security Division, P.O. Box 1728, Helena, Mont. 59601.

Nebraska

Information Officer, Division of Employment, Department of Labor, P.O. Box 94600, State House Station, Lincoln, Nebr. 68509.

Nevada

Public Information Officer, Employment Security Department, 500 East Third St., Carson City, Nev. 89701.

New Hampshire

Commissioner, Department of Employment Security, 32 South Maine St., Concord, N.H. 03301.

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New Jersey

Director of Public Information, Division of Employment Security, Department of Labor and Industry, John Fitch Plaza, Trenton, N.J. 08625.

New Mexico

Information Officer, Employment Security Commission, P.O. Box 1928, Albuquerque, N. Mex. 87103.

New York

Director, Division of Research and Statistics, Department of Labor, 2 World Trade Center, New York, N.Y. 10047.

North Carolina

Communications and Information Specialist, Employment Security Commission, P.O. Box 25903, Raleigh, N.C. 27602.

North Dakota

Public Information Section, Employment Security Bureau, 145 South Front St., Bismarck, N. Dak. 58501.

Ohio

Public Information Officer, Bureau of Employment Services, 145 South Front St., Columbus, Ohio 43216.

Oklahoma

Information Director, Employment Security Commission, Will Rogers Memorial Office Bldg., Oklahoma City, Okla. 73105.

Oregon

Information Officer, Employment Division, 875 Union St. NE., Salem, Oreg. 97310.

Pennsylvania

Director of Public Relations, Bureau of Employment Security, Department of Labor and Industry Bldg., 7th and Forster Sts., Harrisburg, Pa. 17121.

Puerto Rico

Information Officer, Bureau of Employment Security, 414 Barbosa Ave., Hato Rey, P.R. 00917.

Rhode Island

Information Officer, Department of Employment Security, 24 Mason St., Providence, R.I. 02903.

South Carolina

Public Information Director, Employment Security Commission, P.O. Box 995, Columbia, S.C. 29202.

South Dakota

Public Information Director, Department of Labor, Office Bldg. No. 2, Pierre, S. Dak. 57501.

Tennessee

Chief of Public Relations, Department of Employment Security, 519 Cordell Hull Bldg., Nashville, Tenn. 37219.

Texas

Public Information Officer, Texas Employment Commission, TEC Bldg., 15th and Congress Ave., Austin, Tex. 78778.

Utah

Public Relations Director, Department of Employment Security, P.O. Box 11249, Salt Lake City, Utah 84111.

Vermont

Public Information Officer, Department of Employment Security, P.O. Box 488, Montpelier, Vt. 05602.

Virginia

Director, Information Services, Virginia Employment Commission, P.O. Box 1358, Richmond, Va. 23211.

Washington

Information Officer, Employment Security Department, P.O. Box 367, Olympia, Wash. 98504.

West Virginia

Information Representative, Department of Employment Security, 4407 McCorkle Ave. SE., Charleston, W. Va. 25305.

Wisconsin

Director of Information, Department of Industry, Labor, and Human Relations, P.O. Box 2209, Madison, Wis. 53701.

Wyoming

Information Officer, Employment Security Commission, P.O. Box 2760, Casper, Wyo. 82601.

Career Information for Special Groups

Certain groups of jobseekers face special difficulties in obtaining suitable and satisfying employment. All too often, veterans, youth, handicapped persons, members of ethnic and racial minorities, older workers, and women experience difficulty in the labor market. Choosing a career wisely and realistically is important for everyone, but it is doubly important for members of these groups. Special counseling, training, and placement are available in many communities—through the public employment service, community service agencies, or other organizations.

In addition, literature on career guidance and vocational training for special labor force groups is available from the Federal Government. Most of these publications can be obtained free of charge. Following are selected examples:

Youth

Employment and Training for Youth. (program fact sheet), February 1977.

Office of Information, Inquiries Section, Room 10225, Employment and Training Administration, U.S. Department of Labor, 601 D St. NW., Washington, D.C. 20213.

A Message to Young Workers About the Fair Labor Standards Act, As Amended in 1974. (WH Publication 1236), 1976.

Office of Information, Room 4331, Employment Standards Administration, U.S. Department of Labor, 200 Constitution Ave. NW., Washington, D.C. 20210.

Mentally handicapped

These, Too, Must Be Equal:America's Needs in Habilitation and Employment of the Mentally Retarded, 1974.

President's Committee on Mental Retardation, Regional Office Building, 7th and D Sts. SW., Washington, D.C. 20201.

Guide to Job Placement of Mentally Retarded Workers.
Preparing for Work, 1975.
How to Get a Job.
Jobs and Mentally Retarded People, 1974.

President's Committee on Employment of the Handicapped, Room 600, Vanguard Building, 1111 20th St. NW., Washington, D.C. 20036.

Affirmative Action to Employ Handicapped People.

Office of Information, Room 4331, Employment Standards Administration, U.S. Department of Labor, 200 Constitution Ave. NW., Washington, D.C. 20210.

Physically handicapped

Careers for the Homebound.
People at Work:50 Profiles of Men and Women With MS, 1975.

President's Committee on Employment of the Handicapped, Room 600, Vanguard Building, 1111 20th St. NW., Washington, D.C. 20036.

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Affirmative Action to Employ Handicapped People.

Office of Information, Room 4331, Employment Standards Administration, U.S. Department of Labor, 200 Constitution Ave. NW., Washington, D.C. 20210.

Older workers

The Law Against Age Discrimination in Employment. (WH Publication 1303).

Office of Information, Room 4331, Employment Standards Administration, U.S. Department of Labor, 200 Constitution Ave. NW., Washington, D.C. 20210.

Services for Older Workers. (program fact sheet), April 1977.

Memo to Mature Jobseekers, 1977.

Office of Information, Inquiries Section, Room 10225, Employment and Training Administration, U.S. Department of Labor, 601 D St. NW., Washington, D.C. 20213.

Employment and Volunteer Opportunities for Older People. (AoA Fact Sheet), Revised 1976.

National Clearinghouse on Aging, Room 4146, U.S. Department of Health, Education, and Welfare, 330 Independence Ave. SW., Washington, D.C. 20201.

Women

Steps to Opening the Skilled Trades to Women, June 1974.

Why Not be an Apprentice and Become a Skilled Craft Worker. (leaflet 52), 1974.

Publications of the Women's Bureau, January 1977.

Selected Sources of Career Information, 1974.

Women's Bureau, Employment Standards Administration, U.S. Department of Labor, 200 Constitution Ave. NW., Washington, D.C. 20210.

Veterans

Out of the Service and Looking for a Job? Here's Help!, 1976.

Veterans for Hire: Good Business, 1976.

Office of Information, Inquiries Section, Room 10225, Employment and Training Administration, U.S. Department of Labor, 601 D St. NW., Washington, D.C. 20213.

Veterans Readjustment Appointments—Questions and Answers.(BRE-36), revised 1977.

Bureau of Recruiting and Examining, Room 6552, Civil Service Commission, 1900 E St. NW., Washington, D.C. 20415.

The following publications are available from VA regional offices (listed in the telephone directory under "United States Government—Veterans Administration") or from:

Department of Veterans Benefits - 232A, Veterans Administration Central Office, 810 Vermont Ave. NW., Washington, D.C. 20420.

Apprenticeship or Other On-Job Training Benefits for Veterans With Service Since January 31, 1975. (VA pamphlet 20-69-4), March 1975.

A Summary of Employment Benefits and Opportunities for Vietnam Era Veterans. (VA pamphlet 20-69-6), December 1974.

Information on Finding a Job

Do you need help in finding a job? For information on job openings, follow up as many leads as possible. Parents, neighbors, teachers, and counselors may know of jobs. Check the want ads. Investigate the local office of your State employment service. And find out whether private or nonprofit employment agencies in your community can help you. The following section will give you some idea of where you can go to look for a job and what sort of help to expect.

Informal job search methods. Informal methods of job search are the most popular, and also the most effective. Informal methods include direct application to employers with or without referral by friends or relatives. Jobseekers locate a firm that might employ them and file an application, often without certain knowledge that an opening exists.

You can find targets for your informal search in several ways. The Yellow Pages and local chambers of commerce will give you the names and addresses of appropriate firms in the community where you wish to work. You can also get listings of most firms in a specific industry—banking, insurance, manufacturing, and newspaper publishing, for example—by consulting one of the directories on the reference shelf of your public library. Friends and relatives may suggest places to apply for a job, and people you meet in the course of your job search are also likely to give you ideas.

Want ads. The "Help Wanted" ads in a major newspaper contain hundreds of job listings. As a job search tool, they have two advantages: They are cheap and easy to acquire, and they often result in successful placement. There are disadvantages as well. Want ads give a distorted view of the local labor market, for they tend to underrepresent small firms. They also tend to overrepresent certain occupations, such as clerical and sales jobs. How helpful they are to you will depend largely on the kind of job you seek.

Bear in mind that want ads do not provide complete information; many ads give little or no description of the job, working conditions, and pay. Some ads omit the identity of the employer. In addition, firms often run multiple listings. Some ads offer jobs in other cities (which do not help the local worker); others advertise employment agencies rather than employment.

If you use the want ads, keep the following suggestions in mind:

* Don't rely *exclusively* on the want ads; follow up other leads, too.

* Answer ads promptly. The opening may be filled before the ad stops running.

* Follow the ads diligently. Checking them every day as early as possible gives you the best advantage over other applicants, which may mean the difference between a job and a rejection.

* Don't expect too much from "blind ads" that do not reveal the employer's identity. Employers use blind ads to avoid being swamped with applicants, or to fill a particular vacancy quietly and confidentially. The chances of finding a job through blind ads tend to be slim.

* Be cautious about answering "no experience necessary" ads. Most employers are able to fill job openings that do not require experience without advertising in the newspaper. This type of ad may mean that the job is hard to fill because of low wages or poor working conditions, or because it is straight commission work.

Public employment service. The public employment service, also called

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the Job Service, can be a good source of information about job openings in your community. Employment security (ES) agencies in each of the 50 States and the District of Columbia are affiliated with the U.S. Employment Service, and provide their services without charge. Operating through a network of 2,500 local offices, State agencies help jobseekers find employment and help employers find qualified workers. To find the office nearest you, look in the State government telephone listings under "Job Service" or "Employment." If the local office does not provide the information or services you are looking for, write to the information officer in your State capital. Addresses are given in the first section of this chapter.

General services. Assuming you come to your local employment service office because you're looking for a job, the first step is to fill out an application that asks for general background and work history. To speed up the process, you should bring along complete information on previous jobs, including dates of employment, names and addresses of employers, and pay levels.

After completing the application, you will talk briefly with an interviewer in order to be classified into a particular job cluster—professional and management, sales, clerical, and so forth. This process, although crucial, takes very little time. If you have specific training and experience and know exactly what you want, the initial interview may suffice. Most applicants, however, can benefit from additional guidance services, which are available on request. The unskilled and inexperienced may take a general aptitude test battery that measures their abilities, and a vocational interest questionaire that measures their occupational interests. Specific tests in typing and shorthand may also be given.

You may also talk at length with occupational counselors. These counselors, or interviewers, can assist in a wide range of areas. They can help you pinpoint a suitable field of interest, suggest training programs and other means of preparing for a particular occupation, or simply advise you on compiling a resume.

One other aspect of your local office's services deserves particular attention—the occupational registers. Employment service offices often maintain files of resumes of qualified workers in professional, clerical, and craft occupations, for use by employers seeking such workers. Ask to have your resume filed in the appropriate register.

Job Information Service. The Job Information Service (JIS) plays an important role in matching workers and jobs. JIS provides a self-service listing of job openings, as well as a library of occupational and job search literature. Employment service offices in most large cities have a Job Bank as well--a computerized file of job openings, revised and printed out daily. Because it is self-service, the JIS unit is meant for applicants who know what kind of work they are qualified to do. Those applicants can look over Job Bank listings and select the openings they want to apply for. This gives them quick access to job information and frees employment service staff to spend more time with clients who need personal assistance.

The JIS may include the Job Bank Openings Summary (JBOS) and the Job Bank Frequently Listed Openings Report (JOB-FLO). JBOS is a monthly report that provides information on job opportunities listed during the previous month in Job Banks across the Nation. JOB-FLO provides similar information, but focuses on the "high volume" occupations—those with the greatest number of openings. JBOS and JOB-FLO may not help you find a particular opening, but they can describe employment trends in a particular city or pinpoint the cities that have the greatest numbers of openings in a particular occupation.

The JIS also includes a monthly publication, entitled "Occupations in Demand," that reports the number and locations of openings in high-demand occupations during the previous month. It is designed to be easily read by the average jobseeker and can be found in libraries and counseling offices as well as at the employment service.

Special services. Serving people with job market disadvantages is an important function of the employment service, and many local offices have specially trained counselors who advise veterans, youth, handicapped, or older workers.

By law, veterans are entitled to priority in interviewing, counseling, testing, job development, and job placement. Special counselors called veterans reemployment representatives are trained to deal with the particular problems of veterans, many of whom find it difficult to readjust to civilian life. While such veterans often face multiple problems, joblessness alone is a major barrier to resuming an ordinary life. Special help for disabled veterans begins with outreach units in each State, whose job it is to identify jobless disabled veterans and make them aware of the many kinds of assistance available to them.

As part of the effort to reduce excessive youth unemployment, local employment service offices test and counsel young people, and refer them to training programs or jobs whenever possible. These offices also manage summer youth programs. Youthful jobseekers from very poor families receive information on the various kinds of federally funded job programs for young people, including part-time and work-experience projects and the Job Corps.

For people with mental or physical disabilities, the employment service provides assistance in making realistic job choices, and in overcoming problems related to getting and holding jobs. Job openings for handicapped workers are listed as well. Often, these openings are with government contractors and other firms that are making a positive effort to employ handicapped workers.

Older worker specialists in many local employment service offices assist middle-aged and older workers, whose job search generally differs from that of younger workers. Both counseling and placement services are tailored to the unique needs of older workers. Jobseekers over 55 who have very low incomes may be referred to one of the thousands of part-time, community service jobs

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for the elderly funded by the Federal Government.

Private employment agencies. In the appropriate section of the classified ads or the telephone book you can find numerous advertisements for private employment agencies. All are in business to make money, but some offer higher quality service and better chances of successful placement than others.

The three main places in which private agencies advertise are newspaper want ads, the Yellow Pages, and trade journals. Telephone listings give little more than the name, address, phone number, and specialty of the agency, while trade journals only list openings for a particular occupation, such as accountant or computer programmmer. Want ads, then, are the best source of general listings of agencies.

These listings fall into two categories—those offering specific openings and those offering general promise of employment. You should concentrate on the former, using the latter only as a last resort. With a specific opening mentioned in the ad, you have greater assurance of the agency's desire to place qualified individuals in suitable jobs.

When responding to such an ad, you may learn more about the job over the phone. If you are interested, visit the agency, fill out an application, present a resume, and talk with an interviewer. The agency will then arrange an interview with the employer if you are qualified, and perhaps suggest alternative openings if you are not.

Most agencies operate on a commission basis, with the fee contingent upon a successful match. Agencies advertising "no fees, no contracts" are paid by the employer and charge the applicant nothing. Many other agencies, however, do charge their applicants. You should find out before using them exactly what the services will cost you.

Community agencies. A growing number of nonprofit organizations throughout the Nation provide counseling, career development, and job placement services. These agencies generally concentrate on services for a particular labor force group—women, the elderly, youth, minorities, or ex-offenders, for example.

Community employment agencies serve an important function in providing the extensive counseling that many disadvantaged jobseekers require. They often help their clients resolve personal, family, or other fundamental problems that may stand in the way of finding a suitable job. Some agencies provide necessary job training, while others refer their clients to training programs elsewhere. For the most part, these community agencies take a strong active interest in their clients, and provide an array of services designed to help people find and keep jobs.

It's up to you to discover whether there are such agencies in your community—and whether they can help you. The State employment service should be able to tell you whether such an agency has been established in your community. If the local office cannot help, write the State information officer. Your church, synagogue, or local library may have the information, too. The U.S. Department of Labor is another possible source of information, for many of these agencies receive some or all of their funding from the Federal Government, through the Comprehensive Employment and Training Act (CETA). Among its many and varied provisions, CETA authorizes Federal money for local organizations that offer job counseling, training, and placement help to unemployed and disadvantaged persons. For further information, write:

Office of Comprehensive Employment Development, Employment and Training Administration, U.S. Department of Labor, Room 6000, 601 D St. NW., Washington, D.C., 20213; or the Office of Information, Room 10406, at the same address.

Another likely source of information is the U.S. Department of Labor's *Directory for Reaching Minority Groups*. Although the 1973 directory is out of print, a revised edition is being prepared, and will list organizations that provide job information, training, and other services to minorities. For information, write to:

Bureau of Apprenticeship and Training, U.S. Department of Labor, 601 D St. NW., Washington, D.C. 20213.

A directory that lists employment counseling and advocacy organizations for women is available for a nominal charge from:

Wider Opportunities for Women (WOW), 1649 K St. NW., Washington, D.C., 20006.

College career planning and placement offices. For those who have access to them, career planning and placement offices at colleges and universities offer the jobseeker many valuable services. Like the community agencies that serve disadvantaged jobseekers by offering supportive services, college placement offices function as more than just employment agencies. In addition to counseling, they teach students to acquire jobseeking skills. They emphasize writing resumes and letters of application, making a list of possible employers, preparing for interviews, and other aspects of job searching. College placement offices offer other services, too. At larger campuses they bring students and employers together by providing schedules and facilities for interviews with industry recruiters. Many offices also maintain lists of local part-time and temporary jobs, and some have files of summer openings.

Labor Market Information

All State employment security agencies develop detailed labor market data needed by employment and training specialists and educators who plan for local needs. Such information helps policymakers decide whether or not to expand a vocational training program, for example—or drop it altogether. Jobseekers and counselors also may find these studies helpful. Typically, State agencies publish reports that deal with future occupational supply, characteristics of the work force, changes in State and area economic activities, and the employment structure of important industries. For all States, and for nearly all Standard Metropolitan Statistical Areas (SMSA's) of 50,000 inhabitants or more, data are available that show current employment as

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well as estimated future needs. This information is very detailed; generally, each State issues a report covering current and future employment for as many as 200 industries and 400 occupations. In addition, major statistical indicators of labor market activity are released by all of the States on a monthly, quarterly, and annual basis. For information on the various labor market studies, reports, and analyses available in a specific State, contact the chief of research and analysis in the State employment security agency. Titles and addresses are as follows:

Alabama

Chief, Research and Statistics, Department of Industrial Relations, Industrial Relations Bldg., 649 Monroe St., Montgomery, Ala. 36130.

Alaska

Chief, Research and Analysis, Employment Security Division, Department of Labor, P.O. Box 3-7000, Juneau, Alaska 99811.

Arizona

Manager, Labor Market Information, Research and Analysis, Department of Economic Security, P.O. Box 6123, Phoenix, Ariz. 85005.

Arkansas

Chief, Research and Statistics, Employment Security Division, P.O. Box 2981, Little Rock, Ark. 72203.

California

Chief, Employment Data and Research Division, Employment Development Department, 800 Capitol Mall, Sacramento, Calif. 95814.

Colorado

Chief, Research and Analysis, Division of Employment, Department of Labor and Employment, 251 East 12th Ave., Denver, Colo. 80203.

Connecticut

Director, Research and Information, Connecticut Employment Security Division, 200 Folly Brook Blvd., Weatherfield, Conn. 06109.

Delaware

Chief, Office of Research, Planning, and Evaluation, Department of Labor, 801 West 14th St., Wilmington, Del. 19899.

District of Columbia

Chief, Division of Manpower Reports and Analysis, Office of Administration and Management Services, D.C. Department 6f Manpower, 605 G St. NW., Washington, D.C. 20001.

Florida

Director, Research and Statistics, Division of Employment Security, Florida Department of Commerce, 1720 South Gadsden St., Tallahassee, Fla. 32304.

Georgia

Director, Information Systems, Employment Security Agency, Department of Labor, 254 Washington St. SW., Atlanta, Ga. 30334.

Hawaii

Chief, Research and Statistics, Department of Labor and Industrial Relations, 825 Mililani St., Honolulu, Hawaii 96813.

Idaho

Chief, Research and Analysis, Department of Employment, P.O. Box 35, Boise, Idaho 83707.

Illinois

Manager, Research and Analysis Division, Bureau of Employment Security, Department of Labor, 910 South Michigan Ave., Chicago, Ill. 60605.

Indiana

Chief of Research, Employment Security Division, 10 North Senate Ave., Indianapolis, Ind. 46204.

Iowa

Chief, Research and Statistics, Employment Security Commission, 1000 East Grand Ave., Des Monies, Iowa 50319.

Kansas

Chief, Research and Analysis Department, Employment Security Division, Department of Labor, 401 Topeka Ave., Topeka, Kans. 66603.

Kentucky

Director, Research and Special Projects, Department of Human Resources, State Office Building Annex, Frankfort, Ky. 40601.

Louisiana

Acting Chief, Research and Statistics, Department of Employment Security, P.O. Box 44094, Baton Rouge, La. 70804.

Maine

Director, Manpower Research Division, Employment Security Commission, 20 Union St., Augusta, Maine 04330.

Maryland

Acting Director, Research and Analysis, Department of Human Resources, 1100 North Eutaw St., Baltimore, Md. 21201.

Massachusetts

Assistant Director, Research and Information Service, Division of Employment Security, Hurley Bldg., Government Center, Boston, Mass. 02114.

Michigan

Director, Research and Statistics Division, Employment Security Commission, Department of Labor Bldg., 7310 Woodward Ave., Detroit, Mich. 48202.

Minnesota

Director, Research and Planning, Department of Employment Services, 390 North Robert St., St. Paul, Minn. 55101.

Mississippi

Chief, Research and Statistics, Employment Security Commission, P.O. Box 1699, Jackson, Miss. 39205.

Missouri

Chief, Research and Analysis, Division of Employment Security, Department of Labor and Industrial Relations, P.O. Box 59, Jefferson City, Mo. 65101.

Montana

Chief, Research and Analysis, Employment Security Division, P.O. Box 1728, Helena, Mont. 59601.

Nebraska

Chief, Research and Statistics, Division of Employment, Department of Labor, P.O. Box 94600, State House Station, Lincoln, Nebr. 68509.

Nevada

Chief, Manpower Information and Research, Employment Security Department, 500 East Third St., Carson City, Nev. 89701.

New Hampshire

Supervisor, Economic Analysis and Reports, Department of Employment Security, 32 South Main St., Concord, N.H. 03301.

New Jersey

Director, Division of Planning and Research, Department of Labor and Industry, John Fitch Plaza, Trenton, N.J. 08625.

New Mexico

Chief, Research and Statistics, Employment Security Commission, P.O. Box 1928, Albuquerque, N. Mex. 87103.

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New York

Director, Division of Research and Statistics, Department of Labor, 2 World Trade Center, New York, N.Y. 10047.

North Carolina

Manager, Bureau of Employment Security Research, Employment Security Commission, P.O. Box 25903, Raleigh, N.C. 27602.

North Dakota

Chief, Reports and Analysis, Employment Security Bureau, P.O. Box 1537, Bismarck, N. Dak. 58501.

Ohio

Director, Division of Research and Statistics, Bureau of Employment Services, 145 South Front St., Columbus, Ohio 43216.

Oklahoma

Chief, Research and Planning Division, Employment Security Commission, Will Rogers Memorial Office Bldg., Oklahoma City, Okla. 73105.

Oregon

Chief, Research and Statistics, Employment Division, 875 Union St. NE., Salem, Oreg. 97310.

Pennsylvania

Assistant Director, Research and Statistics, Bureau of Employment Security, Department of Labor and Industry, 7th and Forster Sts., Harrisburg, Pa. 17121.

Puerto Rico

Chief of Research and Statistics, Bureau of Employment Security, 427 Barbosa Ave., Hato Rey, P.R. 00917.

Rhode Island

Supervisor, Employment Security Research, Department of Employment Security, 24 Mason St., Providence, R.I. 02903.

South Carolina

Director, Manpower Research and Analysis, Employment Security Commission, 1550 Gadsden St., Columbia, S.C. 29202.

South Dakota

Chief, Research and Statistics, Employment Security Department, 607 North Fourth St., Box 730, Aberdeen, S. Dak. 57401.

Tennessee

Chief, Research and Statistics, Department of Employment Security, 519 Cordell Hull Bldg., Nashville, Tenn. 37219.

Texas

Chief, Manpower Data Analysis and Research, Texas Employment Commission, TEC Bldg., 15th and Congress Ave., Austin, Tex. 78778.

Utah

Director, Reports and Analysis, Department of Employment Security, P.O. Box 11249, Salt Lake City, Utah 84111.

Vermont

Chief, Research and Statistics, Department of Employment Security, P.O. Box 488, Montpelier, Vt. 05602.

Virginia

Chief, Manpower Research, Virginia Employment Commission, P.O. Box 1358, Richmond, Va. 23211.

Washington

Chief, Research and Statistics, Employment Security Department, P.O. Box 367, Olympia, Wash. 98504.

West Virginia

Chief, Research and Statistics, Department of Employment Security, 112 California Ave., Charleston, W. Va. 25305.

Wisconsin

Director, Research and Statistics, Department of Industry, Labor and Human Relations, P.O. Box 2209, Madison, Wis. 53701.

Wyoming

Chief, Research and Analysis, Employment Security Commission, P.O. Box 2760, Casper, Wyo. 82601.

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ASSUMPTIONS AND METHODS USED IN PREPARING EMPLOYMENT PROJECTIONS

Although the discussions of future job prospects contained in the *Handbook* are written in qualitative terms, the analyses upon which they are based begin with quantitative estimates of projected employment, replacement openings, and—in a few cases—supply.

These projections were developed using the most recent data available on population, industry and occupational employment, productivity, consumer expenditures, and other factors expected to affect employment. The Bureau's research offices provided much of these data, but many other agencies of the Federal Government were important contributors, including the Bureau of Apprenticeship and Training and the U.S. Employment Service, both in the Employment and Training Administration of the Department of Labor; the Bureau of the Census of the Department of Commerce; the Office of Education and the Rehabilitation Services Administration of the Department of Health, Education, and Welfare; the Veterans Administration; the Civil Service Commission; the Interstate Commerce Commission; the Civil Aeronautics Board; the Federal Communications Commission; the Department of Transportation; and the National Science Foundation.

In addition, experts in industry, unions, professional societies, and trade associations furnished data and supplied information through interviews. Many of these individuals also reviewed preliminary drafts of the statements. The information presented in each statement thus reflects the knowledge and judgment not only of the Bureau of Labor Statistics staff, but also of leaders in the fields discussed, although the Bureau, of course, takes full responsibility.

After the information from these sources was compiled, it was analyzed in conjunction with the Bureau's model of the economy in 1985. Like other models used in economic forecasting, it encompasses the major facets of the economy and represents a comprehensive view of its projected structure. The Bureau's model is comprised of internally consistent projections of gross national product (GNP) and its components—consumer expenditures, business investment, government expenditures, and net exports; industrial output and productivity; labor force; average weekly hours of work; and employment for detailed industry groups and occupations. The methods used to develop the employment projections in this edition of the *Handbook* are the same as those used in other Bureau of Labor Statistics studies of the economy. Detailed descriptions of these methods appear in *The U.S. Economy in 1985*, BLS Bulletin 1809, and the *BLS Handbook of Methods for Surveys and Studies*, Bulletin 1910.

Assumptions. The Bureau's projections to 1985 are based on the following general assumptions:

—The institutional framework of the U.S. economy will not change radically.

—Current social, technological, and scientific trends will continue, including values placed on work, education, income, and leisure.

—The economy will gradually recover from the high unemployment levels of the mid-1970's and reach full employment (defined as an unemployment rate of 4 percent) in the mid-1980's.

—No major event such as widespread or long-lasting energy shortages or war will significantly alter the industrial structure of the economy or alter the rate of economic growth.

—Trends in the occupational structure of industries will not be altered radically by changes in relative wages, technological changes, or other factors.

Methods. Beginning with population projections by age and sex developed by the Bureau of the Census, a projection of the total labor force is derived using expected labor force participation rates for each of these groups. In developing the participation rates, the Bureau takes into account a variety of factors that affect a person's decision to enter the labor force, such as school attendance, retirement practices, and family responsibilities.

The labor force projection then is translated into the level of GNP that would be produced by a fully employed labor force. Unemployed persons are subtracted from the labor force estimate and the result is multiplied by a projection of output per worker. The estimates of future output per worker are based on an analysis of trends in productivity (output per work hour) among industries and changes in the average weekly hours of work.

Next, the projection of GNP is divided among its major components: Consumer expenditures, business investment, government expenditures—Federal, State, and local—and net exports. Each of these components is broken down by producing industry. Thus, consumer expenditures, for example, are divided among industries producing goods and services such as housing, food, automobiles, medical care, and education.

Once estimates are developed for these products and services, they are translated into detailed projections of industry output, not only for the industries producing the final product, but also for the intermediate and basic industries that provide the raw materials, electric power, transportation, component parts, and other inputs required in the production process. To facilitate this translation, the

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Department of Commerce has developed input-output tables that indicate the amount of output from each industry—steel, glass, plastics, etc.—that is required to produce a final product, automobiles for example.

By using estimates of future output per work-hour based on studies of productivity and technological trends for each industry, industry employment projections are derived from the output estimates.

These projections are then compared with employment projections derived using regression analysis. This analysis develops equations that relate employment by industry to combinations of economic variables, such as population and income, that are considered determinants of long-run changes in employment. By comparing projections resulting from input-output analysis and regression analysis, areas may be identified where one method produces a projection inconsistent with past trends or with the Bureau's economic model. The projections are then adjusted accordingly.

Occupational employment projections. Projections of industry employment are translated into occupational employment projections using an industry-occupation matrix. This matrix, which is divided into 200 industry sectors and 400 occupation sectors, describes the current and projected occupational structure of each industry. By applying the projected occupational structure for each industry to the industry employment projection and aggregating the resulting estimates, employment projections for each of the 400 occupations contained in the matrix are obtained. The growth rate of an occupation, thus, is determined by 1) changes in the proportion of workers in the occupation to the total work force in each industry, and 2) the growth rate of industries in which an occupation is concentrated. An occupation that is projected to increase as a proportion of the work force in each industry, for example, or one that is concentrated in industries projected to grow more rapidly than the average for all industries, would be projected to grow faster than the average for all occupations.

In some cases employment is related directly to one of the components of the Bureau's model--for example, the number of cosmetologists is related to consumer expenditures for beauty shop services. In others, employment is related to an independent variable not explicitly projected in the model, but believed to be a primary determinant of employment in that occupation. The projection of automobile mechanics, for example, is based on the expected stock of motor vehicles. Projections that are developed independently are compared with those in the matrix and revised, if necessary, to assure consistency.

Replacement needs. In addition to a projection of employment for each occupation, a projection is made of the number of workers who will be needed as replacements. Separations constitute a significant source of openings. In most occupations, more workers are needed to replace those who retire, die, or leave the occupation than are needed to fill jobs created by growth. Consequently, even some declining occupations offer employment opportunities.

To estimate replacement openings, the Bureau has developed tables of working life based on actuarial experience for deaths and on decennial census data for general patterns of labor force participation by age and sex. Withdrawals from each occupation are calculated separately for men and women by age group and used to compute an overall separation rate for the occupation. These rates are used to estimate average annual replacement needs for each occupation over the projection period.

The Bureau is currently analyzing data from the 1970 Census to determine the effect of occupational transfers on job openings. These transfers have not been taken into account in calculating replacement needs. Some data on occupational transfers have been published in two *Monthly Labor Review* articles, "Occupational Mobility in the American Labor Force" and "Occupational Mobility of Health Workers," January and May 1977, respectively.

Supply. Supply estimates used in analysis of certain *Handbook* occupations represent the numbers of workers who are likely to seek entry to a particular occupation if past trends of entry to the occupation continue. These estimates are developed independently of the demand estimates. Thus, supply and demand are not discussed in the usual economic sense in which wages play a major role in equating supply and demand. Statistics on college enrollments and graduations by field are the chief sources of information on the potential supply of personnel in professional, technical, and other occupations requiring extensive formal education. Data on persons completing apprenticeship programs provide some information on new entrants into skilled trades. A Bureau publication, *Occupational Supply: Concepts and Sources of Data for Manpower Analysis* (BLS Bulletin 1816, 1974), explores several aspects of occupational supply.

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TOMORROW'S JOBS

Early in human history, people entered occupations by simply following their parents into one of the relatively few occupations that existed. Boys became farmers, shepherds, priests, artisans, or traders. Girls generally became housewives, helping their husbands in their work, but having no paid occupations. Not until the Industrial Revolution did the number of possible choices begin to expand.

But as the choices have increased, so has the difficulty of making a decision. Today there are thousands of occupations—the newest *Dictionary of Occupational Titles* lists 20,000 separate titles—and a variety of education and training programs from which to choose. Many questions must be considered: What fields match one's interests and abilities? What types of education and training are required to enter particular jobs? What fields are expected to offer good prospects for employment? How do earnings compare among occupations requiring similar training? What types of employers provide which kinds of jobs? Does a particular job offer steady, year-round employment or is it affected by minor swings in the economy?

The answers to these questions change as our economy changes. Current information therefore is a necessity. While the individual occupation and industry chapters in the *Handbook* answer most of the questions raised here, two areas of particular concern, to educators and vocational planners as well as to individuals who are choosing their careers, require a broader perspective. One concerns employment projections, the other, the relationship between job prospects and education. This section focuses on these two aspects of choosing a career.

Employment Projections in a Changing Economy

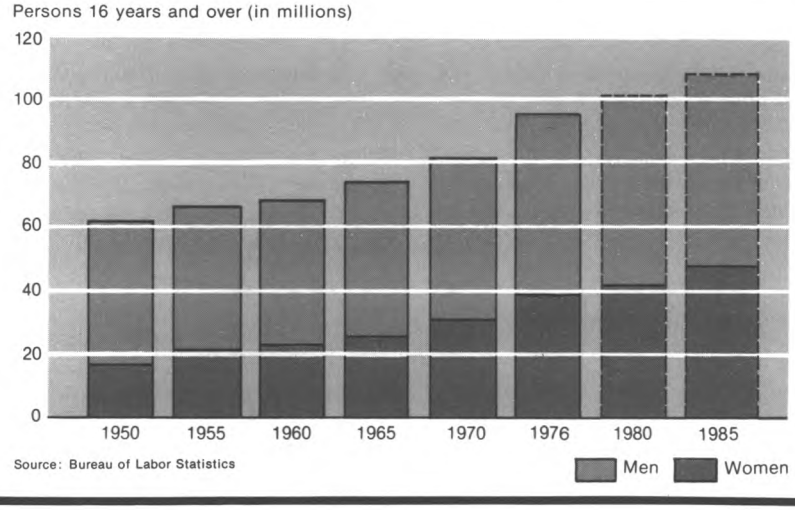
The demand for workers in any occupation depends ultimately on the tastes and desires of consumers. If a product or service is unwanted, whether by private or public purchasers, no workers will be needed to produce or provide it. Barbers would become unnecessary if people decided to cut their own hair, as would astronauts if the Federal Government abandoned its space program.

Closely interwoven with the demand for products or services is technological innovation. In the 20th century, technology has both created and eliminated hundreds of thousands of jobs. The telephone, for example, gave birth to an entire industry at about the same time that the automobile put stable owners and carriage manufacturers out of business. Changes in the way businesses are organized and managed have had similar effects; the rise of supermarket chains has drastically reduced the number of self-employed grocers.

Fortunately, most of the factors that alter the demand for workers in various occupations do not change overnight. Shifts in the state of the economy, the introduction of new technology, and the development of new organization and management techniques generally occur in an orderly, fairly predictable fashion. Although no one can forecast the future with certainty, it is possible to make industry and occupation employment projections that are useful to educators, vocational planners, and individuals who are planning their careers. The economic and statistical analysis used by the Bureau of Labor Statistics to develop its projections is described in some detail in a separate introductory section.

In 1985, approximately 104.3 million persons will be in the civilian labor force. This is an 19-percent increase over the 1976 level of 87.5 million. As shown in chart 1, the size of the civilian labor force increased sharply after 1960, largely due to the increase in the number of women en-

Civilian labor force growth, 1950-76 and projected 1980 and 1985 **1**



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The percent of women who are in the labor force has been increasing, while the percent of men has been declining **2**



Source: Bureau of Labor Statistics

tering the labor market. The labor force participation rate for women has continued to rise even while the rate for men has declined. (See chart 2.)

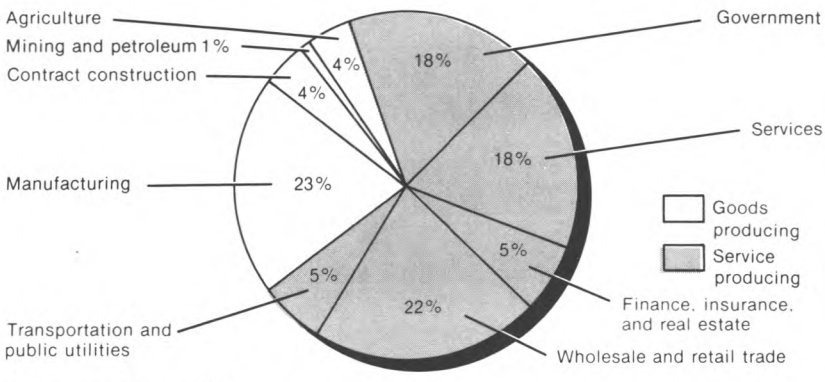
Industrial Profile

Economists customarily divide our economy into nine industry categories under two broad groups—goods producing and service producing. Most of the Nation's workers currently are employed in industries that provide services, such as education, health care, trade, repair and maintenance, government, transportation, banking, and insurance. The production of goods through farming, construction, mining, and manufacturing requires only about one-third of the country's work force. (See chart 3.)

As shown in chart 4, employment in the goods-producing industries has remained relatively constant since World War II, whereas the service-producing industries have expanded rapidly. Among the factors contributing to this rapid growth were the migration from rural to urban areas and the accompanying need for more local government services, and rising incomes and living standards that resulted in a demand for improved health and education services. These factors are expected to continue to cause the demand for services to grow.

Where people work, 1976 **3**

Wage and salary workers except agriculture, which includes self-employed and unpaid family workers



Source: Bureau of Labor Statistics

Service-Producing Industries. Employment in the service-producing industries is expected to increase from 56.1 million workers in 1976 to 71.0 million in 1985, an increase of 26 percent. Of course, growth rates will vary among the industries within this group. (See chart 5.)

Trade, the largest of the service industries, is expected to grow by about 20 percent between 1976 and 1985, from 17.7 million to 21.3 million workers.

Both wholesale and retail trade have increased as population has grown and as rising incomes have enabled people to buy a greater number and variety of goods. Retail trade has grown more rapidly than wholesale trade as the expansion of the suburbs has created a demand for more shopping centers. Although self-service is expected to become more prevalent, employment in retail trade nonetheless will continue to grow faster than in wholesale trade.

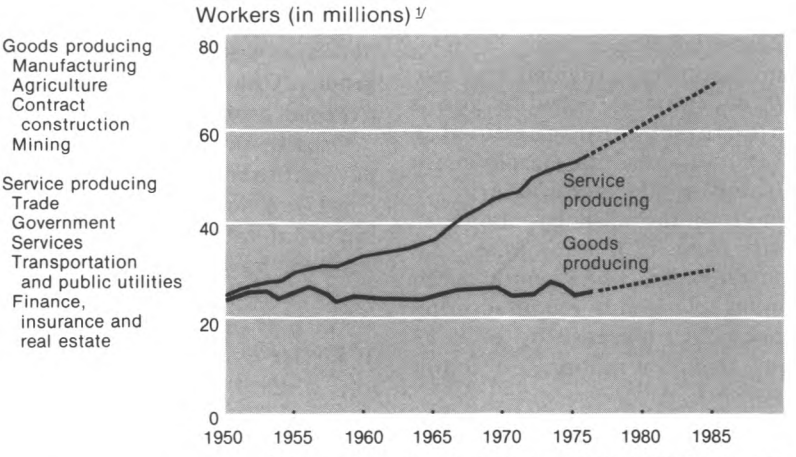
Government has been the second fastest growing service industry. Employment in State and local governments doubled between 1960 and 1976. Growth has been greatest in agencies providing education, health, sanitation, welfare, and police and fire protection. Federal Government employment has increased only 20 percent during the same period.

Between 1976 and 1985, employment in government is expected to rise 22 percent, from 14.9 million to 18.3 million workers. This growth rate is less than that expected for services as a whole. Although State and local governments will continue to be the major source of jobs, the budget problems many local governments now face are expected to retard the expansion of some government programs.

Service industries have been the fastest growing group in the service-producing category, nearly doubling in employment between 1960 and 1976. The growing need for health

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Industries providing services offer more jobs than those providing goods 4



1/ Wage and salary workers, except agriculture, which includes self-employed and unpaid family workers.

Source: Bureau of Labor Statistics

care, maintenance and repair, advertising, and commercial cleaning services has been the primary force behind this growth.

In the future, service industries are expected to continue their rapid growth—employment is projected to increase from 14.6 million workers in 1976 to 20.6 million in 1985. This projected growth rate of 40 percent is nearly twice as rapid as that of the service-producing industries as a group. Employment requirements in health care are expected to grow rapidly due to population growth—in particular the growth in the number of elderly persons—and rising incomes that increase people's ability to pay for medical care. Business services, including accounting, data processing, and maintenance, also are expected to grow rapidly.

Transportation and public utility industries experienced a much slower growth rate between 1960 and 1976 than any of the other service-producing industries. This has largely been due to employment declines in the railroad and water transportation industries.

Although employment in the railroad and water transportation industries is expected to continue to decline (but at a slower rate than before), other industries in this group will experience increases. The air transportation industry, which nearly doubled in size between 1960 and 1976, will continue to grow at a moderate pace.

Between 1976 and 1985, employment in transportation and public utilities industries is expected to rise from 4.5 million to 5.2 million workers, an increase of 16 percent.

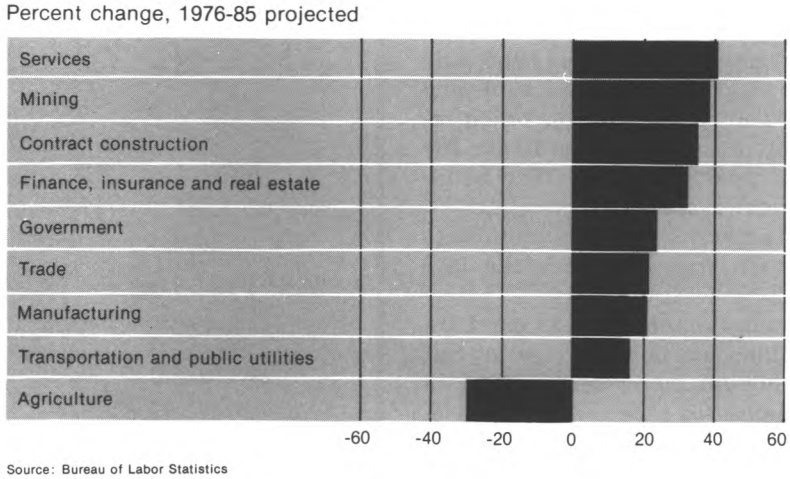
Finance, insurance, and real estate will grow faster than services as a whole. Employment is expected to increase from 4.3 million to 5.6 million workers between 1976 and 1985, an increase of 30 percent.

Within this group, the two fastest growing industries have been banking and credit agencies. Employment in banking nearly doubled between 1960 and 1976, reflecting a growing population that increasingly pays its bills by check. Employment requirements also grew as banks began to provide more services, particularly the bank credit cards, and remained open longer hours. Population growth also meant an increased demand for the services of finance companies, savings and loan associations, and other credit agencies. These trends are expected to continue through the mid-1980's.

Goods-Producing Industries. Employment in the goods-producing industries—agriculture, mining, construction, and manufacturing—has changed very little since 1960. Significant gains in productivity resulting from automated production, improved machinery, and other technological breakthroughs have permitted large increases in output without additional workers. Between 1976 and 1985, employment in goods-producing industries is expected to increase by about 17 percent, from 26.6 million to 31.1 million workers.

Growth rates will vary from industry to industry within this group. Employment in *agriculture*, which has long been declining, stabilized at about 3.5 million workers between

Through the mid-1980's employment growth will vary widely by industry 5



Source: Bureau of Labor Statistics

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1970 and 1975, but dropped again to 3.3 million in 1976. Since the 1950's, the trend toward fewer but larger farms and the use of more and better machinery has reduced the need for farmers and farmworkers. So too has the development of improved hybrid crops. Recently, for example, a hybrid tomato was developed that has a harder skin and can be machine harvested.

Although employment on farms has declined, rapid mechanization combined with better fertilizers, feeds, pesticides, and hybrids have created large increases in output. The worldwide demand for food is rising rapidly as population increases, but production is expected to continue to rise without reversing the employment decline in agriculture. Between 1976 and 1985, employment is expected to drop about 29 percent, from 3.3 million to 2.3 million workers.

Mining, once declining in employment, increased abruptly between 1970 and 1976, experiencing a 26-percent growth rate during this period and matching the growth rate of the fastest growing industry group, services. Most of this growth was a direct result of our need for additional energy. Employment in the oil and gas extraction industry rose 33 percent between 1970 and 1976, and is expected to rise another 70 percent by 1985. Coal, the most commonly used alternative energy source, has been and will continue to be in great demand.

Employment in mining is expected to grow 39 percent between 1976 and 1985, from 0.8 to 1.1 million workers.

Contract construction, which grew fairly rapidly between 1960 and 1968, stagnated between 1968 and 1976. The earlier growth, which reflected an increasing need for houses, apartment and office buildings, highways, and shopping centers, was dampened by the economic downturn that began in the late 1960's.

Buildings that had been vacant are now filling up, however, and as our economy recovers, employment in construction is expected to increase, rising by 38 percent between 1976 and 1985, or from 3.6 million to 4.9 million workers.

Manufacturing employment, also adversely affected by the economic conditions of the early 1970's, is expected to grow from 18.9 million to 22.8 million between 1976 and 1985, an increase of 20 percent.

Manufacturing is divided into two broad categories, durable goods manufacturing and nondurable goods manufacturing. Employment in durable goods manufacturing is expected to increase by about 25 percent, from 11.0 million to 13.8 million workers, while employment in nondurable goods manufacturing is expected to increase by only 13 percent, from 7.9 million to 9.0 million workers.

Growth rates will vary among individual industries within each of these categories. In nondurable goods industries, for example, employment in tobacco manufacturing is expected to decline, while a moderate rise in employment is projected for the synthetic fiber industry. Among durable goods manufacturing industries, medical instrument manufacturing is expected to undergo a rapid employment increase; motor vehicle manufacturing will employ about the same number of workers in 1985 as it did in 1976.

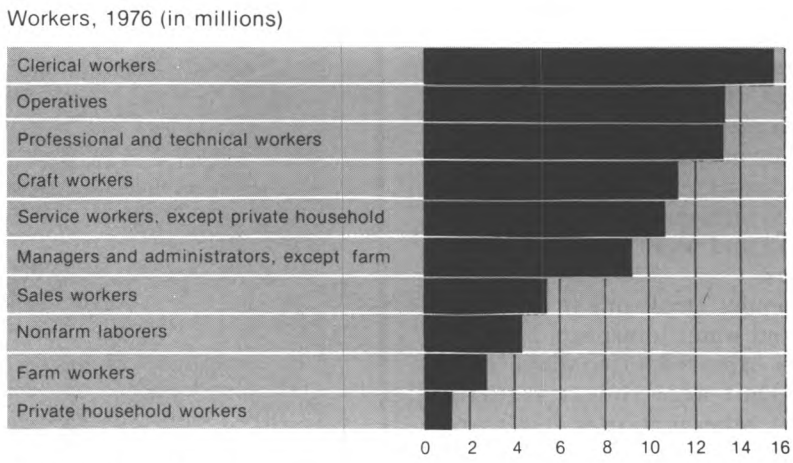
Occupational Profile

Customarily, occupations also are divided into several groups. White-collar workers are those in professional and technical, clerical, sales, and managerial jobs. Blue-collar workers are those in craft, operative, and laborer jobs. Service workers and farm workers constitute separate groups. Chart 6 illustrates the occupational profile in 1976.

Growth rates among these groups have differed markedly, as shown in chart 7. Once a small proportion of the total labor force, white-collar workers have steadily increased in importance until they now represent about half of the total. The number of service workers also has risen rapidly, while the blue-collar work force has grown only slowly and the number of farmworkers has declined.

Most of these changes in occupational employment have been due to variations in the growth rates of industries. Every industry group has a unique occupational pattern. (See chart 8.) Construction, for example, employs mostly blue-collar workers, while finance, insurance, and real estate is predominantly a white-collar industry group. Growth in the construction industry would result in an increase in employment of blue-collar workers. The same would be true for growth in mining, manufacturing, or transportation—industries that also employ mostly blue-collar workers. The magnitude of the change

Employment in major occupational groups **6**

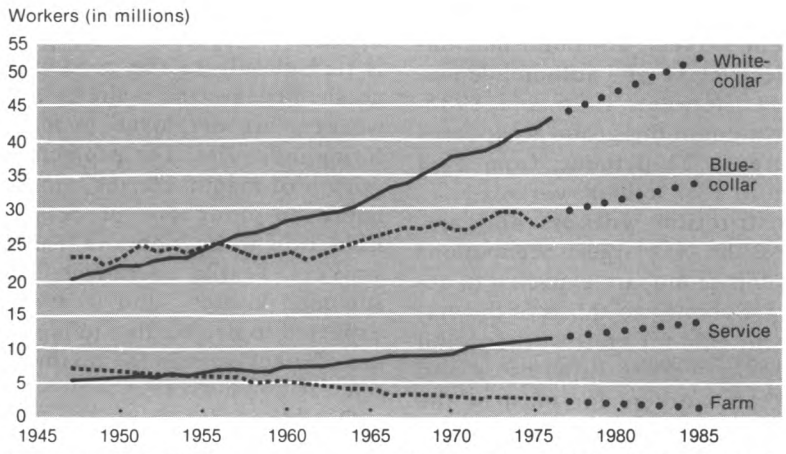


Source: Bureau of Labor Statistics

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The shift toward white-collar occupations will continue through 1985

7



Source: Bureau of Labor Statistics

Note: 14- and 15- year olds are included prior to 1958 only.

would depend on both the rate of growth and the size of the industry.

The following sections describe the changes that are expected to occur among the broad occupational groups between 1976 and 1985. (See also chart 9.)

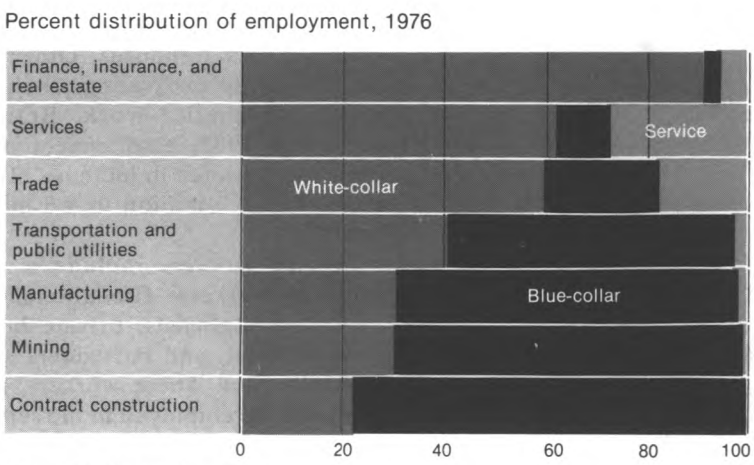
Professional and technical workers include a wide range of workers, many of them highly trained. Among this group are scientists and engineers, medical practitioners, teachers, entertainers, pilots, and accountants. Employment in this group is expected to grow by about 18 percent between 1976 and 1985, rising from 13.3 million to 15.8 million workers.

Greater efforts in energy production, transportation, and environmental protection will contribute to a growing demand for scientists, engineers, and technicians. The medical professions can be expected to grow as the health services industry expands. The demand for professional workers to develop and utilize computer resources also is projected to grow rapidly.

Some occupations will offer less favorable job prospects, in many cases because the supply of workers exceeds the available openings. Teachers will continue to face competition, as will artists and entertainers, airline pilots, and oceanographers.

Industries differ in the kinds of workers they employ

8



Source: Bureau of Labor Statistics

Managers and administrators include workers such as corporate executives, school and health services administrators, department store managers, and self-employed business operators. This group is expected to grow from 9.3 million to 11.3 million workers, an increase of 21 percent. The rapidly expanding service industries are expected to offer more jobs for managers than the slowly growing manufacturing industries.

Changes in business size and organization have resulted in differing trends for self-employed and salaried managers. The number of self-employed managers will continue to decline as many areas of business are increasingly dominated by large corporations and chain operations. Some kinds of small businesses, such as quick-service groceries and fast-food restaurants, still will provide opportunities for self-employment, however. The demand for salaried managers will continue to grow rapidly as firms increasingly depend on trained management specialists, particularly in highly technical areas of operation.

Clerical workers constitute both the largest and the fastest growing occupational group. Employment in these occupations is expected to grow about 29 percent between 1976 and 1985, rising from 15.6 million to 20.0 million workers.

New developments in computers, office machines, and dictating equipment will greatly affect employment in many occupations within this group. As computers are used more extensively to store information and perform billing, payroll, and other calculations, employment of file clerks and many types of office machine operators will level off or decline. At the same time, however, the need for computer and peripheral equipment operators will increase. Dictation machines, which have sharply reduced the need for stenographers, will continue to adversely

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affect employment prospects for workers in this occupation. The sole exception will be stenographers who are trained as court reporters.

Many types of clerical workers, however, will not be affected by technological innovations because their jobs involve a high degree of personal contact. Substantial growth is anticipated for secretaries, typists, and receptionists, largely as a result of growth in the expanding business services and medical and health care services industries. Counter and fountain workers also are expected to increase as the restaurant industry grows.

Sales workers are employed primarily by retail stores, manufacturing and wholesale firms, insurance companies, and real estate agencies. Employment of this group is expected to grow from 5.5 million to 6.4 million workers, an increase of 17 percent.

Much of the growth of sales workers will be due to expansion in the retail trade industry, which employs about one-half of these workers. The demand for both full- and part-time sales workers in retail trade is expected to increase as our growing population requires an increasing number of shopping centers and stores. Despite the widespread use of laborsaving merchandising techniques, such as self-service and computerized checkout counters, suburban expansion and longer operating hours will cause employment to increase.

Craft workers include a wide variety of highly skilled workers, such as carpenters, tool-and-die makers, instrument makers, all-round machinists, electricians, and automobile mechanics. Between 1976 and 1985, employment of this group is expected to increase 22 percent, from 11.3 million to 13.7 million workers.

Construction workers and mechanics, the two largest occupations within this group, are expected to account for about two-thirds of the employment gain for craft workers, and blue-collar worker supervisors and metalcraft workers for most of the remainder.

Nearly all construction trades are expected to grow, but particularly rapid increases are anticipated for heavy equipment operators, plumbers, ironworkers, roofers, and cement masons. Among mechanics and repairers, the most rapid increases will be for workers who repair computers, office machines, air conditioners, and industrial machinery.

In contrast, a continuation of the long-run employment decline in the railroad industry will lead to the decline of some craft occupations concentrated in that industry, such as railroad and car shop repairers. Because of advances in printing technology, very little growth is anticipated in printing crafts.

Operatives are the largest blue-collar group, including workers such as assemblers, packers, truck and bus drivers, and many types of machine operators. Employment of operatives is tied closely to the production of goods, because the majority of these workers are employed in manufacturing industries. The projected slow growth of manufacturing, along with improved production processes, will hold down the demand for these workers. Textile operatives, such as spinners, knitters, and weavers, are expected to decline due to increasing use of machinery in the textile industry.

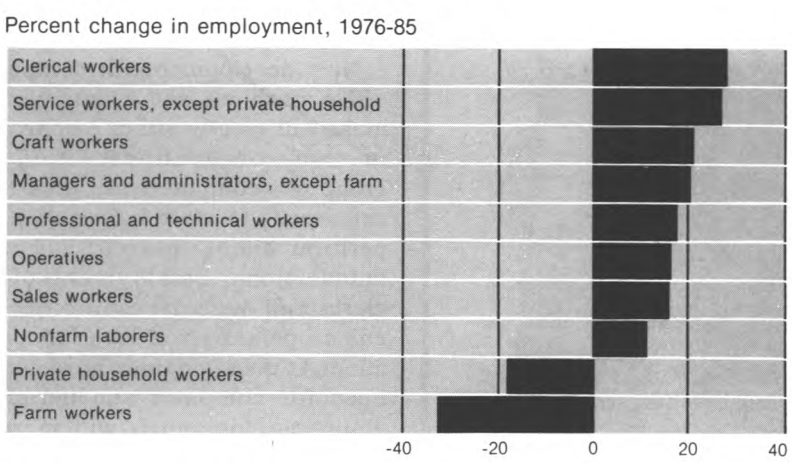
Outside of manufacturing, employment of most transportation operatives, such as truckdrivers and bus drivers, will increase as the transportation industry grows. An exception will be brake and switch operators; these occupations are expected to decline along with the railroad industry.

Employment of operatives is expected to rise from 13.4 million to 15.6 million workers between 1976 and 1985, an increase of 17 percent.

Laborers, (except farm) include workers such as garbage collectors, construction laborers, freight and stock handlers, and equipment washers. Employment in this group is expected to grow only slowly as machinery increasingly replaces manual labor in construction and manufacturing, the two largest employers of these workers. Power-driven equipment, such as forklift trucks, cranes, and hoists, will handle more and more material in factories, loading docks, and warehouses. Other machines will do excavating, ditch digging, and similar work. Between 1976 and 1985, employment of laborers is expected to increase 11 percent, from 4.3 million to 4.8 million workers.

Service workers include a wide range of workers—firefighters, janitors, cosmetologists, private household workers, and bartenders are a few examples. These workers, most of whom are employed in the service-producing industries, make up one of the fastest growing occupational groups.

Through the mid-1980's employment growth will vary widely among occupational groups **9**



Source: Bureau of Labor Statistics

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Some of the main factors that are expected to increase the need for these workers are the rising demand for medical care; the greater need for commercial cleaning and protective services; and the more frequent use of restaurants, beauty salons, and leisure services as incomes rise. The employment of private household workers, however, will continue to decline despite a rising demand for their services, because low wages and the strenuous nature of the work make this occupation unattactive to many people.

Employment of service workers is expected to increase 23 percent between 1976 and 1985, from 12.0 million to 14.8 million workers.

Farm workers include farmers and farm operators, as well as farm laborers. Employment of these workers has declined for decades as farm productivity has increased as a result of the trend toward fewer but larger farms, the use of more and better machinery, and the development of new feeds, fertilizers, and pesticides. Between 1976 and 1985, the number of farmworkers is expected to decline 34 percent, from 2.8 million to 1.9 million workers.

Job Openings

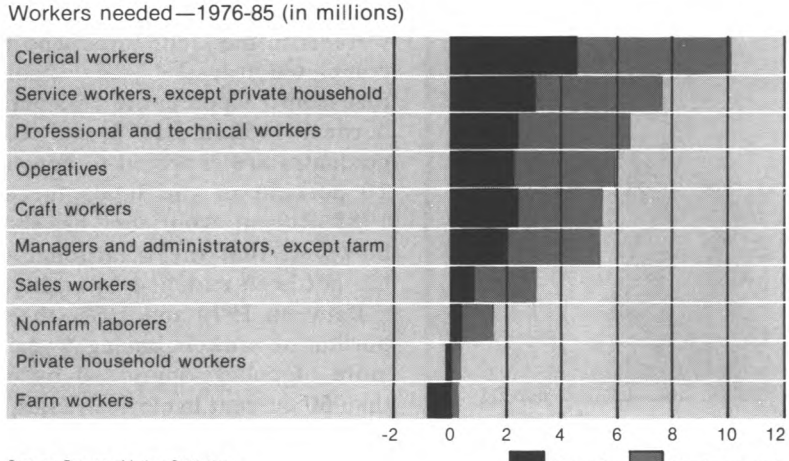
The rate of employment growth in an occupation is only one indicator of future job prospects; another indicator is the total number of job openings expected in the occupation. The total includes not only openings resulting from employment growth, but also those resulting from labor force separations (retirements and deaths) and transfers to other occupations.

Between 1976 and 1985, retirements and deaths alone are expected to account for nearly two-thirds of all job openings. (See chart 10.) The need to replace workers who retire or die will be a more significant source of job openings than employment growth in every major occupational group, and in most individual occupations.

Furthermore, a large occupation that is growing slowly may offer more openings than a fast-growing small one. For example, among the major occupational groups, total openings for operatives will exceed total openings for craft workers, despite the fact that employment of craft workers is expected to grow at a faster rate.

Many job openings also are created because of occupational transfers. When a technician is upgraded to an engineer, for example, a job opening for a technician is created. Of course, this shift also adds to the supply of engineers. Data for estimating occupational losses and gains resulting from transfers are not yet available, but work is continuing towards the development of such data.

Job openings are determined by replacement plus growth **10**



Source: Bureau of Labor Statistics

Education and Employment

A high school diploma by itself is not sufficient preparation for many occupations. But neither is a college degree. Different fields of work require different types of training. Just as there are occupations that require college degrees, so too there are occupations for which technical training, work experience, or training in a particular skill is the most important entry requirement. Employers always wish to hire the best qualified persons available, but this does not mean that they always choose those applicants who have the most education. The type of education and training an individual has had is as important as the amount. For this reason, a vital part of the career planning process is deciding what type as well as how much education and training to pursue.

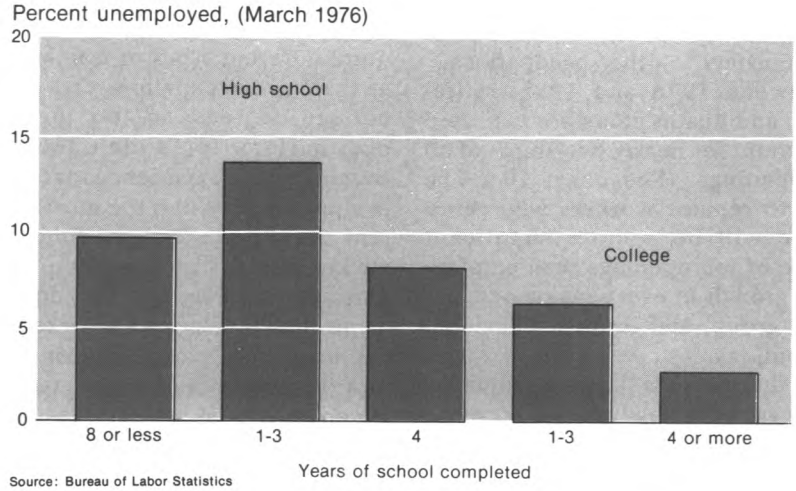
Persons who have definite career goals may not find this decision difficult. Many occupations have specific education requirements. Physicians, for example, must generally complete at least 3 years of college, 4 years of medical school, and in most States 1 year of residency. Cosmetologists are required to complete a State-approved cosmetology course that generally lasts 18 months.

But for most people, the decision is more difficult. Either they have yet to choose a field of work, or the field they have selected may be entered in a variety of ways. Some may know only that they want jobs that provide status and large incomes, for example. Or, an individual may wish to be an auto mechanic but cannot decide whether to leave high school and learn on the job, or graduate and attend a vocational school, or seek an apprenticeship.

Making this type of decision requires specific information about the types of education and training preferred for various occupations, and a knowledge of one's own abilities and aspirations. Information on how to enter each of the occupations included in the *Handbook* is contained in the individual occupational statements, but general information on the relationship of employment prospects to education also is useful.

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The unemployment rate is lowest for persons with a college education 11

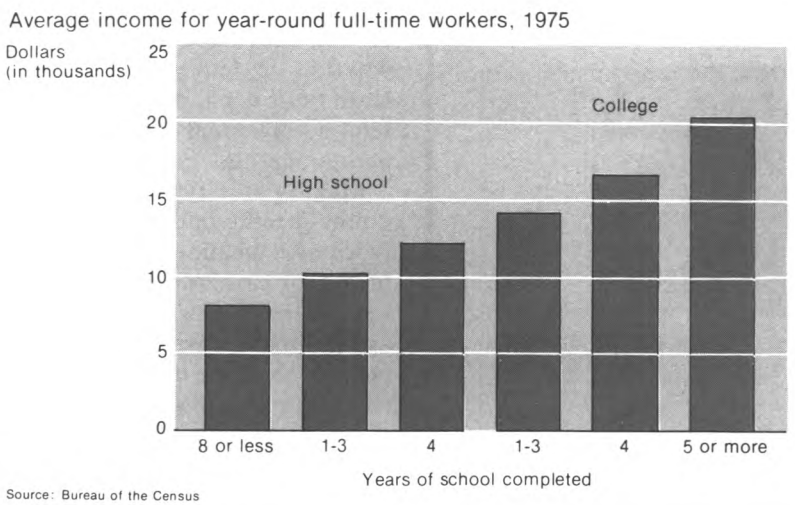


Source: Bureau of Labor Statistics

Persons contemplating dropping out of high school should recognize that a high school education has become standard. The educational attainment of the labor force has risen from 10.9 years of school in 1952 to 12.6 in 1976. Thus, nongraduates are likely to be at a serious disadvantage when seeking jobs that offer better pay or advancement opportunities, unless they have participated in a training program specific to the occupation they wish to enter. As shown in chart 11, the unemployment rate is much higher for persons who did not finish high school than for those who did.

For many individuals, the decision they face is whether to extend their education beyond high school by going to college or by pursuing some other postsecondary education or training program. Looking again at chart 11, for individuals who have graduated from high school, the unemployment rate drops steadily as the amount of education completed increases. In addition, as chart 12 shows, average yearly income rises with the number of years of school completed. In 1975, college graduates, on the average, earned over one-third more than high school graduates, while persons with 5 years or more of college earned one-fifth more than those with 4 years of college.

Income increases as the number of years of schooling increases 12



Source: Bureau of the Census

Although college graduates do earn more, on the average, than high school graduates, there are numerous well-paying occupations that do not require a college degree. Workers in the construction crafts and in mechanic and repairer occupations, for example, generally are high school graduates, yet many earn more than workers in some jobs that require a college degree. In fact, earnings in many occupations not requiring college degrees have increased faster than earnings in occupations that do require a degree. Chart 13 shows how much the difference between the earnings of high school graduates and college graduates has narrowed.

Although data are not available on the earnings of high school graduates who have completed other postsecondary education programs, it is likely that most of those who earn relatively high incomes have obtained some type of additonal education or training.

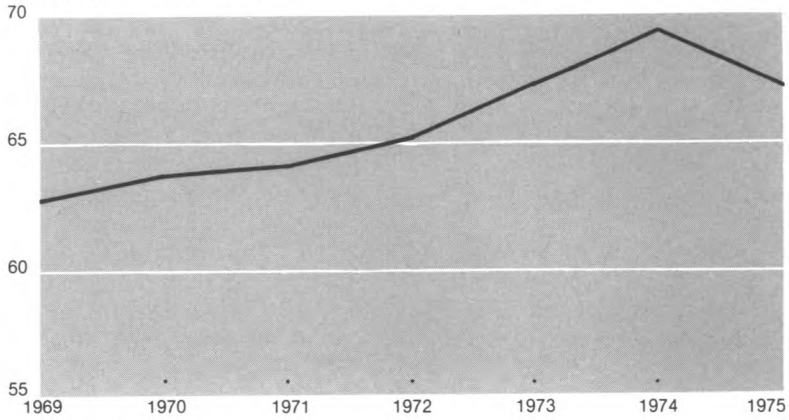
Traditionally, a college education has been viewed as a gateway to better pay, higher status, and more challenging work. As the opportunity to obtain a college education has become more widespread, more high school graduates have attended college. Accordingly, the proportion of workers in the labor force who have completed at least 4 years of college rose from 7.9 percent to 16.5 percent between 1952 and 1976, and college graduates are expected to constitute 20 percent of the labor force by 1985. Recent experience has shown, however, that the traditional view has not been matched by reality.

Between 1970 and 1976, the proportion of workers having 4 years or more of college increased by more than 60 percent in clerical, sales, service, and blue-collar occupations—areas that have employed very few college graduates in the past. This

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Earnings of high school graduates have increased relative to earnings of college graduates **13**

Earnings of high school graduates as a percent of earnings of college graduates, 1969-75



Source: Bureau of the Census

"spillover" reflects, at least in part, the economic conditions of the 1970-75 period. Cutbacks in the aerospace industry and the recession of 1970-71, followed by an oil embargo in 1972-73 and recession in 1974-75, dampened the economy's growth during the first half of this decade.

Analysis of the future demand for college graduates, and of future supply, indicates that more students are expected to graduate, and more persons currently holding degrees are expected to reenter the labor force, than will be needed to fill jobs that currently demand a college degree.

Prospects are no brighter for many individuals who hold advanced degrees. Colleges and universities, the primary employers of this group, have been faced with declining enrollments and budget cuts in recent years. Their need for teaching and research staff is not expected to grow as rapidly as the number of graduates seeking these positons. Except for persons whose degrees are in areas demanded by business and industry, advanced degree holders may have to take jobs that once went only to graduates who had bachelor's degrees.

Not all occupations requiring college degrees will be overcrowded, however. Nor will there be a lack of demand for graduates of other postsecondary education programs. Many of the occupations that have grown most rapidly or have provided large numbers of job openings have required vocational, apprenticeship, or junior college education. Science and health technicians have been increasingly in demand, as have television and radio service technicians, data processing machine repairers, and air-conditioning mechanics. Technological advances, in particular the computer, have made many office jobs more complicated, thus requiring people who hold these jobs to have a higher level of skill.

Persons wishing to enter these and other occupations have found postsecondary training helpful because employers prefer to hire applicants who have had training in these areas, rather than provide such training themselves. Over the past 10 years, enrollments in public vocational schools, for example, have tripled, while the number of persons registered in apprenticeship programs has jumped 40 percent.

The demand for workers in these and other occupations requiring technical, vocational, or apprenticeship training is expected to continue to rise through the mid-1980's.

The need for workers who have some type of postsecondary training definitely is expanding. But the decision to go to college is an individual matter. Persons who choose occupations that require college degrees should not necessarily be discouraged from pursuing careers that they believe match their interests and abilities. They may wish, however, to acquire more information on the employment outlook for their fields, and to retain the option of switching to related occupations that offer better opportunities. The introductory section of the *Occupational Outlook Handbook for College Graduates* contains a detailed discussion of the job prospects for college graduates.

Individuals who have less clear-cut occupational goals may wish to review their reasons for going to college. College can provide many valuable opportunities for personal growth and self-discovery, as well as the chance to increase one's knowledge of particular subject areas. Attending college for personal reasons alone can be worthwhile, but a student solely interested in career preparation may find alternative types of education and training programs more appropriate—either as an addition to or as a substitute for college attendance.

Whatever one's goals and aspirations, beginning the planning process early allows students time to consider all the choices that are available for preparing for tomorrow's jobs.

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The Outlook for Occupations

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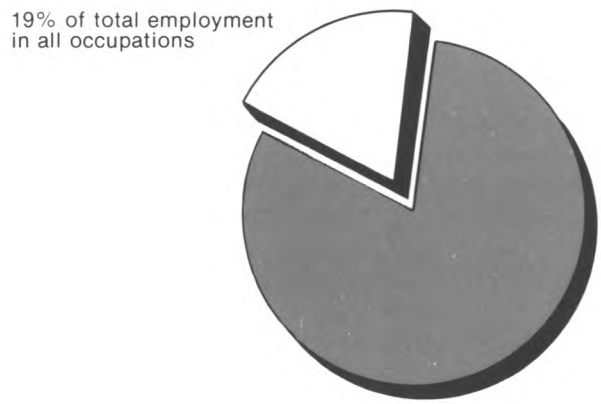
INDUSTRIAL PRODUCTION AND RELATED OCCUPATIONS

Cars, newspapers, radios, bathtubs, guided missiles, eating utensils, books, and pencil sharpeners all have at least one thing in common. They, and almost all other products that we use, are made by the millions of workers in industrial production and related occupations.

Most of these skilled and semiskilled blue-collar workers are employed in factories in the mass production of goods. Others work outside of manufacturing in a wide variety of activities ranging from showing motion pictures to shoeing horses.

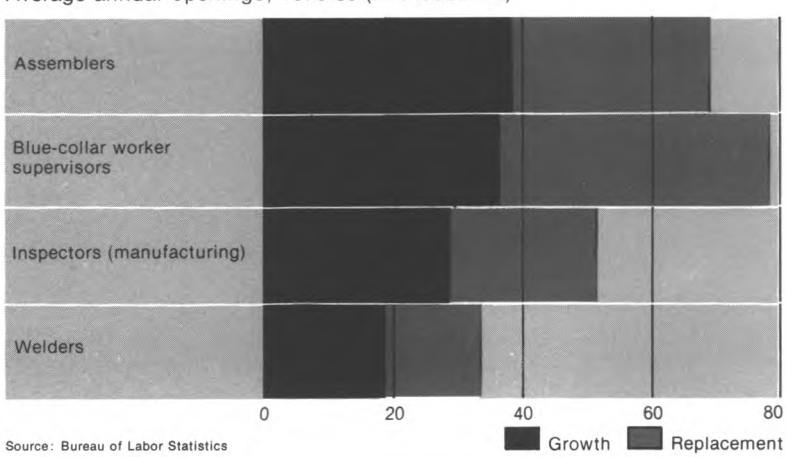
Because mass production would not be possible without interchangeable parts, workers in the machining and foundry occupations play a basic role in the production process. These workers make the tools, dies, molds, cores, and other items that can be used to make hundreds or even thousands of identical parts. Assemblers may then put these parts together to make automobiles, television sets, and hundreds of other products. If the parts or finished products require painting, production painters do that job. After the products are made, inspectors examine and test them to insure quality.

Industrial production and related occupations, 1976



A very large number of jobs open each year in several industrial production and related occupations

Selected industrial production and related occupations
Average annual openings, 1976-85 (in thousands)



Source: Bureau of Labor Statistics

Other factory workers are not directly involved in the production process, but support it in some way. Stationary engineers, for example, operate soilers and other equipment used to heat and air-condition factories and other buildings, Millwrights move and install heavy machinery used in the production process and power truck operators move materials about the plant.

Printing is another type of mass production. Printing craft workers operate the machinery used to print newspapers, books, and other publications.

Industrial workers also are employed outside of manufacturing in a variety of activities. Automobile painters, for example, restore the finish on old and damaged cars. Photographic laboratory workers develop film and make prints and slides.

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Most jobs in industrial production do not require a high school diploma. However, many employers prefer high school or vocational school graduates who have taken courses such as blueprint reading and machine shop.

Semiskilled workers, such as assemblers and power truck operators, ordinarily need only brief on-the-job training. Skilled workers, such as stationary engineers and machinists, require considerable training to qualify for their jobs. Many learn their trades on the job, but training authorities generally recommend completion of a 3- or 4-year apprenticeship program as the best way to learn a skilled trade.

This chapter includes statements on 21 industrial production and related occupations. Many other workers who are involved in industrial production are described elsewhere in the *Handbook* because of their close association with particular occupational groups. For example, engineers are included in the chapter on scientific and technical occupations.

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FOUNDRY OCCUPATIONS

Many of the products that we use every day are made by casting or have parts that are made by casting. Casting is a method of forming metal into intricate shapes by pouring molten metal into carefully prepared molds and allowing it to solidify. Foundry workers produce metal castings for numerous industrial household products that range from machine tools and automobiles to bathtubs.

The *patternmaker*, the *molder*, and the *coremaker* each play an important part in the process. A *patternmaker* makes a wood or metal model of the casting. A *molder* places it in a box and packs sand around the model to form a mold. If the casting is to have a hollow section, a *coremaker* makes a core of packed and hardened sand that is positioned in the mold before the molten metal is poured in.

In 1976, about 18,000 patternmakers, 53,000 molders, and 22,000 coremakers worked in the foundry industry. About three-fourths of them worked in shops that make and sell castings. The remainder worked in plants that make castings to use in their final products, such as plants operated by manufacturers of automobiles or machinery.

A high school education is the minimum requirement for an apprenticeship in patternmaking. Some highly skilled molding and coremaking jobs also may require a high school education, but an eighth grade education may be enough for entry into many molding and coremaking jobs.

The production and use of castings are expected to grow significantly through the mid-1980's. However, because of automation and other laborsaving improvements in production methods, employment of patternmakers, coremakers, and molders is expected to increase only about as fast as the average for all occupations. In addition to those job openings that result from employment growth, other openings will arise from the need to replace experienced workers who die, retire, or transfer to other occupations. The number of openings may fluctuate from year to year because foundry employment is very sensitive to ups and downs in the economy.

Patternmakers, molders, and coremakers are discussed in detail in the following statements. (For a general description of many other jobs involved in metal casting, see the statement on foundries elsewhere in the *Handbook*.)

Sources of Additional Information

For details about training opportunities for patternmakers, molders, and coremakers, contact local foundries, the local office of the State employment service, the nearest office of the State apprenticeship agency, or the Bureau of Apprenticeship and Training, U.S. Department of Labor. Information also is available from the following organizations:

American Foundrymen's Society, Golf and Wolf Rds., Des Plaines, Ill. 60016.

International Molders' and Allied Workers' Union, 1225 E. McMillan St., Cincinnati, Ohio 45206.

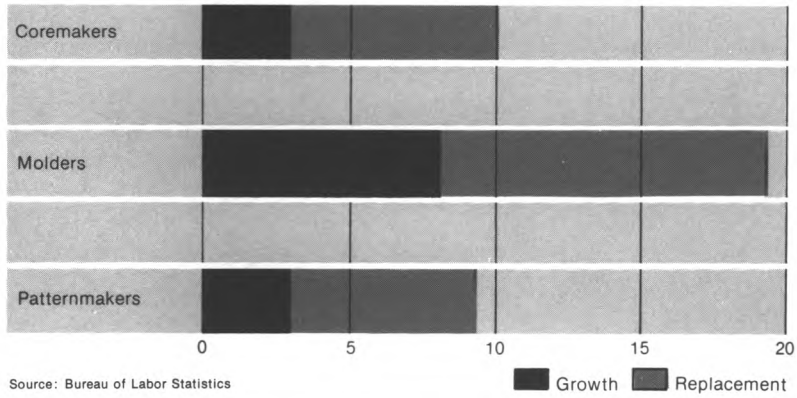
PATTERNMAKERS

Nature of the Work

Foundry patternmakers are highly skilled craftworkers who make the patterns used in making molds for metal castings. Most of the workers in the occupation are *metal patternmakers* (D.O.T. 600.280); a smaller number are *wood patternmakers* (D.O.T. 661.281). Some patternmakers work with both metal and wood as well as with plaster and plastics.

Patternmakers work from blueprints prepared by engineers or drafters. They make a precise pattern for the product, carefully checking each dimension with instruments such as micrometers and calipers. Precision is important because any imperfections in the pattern will be reproduced in the castings made from it.

Although employment of foundry workers is expected to show little change, some openings will be created by growth and replacement needs



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Wood patternmakers select the wood stock, lay out the pattern, and saw each piece of wood to size. They then shape the rough pieces into final form with various woodworking machines, such as lathes and sanders, as well as many small handtools. Finally, they assemble the pattern segments by hand, using glue, screws, and nails.

Metal patternmakers prepare patterns from metal stock or from rough castings made from a wood pattern. To shape and finish the patterns, they use many metalworking machines, including lathes, drill presses, shapers, milling machines, power hacksaws, and grinders. They also use small handtools, such as files and rasps.

Training, Other Qualifications, and Advancement

Apprenticeship is the best means of qualifying as an experienced patternmaker. Because of the high degree of skill and the wide range of knowledge needed for patternmaking, it is difficult to learn the trade on the job, but in some instances skilled machinists have been able to transfer to metal patternmaking with additional on-the-job training or experience. High school courses in mechanical drawing, blueprint reading, and shop mathematics are helpful to persons interested in becoming patternmakers. In addition, vocational and technical school training in patternmaking, metalworking, and machining provide useful preparation for an apprentice, and may be credited toward completion of the apprenticeship.

The usual apprenticeship period for patternmaking is 5 years; however, a few apprenticeships last only 3 or 4 years. Each year at least 144 hours of classroom instruction usually are provided. Apprenticeship programs for wood and metal patternmaking are separate. Employers almost always require apprentices to have a high school education.

Apprentices begin by helping experienced patternmakers in routine duties. They make simple patterns under close supervision; as they progress, the work becomes increasingly complex and the supervision more general. Patternmakers earn higher pay as their skill increases, and some become supervisors.

Patternmaking, although not strenuous, requires considerable standing and moving about. Manual dexterity is especially important because of the precise nature of the work. The ability to visualize objects in three dimensions also is important when reading blueprints.



Patternmakers must carefully check each dimension.

Employment Outlook

Employment of foundry patternmakers is expected to increase only about as fast as the average for all occupations through the mid-1980's despite the anticipated large increases in foundry production. The increased use of metal patterns will allow production to increase faster than employment. Metal patterns, unlike wooden ones, can be used again and again, thus reducing the number of patterns that have to be made.

In addition to those openings created by employment growth, some job openings will arise because of the need to replace experienced patternmakers who retire, die, or transfer to other occupations. Most of these openings will be for metal patternmakers. The number of openings may fluctuate from year to year since the demand for foundry products is sensitive to changes in the economy.

Because patternmakers learn either basic metalworking or woodworking, they are prepared for jobs in related fields when patternmaking employment is not available. Wood patternmakers can qualify for woodworking jobs such as cabinetmaker, and metal patternmakers can transfer their skills to metalworking jobs such as machinist.

Earnings and Working Conditions

Patternmakers generally have higher earnings than other production workers in manufacturing. In January 1976, average straight-time hourly earnings of wood patternmakers ranged from $6 in gray iron and

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malleable iron foundries, to $6.25 in nonferrous foundries, according to a wage survey made by the National Foundry Association. In comparison, all production workers in manufacturing industries averaged $5.19 an hour.

Patternmakers work indoors in well-lighted, well-ventilated areas. The rooms in which they work generally are separated from the areas where the casting takes place, so they are not exposed to the heat and noise of the foundry floor.

For sources of additional information, see the introductory section of this chapter.

MOLDERS

Nature of the Work

One of the oldest known methods of making metal products is by metal casting, or the process of pouring molten metal into a previously made mold and allowing the metal to harden in the shape of the mold. There are several different ways of making molds, but sand molding is the most common. In sand molding, molders make the mold by packing and ramming specially prepared sand around a pattern—a model of the object to be duplicated—in a box called a flask. A flask usually is made in two parts that can be separated to remove the pattern without damaging the mold cavity. When molten metal is poured into the cavity, it solidifies and forms the casting. (Other types of molds and molding processes are described in the foundry industry section of the *Handbook*).

Technologically advanced molding machines that pack and ram the sand mechanically are now used to make most molds. Thus, most of the workers in this occupation are machine molders. *Machine molders* (D.O.T. 518.782) operate machines that speed up and simplify the making of large quantities of identical sand molds. Machine molders assemble the flask and pattern on the machine table, fill the flask with prepared sand, and operate the machine with levers and pedals. Many of these workers set up and adjust their own machines.

In a few foundries, hand molders still construct the sand molds, using primarily manual methods. Power tools, such as pneumatic rammers, and handtools, such as trowels and mallets, are used to smooth the sand. Molds for small castings usually are made on the workbench by *bench molders* (D.O.T. 518.381); those for large and bulky castings are made on the foundry floor by *floor molders* (D.O.T. 518.381). An all-round hand molder makes many different types of molds. A less skilled molder specializes in a few simple types.

Training, Other Qualifications, and Advancement

Completion of a 4-year apprenticeship program, or equivalent experience, is needed to become a skilled hand molder. Workers with this training also are preferred for some kinds of machine molding, but in general a shorter training period is required in order to become a qualified machine molder. Some people learn molding skills informally on the job, but this way of learning the trade takes longer and is less reliable than apprenticeship.

An eighth grade education usually is the minimum requirement for apprenticeship. Many employers, however, prefer high school graduates.



Molders need good vision and manual dexterity.

Apprentices, under close supervision by skilled molders, begin with simple jobs, such as shoveling sand, and then gradually take on more difficult and responsible work, such as ramming molds, withdrawing patterns, and setting cores. They also learn to operate the various types of molding machines. As their training progresses, they learn to make complete molds. In addition, the apprentice may work in other foundry departments to develop all-round knowledge of foundry methods and practices. The apprentice usually receives at least 144 hours of classroom instruction each year in subjects such as shop arithmetic, metallurgy, and shop drawing.

Hand molders who do highly repetitive work that requires less skill usually learn their jobs during a brief training period. Trainees work with a molder to make a particular kind of mold. After 2 to 6 months, the trainee usually is capable of making a similar mold. Most machine molding jobs can be learned in 2 to 3 months on the job.

Physical standards for molding jobs are fairly high. Hand molders stand while working, must move about a great deal, and frequently must lift heavy objects. They need good vision and a high degree of manual dexterity. Molders may advance to a specialized molding job or eventually to a supervisory position.

Employment Outlook

Employment of molders is expected to increase about as fast as the average for all occupations through the mid-1980's. Although the demand for metal castings is expected to increase significantly, the trend to more machine molding, such as the sand slinging process, and other laborsaving innovations will allow large increases in production with only moderate employment growth. In addition to job openings created by employment growth, openings will arise from the need to replace experienced molders who retire, die, or transfer to other occupations. The number of openings, however, may fluctuate greatly from year to year

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because the demand for foundry products is sensitive to changes in the economy.

Earnings and Working Conditions

In January 1976, floor molders averaged $5.52 an hour and bench molders averaged $4.98, according to a wage survey made by the National Foundry Association. By comparison, production workers in all manufacturing industries averaged $5.19 an hour. Molders who were paid on an incentive basis generally had higher earnings.

Working conditions vary considerably from one foundry to another. Heat, fumes, and dust, have been greatly reduced in many plants by the installation of improved ventilation systems and air-conditioning; however, in many older foundries these still are problems.

Working in a foundry can be hazardous, and the injury rate is higher than the average for all manufacturing industries. Safety programs and safety equipment, such as metal-plated shoes, have helped reduce injuries at many foundries; however, molders must be careful to avoid burns from hot metal and to avoid cuts and bruises when handling metal parts and power tools.

For sources of additional information, see the introductory section of this chapter.

COREMAKERS

Nature of the Work

Coremakers prepare the "cores" that are placed in molds to form the hollow sections in metal castings. The poured metal solidifies around the core, so that when the core is removed the desired cavity or contour remains.

A core may be made either by hand or by machine. In both instances, sand is packed into a block of wood or metal in which a space of the desired size and shape has been hollowed out. After the core is removed from this box, it is hardened by baking or by another drying method. When hand methods are used, the coremaker uses mallets and other handtools to pack sand into the core box. Small cores are made on the workbench by *bench coremakers* (D.O.T. 518.381) and large ones are made on the foundry floor by *floor coremakers* (D.O.T. 518.381).

Machine coremakers (D.O.T. 518.885) operate machines that make sand cores by forcing sand into a core box. Some machine coremakers are required to set up and adjust their machines and do finishing operations on the cores. Others are primarily machine tenders. They are closely supervised and their machines are adjusted for them. (To see how the coremaker's job is a basic step in the casting process, read the description of sand casting given in the statement on foundries elsewhere in the *Handbook*.)

Training, Other Qualifications, and Advancement

Completion of a 4-year apprenticeship training program or the equivalent experience is needed to become a skilled hand coremaker. Apprenticeships also are sometimes required for the more difficult machine coremaking jobs. Apprenticeships in coremaking and molding often are combined.

Experienced coremakers teach apprentices how to make cores and operate ovens. Classroom instruction covering subjects such as arithmetic and the properties of metals generally supplements on-the-job training. Coremakers earn higher pay as their skill increases, and some may advance to supervisors.

An eighth grade education usually is the minimum requirement for coremaking apprentices; however, most employers prefer high school graduates, and some employers require apprentices to have graduated from high school. Some types of hand coremaking require a high degree of manual dexterity.

Employment Outlook

Although the production and use of metal castings are expected to



Coremaker operating machine that produces cores for automobile engine heads.

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increase substantially, employment of coremakers is expected to increase only about as fast as the average for all occupations through the mid-1980's, as the growing use of machine coremaking will allow large increases in production with only moderate employment growth. In addition to those job openings created by employment growth, other openings will arise because of the need to replace experienced coremakers who retire, die, or transfer to other occupations. The number of openings may fluctuate greatly from year to year since the demand for foundry products is sensitive to changes in the economy.

Earnings and Working Conditions

In January 1976, average hourly earnings of floor coremakers were $5.30; bench coremakers, $5.28; and machine coremakers, $5.31, according to a wage survey made by the National Foundry Association. By comparison, production workers in all manufacturing industries averaged $5.19 an hour. Coremakers who were paid on an incentive basis generally had higher earnings than those who were paid a straight hourly wage.

Working conditions vary considerably from one foundry to another. Heat, fumes, and dust, have been greatly reduced in many plants by the installation of improved ventilation systems and air-conditioning. Although the injury rate in foundries is higher than the average for manufacturing, coremaking is one of the least hazardous foundry jobs.

For sources of additional information, see the introductory section of this chapter.

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MACHINING OCCUPATIONS

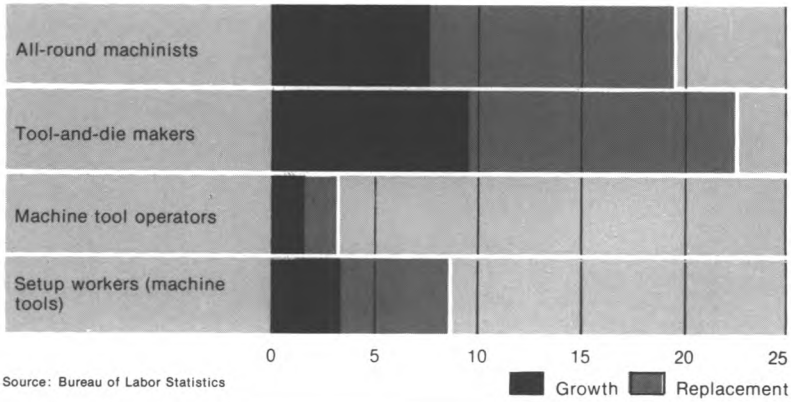
Machine tools are stationary, power-driven devices used to shape or form metal by cutting, impact, pressure, electrical techniques, or a combination of these processes. Most machine tools are named for the way in which they shape metal. For example, commonly used machine tools include boring machines, milling machines, lathes, drilling machines, and grinding machines. In 1976, over 1.1 million machinists, machine tool operators, tool-and-die makers, setup workers, and instrument makers used machine tools to make precise metal parts.

The most outstanding characteristic of machine tools is their precision of operation. For example, in this century the accuracy of machine tools has improved from a thousandth of an inch to about a millionth of an inch. A millionth of an inch is about 1/300th as thick as a human hair. This precision makes possible the production of thousands of identical parts which may easily be interchanged in the assembly or repair of final products. The interchangeability of parts, made possible by machine tools, is the most important requirement for the mass production of goods. As a result, nearly every product of American industry, from cornflakes to turbines, is made either using machine tools or using machines made with machine tools.

All-round machinists can operate most types of machine tools, whereas machine tool operators generally work with one kind only. Tool-and-die makers make dies (metal forms) for presses and diecasting machines, devices to guide drills into metal, and special gauges to determine whether the work meets specified tolerances. Instrument makers use machine tools to produce highly accurate instrument parts from metal and other materials. Setup workers adjust tools for semiskilled machine tool operators to run. (Detailed discussions of work performed, training, and earnings of these occupations are presented in the chapters that follow.)

Technological advances will limit growth in all machining occupations. However, highly skilled machinists and tool-and-die makers will not be affected as much as less skilled operators and setup workers

Selected machining occupations
Average annual openings, 1976-85 (in thousands)



Source: Bureau of Labor Statistics

ALL-ROUND MACHINISTS

(D.O.T. 600.280, .281, and .381)

Nature of the Work

All-round machinists are skilled metal workers who can perform a wide variety of machining operations. They are able to set up and operate most types of machine tools used to make metal parts for cars, machines, and other equipment. Machinists also know the working properties of a variety of metals including steel, cast iron, aluminum, brass, and other metals. This knowledge of metals, plus their ability to work with machine tools, enables machinists to turn a block of metal into an intricate part meeting precise specifications.

All-round machinists plan and carry through all the operations needed to make a machined product. They also often are able to switch from making one product to another; as a result, variety is a major feature of all-round machinists' work.

Before they begin actually making a machined product, machinists usually consult blueprints or written specifications for the item. Using these, they are able to select tools and materials for the job and plan the cutting and finishing operations. They also make standard shop computations relating to dimensions of work and machining specifications. To be sure their work is accurate, they check it using precision instruments, such as micrometers, which measure to thousandths or even millionths of an inch. After completing machining operations, they may use hand files and scrapers to smooth rough metal edges before assembling the finished parts with wrenches and screwdrivers.

Like production machinists, all-round machinists who work in plant maintenance shops have a broad knowledge of mechanical principles and machining operations. These workers are responsible for repairing

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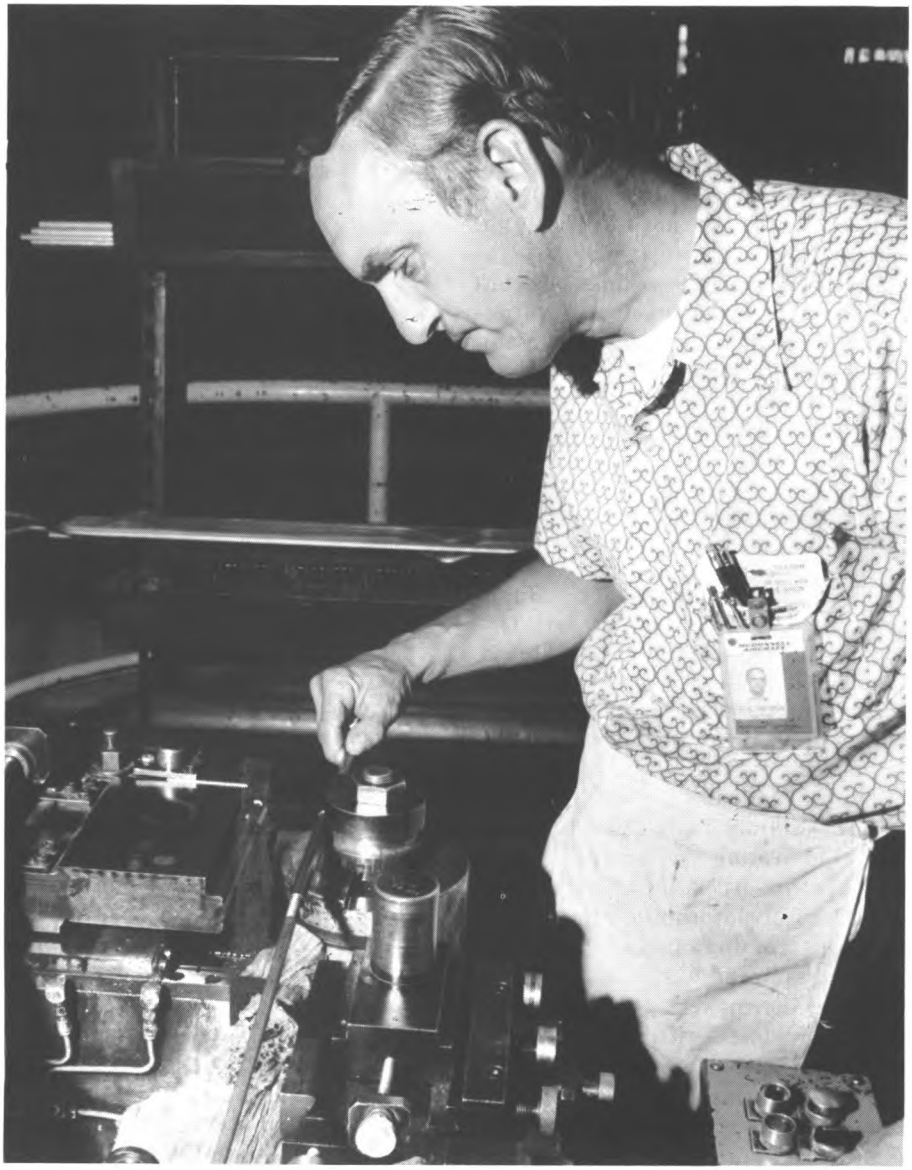
parts or making new parts for machinery that has broken down. They sometimes also adjust and test the parts they have made or repaired for a machine.

Places of Employment

About 400,000 persons worked as machinists in 1976. Almost every factory using substantial amounts of machinery employed all-round machinists to maintain its mechanical equipment. Some all-round machinists made large quantities of identical parts such as automobile axle shafts in production departments of metalworking factories; others made limited numbers of varied products such as missile motor cases in machine shops.

Most all-round machinists worked in the following industries: machinery, including electrical; transportation equipment; fabricated metal products; and primary metals. Other industries employing substantial numbers of these workers were the railroad, chemical, food processing, and textile industries. The Federal Government also employed all-round machinists in Navy yards and other installations.

Although machinists work in all parts of the country, jobs are most plentiful in areas where many factories are located. Among the leading areas of employment are Los Angeles, Chicago, New York, Philadelphia, Boston, San Francisco, and Houston.



Most machinists work in factories that produce metal products such as automobiles and machinery.

Training, Other Qualifications, and Advancement

A 4-year formal apprenticeship is the best way to learn the machinist trade, but some companies have training programs for single-purpose machines that require less than 4 years to complete. Many machinists do learn this trade on the job, however.

Persons interested in becoming machinists should be mechanically inclined and temperamentally suited to do highly accurate work that requires concentration as well as physical effort. Prospective machinists should be able to work independently. Although the work sometimes is tedious and repetitious, all-round machinists frequently have the satisfaction of seeing the final results of their work.

A high school or vocational school education, including mathematics, physics, or machine shop training, is desirable. Some companies require experienced machinists to take additional courses in mathematics and electronics at company expense so that they can service and operate numerically controlled machine tools. In addition, equipment builders generally provide training in the electrical, hydraulic, and mechanical aspects of machine-and-control systems.

Typical machinist apprentice programs consist of approximately 8,000 hours of shop training and about 570 hours of related classroom instruction. In shop training, apprentices learn chipping, filing, hand tapping, dowel fitting, riveting, and the operation of various machine tools. In the classroom, they study blueprint reading, mechanical drawing, shop mathematics, and shop practices.

All-round machinists have numerous opportunities for advancement. Many become supervisors. Some take additional training and become tool-and-die or instrument makers. Skilled machinists may open their own shops or advance into othe

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technical jobs in machine programming and tooling.

Employment Outlook

The number of all-round machinists is expected to increase at about the same rate as the average for all occupations through the mid-1980's. Growth in the demand for machined metal parts will cause most of the increase. In addition to openings created by growth in this large occupation, many openings will arise from the need to replace experienced machinists who retire, die, or transfer to other fields of work.

As population and income rise, so will the demand for machined goods, such as automobiles, household appliances, and industrial products. However, technological developments that increase the productivity of machinists are expected to keep employment from rising as fast as the demand for machined goods.

Chief among these technological innovations is the expanding use of numerically controlled machine tools. These machines, which use computers to control various machining operations, significantly reduce the time required to perform machining operations.

Much of the employment growth will occur in the maintenance shops of manufacturing plants as industries continue to use a greater volume of complex machinery and equipment. More skilled maintenance machinists will be needed to prevent costly breakdowns in highly mechanized plants. Often the breakdown of just one machine can stop an entire production line for hours.

Earnings and Working Conditions

The earnings of machinists compare favorably with those of other skilled workers. Machinists employed in metropolitan areas had estimated average hourly earnings of $6.76 in 1976. Average hourly rates in 10 of the areas surveyed, selected to show how wage rates differ in various parts of the country, appear in the accompanying tabulation. Because machinists work indoors, they are able to work year round and in all kinds of weather. As a result, their earnings are relatively stable. Many also receive numerous opportunities for overtime work.

Area	*Hourly rate*
San Francisco—Oakland	$7.82
Detroit	7.61
New York	7.39
Houston	7.23
Chicago	7.19
Minneapolis—St. Paul	6.87
Atlanta	6.65
Dallas—Fort Worth	6.60
Boston	6.33
New Orleans	6.18

Machinists must follow strict safety regulations when working around high-speed machine tools. Short-sleeved shirts, safety glasses, and other protective devices are required to reduce accidents. Most shops are clean and workplaces are well-lighted.

Many machinists are members of unions including the International Association of Machinists and Aerospace Workers; the International Union, United Automobile, Aerospace and Agricultural Implement Workers of America; the International Union of Electrical, Radio and Machine Workers; the International Brotherhood of Electrical Workers; and the United Steelworkers of America.

Sources of Additional Information

The National Machine Tool Builders Association, 7901 Westpark Dr., McLean, Va. 22101—whose members build a large percentage of all machine tools used in this country—will supply, on request, information on career opportunities in the machine tool industry.

The National Tool, Die and Precision Machining Association, 9300 Livingston Rd., Oxon Hill, Md. 20022, offers information on apprenticeship training, including recommended apprenticeship standards for tool and die makers certified by the U.S. Department of Labor's Bureau of Apprenticeship and Training.

The Tool and Die Institute, 777 Busse Highway, Park Ridge, Ill. 60068—a trade association—offers information on apprenticeship training in the Chicago area.

Many local offices of State employment services provide free aptitude testing to persons interested in becoming all-round machinists or tool and diemakers. In addition, the State employment service refers applicants for apprentice programs to employers. In many communities, applications for apprenticeship also are received by labor-management apprenticeship committees.

Apprenticeship information also may be obtained from the following unions (which have local offices in many cities):

International Association of Machinists and Aerospace Workers, 1300 Connecticut Ave. NW., Washington, D.C. 20036.

International Union, United Automobile, Aerospace and Agricultural Implement Workers of America, Skilled Trades Department, 8000 East Jefferson Ave., Detroit, Mich. 48214.

International Union of Electrical Radio and Machine Workers, 1126 16th St. NW., Washington, D.C. 20036.

INSTRUMENT MAKERS (MECHANICAL)

(D.O.T. 600.280)

Nature of the Work

Instrument makers (also called experimental machinists and modelmakers) are among the most skilled of all machining workers. They work closely with engineers and scientists to translate designs and ideas into experimental models, special laboratory equipment, and custom instruments. Experimental devices constructed by these craft workers are used, for example, to regulate heat, measure distance, record earthquakes, and control industrial processes. The parts and models may range from simple gears to intricate parts of navigation systems for guided missiles. Instrument makers also modify existing instruments for special purposes.

Instrument makers perform many tasks similair to those done by all-round machinists, tool-and-die makers, and setup workers. For example

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they may set up and use machine tools such as lathes and milling machines to fabricate metal parts for the instruments they make. In addition, they use handtools such as files and chisels to smooth rough metal parts. As in other types of machining work, accuracy is important. Like most machining workers, instrument makers measure finished parts to make sure they meet specifications, using a wide variety of precision measuring equipment, including micrometers, verniers, calipers, and dial indicators, as well as standard optical measuring instruments.

Unlike other skilled machining workers, instrument makers often are not given detailed instructions, such as blueprints, for their work. Instead, they may work from rough sketches or verbal instructions, or they may simply be given a concept to work with. As a result, their work often requires considerable imagination and ingenuity. In addition they must often work to finer tolerances than other machining workers. Sometimes specifications must not vary more than 10 millionths of an inch. To meet these standards, they use special equipment or precision devices, such as the electronic height gauge, which other machining workers seldom use. They also work with a wider variety of materials than other machining workers. These materials include plastics and rare metals such as titanium and rhodium.

In some instances, instrument makers work on instruments from start to finish. That is, they make all the parts, assemble them, and then test the finished product. However, in large shops, or where time is important, the work may be divided among a number of workers. Similarly, if an instrument has electrical or electronic components, electronic specialists may be consulted.

Places of Employment

Many of the approximately 6,000 instrument makers employed in 1976 worked for firms that manufactured instruments. Others were in research and development laboratories that make special devices for scientific research. The Federal Government employed many instrument makers.

The main centers of instrument making are located in and around a few large cities, particularly New York, Chicago, Los Angeles, Boston, Philadelphia, Washington, Detroit, Buffalo, and Cleveland.



Instrument makers work closely with engineers and scientists.

Training, Other Qualifications, and Advancement

Some instrument makers advance from the ranks of machinists or skilled machine tool operators. These already skilled craft workers begin by doing the simpler instrument making tasks under close supervision. Usually 1 to 2 years or more of instrument shop experience are needed to qualify as instrument makers.

Other instrument makers learn their trade through apprenticeships that generally last 4 years. A typical 4-year program includes 8,000 hours of shop training and 576 hours of related classroom instruction. Shop training emphasizes the use of machine tools, handtools, and measuring instruments, and the working properties of various materials. Classroom instruction covers related technical subjects such as mathematics, physics, blueprint reading, chemistry, metallurgy, electronics, and fundamental instrument design. Apprentices must learn enough shop mathematics to plan their work and to use formulas. A basic knowledge of mechanical principles is needed in solving gear and linkage problems.

For apprenticeship programs, employers generally prefer high school graduates who have taken algebra, geometry, trigonometry, science, and machine shopwork. Further technical schooling in electricity, physics, machine design, and electronics often is desirable, and may make possible future promotions to technician jobs.

Persons interested in becoming instrument makers should have a strong interest in mechanical subjects and better than average ability to work with their hands. They must have initiative and resourcefulness

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because instrument makers often work with little or no supervision. Since instrument makers often face new problems, they must be able to develop original solutions. Frequently, they must visualize the relationship between individual parts and the complete instrument, and must understand the principles of the instrument's operation. Because of the nature of their jobs, instrument makers have to be very conscientious and take considerable pride in creative work.

As instrument makers' skills and knowledge improve, they may advance to more responsible positions. For example, they may plan and estimate time and material requirements for the manufacture of instruments or provide specialized support to professional personnel. Others may become supervisors and train less skilled instrument makers.

Employment Outlook

Employment in this very small occupation is expected to increase at about the same rate as the average for all occupations through the mid-1980's. Most openings, however, will occur as workers retire, die, or leave the occupation for other reasons. Overall, replacement needs will be small because there are so few workers in this field.

Some workers will be needed to make models of new instruments for mass production and also to make custom or special instruments, particularly in the expanding field of industrial automation. Also, more versatile and sensitive precision instruments can be expected to emerge from current research and development programs. Laborsaving technological innovations, however, will limit employment growth. Numerically controlled machine tools, for example, reduce the amount of labor required in machining operations.

Earnings and Working Conditions

Earnings of instrument makers compare favorably with those of other highly skilled metalworkers. In 1976, instrument makers generally earned about $7 an hour.

Instrument shops usually are clean and well-lighted, with temperatures strictly controlled. Instrument assembly rooms are sometimes known as "white rooms," because almost sterile conditions are maintained.

Serious work accidents are not common, but machine tools and flying metal particles may cause finger, hand, and eye injuries. Safety rules generally require the wearing of special glasses, aprons, tightly fitted clothes, and short-sleeved shirts.

Many instrument makers are union members. Among the unions representing them are the International Association of Machinists and Aerospace Workers; the International Brotherhood of Electrical Workers; and the International Union, United Automobile, Aerospace and Agricultural Implement Workers of America.

Sources of Additional Information

See the list under this same heading in the previous statement on all-round machinists.

MACHINE TOOL OPERATORS

(D.O.T. 602., 603., 604., 605., and 606.)

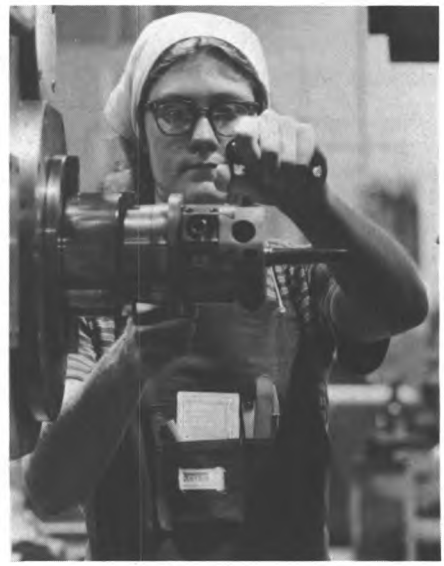
Nature of the Work

Machine tool operators use machine tools such as lathes, drill presses, milling machines, grinding machines, and punch presses to shape metal to precise dimensions. Although some operators can work with a wide variety of machine tools, most specialize in one or two types.

Operators fall into two broad skill categories—semiskilled and skilled. Semiskilled operators are essentially machine tenders who perform simple, repetitive operations that can be learned relatively quickly. Skilled operators can perform varied and complex machining operations. Both skilled and semiskilled operators have job titles related to the kind of machine they operate, such as milling machine operator and drill press operator.

Most machine tool operators fall into the semiskilled category. Their jobs vary according to the type of machine they work with; however, there are many tasks common to most machine tools. Typically, semiskilled operators place rough metal stock in a machine tool on which the speeds and operation sequence already have been set by skilled workers. By using special, easy-to-use gauges they watch the machine and make minor adjustments. However, they depend on skilled machining workers for major adjustments when their machine is not working properly.

The work of skilled machine tool operators is similar to that of all-round machinists, except that it usually is limited to only one type of machine and involves little or no hand fitting or assembly work. Skilled machine tool operators plan and set up the correct sequence of machining operations according to blueprints, layouts, or other instructions. They adjust speed, feed, and other controls, and select the proper cutting instruments or tools for each operation. Using micrometers, gauges, and other precision measuring instruments, they compare the completed work with the tolerance limits given in the specifications. They also may select cutting oils to keep the



Machine tool operators must adjust machines with precision.

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metal workpiece from getting too hot and lubricating oils to keep the machine tools running smoothly.

Places of Employment

More than 500,000 machine tool operators were employed in 1976. Most worked in factories that produce fabricated metal products, transportation equipment, and machinery in large quantities. Skilled machine tool operators also worked in production departments, maintenance departments, and toolrooms.

Machine tool operators work in every State and in almost every city in the United States. They are concentrated, however, in major industrial areas such as the Great Lakes Region. About one-fourth of all machine tool operators work in the Great Lakes cities of Detroit, Flint, Chicago, Cleveland, and Milwaukee. Among the other areas that have large numbers of these workers are Los Angeles, Philadelphia, St. Louis, and Indianapolis.

Training, Other Qualifications, and Advancement

Most machine tool operators learn their skills on the job. Beginners usually start by simply observing experienced operators at work. Later they learn to use measuring instruments and to make elementary computations needed in shopwork. When trainees first operate a machine, they are supervised closely by more experienced workers. After gaining some experience themselves, beginners often take over more of the duties associated with the tools they operate. For example, they may learn to adjust feed speeds and cutting edges, instead of calling upon other workers to perform these tasks. Some also may learn to read blueprints and plan the sequence of machining work.

Individual ability and effort largely determine the time required to become a machine tool operator. Most semiskilled operators learn their jobs in a few months, but becoming a skilled operator often requires 1 to 2 years. Some companies have formal training programs for new employees.

Although no special education is required for semiskilled jobs, persons seeking such work can improve their opportunities by completing courses in mathematics and blueprint reading. In hiring beginners, employers often look for persons with mechanical aptitude and some experience working with machinery. Physical stamina is important since much time is spent standing. Applicants should be able to work independently. They also should not mind working in a relatively small workspace. Although much of the work is tedious, many machine tool operators derive satisfaction from seeing the results of their work.

Skilled machine tool operators may become all-round machinists, tool-and-die makers, or advance to jobs in machine programming and maintenance.

Employment Outlook

Job opportunities for machine tool operators should be fairly plentiful in the years ahead. Employment in the occupation is expected to increase about as fast as the average for all occupations through the mid-1980's. In addition to openings arising from growth, many thousands of openings are expected to occur each year in this large occupation as operators retire, die, or transfer to other fields of work.

More machine tool operators will be needed as metalworking industries expand their output. However, the use of faster and more versatile automatic machine tools and numerically controlled machine tools will result in greater output per worker and tend to limit employment growth. Other factors that may slow growth in this occupation are the increasingly important new processes in metalworking, such as electrical discharge and ultrasonic machining, and the use of powdered metals that reduce the machining necessary for a final product.

Workers with thorough backgrounds in machining operations, mathematics, blueprint reading, and a good working knowledge of the properties of metals will be better able to adjust to the changing job requirements that will result from technological advances.

Earnings and Working Conditions

Machine tool operators are paid according to hourly or incentive rates, or on the basis of a combination of both methods. Highly skilled operators in metropolitan areas had estimated hourly earnings of $7.11 in 1976. This compares favorably with the average for nonsupervisory workers in private industry, except farming. Average hourly rates in 10 of the areas surveyed, selected to show how wage rates of machine tool operators differ in various parts of the country, appear in the accompanying tabulation.

Area	*Hourly rate*
Detroit	$7.89
Cleveland	7.30
Chicago	7.14
St. Louis	6.93
Baltimore	6.84
Cincinnati	6.34
Houston	6.30
Minneapolis—St. Paul	6.18
Dallas—Fort Worth	6.12
Boston	5.76

Most shops are clean and workplaces are well-lighted. Machine tool operators must use protective glasses to protect their eyes from flying metal particles. They cannot wear loose-fitting garments as these might get caught in the machine, injuring the operator or causing damage to the machine.

Most machine tool operators belong to unions, including the International Association of Machinists and Aerospace Workers; the International Union, United Automobile, Aerospace and Agricultural Implement Workers of America; the International Union of Electrical, Radio and Machine Workers; the International Brotherhood of Electrical Workers; and the United Steelworkers of America.

Sources of Additional Information

See the list under this same head-

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ing in the statement on all-round machinists elsewhere in the *Handbook*.

SETUP WORKERS (MACHINE TOOLS)

(D.O.T. 600.380)

Nature of the Work

Machine tools used in shops that do machining in large volume usually are both very large and very complex. Setup workers, often called machine tool job setters, are skilled workers who specialize in preparing these tools for use. Most setup workers work on only one type of machine, such as a drill press or lathe; however, some set up several different kinds.

Before they begin preparing a machine for use, setup workers consult blueprints, written specifications, or job layouts. From these they can determine how fast the material to be machined should be fed into the machine, operating speeds, tooling, and the order in which the machine will perform its operations (operation sequence). They then select and install the proper cutting or other tools and adjust guides, stops, and other controls.

After setting up the machine, they usually make a trial run to be sure that it is running smoothly and producing parts that conform to specifications. When they are sure the machine is functioning properly, they explain to semiskilled operators how to run the machine and how to be sure that the machine's output meets specifications. They then turn the machine over to the semiskilled operators to begin production.



Setup worker in a turret lathe operation.

Places of Employment

In 1976, an estimated 60,000 setup workers were employed in factories that manufactured fabricated metal products, transportation equipment, and machinery. Most worked for large companies that employed many semiskilled machine tool operators. Setup workers usually are not employed in maintenance shops or in small jobbing shops.

Setup workers are found in every State. However, employment is concentrated in major industrial areas such as Los Angeles, Philadelphia, New York, Chicago, Detroit, and Cleveland.

Training, Other Qualifications, and Advancement

Setup workers must meet the same qualifications as all-round machinists. They must be able to operate one or more kinds of machine tools and select the sequence of operations so that metal parts will be made according to specifications. The ability to communicate clearly is important in explaining the machining operations to semiskilled workers. Setup workers may advance within a shop to supervisory jobs or transfer into other jobs, such as parts programmer.

Employment Outlook

Employment of setup workers is expected to increase about as fast as

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the average for all occupations through the mid-1980's. Although consumer and industrial demand for machined goods will grow, partly offsetting this will be greater productivity of setup workers due to the increasing use of numerically controlled machined tools. In these machine tools, cutting sequences, feed speeds, tool selection, and other operations are controlled by a computer. Most job opportunities will arise from the need to replace experienced workers who retire, die, or transfer to other occupations.

Earnings and Working Conditions

The earnings of setup workers compare favorably with those of other skilled machining workers. In 1976, setup workers in metropolitan areas had average earnings of about $7 an hour.

Because they work with high-speed machine tools that have sharp cutting edges, setup workers must follow certain safety practices. For example, they cannot wear loose-fitting clothes as these might get caught in the machine and they must wear safety goggles to protect their eyes from flying metal particles.

Many setup workers are members of unions, including the International Association of Machinists and Aerospace Workers; the International Union, United Automobile, Aerospace and Agricultural Implemen Workers of America; and the United Steelworkers of America.

Sources of Additional Information

See the list under this same heading in the statement on all-round machinists elsewhere in the *Handbook*.

TOOL-AND-DIE MAKERS

(D.O.T. 601.280, .281, and .381)

Nature of the Work

Tool-and-die makers are highly skilled, creative workers whose products—tools, dies, and special guiding and holding devices—are used by other machining workers to mass-produce metal parts. Toolmakers produce jigs and fixtures (devices that hold metal while it is shaved, stamped, or drilled). They also make gauges and other measuring devices used in manufacturing precision metal parts. Diemakers construct metal forms (dies) to shape metal in stamping and forging operations. They also make metal molds for diecasting and for molding plastics. Tool-and-die makers also repair worn or damaged dies, gauges, jigs, and fixtures, and design tools and dies.

Compared with most other machining workers, tool-and-die makers have a broader knowledge of machining operations, mathematics, and blueprint reading. Like machinists, tool-and-die makers use almost every type of machine tool and precision measuring instrument. Because they work with all the metals and alloys commonly used in manufacturing, tool-and-die makers must be familiar with the machining properties, such as heat tolerance, of a wide variety of metals and alloys.

Places of Employment

More than 180,000 tool-and-die makers were employed in 1976. Most worked in plants that produce manufacturing, construction, and farm machinery. Others worked in automobile, aircraft, and other transportation equipment industries; small



Tool-and-die makers must have a broad knowledge of machine operations.

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tool-and-die shops; and electrical machinery and fabricated metal industries.

Although tool-and-die makers are situated throughout the country, jobs are most plentiful in areas where many large factories are located. About one-fifth of all tool-and-die makers work in the Detroit and Flint, Chicago, and Los Angeles areas, which are major manufacturing centers for automobiles, machinery, and aircraft, respectively. Among the other areas that have large numbers of these workers are Cleveland, New York, Newark, Dayton, and Buffalo.

Training, Other Qualifications, and Advancement

Tool-and-die makers obtain their skills in a variety of ways including formal apprenticeship, vocational school, and on-the-job training. Formal apprenticeship programs, however, are probably the best way to learn the trade.

In selecting apprentices, most employers prefer persons with a high school or trade school education. Applicants should have a good working knowledge of mathematics and physics, as well as considerable mechanical ability, finger dexterity, and an aptitude for precise work. Some employers test apprentice applicants to determine their mechanical aptitudes and their abilities in mathematics.

Most of the 4 years of a tool-and-die apprenticeship are spent in practical shop training. Apprentices learn to operate the drill press, milling machine, lathe, grinder, and other machine tools. They also learn to use handtools in fitting and assembling tools, gauges, and other mechanical equipment, and study heat treating and other metalworking processes. Classroom training consists of shop mathematics, shop theory, mechanical drawing, tool designing, and blueprint reading. Several years of experience after apprenticeship are often necessary to qualify for more difficult tool-and-die work. Some companies have separate apprenticeship programs for toolmaking and diemaking.

Some machining workers become tool-and-die makers without completing formal apprenticeships. After years of experience as skilled machine tool operators or machinists, plus additional classroom training, they develop into skilled all-round workers who can make tools and dies.

Skilled tool-and-die makers have numerous paths for advancement. Some advance to supervisory and administrative positons in industry. Many tool-and-die makers become tool designers and others may open their own tool-and-die shops.

Employment Outlook

Employment of tool-and-die makers is expected to increase at about the same rate as the average for all occupations through the mid-1980's. Most openings, however, will occur as experienced tool-and-die makers retire, die, or transfer to other fields of work.

The long-range expansion in metalworking industries will result in a continued need for tools and dies. The growth of this occupation may be limited, however, by the use of electrical discharge machines and numerically controlled machines that have significantly changed toolmaking processes. Numerically controlled machining operations require fewer of the special tools and jigs and fixtures, and could increase the output of each tool-and-die maker.

The extensive skills and knowledge of tool-and-die makers can be acquired only after many years of experience. Because of this, tool-and-die makers are able to change jobs within the machining occupations more easily than other less skilled workers.

Earnings and Working Conditions

Tool-and-die makers are among the highest paid machining workers. In 1976, tool-and-die makers employed in metropolitan areas had estimated earnings of $7.21 an hour. This was about one and one-half times as much as the average for all nonsupervisory workers in private industry, except farming. Average hourly rates in 13 of the areas surveyed, selected to show how wage rates for tool-and-die makers differ in various parts of the country, appear in the accompanying tabulation.

Area	*Hourly rate*
San Francisco—Oakland	$8.87
Detroit	7.88
Chicago	7.72
Baltimore	7.61
Cleveland	7.18
Atlanta	7.07
Dallas—Fort Worth	7.00
Cincinnati	6.82
Boston	6.62
Houston	6.61
New York	6.45
Salt Lake City	6.17
Chattanooga	5.56

As with other machining workers, tool-and-die makers wear protective glasses when working around metal-cutting machines. Tool-and-die shops are usually safer than similar operations in production plants.

Many tool-and-die makers are members of unions, including the International Union, United Automobile, Aerospace and Agricultural Implement Workers of America; and the United Steelworkers of America.

Sources of Additional Information

See the list under this same heading in the statement on all-round machinists elsewhere in the *Handbook*.

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PRINTING OCCUPATIONS

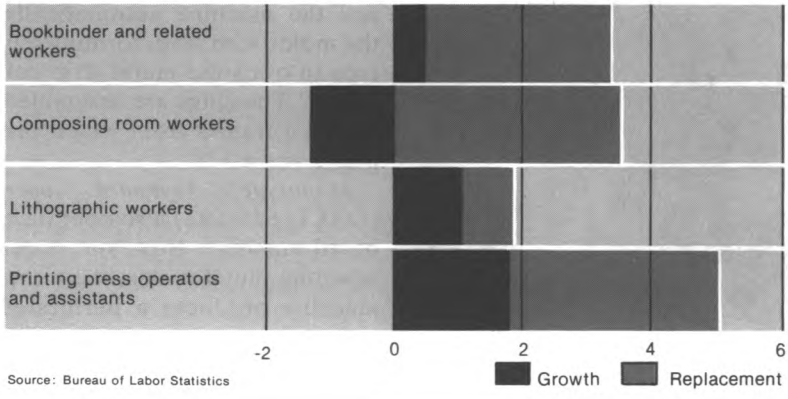
In 1976, about 390,0000 printing craft workers were employed to produce newspapers, magazines, business forms, and hundreds of other printed materials. Although most worked for publishers and commercial printing shops, many had jobs in insurance companies, paper mills, government agencies, and many other organizations that do their own printing.

Printing craft workers usually specialize in one area of printing operations: Type composition, platemaking, presswork, or binding. The most common way to learn the skills needed in most of these fields is through apprenticeship, which generally lasts from 4 to 6 years. Apprenticeship applicants usually must be high school graduates who are at least 18 years of age, but requirements vary among employers. Most printing craft workers who are covered by union contracts work fewer than 40 hours a week. Some contracts specify a standard workweek of less than 35 hours, but most fall within a 35- to 37-1/2-hour range.

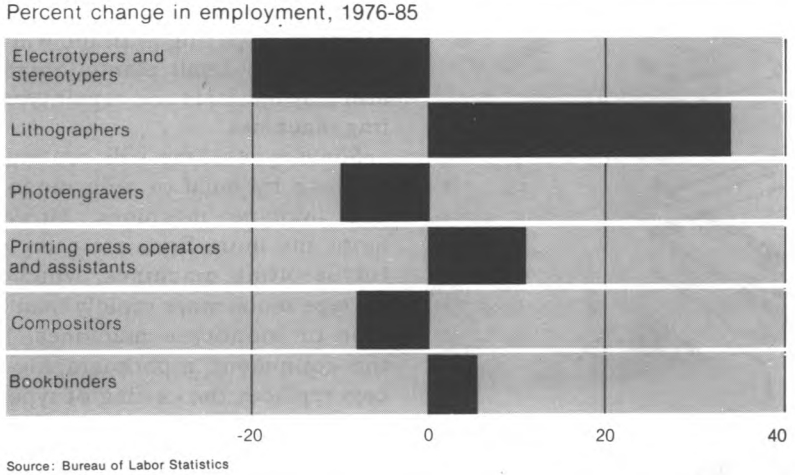
Through the mid-1980's, opportunities to enter printing crafts will stem mainly from the need to replace experienced workers who retire, die, or leave the field for other reasons. Employment growth also will provide job openings in some crafts, but laborsaving technological developments will restrict growth in others.

The statements that follow deal with employment opportunities for the major groups of printing workers: Composing room occupations, photoengravers, electrotypers and stereotypers, printing press operators and assistants, lithographers, and bookbinders.

Most job openings in the printing occupations are to replace persons who retire or leave their jobs for other reasons



There will be fewer jobs in some printing occupations in 1985 than in 1976, due to improved technology



COMPOSITORS

(D.O.T. 650.582, 654.782, and 973.381)

Nature of the Work

In a small shop, one person may do all the worked needed to complete a printing job. In large shops however, the work is divided among specialists. Editors select the material to be printed, while composing room workers prepare preliminary printing plates for press room workers who do the actual printing. Compositors, the most numerous of the composing room occupations, are vital to insur-

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ing that the job is completed accurately and on time.

After deciding what is to be printed and how it should look, editors send the material or "copy" along with a list of specifications to the composing room. There, a composing room supervisor reviews the editor's specifications and marks the manuscript with instructions about the style and size of type, column width, and size of pictures or illustrations. The copy—the term given to the material to be printed—then is given to a compositor who specializes in typesetting.

Hand compositors (D.O.T. 973.381) make up the oldest composing room occupation. Today, hand typesetting only is used for small jobs in which the setting of type by machine is impractical. Hand typesetters read from the copy and set each line of type, letter by letter, on a "compositing stick," a device that holds type in place. They select the place where words will be divided and a hyphen placed if the word doesn't fit on a line (hyphenation), as well as adjust the spacing of the type with pieces of metal so that the line of type will be the width of the column. As each "stick" is filled, they slide the completed lines into a shallow metal tray called "galley."



A compositor apprenticeship generally covers a 6-year period.

Linotype and monotype machine operators are craft workers who operate semiautomatic machines that set type much more rapidly than hand methods.

Linotype machine operators (D.O.T. 650.582) read from copy clipped to the machine and operate a keyboard to select letters and other characters. As they press the keys, metal molds of the letters are assembled into lines of words. After completing a line, operators touch a lever and the machine automatically fills the molds with lead, forming a line of type into a solid metal strip called a "slug." The slugs are assembled into the type frames from which printing plates are made.

Monotype keyboard operators (D.O.T. 650.582) also operate a keyboard machine. However, instead of selecting metal molds, the monotype machine produces a perforated paper tape. *monotype keyboard operators* or *monotype caster operators* (D.O.T. 650.782) feed the tape into a machine that reads the tape and automatically select metal molds for each letter. The machine then forces molten metal into each mold to form the type.

While machines make their tasks easier, monotype and linotype machine operators must hyphenate and adjust type spacing to fit the width of columns. In small plants, operators also may maintain and repair typesetting machines.

Some typesetting will continue to be done by hand or with monotype and linotype machines. However, more and more firms are using phototypesetting machines, which can set type much more rapidly than linotype or monotype machines. With this equipment, a photographic process replaces the casting of type and the final product is a photographic film of the type rather than a metal slug.

In a common type of phototypesetting, a *phototypesetter* (D.O.T. 650.582) types in the text without

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regard to column width or hyphenation and produces a magnetic or perforated paper tape. The operator then feeds the tape containing the text into a computer that is programmed to do hyphenation and create columns of text. The computer creates a second tape—containing the text as it will appear when printed—that phototypesetters insert into a photocomposition machine. This machine displays the individual characters on the tape and photographs them. The phototypesetter then develops films of the material to be printed.

The most advanced method of typesetting uses electronic phototypesetting equipment. With this equipment, an operator uses a keyboard to select the size and style of type to select column width and provide spacing instructions, as well as to store each character in a computer. The computer then displays columns of type on a screen that is similar to a TV picture tube. Operators visually check the text and make any required corrections. They then photograph the screen to obtain a film of the material. These machines can prepare entire pages of type and any accompanying pictures instead of a single line of type.

After the copy is set, typesetters pass it to other compositors who arrange the columns of type, pictures, and illustrations according to the desired layout for each page. If 3etter press printing equipment are being used, they assemble the metal type and photoengravings in a large metal frame that clamps all the pieces together. If lithographic film equipment is being used, they cut the film of type and pictures and tape the pieces in place. Either method results in a preliminary printing plate.

After arranging all the pages of a particular job in proper sequence, compositors use a proof press to make a test of the entire job. Page proofs are checked with the original copy for errors and returned to the editor for final changes. After final changes have been put into the type, the plate is sent to the pressroom where production printing plates are made.

Places of Employment

About 152,000 workers were employed in composing room occupations in 1976. About one-third work for newspaper plants. Many others work for commercial printing plants, book and magazine printers, and Federal, State, and local governments. Some work for banks, insurance companies, advertising agencies, manufacturers, and other firms that do their own printing.

Composing room workers are located in almost every community throughout the country, but they are concentrated in large cities.

Training and Other Qualifications

Individuals who want to be all-round skilled compositors usually learn their skills through apprenticeship programs.

Generally, apprenticeship covers a 6-year period of progressively advanced training, supplemented by classroom instruction or correspondence courses. However, this period may be shortened by as much as 2 to 2-1/2 years for apprentices who have had previous experience or schooling or who show the ability to learn the trade more rapidly.

After basic training as a hand compositor, the apprentice receives intensive training in one specialized field or more, such as in the operation of typesetting machines, including phototypesetting machines, as well as in specialized work in hand composition and photocomposition.

Applicants for apprenticeship generally must be high school graduates and in good physical condition. They usually are given aptitude tests. Important qualifications include training in mathematics and English, especially spelling. Printing and typing courses in vocational or high schools are good preparation for apprenticeship applicants, and a general background in electronics and photography is becoming increasingly useful. Artistic ability is an asset for a compositor in layout work. Many technical institutes, junior colleges, and colleges offer courses in printing technology, which provide a valuable background for people who are interested in becoming all-round compositors.

More and more compositors are bypassing the traditional apprentice approach and learning the work through on-the-job experience. Persons with good typing skills can learn to be phototypesetting machine operators in a relatively short period of time. These workers need not be trained as skilled compositors but they must be familiar with printing terms and measurements.

Employment Outlook

Employment in composing room occupations is expected to decline through the mid-1980's. Nevertheless, a few thousand job openings are expected each year as experienced workers retire, die, or change occupations.

In spite of the anticipated expansion in the volume of printing, employment in composing room occupations is expected to decline because of the trend to high-speed phototypesetting and typesetting computers. These high speed machines require fewer operators than the traditional hot metal method of typesetting.

For the jobs that do become available, opportunities should be best for persons who have completed post high school programs in printing technology, such as those offered by technical institutes and junior colleges. Many employers prefer to hire applicants who have tompleted these programs because the comprehensive training that they receive helps them learn composing room trades and adapt to new processes and techniques more rapidly.

Although most job opportunities will continue to be in the printing industry, a growing number will be found in other industries, such as paper and textile mills, which are doing their own typesetting instead of contracting it to printing firms.

Earnings and Working Conditions

Union compositors on the day shift in newspaper plants had an estimated average minimum rate of $7.91 an hour in 1976, according to a survey

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of 69 large cities. This rate was about one-half more than the average for nonsupervisory workers in all private industries, except farming.

Working conditions for compositors vary from plant to plant. Some heat and noise are made by typesetting machines. In general, the new plants are well-lighted and clean, and many are air-conditioned. Hand compositors have to stand for long periods and do some heavy lifting. People with some types of physical handicaps, such as deafness, have been able to work in the trade.

Sources of Additional Information

Details about apprenticeship and other training opportunities may be obtained from local employers, such as newspapers and printing shops, the local office of the International Typographical Union, or the local office of the State employment service.

For general information 6n composing room occupations, write to:

American Newspaper Publishers Association, 11600 Sunrise Valley Dr., Reston, Va. 20041.

Graphic Arts Technical Foundation, 4615 Forbes Ave., Pittsburgh, Pa. 15213.

International Typographic Composition Association, Inc., 2233 Wisconsin Ave. NW., Washington, D.C. 20007.

Printing Industries of America, Inc., 1730 N. Lynn St., Arlington, Va. 22209.

LITHOGRAPHERS

Nature of the Work

Lithography, also called offset printing, is one of the most rapidly growing methods of printing. It is a process of photographing the matter to be printed, making a printing plate from the photograph, and pressing the inked plate against a rubber plate which in turn presses it onto the paper.

Lithographers are responsible for a variety of printing activities ranging from photographing copy and pictures to making the final printing plates. Most lithographers are divided into specialized occupations such as camera operators, artists, strippers, and platemakers.

Camera operators (D.O.T. 972.382) start the process of making a lithographic plate by photographing and developing negatives of the material to be printed. They generally are classified as line camera operators, halftone operators, or color separation photographers. Negatives may need retouching to lighten or darken certain parts. *Lithographic artists* (D.O.T. 972.281) make these corrections by sharpening or reshaping images on the negatives. They do the work by hand, using chemicals, dyes, and special tools. Like camera operators, they are assigned to only one phase of the work, and may have job titles such as dot etchers, retouchers, or letterers.

Strippers (D.O.T. 971.281) arrange and paste the negatives onto layout sheets, which are used by platemakers to make press plates. Platemakers (D.O.T. 972.781) cover the surface of flat pieces of metal with a coating of photosensitive chemicals, or may use plates with the coating already applied. They then put the layout sheet on top of the plate and expose both to bright lights. As the final step, platemakers treat the plate with chemicals to bring out the images of the material to be printed. When a large number of plates or a multiple number of images are needed, operators use a photocomposition machine.



Many technical institutes, junior colleges, and colleges offer 2-year programs in printing technology.

Places of Employment

About 29,000 skilled lithographers were employed in 1976. Many work for commercial printing plants, newspapers, and book and magazine printers. Some work for the U.S. Government Printing Office.

Although lithographic workers are located in all parts of the country, most are employed in large cities.

Training and Other Qualifications

A 4- or 5-year apprenticeship program usually is required in order to become a well-rounded lithographic craft worker. These programs may emphasize a specific craft, such as camera operator or lithographic artist, although an attempt is made to make the apprentice familiar with all lithographic operations.

Usually, apprenticeship applicants must be in good physical condition, high school graduates, and at least 18 years of age. Aptitude tests usually are given to prospective apprentices to determine if they are suited for the work.

Many technical institutes, junior colleges, and colleges offer 2-year programs in printing technology, which provide a valuable background for persons who are interested in learning lithographic crafts. High school and vocational school training in printing, photography, mathematics, chemistry, physics, and art also are helpful.

Employment Outlook

Employment of lithographers is expected to increase faster than the average for all occupations through the mid-1980's. In addition to the job openings resulting from employment growth, the need to replace workers who retire, die, or change occupations will provide some openings.

Employment of lithographic workers is expected to increase in response to the continued growth of offset printing. Commercial printing firms and newspaper publishers in-

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creasingly are using offset printing methods instead of letterpresses. Employment growth also will be stimulated by the greater use of photographs and drawings in printed matter, and by the more widespread use of color in many printed products.

Employment opportunities should be best for people who have completed post-high school programs in printing technology, such as those offered by technical institutes and junior colleges. Many employers prefer to hire applicants who have completed these programs because the comprehensive training they receive helps them learn lithography and adapt more rapidly to new processes and techniques.

Earnings and Working Conditions

Based on a survey of union wages in 69 large cities, it is estimated that in 1976, average minimum wages for lithographic artists were $8.98; for strippers $8.67; for camera operators $8.78; and platemakers $8.78. These rates were higher than the average for all nonsupervisory workers in private industry, except farming.

Lithographic workers are on their feet much of the time, but the work is not strenuous. They sometimes are under pressure to meet publication deadlines.

Many lithographic workers are members of the Graphic Arts International Union.

Sources of Additional Information

Details on apprenticeship and other training opportunities in lithographic occupations are available from local employers such as newspapers and printing shops, local offices of the Graphic Arts International Union, or the local office of the State employment service. For information on schools that offer courses in printing technology, write to:

Graphic Arts Technical Foundation, 4615 Forbes Ave., Pittsburgh, Pa. 15213.

For general information on lithographic occupations, write to:

American Newspaper Publishers Association, 11600 Sunrise Valley Dr., Reston, Va. 20041.

American Photoplatemakers Association, 105 West Adams St., Suite 905, Chicago Ill. 60603.

Graphic Arts International Union, 1900 L St. NW., Washington, D.C. 20036.

International Printing and Graphic Communications Union, 1730 Rhode Island Ave. NW., Washington, D.C. 20036.

Printing Industries of America, Inc., 1730 N. Lynn St., Arlington, Va. 22201.

PHOTOENGRAVERS

(D.O.T. 971.281 and .382)

Nature of the Work

Photoengravers make metal printing plates of pictures and other copy that cannot be set up in type. In letterpress photoengraving, ink is rolled over a printed surface which stands higher than the rest of the plate. When paper is pressed against the raised surface, the print or image is picked up. Similarly, gravure photoengravers make gravure cylinders on which the image is etched below the surface of the cylinder. Ink is placed in the etched or sunken areas, and when paper is pressed against the surface the ink is lifted out and appears on the paper. In both methods, however, the work of photoengravers is the same.

For a typical job, photoengravers first mount the picture or copy to be reproduced on a board, adjust the position and focus of a camera, and take a picture. After developing the negative, they print its image on a flat, metal plate by coating the plate with a chemical solution sensitive to light, placing the negative on the plate, and exposing both to a bright light. As the final step in making the printing plate, photoengravers put the plate in an acid bath which eats the metal away from areas which will not be covered with ink. The areas to receive ink—those that were shielded from the light by the negative—stand out to make contact with the paper.



Most photoengravers learn their trade through a 5-year apprenticeship program.

The number of photoengraving operations performed depends on the quality of the printing required. Photoengravings for very high quality books or periodicals, for example, require more careful finishing than those for newspapers. Photoengravers use handtools to inspect and touch up the plates. They cut away metal from the nonprinting part of the plate to prevent it from touching the inking rollers during printing.

In a small shop, the entire photoengraving operation usually is done by one person. In large shops, however, the work is divided among specialists who perform a particular operation such as camera work, printing, or etching.

Places of Employment

An estimated 10,000 skilled photoengravers were employed in 1976. More than half work in commercial shops that make photoengravings for other printing firms. Newspapers and photogravure shops employ several thousand photoengravers. Book and magazine printers and the Federal Government also employ these workers. Many photoengravers have their own shops.

Although photoengravers are located in all parts of the country, em-

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ployment is concentrated in large printing centers, such as New York, Chicago, Philadelphia, and Los Angeles.

Training and Other Qualifications

Most photoengravers learn their trade through a 5-year apprenticeship program that includes at least 800 hours of classroom instruction. In addition to the care and use of tools, the apprentice is taught to cut and square negatives, inspect negatives for defects, mix chemicals, sensitize metals, and operate machines used in the photoengraving process.

Apprenticeship applicants must be at least 18 years of age and generally must have a high school or vocational school education or its equivalent, preferably with courses in printing, chemistry, and physics. Many employers require a physical examination for prospective photoengravers. Good eyesight is particularly important because of the close work and color discrimination involved.

Employment Outlook

Employment opportunities for photoengravers are expected to be scarce in the years ahead. Despite the growing use of photographs and other illustrations in publications, employment of photoengravers will decline as many firms switch from letterpress to offset printing, which requires no photoengraving. Also, new technological advances such as color scanners and color enlargers plus the trend toward automated platemaking should reduce the need for these workers. However, some job openings are expected each year as experienced photoengravers retire, die, or leave the occupation for other reasons.

Earnings and Working Conditions

It is estimated that photoengravers on the day shift in newspaper plants earned an average minimum rate of $8.47 an hour in 1976, based on a union survey of 69 large cities. This average was about two-thirds more than the average for all nonsupervisory workers in private industry, except farming.

Photoengravers stand up much of the time, but the work is not strenuous. Work areas usually are air-conditioned and well-lighted. Most photoengravers are members of the Graphic Arts International Union.

Sources of Additional Information

Details about apprenticeship and other training opportunities may be obtained from local employers such as newspapers and printing shops, the local office of the union mentioned above, or the local office of the State employment service.

For general information on photoengravers, write to:

American Newspaper Publishers Association, 11600 Sunrise Valley Dr., Reston, Va. 20041.

American Photoplatemakers Association, 105 West Adams St., Suite 950, Chicago, Ill. 60603.

Graphic Arts Technical Foundation, 4615 Forbes Ave., Pittsburgh, Pa. 15213.

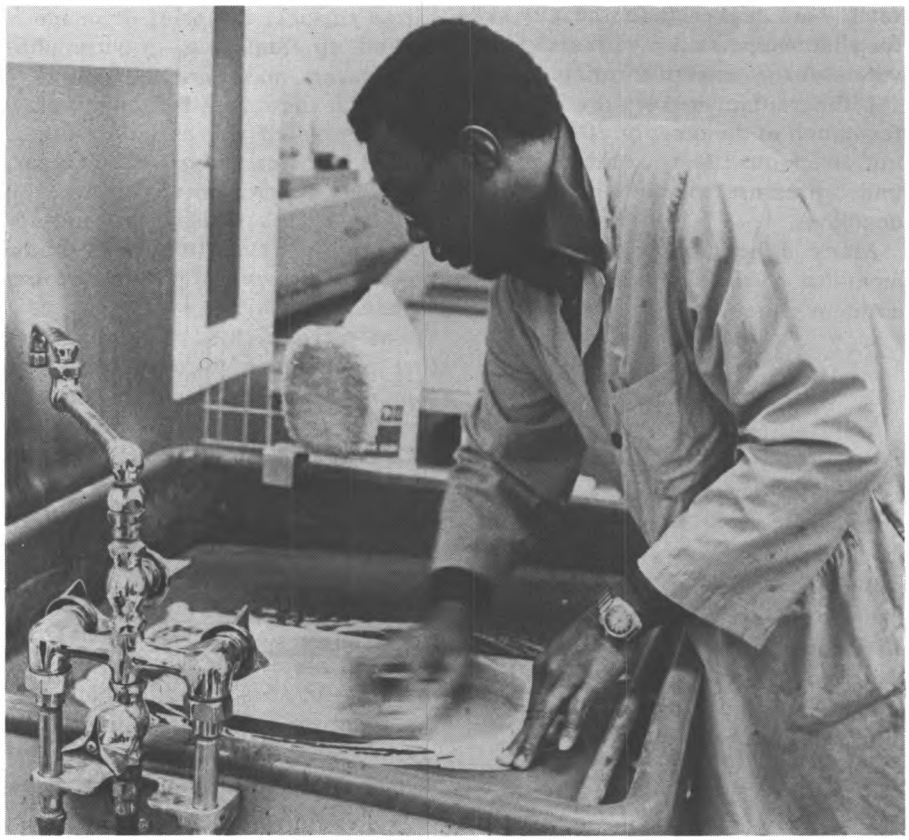
Graphic Arts International Union, 1900 L St. NW., Washington, D.C. 20036.

Printing Industries of America, Inc., 1730 N. Lynn St., Arlington, Va. 22201.

ELECTROTYPERS AND STEREOTYPERS

Nature of the Work

Electrotypers (D.O.T. 974.381) and *stereotypers* (D.O.T. 975.782) make duplicate press plates of metal, rubber, and plastic for letterpress printing. These plates are made from the metal type forms prepared in the composing room. Electrotypes are used mainly in book and magazine work. Stereotypes, which are less durable, are used chiefly for newspapers. Electrotyping and stereotyping are necessary because most volume printing requires the use of duplicate plates. When a large edition of a



Stereotyper prepares mats for casting machines.

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magazine or newspaper is printed, several plates must be used to replace those that become too worn to make clear impressions. Also, by having duplicate plates, printers can use several presses at the same time and finish a big run quickly. Furthermore, many big plants use rotary presses, which require curved plates made by either electrotyping or stereotyping from flat type forms.

Electrotypers make a wax or plastic mold of the metal type form. They then coat the mold with chemicals and place the mold into an electrolytic bath that puts a metallic shell on the coated mold. Electrotypers then strip the shell from the mold and fill the back of the shell with molten lead to form a plate. After removing excess metal from the edges and back of the plate, electrotypers inspect the plate for any defects.

The stereotyping process is simpler, quicker, and less expensive than electrotyping, but it does not yield as durable or as fine a plate. Stereotypers make molds or mats of papier-mache' instead of wax or plastic. The mat is placed on the type form and covered with a cork blanket and a sheet of fiberboard. The covered form is run under heavy steel rollers to impress the type and photoengravings on the mat. Then the mat is placed in a stereotype casting machine which casts a composition lead plate on the mold. In many of the larger plants, automatic machines cast stereotype plates.

Some electrotypers and stereotypers do only one phase of the work, such as casting, molding, or finishing. Others handle many tasks.

Places of Employment

About 4,000 electrotypers and stereotypers were employed in 1976. Many electrotypers work in large plants that print books and magazines. Most stereotypers work for newspaper plants, but some work in large commercial printing plants. Electrotypers and stereotypers also are employed in service shops that do this work for printing firms.

Jobs in these trades can be found throughout the country, but employment is concentrated in large cities.

Training and Other Qualifications

Nearly all electrotypers and stereotypers learn their trades through 5- to 6-year apprenticeships. Electrotyping and stereotyping are separate crafts and relatively few transfers take place between the two. The apprenticeship program of each trade covers all phases of the work and almost always includes classes in related technical subjects as well as training on the job.

Apprenticeship applicants must be at least 18 years of age and, in most instances be able to pass physical examinations that usually are given to prospective apprentices. Due to the decline in demand for electrotypers and stereotypers, however, very few apprenticeships have been offered in the last several years. Many experienced electroplaters and stereotypers are now being retrained as plate makers in offset and press operators.

Employment Outlook

Job opportunities for electrotypers and stereotypers are expected to be scarce through the mid-1980's. Despite the anticipated increase in the volume of printing, employment of electrotypers and stereotypers is expected to decline because of labor-saving developments. For example, automatic plate casting eliminates many steps in platemaking. The use of plastic printing plates also requires less labor because such plates are more durable and reduce the demand for duplicate plates. Furthermore, the greater use of offset printing reduces the need for electrotype and stereotype plates, which are not needed in offset printing.

Earnings and Working Conditions

Based on a union wage survey, it is estimated that in 1976, union minimum wage rates in 69 large cities averaged $7.23 an hour for electrotypers and $7.88 an hour for stereotypers in book and commercial printing shops. Both averages were considerably higher than the average for all nonsupervisory workers in private industry, except farming.

Much of the work in these trades requires little physical effort since the preparation of duplicate printing plates is highly mechanized. However, some lifting of relatively heavy press plates occasionally is required.

Nearly all electrotypers and stereotypers are members of the International Printing and Graphic Communications Union.

Sources of Additional Information

Details about apprenticeship and other training opportunities may be obtained from local employers, such as newspapers and printing shops, the local office of the International Printing and Graphic Communications Union, or the local office of the State employment service.

For general information on electrotypers and stereotypers, write to:

American Newspaper Publishers Association, 11600 Sunrise Valley Dr., Reston, Va. 20041.

Graphic Arts Technical Foundation, 4615 Forbes Ave., Pittsburgh, Pa. 15213.

International Printing and Graphic Communications Union, 1730 Rhode Island Ave. NW., Washington, D.C. 20036.

Printing Industries of America, Inc., 1730 N. Lynn St., Arlington, Va. 22209.

PRINTING PRESS OPERATORS AND ASSISTANTS

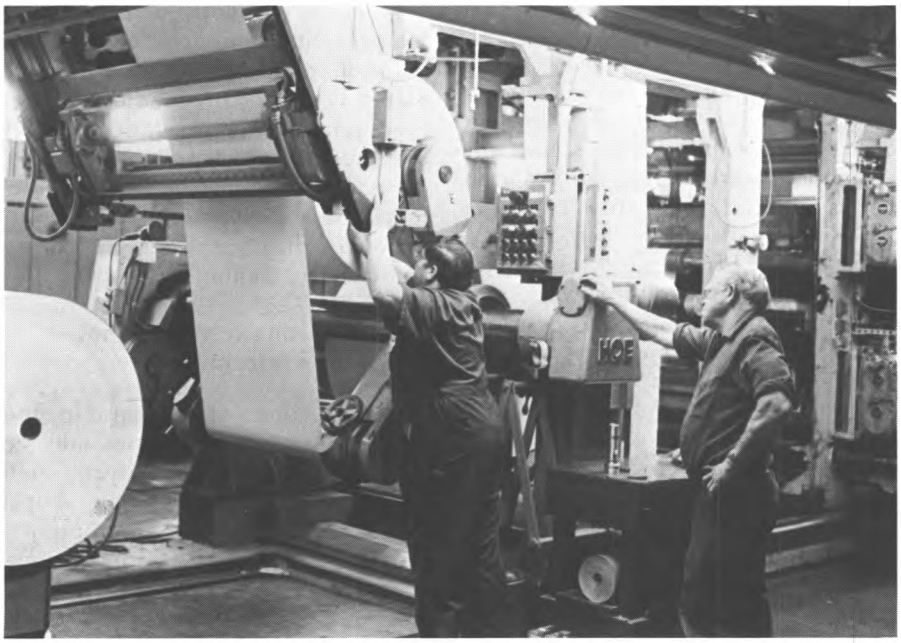
(D.O.T. 651.782, .885. and .886)

Nature of the Work

Printing operations are performed in a pressroom. Printing press operators prepare and operate the printing presses.

Before actually starting the press, press operators set up and adjust the press to insure that the printing impressions are distinct and uniform. Press operators first insert and lock type setups or plates into the press bed and then tighten the locking attachment with a wrench. The press operator then levels the press plates by placing pieces of paper that are

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Press operator adjusts controls.

exactly the right thickness underneath low areas of the plates.

Press operators also adjust control margins and the flow of ink to the inking roller. In some shops, they oil and clean the presses and make minor repairs. Press operators who work with large presses have assistants and helpers.

Press operators' jobs may differ from one shop to another, mainly because of differences in the kinds and sizes of presses. Press operators in small commercial shops generally operate relatively simple manual presses. On the other hand, a crew of several press operators and press assistants runs giant presses used by the large newspaper, magazine, and book printers. These presses are fed paper zn big rolls called "webs" up to 50 inches or more in width. 0t ey print the paper on both sides; cut, assemble, and fold the pages; and count the finished newspaper sections as they come off the press.

Most press operators are generally designated according to the type of press they operate: letterpress, gravure, or offset.

Places of Employment

About 145,000 press operators and assistants were employed in 1976. More than half work for commercial printing shops and book and magazine publishers. Many others have jobs in newspaper plants. Some press operators and assistants work for banks, insurance companies, manufacturers, and other organizations that do their own printing, such as Federal, State, and local goverments.

Press operators and assistants can find jobs throughout the country, but employment is concentrated in large cities.

Training and Other Qualifications

Most press operators learn their trade through apprenticeship, but some workers learn as helpers or press assistants. Others obtain their skills through a combination of work experience and vocational or technical school training.

The length of apprenticeship and the content of training depend largely on the kind of press used in the plant. The apprenticeship period in commercial shops is 2 years for press assistants, and 4 to 5 years for press operators. In addition to on-the-job instruction, the apprenticeship includes related classroom or correspondence school courses. Courses in printing provide a good background. Because of technical developments in the printing industry, courses in chemistry and physics also are helpful. Mechanical aptitude is important in making press adjustments and repairs. An ability to visualize color is essential for work on color presses. Physical strength and endurance are needed for work on some kinds of presses, where operators lift heavy plates and stand for long periods.

Technological changes have had a tremendous effect on the skill requirements of press operators. For example, printing companies which change from sheet-fed offset presses to web-offset presses have to retrain their entire press crew because the skill requirements for the two types of press are very different. Web-offset presses, with their faster operating speeds, require faster decisions monitoring of more variables, and greater physical effort.

Advancement opportunities generally are limited. Press operators may advance in pay and responsibility by taking a job working on a more complex printing press or by becoming a supervisor.

Employment Outlook

Employment of press operators is expected to increase more slowly than the average for all occupations through the mid-1980's. Despite the increased use of faster and more efficient presses, more press operators will be needed because of the growth in the amount of printed materials.

In addition to the jobs from employment growth, a few thousand openings will arise each year as experienced workers retire, die, or leave their job for other reasons. However, printing press operators are expected to face competition for jobs. Since there are generally long waiting lists for apprenticeship programs, most people will have to take jobs as press assistants or unskilled laborers before being selected for an apprenticeship. It is not uncommon for a person to work 2 or 3 years or more before beginning apprenticeship training.

Since many firms are switching to web offset presses from letterpresses or sheet-fed presses, opportunities

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are expected to be more favorable for web-press operators.

Although most job opportunities will continue to be in the printing industry, a growing number of openings will be found in other industries, such as papermills, which are doing more of their own presswork instead of contracting it out to printing firms.

Earnings and Working Conditions

Based on a survey of union wages in 69 large cities, it is estimated that in 1976 the average minimum hourly rate for newspaper press operators-in-charge was $8.18; for newspaper press operators, $7.65; for book and job cylinder press operators, $7.72; and for book and job press assistants and feeders, $6.84. These rates were higher than the average for all nonsupervisory workers in private industy, except farming. Many press operators work night shifts and receive extra pay.

Pressrooms are noisy, and workers in certain areas frequently wear ear protectors. Press operators are subject to hazards when working near machinery. At times, they work under pressure to meet deadlines.

Many pressroom workers are covered by union agreements. The principal union in this field is the International Printing and Graphic Communications Union.

Sources of Additional Information

Details about apprenticeship and other training opportunities may be obtained from local employers such as newspapers and printing shops, the local office of the union mentioned above, or the local office of the State employment service.

For general information about press operators and assistants, write to:

American Newspaper Publishers Association, 11600 Sunrise Valley Dr., Reston, Va. 20041.

Graphic Arts International Union, 1900 L St. NW., Washington, D.C. 20036.

Graphic Arts Technical Foundation, 4615 Forbes Ave., Pittsburgh, Pa. 15213.

International Printing and Graphic Communications Union, 1730 Rhode Island Ave. NW., Washington, D.C. 20036.

Printing Industries of America, Inc., 1730 N. Lynn St., Arlington, Va. 22209.

BOOKBINDERS AND BINDERY WORKERS

Nature of the Work

Many printed items, such as books and magazines, must be folded, sewed, stapled, or bound after they leave the printing shops. Much of this work is done by skilled *bookbinders* (D.O.T. 977.781).

Edition-binding—making books in quantity from big, flat printed sheets of paper—is the most complicated kind of binding. Bookbinders first fold the printed sheets into units, known as "signatures," so that the pages will be in the right order. They then insert any illustrations that have been printed separately, gather and assemble signatures in proper order, and sew them together. They shape the book bodies with presses and trimming machines and reinforce them with glued fabric strips. Covers are glued or pasted onto the book bodies, and then the books undergo a variety of finishing operations and frequently are wrapped in paper jackets. Machines are used extensively throughout the process.



Many bindery workers are trained in only one operation.

Bookbinders seldom perform all the different binding tasks, but many have had training in all of them. In large shops, bookbinders may be assigned to one or a few operations, most often to the operation of complicated machines, such as a large paper cutter or a folding machine.

In many binding shops much of the work is done by bindery workers who are trained zn only one operation 6r in a small number of relatively simple tasks. For example, bindery workers perform such tasks as wastening sheets or signatures together using a machine stapler and feeding signatures into various machines for stitching, folding, or gluing operations.

Some bookbinders work in hand binderies designing original bindings and special bindings for a small number of copies of a large edition or restoring and rebinding rare books. This skilled work requires creative ability, knowledge of materials, and a thorough background in the history of binding. Hand bookbinding is perhaps the only kind of binding that gives the individual an opportunity to work at a variety of jobs.

Places of Employment

About 80,000 bookbinders and bindery workers were employed in 1976. Many work in shops that specialize in bookbinding; others work in the bindery departments of book publishing firms, commercial printing plants, and large libraries. Some bookbinders work for the Federal Government.

Although bookbinders work in all parts of the country, employment is concentrated in large printing centers such as New York, Chicago, Washington, D.C., and Los Angeles.

Training, Other Qualifications, and Advancement

A 4- or 5-year apprenticeship, which includes on-the-job training as well as related classroom instruction, generally is required to qualify as a skilled bookbinder. Apprenticeship applicants usually must have a high school education, mechanical apti-

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tude, and be at least 18 years of age. During the apprenticeship, trainees learn to assemble signatures; to renovate old, worn bindings; and to use various binding machines, such as punchers and folders.

Most bindery workers learn their tasks through informal on-the-job training that may last from several months to 2 years. A large number, however, learn through formal apprenticeship programs that include classroom instruction as well as on-the-job training.

High school students interested in bookbinding careers should take shop courses to develop their mechanical skills.

Advancement opportunities generally are limited. In large binderies skilled bookbinders with considerable experience may advance to supervisors.

Employment Outlook

Employment of bookbinders and bindery workers is expected to increase more slowly than the average for all occupations through the mid-1980's. Most job openings will arise as experienced workers retire, die, or change occupations.

Despite the anticipated growth in the amount of bound printed materials, employment growth will be limited by the increasing mechanization of bindery operations. For example, the use of integral folders that automatically fold pages as they come off the press eliminates the need for bindery workers to do the folding by hand.

Earnings and Working Conditions

Wage rates for skilled bookbinders tend to be below the average for other printing crafts. Based on a survey of union wage rates in 69 large cities, it is estimated that mininimum wage rates for bookbinders in publishing firms and bookbinding shops averaged about $7.47 an hour in 1976. This rate was about one and one-half times the average for all nonsupervisory workers in private industry, except farming.

Wage rates for bindery workers are considerably lower than the rates for bookbinders, and are among the lowest for printing industry workers. A survey of union wages in 69 large cities shows that in 1976 the average minimum hourly rate for bindery workers was $4.77.

Accuracy, patience, neatness, and good eyesight are among qualities needed by bookbinders. Good finger dexterity is essential for those who count, insert, paste, and fold.

Bookbinding shops tend to be noisy when machinery is operating. Bookbinders have some variety in their jobs, but the jobs of bindery workers tend to be monotonous. Long periods of standing and constant use of the arms can be tiring.

Many bindery workers are members of The Graphic Arts International Union.

Sources of Additional Information

Details about apprenticeship and other training opportunities may be obtained from local bookbinding shops, local offices of the Graphic Arts Union, or the local office of the State employment service.

For general information on bookbinding occupations, write to:

American Newspaper Association, 11600 Sunrise Valley Dr., Reston, Va. 20041.

Graphic Arts Technical Foundation, 4615 Forbes Ave., Pittsburgh, Pa. 15213.

Graphic Arts International Union, 1900 L St. NW., Washington, D.C. 20036.

Printing Industries of America, Inc., 1730 N. Lynn St., Arlington, Va. 22201.

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OTHER INDUSTRIAL PRODUCTION AND RELATED OCCUPATIONS

ASSEMBLERS

Nature of the Work

When Henry Ford began producing his automobile on an assembly line, modern mass production was born. Workers who before had built each automobile independently, now found themselves specializing in just one part of the job. Production became a team effort, with each worker performing a single task on every car rolling by on the line. Over the years, the assembly line spread to other industries, until today almost every manufactured item is produced in this way.

The workers who put together the parts of manufactured articles are called assemblers. Sometimes hundreds are needed to turn out a single finished product.

Many assemblers work on items that automatically move past their work stations on conveyors. In the automobile industry, for example, one assembler may start nuts on bolts by hand or with a hand tool, and the next worker down the line may tighten the nuts with a power wrench. These workers must complete their job within the time it takes the part or product to pass their work station.

Other assemblers, known as bench assemblers, do more delicate work. Some make subassemblies. These units are the intermediate steps in the production process; for example, steering columns for automobiles or motors for vacuum cleaners. Others make entire products. Assemblers in rifle manufacturing plants build complete rifles from a collection of parts and subassemblies and then test all the moving parts to be sure they function correctly. Bench work generally requires the ability to do precise and detailed work. Some electronics assemblers, for example, use tweezers, tiny cutters, and magnifying lenses to put together the small components used in radios and calculators.

Another group of assemblers, called floor assemblers, put together large machinery or heavy equipment on shop floors. School buses, cranes, and tanks are put together in this manner. Parts are installed and fastened, usually with bolts, screws, or rivets. Assemblers often use a power tool, such as a soldering iron or power drill, to get a proper fit.

A small number of assemblers are skilled workers who work with little or no supervision on the more complex parts of subassemblies, and are responsible for the final assembly of complicated jobs. A skilled assembler may have to wire the tubes for a television set or put together and test a calculator. Some work with the engineers and technicians in the factory, assembling products that these people have just designed. To test new ideas and build models, these workers must know how to read blueprints and other engineering specifications, and use a variety of tools and precision measuring instruments.

Places of Employment

About 1,100,000 assemblers worked in manufacturing plants in 1976. Almost two-thirds were in plants that made machinery and motor vehicles. More than half of all



Skilled assemblers work on complex subassemblies.

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assemblers were employed in the heavily industrialized States of California, New York, Michigan, Illinois, Ohio, and Pennsylvania.

Training, Other Qualifications, and Advancement

Inexperienced people can be trained to do assembly work in a few days or weeks. New workers may have their job duties explained to them by the supervisor and then be placed under the direction of experienced employees. When new workers have developed sufficient speed and skill, they are placed "on their own" and are responsible for the work they do.

Employers seek workers who can do routine work at a fast pace. A high school diploma usually is not required.

For some types of assembly jobs, applicants may have to meet special requirements. Some employers look for applicants with mechanical aptitude and prefer those who have taken vocational school courses such as machine shop. Good eyesight, with or without glasses, may be required for assemblers who work with small parts. In plants that make electrical and electronic products, which may contain many different colored wires, applicants often are tested for color blindness. Floor assemblers may have to lift and fit heavy objects, thus they should be physically fit.

As assemblers become more experienced they may progress to assembly jobs that require more skill and be given more responsibility. A few advance to skilled assembly jobs. Experienced assemblers who have learned many assembly operations and thus understand the construction of a product may become product repairers. These workers fix assembled articles that inspectors have ruled defective. Assemblers also may advance to inspector and a few are promoted to supervisor. Some assemblers become trainees in skilled trades jobs such as machinist.

Employment Outlook

Employment of assemblers is expected to grow faster than the average for all occupations through the mid-1980's, with thousands of openings each year. Most job openings, however, will result as workers retire, die, or leave the occupation.

More assemblers will be needed in manufacturing plants to produce goods for the Nations's growing economy. As population grows and personal income rises, the demand for consumer products, such as automobiles and household appliances, will increase. At the same time, business expansion will increase the demand for industrial machinery and equipment.

Most assemblers work in plants that produce durable goods, such as automobiles and aircraft, which are particularly sensitive to changes in business conditions and national defense needs. Therefore, even though employment is expected to grow, jobseekers may find opportunities scarce in some years.

Earnings and Working Conditions

Wage rates for assemblers ranged from about $3 to $7 an hour in 1976, according to information from a limited number of union contracts. Most assemblers covered by these contracts made between $4 and $6 an hour. Some assemblers are paid incentive or piecework rates, and therefore can earn more by working more rapidly.

The working conditions of assemblers differ, depending on the particular job performed. Bench assemblers who put together electronic equipment may work in a room that is clean, well lighted, and free from dust. Floor assemblers of industrial machinery may come in contact with oil and grease, and their working areas may be quite noisy from nearby machinery or tools that are used. Workers on assembly lines may be under pressure to keep up with the speed of the lines. Since most assemblers only perform a few steps in the assembly operation, assembly jobs tend to be more monotonous than other blue-collar jobs.

Work schedules of assemblers may vary at plants with more than one shift. Usually in order of seniority, workers can accept or reject a certain job on a given shift.

Many assemblers are members of labor unions. These include the International Association of Machinists and Aerospace Workers; the International Union of Electrical, Radio and Machine Workers; the International Union; United Automobile, Aerospace and Agricultural Implement Workers of America; the International Brotherhood of Electrical Workers; and United Steelworkers.

Source of Additional Information

Additional information about employment opportunities for assemblers may be available from local offices of the State employment service.

AUTOMOBILE PAINTERS

(D.O.T. 845.781)

Nature of the Work

Automobile painters make old and damaged motor vehicles "look like new." These skilled workers repaint older vehicles that have lost the luster of their original paint and make fender and body repairs almost invisible. (Painters who work on the production lines at motor vehicle manufacturing plants are discussed elsewhere in the *Handbook*.)

To prepare an automobile for painting, painters or their helpers remove the original paint or rust using air-or electric-powered sanders and a course grade of sandpaper. Before painting, they also must remove or protect areas which they do not want painted, such as chrome trim, headlights, windows, and mirrors. Painters or their helpers cover these areas with paper and masking tape.

When the car is ready, painters use a spray gun to apply primer coats to the automobile surface. After each coat of primer dries, they sand the surface until it is smooth before applying another coat. Final sanding may be uone by hand, using a fine grade of sandpaper. If the surface to be painted is not smooth, the paint job will be rough and uneven. Small nicks and scratches that cannot be removed by sanding are filled with automobile body putty.

Before painting repaired portions of an automobile, painters often have

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to mix paints to match the color of the car. This important part of the job can be very difficult when painting repaired parts of older cars because the original color often fades over the years.

Before applying paint, painters adjust the nozzle of the spray gun according to the kind of lacquer or enamel being used and, if necessary, they adjust the air-pressure regulator to obtain the correct pressure. If the spray gun is not adjusted properly, the paint may run or go on too thinly. To speed drying, they may place the freshly painted automobile under heat lamps or in a special infrared oven that is sealed to prevent dust and bugs from getting onto the fresh paint. After the paint has dried, painters or their helpers usually polish the newly painted surface.

Places of Employment

About 30,000 persons worked as automobile painters in 1976. Almost two-thirds worked in shops that specialize in automobile repairs. Most others worked for automobile and truck dealers. Some painters worked for organizations that maintained and repaired their own fleets of motor vehicles, such as trucking companies and buslines.

Painters are employed throughout the county, but are concentrated in metropolitan areas.

Training, Other Qualifications, and Advancement

Most automobile painters start as helpers and gain their skills informally by working with experienced painters. Beginning helpers usually perform tasks such as removing automobile trim, cleaning and sanding surfaces to be painted, and polishing the finished work. As helpers gain experience, they progress to more complicated tasks, such as mixing paint to achieve a good match and using spray guns to apply primer coats and painting small areas. Becoming skilled in all aspects of automobile painting usually requires 3 to 4 years of on-the-job training.

A small number of automobile painters learn through apprenticeship. Apprenticeship programs, which generally last 3 years, consist of on-the-job training supplemented by classroom instruction in areas such as shop safety practices, proper use of equipment, and general painting theory.



Automobile painters often acquire their skills by working with experienced painters.

Persons considering this work as a career should have good health, keen eyesight, and a good color sense. Courses in automobile-body repair offered by high schools and vocational schools provide helpful experience. Completion of high school generally is not a requirement but may be an advantage, because to many employers high school graduation indicates that the person has at least some of the traits of a good worker, such as reliability and perseverance.

An experienced automobile painter with supervisory ability may advance to shop supervisor. Many experienced painters with the necessary funds open their own shops.

Employment Outlook

Employment of automobile painters is expected to increase about as fast as the average for all occupations through the mid-1980's. In addition to jobs created by growth, several hundred openings are expected to arise each year because of the need to replace experienced painters who retire or die. Openings also will occur as some painters transfer to other occupations.

Employment of automobile paintvrs is expected to increase primarily because more 4otor vehicles will be damaged in traffic accidents. As the number of vehicles on the road grows, accident losses will grow, even though better highways, lower speed limits, driver training courses, and improved bumpers and other safety features on new vehicles may slow the rate of growth.

Most persons who enter the occupation can expect steady work because the automobile repair business is not affected much by changes in economic conditions.

Job opportunities will be best in heavily populated areas. Many shops in small cities do not have enough business to hire trainees.

Earnings and Working Conditions

Painters employed by automobile dealers in 36 large cities had estimated average hourly earnings of $8.50 in 1976, compared to an average of $4.87 for all nonsupervisory workers in private industry, except farming. Skilled painters usually earn between

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two and three times as much as inexperienced helpers and trainees.

Many painters employed by automobile dealers and independent repair shops receive a commission based on the labor cost charged to the customer. Under this method, earnings depend largely on the amount of work a painter does and how fast it is completed. Employers frequently guarantee their commissioned painters a minimum weekly salary. Helpers and trainees usually receive an hourly rate until they become sufficiently skilled to work on a commission basis. Trucking companies, buslines, and other organizations that repair their own vehicles usually pay by the hour. Most painters work 40 to 48 hours a week.

Automobile painters are exposed to fumes from paint and paint-mixing ingredients. In most shops, however, the painting is done in special ventilated booths that protect the painters. Painters also wear masks to protect their noses and mouths. Painters must be agile because they often bend and stoop while working to reach all parts of the car.

Many automobile painters belong to unions, including the International Association of Machinists and Aerospace Workers; the International Union, United Automobile, Aerospace and Agricultural Implement Workers of America; the Sheet Metal Workers' International Association; and the International Brotherhood of Teamsters, Chauffeurs, Warehousemen and Helpers of America (Ind.). Most painters who are union members work for the larger automobile dealers, trucking companies, and buslines.

Sources of Additional Information

For more details about work opportunities, contact local employers, such as automobile-body repair shops and automobile dealers; locals of the unions previously mentioned; or the local office of the State employment service. The State employment service also may be a source of information about apprenticeship and other programs that provide training opportunities.

For general information about the work of automobile painters, write:

Automotive Service Industry Association, 230 North Michigan Ave., Chicago, Ill. 60601.

Automotive Service Councils, Inc., 188 Industrial Dr., Suite 112, Elmhurst, Ill. 60126.

BLACKSMITHS

(D.O.T. 356.381 and 610.381)

Nature of the Work

Years ago the village blacksmith was as vital to a community as the country doctor. No one else could repair a broken wagon wheel, shoe a horse, or forge a tool to suit a farmer's needs. Today, the blacksmith's work still is important in factories and mines where heavy metal equipment must be repaired, and at stables and racetracks. Power hammers and ready-made horseshoes have made much of the work easier, but the basic tasks remain largely the same.

The first thing a blacksmith must do when making or repairing anything made of metal is to heat it in a forge to soften it. Once the metal begins to glow red, it is ready for the blacksmith to pick it up with tongs, place it on the anvil, and begin to shape it using presses and power hammers. On repair jobs broken parts are rejoined by hammering them together. The blacksmith uses handtools such as hammers and chisels to finish the task at hand, often reheating the metal in the forge to keep it soft and workable.

Before a metal article can be used, it must be hardened. To complete this stage of the process, the blacksmith reheats the metal to a high temperature in the forge and then plunges it into a water or oil bath. However, metal hardened in this way is brittle and can break under stress. If strength is important, blacksmiths temper the metal instead. To do this, they heat the metal to a lower temperature than they use for hardening, keep it hot for some time, and then allow it to cool at room temperature.

Blacksmiths who specialize in shoeing horses are called farriers. Today, most farriers use ready-made horseshoes so that their primary job is to adjust shoes for a proper fit. On some occasions, however, they may have to make the shoes themselves. Racehorses need special care because they must withstand strenuous punishment to their legs and hooves. Improper shoeing can permanently damage a valuable horse. Farriers who shoe racehorses need to be able to recognize weaknesses in a horse's legs, and shoe it accordingly. Some horses, for example, need shoes that are thicker on the outside as compared to the inside edge in order to walk correctly. To shoe a horse, farriers begin by removing the old shoe with nail snippers and pincers. They examine the horse's hoof for bruises and then clean, trim, and shape the hoof. When the hoof is ready, they position and nail a shoe onto the hoof and finish by trimming the hoof flush to the new shoe.

Industrial occupations that are similar to blacksmith include forge and hammer operator, welder, and boilermaker. (These occupations are discussed elsewhere in the *Handbook*.)

Places of Employment

Of the approximately 10,000 blacksmiths employed in 1976, almost two-thirds worked in factories, railroads, and mines. The remainder worked in small shops, and most were self-employed. Blacksmiths work in all parts of the country—in rural communities as well as in large industrial centers.

Most farriers are self-employed and contract their services to horse trainers at racetrack stables and to owners of horses used for private or public recreation.

Training, Other Qualifications, and Advancement

Many beginners enter the occupation by working as helpers in blacksmith shops or large industrial firms that employ blacksmiths. Others enter through formal apprenticeship programs and transfer from related occupations such as forge operator or hammer operator. Apprenticeship programs usually last 3 or 4 years. The programs teach blueprint reading, proper use of tools and equipment, heat-treatment of metal,

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Many beginners work as helpers in blacksmith shops.

and forging methods. Most apprentices are found in large industrial firms rather than in small repair shops. Vocational school or high school courses in metalworking and blueprint reading are helpful to persons interested in becoming blacksmiths.

Many farriers learn their craft by assisting experienced farriers. Others may take a short course in horseshoeing lasting about 3 or 4 weeks before gaining experience on their own or as farriers' assistants. Courses in horseshoeing are taught in several colleges, as well as at private horseshoeing schools. Most of these are located in the Midwest. Persons considering enrolling at any school should talk to a farrier in their area concerning the school's performance in producing qualified farriers. At least 3 to 5 years of special training or experience are needed to obtain the skills necessary to shoe racehorses.

Farriers who wish to work at racetracks must pass a licensing examination. During the examination, they must demonstrate their knowledge of corrective shoeing techniques and the proper shoe to use depending on the condition of the horse's hoof or leg, and the condition of the racetrack. The examination is a performance test and does not require a written examination.

Blacksmiths must be in good physical condition. Pounding metal and handling heavy tools and parts require considerable strength and stamina. Farriers, of course, must have the patience to handle horses.

Opportunities for advancement are limited, especially for blacksmiths who work in small repair shops. However, blacksmiths may advance to be supervisors or inspectors in factories, or decide to open their own repair shops. Blacksmiths also may be able to transfer to related occupations such as forge, hammer, and press operators.

Farriers may open their own shops or travel from job to job with a portable forge, if one is needed. Those with sufficient skills to pass a licensing examination may find employment at racetracks.

Employment Outlook

Employment of blacksmiths is expected to decline through the mid-1980's. Forge shops are using machines to produce many of the metal articles that were formerly handmade by blacksmiths. In addition, welders are doing much of the metal repair work once done by blacksmiths. Nevertheless, some job openings will occur as experienced blacksmiths retire, die, or leave the occupation for other reasons.

Employment of farriers may increase slightly due to the growing popularity of horseracing and the increasing use of horses for recreational purposes. Since this is a small occupation, however, relatively few job openings will become available.

Earnings and Working Conditions

In union contracts covering a number of blacksmiths in steel plants and in the shipbuilding and petroleum industries, hourly pay ranged from $4 to $7.50 in 1976. Earnings of blacksmiths in railroad shops averaged $6.87 an hour in 1976. According to limited information, yearly earnings of farriers who shoed saddle horses averaged between $10,000 and $12,000 a year in 1976; those who shoed racehorses averaged around $15,000 a year.

Blacksmith shops tend to be hot and noisy, but conditions have improved in recent years because of large ventilating fans and less vibration from new machines. Blacksmiths are subject to burns from forges and heated metals and cuts and bruises from handling tools. Safety glasses, metal-tip shoes, face shields, and other protective devices have helped to reduce injuries.

The jobs of some farriers may be seasonal. During the summer months, when horses are ridden more often, farriers may work long hours and even on weekends. Also, those who specialize in shoeing racehorses often work at several different racetracks within their area and, therefore, must travel a great deal. In areas where horseracing is season-

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al, they may have to move to another State during the off season.

Many blacksmiths are members of the International Brotherhood of Boilermakers, Iron Shipbuilders, Blacksmiths, Forgers and Helpers. Other unions representing blacksmiths include the United Steelworkers of America, the Industrial Union of Marine and Shipbuilding Workers of America, and the International Union of Journeymen Horseshoers.

Sources of Additional Information

For details about training opportunities in this trade, contact local blacksmith shops and local offices of the State employment service.

BLUE-COLLAR WORKER SUPERVISORS

Nature of the Work

In any organization, someone has to be boss. For the millions of workers who assemble television sets, service automobiles, lay bricks, unload ships, or perform any of thousands of other activities, a blue-collar worker supervisor is the boss. These supervisors direct the activities of other employees and frequently are responsible for seeing that millions of dollars worth of equipment and materials are used properly and efficiently. While blue-collar worker supervisors are most commonly known as foremen or forewomen, they also have many other titles. In the textile industry they are referred to as second hands; on ships they are known as boatswains; and in the construction industry they are often called overseers, straw bosses, or gang leaders.

Although titles may differ, the job of all blue-collar worker supervisors is similar. They tell other employees what jobs are to be done and make sure the jobs are done correctly. For example, loading supervisors at truck terminals assign workers to load trucks, and then check that the material is loaded correctly and that each truck is fully used. They may mark freight bills and keep charts to record the loads and weight of each truck. In some cases, supervisors also do the same work as other employees. This is especially true in the construction industry where, for example, bricklayer supervisors also lay brick.

Because they are responsible for the output of other workers, supervisors make work schedules and keep production and employee records. They use considerable judgment in planning and must allow for unforeseen problems such as absent workers and machine breakdowns. Teaching employees safe work habits and enforcing safety rules and regulations are other supervisory responsibilities. They also may demonstrate timesaving or laborsaving techniques to workers and train new employees.

In addition to their other duties, blue-collar worker supervisors tell their subordinates about company plans and policies; reward good workers by making recommendations for wage increases, awards, or promotions; and deal with poor workers by issuing warnings or recommending that they be fired or laid off without pay for a day or more. In companies where employees belong to labor unions, supervisors may meet with union representatives to discuss work problems and grievances. They must know the provisions of labor-management contracts and run their operations according to these agreements.

Places of Employment

About 1,445,000 blue-collar worker supervisors were employed in 1976. Although they work for almost all businesses and government agencies, over half work in manufacturing, supervising the production of cars, washing machines, or any of thousands of other products. Most of the rest work in the construction industry, in wholesale and retail trade, and in public utilities. Because employment is distributed in much the same way as population, jobs are located in all cities and towns.

Training, Other Qualifications, and Advancement

When choosing supervisors, employers generally look for experience, skill, and leadership qualities. Employers place special emphasis on the ability to motivate employees, maintain high morale, command respect, and get along with people. Completion of high school often is the minimum educational requirement, and 1 or 2 years of college or technical school can be very helpful to workers who want to become supervisors.



Coordinating assignments is a responsibility of the blue-collar worker supervisor.

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Most supervisors rise through the ranks—that is, they are promoted from jobs where they operated a machine, or worked on an assembly line, or at a construction craft. This work experience gives them the advantage of knowing how jobs should be done and what problems may arise. It also provides them with insight into management policies and employee attitudes towards these policies. Supervisors are sometimes former union representatives who are familiar with grievance procedures and union contracts. To supplement this work experience, larger companies usually have training programs to help supervisors make management decisions. Smaller companies often use independent training organizations or written training materials.

Although few blue-collar worker supervisors are college graduates, a growing number of employers are hiring trainees with a college or technical school background. This practice is most prevalent in industries with highly technical production processes, such as the chemical, oil, and electronics industries. Employers generally prefer backgrounds in business administration, industrial relations, mathematics, engineering, or science. The trainees undergo on-the-job training until they are able to accept supervisory responsibilities.

Supervisors with outstanding ability, particularly those with college education, may move up to higher management positions. In manufacturing, for example, they may advance to jobs such as department head and plant manager. Some supervisors, particularly in the construction industry, use the experience and skills they gain to go into business for themselves.

Employment Outlook

Employment of blue-collar worker supervisors is expected to increase at about the same rate as the average for all occupations through the mid-1980's. In addition, many job openings will arise as experienced supervisors retire, die, or transfer to other occupations.

Population growth and rising incomes will stimulate demand for goods such as houses, air conditioners, TV sets, and cars. As a result, more blue-collar workers will be needed to produce and sell these items, and more supervisors will be needed to direct their activities. Although most of these supervisors will continue to work in manufacturing, a large part of the increase in jobs will be due to the expansion of nonmanufacturing industries, especially in the trade and service sectors.

There is usually keen competition for supervisory jobs. Competent workers who possess leadership ability and have a few years of collge are the most likely to be selected.

Earnings and Working Conditions

In 1976, average annual earnings of blue-collar worker supervisors who worked full time were $15,149, compared with $12,946 for workers in all occupations. Supervisors usually are salaried. Their salaries generally are determined by the wage rates of the highest paid workers they supervise. For example, some companies keep wages of supervisors about 10 to 30 percent higher than those of their subordinates. Some supervisors may receive overtime pay.

Since supervisors are responsible for the work of other employees, they generally work more than 40 hours a week and are expected to be on the job before other workers arrive and after they leave. They sometimes do paperwork at home, such as making work schedules or checking employee time cards, and may find themselves worrying about job-related problems after work.

Working conditions vary from industry to industry. In factories, supervisors may get dirty around machinery and materials and have to put up with noisy factory operations.

Some supervisors who have limited authority may feel isolated, neither a member of the work force nor an important part of management. On the other hand, supervisors have more challenging and prestigious jobs than most blue-collar workers.

Sources of Additional Information

A bibliography of career literature on management occupations is available from:

American Management Rssociation, 135 West 50th St., New York, N.Y. 10020.

BOILERMAKING OCCUPATIONS

Nature of the Work

Boilers, vats, and other large vessels that hold liquids and gases are essential to many industries. Boilers, for example, supply the steam that drives the huge turbines in electric utility plants and ships. Tanks and vats are used to process and store chemicals, oil, beer, and hundreds of other products. Layout workers and fitters help make the parts for these vessels, and boilermakers assemble them.

Layout workers (D.O.T. 809.381 and .781) follow blueprints in marking off lines on metal plates and tubes. These lines serve as guides to othe workers in the shop who cut the metal and then shape it on lathes or use other shaping tools such as grinders to produce the finished pieces. Layout workers use compasses, scales, gauges, and other devices to make measurements. Their measurements must be precise because errors may be difficult or impossible to correct once the metal is cut.

Before the boiler parts are assembled, *fitters* (D.O.T. 819.781) see that they fit together properly. These workers use bolts or temporary welds, called tackwelds, to hold the parts in place while they check the parts to see that they line up according to blueprints. Where alterations are necessary, fitters use grinders or cutting torches to remove excess metal, and welding machines to fill in small gaps. If large gaps appear, a new piece may have to be cut. Also, fitters use drills to line up rivet holes.

Small boilers may be assembled at the plant where they are made; however, once the pieces for a larger boiler or tank have been cut out and checked for a proper fit, they are transported to the shop or construction site where they are to be used. There, *boilermakers* (D.O.T. 805.281) assemble and erect the ves-

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sels using rigging equipment such as hoists and jacks to lift heavy metal parts into place, and then weld or rivet the parts together. After a boiler is completed, they test it for leaks or other defects.

Construction boilermakers also install auxiliary equipment on boilers and other vessels. For example, they install vapor barriers on open-top oil, gas, and chemical storage tanks to prevent fumes from polluting in the air. Boilermakers also install air pollution control equipment, such as precipitators and smoke scrubbers, in electric plants that burn high sulfur coal.

Boilermakers also do repair jobs. For example, boilers occasionally develop leaks. When they do, boilermakers find the cause of the problem, and then they may dismantle the boiler, patch weak spots with metal stock, replace defective sections with new parts, or strengthen joints. Installation and repair work usually must meet State and local safety standards.

Places of Employment

About 34,000 boilermakers, layout workers, and fitters were employed in 1976. Of these, several thousand boilermakers worked in the construction industry, mainly to assemble and erect boilers and other pressure vessels. Boilermakers also were employed in the maintenance and repair departments of iron and steel plants, petroleum refineries, railroads, shipyards, and electric powerplants. Large numbers worked in Federal Government installations, principally in Navy shipyards and Federal powerplants. Layout workers and fitters worked mainly in plants that make fire-tube and water-tube boilers, heat exchangers, heavy tanks, and similar products.

Boilermaking workers are employed throughout the country, but employment is concentrated in highly industrialized areas, such as New York, Philadelphia, Chicago, Pittsburgh, Houston, San Francisco, and Los Angeles.

Training, Other Qualifications, and Advancement

Many people have become boilermakers by working for several years as helpers to experienced boilermakers, but most training authorities agree that a formal apprenticeship is the best way to learn this trade. Apprenticeship programs usually consist of 4 years of on-the-job training, supplemented by about 150 hours of classroom instruction each year in subjects such as blueprint reading, shop mathematics, and welding. Apprentices often have to travel from one area to another, since there is not always work available in their locality.

Most layout workers and fitters are hired as helpers and learn the craft by working with experienced employees. It generally takes at least 2 years to become a highly skilled layout worker or fitter.

When hiring apprentices or helpers, employers prefer high school or vocational school graduates. Courses in shop, mathematics, blueprint reading, welding, and machine metalworking provide a useful background for all boilermaking jobs. Most firms require applicants to pass a physical examination because good health and the capacity to uo heavy work are necessary in these jobs. Mechanical aptitude and the manual dexterity needed to handle tools also are important qualifications.

Layout workers and fitters may become boilermakers or advance to shop supervisors. Boilermakers may become supervisors for boiler installation contractors; a few may go into business for themselves.

Employment Outlook

Employment in boilermaking occupations is expected to increase much wasterthan the average for all occupations through the mid–1980's. In addition to the job openings resulting from employment growth, other openings will arise each year as experienced workers retire, die, or transfer to other fields of work.

The construction of many new electric powerplants, especially nuclear plants, will create a need for additional boilers and will cause employment of boilermakers, layout workers, and fitters to increase.

The expansion of other industries that use boiler products, such as the chemical, petroleum, steel, and shipbuilding industries, will further increase the demand for these workers. Also, as more laws are enacted to provide cleaner air, more boilermakers will be needed to install pollution control equipment.

Despite the expected overall increase in employment, most of the industries that purchase boilers are sensitive to economic conditions. Therefore, during economic downturns some boilermakers, fitters, and layout workers may be laid off, and others may have to move from one area of the country to another to find employment.

Earnings and Working Conditions

According to a national survey of workers in the construction industry, union wage rates for boilermakers averaged $10.03 an hour in 1976, compared with $9.47 for all building trades. Boilermakers employed in railroad shops averaged about $7 an hour in 1976.

Comparable wage data were not available for boilermakers employed in industrial plants. However, wage rates were available from union contracts that cover many boilermakers, layout workers, and fitters employed in fabricated plate work and the petroleum and shipbuilding industries in 1976. Most of these contracts called for hourly rates ranging from about $5.50 to $10. Generally, layout workers earned more than boilermakers, and boilermakers earned more than fitters.

When assembling boilers or making repairs, boilermakers often work in cramped quarters and sometimes at great heights, since large boilers may be over 10 stories tall. Some work also must be done in damp, poorly ventilated places. Thus boilermaking is more hazardous than many other metalworking occupations. Employers and unions attempt to eliminate injuries by promoting safety training and the use of protective equipment, such as safety glasses and metal helmets.

Most boilermaking workers belong to labor unions. The principal union is the International Brotherhood of Boilermakers, Iron Shipbuilders, Blacksmiths, Forgers and Helpers. Other workers are members of the Industrial Union of Marine and Ship-

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building Workers of America; the Oil, Chemical and Atomic Workers International Union; and the United Steelworkers of America.

Sources of Additional Information

For further information regarding boilermaking apprenticeships or other training opportunities, contact local offices of the unions previously mentioned, local construction companies and boiler manufacturers, or the local office of the State employment service.

BOILER TENDERS

(D.O.T. 951.885)

Nature of the Work

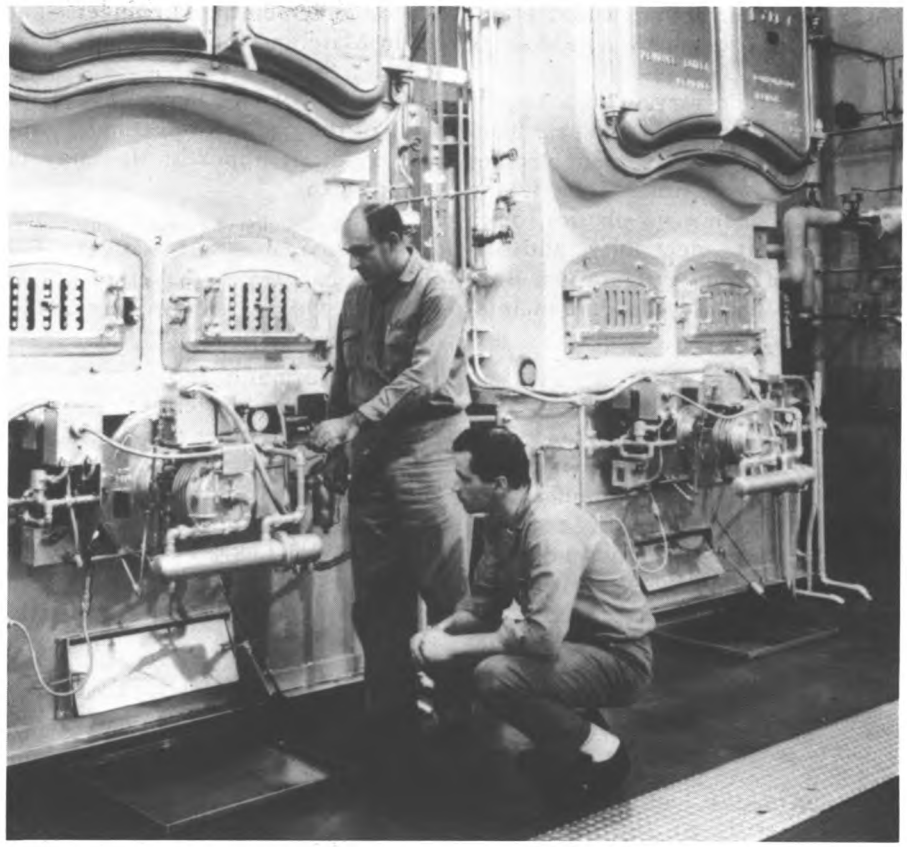
Boiler tenders operate and maintain the steam boilers that power industrial machinery and heat factories, offices, and other buildings. They also may operate waste heat boilers that burn trash and other solid waste.

Boiler tenders control the mechanical or automatic devices that regulate the flow of air and fuel into the combustion chambers. They may, for example, start the pulverizers or stokers to feed coal into the firebox or start the oil pumps and heaters to ignite burners.

These workers may be responsible for inspecting and maintaining boiler equipment. This includes reading meters and gauges attached to the boilers to ensure safe operation. Sometimes boiler tenders make minor repairs, such as packing valves or replacing faulty indicators.

Boiler tenders also chemically test and treat water for purity. In this way, they prevent corrosion of the boiler and buildup of scale.

Boiler tenders often are supervised by stationary engineers who operate and maintain a variety of equipment, including boilers, diesel and steam engines, and refrigeration and air-conditioning systems. (Additional information on stationary engineers appears elsewhere in the *Handbook*.)



Boiler tenders may advance to stationary engineers.

Places of Employment

About one-half of the 73,000 boiler tenders employed in 1976 worked in factories. Plants that manufacture lumber, iron and steel, paper, chemicals, and stone, clay, and glass products are among the leading employers of boiler tenders. Public utilities also employ many of these workers. Many others worked in hospitals, schools, and Federal, State, and local governments.

Although boiler tenders are employed in all parts of the country, most work in the more heavily populated areas where large manufacturing plants are located.

Training, Other Qualifications, and Advancement

Some large cities and a few States require boiler tenders to be licensed. An applicant can obtain the knowledge and experience to pass the license examination by first working as a helper in a boiler room. Applicants for helper jobs should be in good physical condition and have mechanical aptitude and manual dexterity. High school courses in mathematics, motor mechanics, chemistry, and blueprint reading also are helpful to persons interested in becoming boiler tenders.

There are two types of boiler tenders' licenses—for low pressure and high pressure boilers. Low pressure tenders operate boilers generally used for heating buildings. High pressure tenders operate the more powerful boilers and auxiliary boiler equipment used to power machinery in factories as well as heat large buildings, such as high-rise apartments. Both high and low pressure tenders, however, may operate equipment of any pressure if a stationary engineer is on duty.

Due to regional differences in licensing requirements, a boiler tender who moves from one State or city to another 4ay have to pass an examination for a new license. However, the National Institute for Uniform Licensing of Power Engineers is currently assisting many State licensing agencies in adopting uniform licens-

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ing requirements that would eliminate this problem by establishing reciprocity of licenses.

Boiler tenders may advance to jobs as stationary engineers. To help them advance, they sometimes supplement their on-the-job training by taking courses in chemistry, physics, blueprint reading, electricity, and air-conditioning and refrigeration. Boiler tenders also may become maintenance mechanics.

Employment Outlook

Employment of boiler tenders is expected to decline through the mid-1980's as more new boilers are equipped with automatic controls. Nevertheless, a few thousand openings will result each year from the need to replace experienced tenders who retire, die, or transfer to other occupations.

Earnings and Working Conditions

Boiler tenders had average hourly earnings of $6.20, according to a survey of 19 metropolitan areas in 1976. This was higher than the average for all nonsupervisory workers in private industry, except farming. The average for tenders in individual areas ranged from $3.63 in Greenville, S.C., to $7.48 in Detroit, Mich.

Modern boiler rooms usually are clean and well-lighted. However, boiler tenders may have to work in awkward positions and be exposed to noise, heat, grease, fumes, and smoke. They also are subject to burns, falls, and injury from defective boilers or moving parts, such as pulverizers and stokers. Modern equipment and safety procedures, however, have reduced accidents.

The principal unions organizing boiler tenders are the International Brotherhood of Firemen and Oilers and the International Union of Operating Engineers.

Sources of Additional Information

Information about training or work opportunities in this trade is available from local offices of State employment services, locals of the International Brotherhood of Firemen and Oilers, locals of the International Union of Operating Engineers, and from State and local licensing agencies.

Specific questions about the nature of the occupation, training, and employment opportunities may be referred to:

National Association of Power Engineers, Inc., 176 West Adams St., Chicago, Ill. 60603.

International Union of Operating Engineers, 1125 17th St. NW., Washington, D.C. 20036.

For information concerning reciprocity of boiler tenders' licenses among various cities and States, contact:

National Institute for Uniform Licensing of Power Engineers, 176 West Adams St., Suite 1911, Chicago, Ill. 60603.

ELECTROPLATERS

(D.O.T. 500.380 and .781 through .886)

Nature of the Work

Electroplating is a commonly used manufacturing process that gives metal or plastic articles a protective surface or an attractive appearance. Products that are electroplated include items as different as automobile bumpers, silverware, costume jewelry, and jet engine parts. In all cases, however, the object being plated is connected to one end of an electric circuit and placed in an appropriate solution. The other end of the electric circuit is connected to the plating material. By controlling the amount of electricity that flows from the plating material through the solution and to the object being plated, electroplaters control the amount of chromium, nickel, silver, or other metal that is applied to the final product.

Prior to electroplating any object, electroplaters study the job specifications which indicate the parts of the objects to be plated, the type of plating metal to be applied, and the desired thickness of the plating. Following these specifications, they prepare the plating solution by carefully adding the proper amounts and types of chemicals.

In preparing an article for electroplating, platers may first cover parts of it with lacquer, rubber, or tape to keep these parts from being exposed to the plating solution. They then either scour the article or dip it into a cleaning bath to remove dirt and grease before putting it into the solution.

Electroplaters must carefully inspect their work for defects such as minute pits and nodules. They may use a magnifying glass to examine the surface and micrometers and calipers to check the plating thickness.

Skill requirements and work performed vary by type of shop. All-round platers in small shops analyze solutions, do a great variety of plating, calculate the time and current needed for various types of plating, and perform other technical duties. They also may order chemicals and other supplies for their work. Platers in larger shops usually carry out more specialized assignments that require less extensive knowledge.

Places of Employment

About 36,000 people worked as electroplaters in 1976. About half of them worked in shops that specialized in metal plating and polishing for manufacturing firms and other customers. Virtually all of the remaining platers worked in plants that manufactured plumbing fixtures, cooking utensils, household appliances, electronic components, motor vehicles, and other metal products. The Federal Government employed a few platers for maintenance purposes at a number of military and civilian installations.

Electroplaters work in almost every part of the country, although most work in the Northeast and Midwest, near the centers of the metalworking industry. Large numbers 6f electroplaters work in Los Angeles, San Francisco, Chicago, New York, Detroit, Cleveland, Providence, and Newark.

Training, Other Qualifications, and Advancement

Most electroplaters learn the trade on the job by helping experienced platers. It usually takes at least 3 years to become an all-round plater.

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Electroplaters dip aircraft wing pivot in plating solution.

Platers in large shops usually are not required to have an all-round knowledge of plating, and can learn their jobs in much less time. However, workers who receive such limited training generally have difficulty in transferring to shops doing electroplating with metals outside their specialty.

A small proportion of electroplaters receive all-round training by working 3 or 4 years as an apprentice. Apprenticeship programs combine on-the-job training and related classroom instruction in the properties of metals, chemistry, and electricity as applied to plating. Apprentices do progressively more difficult work as their skill and knowledge increase. By the third year, they determine cleaning methods, do plating without supervision, make solutions, examine plating results, and direct helpers. Qualified platers may become supervisors. Some electroplaters who understand the chemical processes of electroplating and the chemical characteristics of metals, and who have an outgoing personality, may become sales representatives for metal products wholesalers or manufacturers. Electroplaters with the necessary capital may go into business for themselves.

A few people take a 1- or 2-year electroplating course in a junior college, technical institute, or vocational high school. In addition, many branches of the American Electroplaters Society give basic courses in electroplating. Persons who wish to become electroplaters will find high school or vocational school courses in chemistry, electricity, physics, mathematics, and blueprint reading helpful.

Employment Outlook

Employment of electroplaters is expected to grow more slowly than the average for all occupations through the mid-1980's. Besides employment growth, other openings will result from the need to replace experienced workers who retire, die, 6r leave the occupation for other reasons. Opportunities are expected to be favorable for individuals who want jobs as electroplaters.

Expansion of the metalworking industries and the electroplating of a broadening group of metals and plastics are expected to increase the need for electroplaters. However, employment growth will be somewhat restricted by the increasing application of automated plating equipment and water effluent standards established by the Environmental Protection Agency. Such standards will require plants to install equipment with additional water pollution controls to prevent pollution of streams and waters. This new non-polluting plating equipment will increase cost of electroplating and thus will reduce the demand for electroplated products and electroplaters.

Earnings and Working Conditions

Hourly wage rates for electroplaters ranged from $2.75 to $9.80 in 1976, according to the limited information available. During apprenticeship or on-the-job training, a worker's wage rate starts at about 60 to 70 percent of an experienced worker's rate and progresses to the full rate by the end of the training period. Electroplaters normally receive premium pay for working night shifts.

Occupational hazards associated with plating work include burns from splashing acids and inhalation of toxic fumes. Humidity and odor also are problems in electroplating plants. However, most plants have ventilation systems and other safety devices that have reduced occupational hazards. Protective clothing and boots provide additional protection. Electroplaters are on their feet most of their workday and do much reaching, lifting, bending and carrying. Generally, mechanical devices are used for lifting, but at times the worker must

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lift and carry objects weighing up to 100 pounds.

Some platers are members of the Metal Polishers, Buffers, Platers and Helpers International Union. Other platers have been organized by the International Union, United Automobile, Aerospace and Agricultural Implement Workers of America, and the International Association of Machinists and Aerospace Workers.

Sources of Additional Information

Information on the availability of apprenticeships or on-the-job training may be obtained from State employment offices and local union offices. Training opportunities may also be located by contacting manufacturing plants and job shops that do electroplating.

For more specific information about job opportunities and training, write to:

American Electroplaters Society, Inc., 1201 Lousiana Avenue Winter Park, Florida 23609.

National Association of Metal Finishers, 22 South Park, Montclair, N.J. 07042.

FORGE SHOP OCCUPATIONS

Forging is one of the oldest methods of working and shaping metals. The exceptional strength of forged metal parts makes this an often used method of forming products that must withstand heavy wear. Many machine tools such as wrenches and drill bits are forged because they are subjected to constant stress and pressure.

The simplest forging method is hand forging done by a blacksmith. Modern forge shops, however, substitute heavy power equipment and dies (tools that shape metal) for the blacksmith's hammer and anvil. In this way, products can be forged in much greater quantity. Five employees operating a large forging machine can turn out more forgings in an hour than five blacksmiths can make in a year.

Most forgings are steel; but aluminum, copper, brass, bronze, and other metals also are forged. Nonferrous forgings are useful in many critical applications, for example, aircraft landing gear. Some of the advantages of nonferrous metal forgings are corrosion resistance and a lighter weight to strength ratio.

Forged products may be as small and lightweight as a key, or they may be as bulky and heavy as a piece of industrial machinery.

Nature of the Work

Before metal can be shaped, it must be heated in intensely hot furnaces (forges) until it is soft. Workers place the heated metal between two metal dies that are attached to power presses or hammers. With tremendous force, the hammers or presses pound or squeeze the metal into the desired shape. To finish the forging, other workers remove rough edges and excess metal and perform other finishing operations such as heat treating and polishing.

Two kinds of dies are used. The open die is flat and similar to the blacksmith's hammer, and is used when only a limited quantity of forgings or large-size, simple-shaped forgings are needed. The impression, or closed die, has a cavity shaped to the form of the metal part, and is used to produce large quantities of identical forgings.

Basic forge-shop equipment consists of various types of hammers, presses, dies, upsetters, and furnaces. Forge-shop workers also use handtools, such as hammers and tongs, to help mold and shape parts to fit exact specifications. Measuring devices such as rules, scales, and calipers are needed to inspect the finished products.

Descriptions of some major forge-shop production occupations follow.

Hammersmiths (D.O.T. 612.381) direct the operation of open die power hammers. They follow blueprints and interpret drawings and sketches so that the part being forged will meet specifications. Hammersmiths determine how to position the metal under the hammer and which tools are needed to produce desired angles and curves. They decide the amount of hammer force and if and when the metal needs additional heating.

Hammersmiths head crews of four or more workers. A typical crew includes a hammer driver or hammer runner who regulates the force of the forging blow; a crane operator who transfers the metal from the furnace to the hammer and properly places it under the hammer; and a heater who controls the furnace that heats the metal to correct temperatures. The rest of the crew consists of one or more helpers to assist as needed.

The duties of *hammer operators* (D.O.T. 610.782), who operate impression die power hammers, are similar to those just described for hammersmiths. Generally the parts forged by closed die hammers are more intricate and detailed, thus these operators are highly skilled. With the assistance of a crew of helpers and heaters, hammer operators set and align dies in the hammers. They correctly position the metal under the hammer, control the force of the forging blow, and determine if and when the metal needs additional heating to make it easier to shape the metal to that of the die impression.

Press operators (D.O.T. 611.782 and .885) control huge presses equipped with either impression or open dies. These machines press and squeeze hot metal rather than hammer or pound it, and the operators regulate machine pressure and move the hot metal between the dies. They also may control the metal heating operations. Some operators set up the dies in the presses, using instruments such as squares and micrometers to make sure these are in place. Their skills are very similar to those of hammersmiths or hammer operators.

With the help of heaters and several helpers, *upsetters* (D.O.T. 611.782) operate machines that shape hot metal by applying horizontal pressure. The heads of nails and bolts, for example, are made by upset forging.

Heaters (D.O.T. 619.782) control furnace temperatures. They determine when the metal has reached the correct temperature by observing the metal's color and the furnace's temperature gauge. Using tongs or mechanical equipment, they transfer the hot metal from the furnace to ham-

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Hammer operator shaping metal parts.

mers or presses. Some heaters clean furnaces.

Inspectors (D.O.T. 612.281) examine forged pieces for accuracy, size, and quality. They use tools such as gauges, micrometers, squares, and calipers to measure the exact dimensions of the forgings. Machines that test strength and hardness and electronic testing devices also may be used.

Die sinkers (D.O.T. 601.280) make the impression dies for the forging hammers and presses. Working from a blueprint, drawing, or template, these skilled workers make an outline of the object to be forged on two matching steel blocks. They measure and mark the object's shape in the blocks to form the impression cavity by using milling machines and other machine tools such as EDM (electrical discharge machinery) and ECM (electrical chemical machinery). Using handtools such as scrapers and grinders, and measuring tools such as calipers and micrometers, die sinkers smooth and finish the die cavity to fit specifications. Finally, a sample is prepared from the finished cavity and is checked against specifications.

Many forge-shop workers clean and finish forgings. For example, *trimmers* (D.O.T. 617.885) remove excess metal with presses equipped with trimming dies. *Grinders* (D.O.T. 705.884) remove rough edges with power abrasive wheels. *Sandblasters* or *shotblasters* (D.O.T. 503.887) operate sandblasting or shotblasting equipment that cleans and smoothes forgings. *Picklers* (D.O.T. 503.885) dip forgings in an acid solution to remove surface scale and reveal any surface defects. *Heat treaters* (D.O.T. 504.782) heat and cool forgings to harden and temper the metal.

Places of Employment

In 1976, about 71,000 production workers were employed in forge shops. About three-fourths of these worked in shops that make and sell forgings. The remainder worked in plants that use forgings in their final products, such as plants operated by manufacturers of automobiles, farm equipment, and handtools.

Although forge-shop workers are found in all areas, they are concentrated near steel-producing centers that provide the steel for forgings, and near metalworking plants that are the major users of forged products. Large numbers of forge-shop workers are employed in and around the cities of Detroit, Chicago, Cleveland, Los Angeles, and Pittsburgh.

Training, Other Qualifications, and Advancement

Most forge-shop workers learn their skills on the job. They generally join hammer or press crews as helpers or heaters, and progress to other jobs as they gain experience. Advancement to hammersmith, for example, requires several years of on-the-job training and experience.

Some forge shops offer apprenticeship training programs for skilled jobs such as diesinker, heat treater, hammer operator, hammersmith, and press operator. These programs usually last 4 years, and offer classroom training and practical experience in metal properties, power hammer and furnace operation, handtool use, and blueprint reading.

Training requirements for inspectors vary. Only a few weeks of on-the-job training are necessary for those who examine forgings visually or use only simple gauges. Others who inspect forgings that must meet exact specifications may need some background in blueprint reading and mathematics, and may be given several months of training.

Employers usually do not require a high school diploma, but graduates may be preferred. Persons interested in more skilled forge-shop jobs

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should complete high school and take mathematics (especially geometry), drafting, and shopwork.

Although cranes are used to move very large objects, forge-shop workers must be strong enough to lift and move heavy forgings and dies. They also need stamina and endurance to work in the heat and noise of a forge shop.

Employment Outlook

Employment of forge-shop production workers is expected to increase more slowly than the average for all occupations through the mid-1980's. Some new jobs will become available because of growth, but most openings will arise from the need to replace experienced workers who or transfer to other fields of work.

Employment will grow because of expansion in industries that use forgings, particularly automobile and energy-related industries. The expansion of nuclear power plant construction will cause a great demand for forged piping and fittings. Likewise, many forged drilling bits and other forged products will be needed for oil drilling and coal mining operations. However, employment will not keep pace with forge shop production because improved forging techniques and equipment will result in greater output per worker.

Employment in some forge shops is sensitive to changes in economic conditions. In shops that make automobile parts, for example, employment fluctuates with changes in the demand for new cars; thus, jobs in these shops may be plentiful in some years, scarce in others.

Earnings and Working Conditions

Average hourly earnings of forge-shop production workers are higher than the average for all manufacturing production workers. In 1976, production workers in iron and steel forging plants averaged $6.86 an hour, compared to $5.19 an hour for production workers in all manufacturing industries.

Forge-shop occupations are more hazardous than most manufacturing occupations. However, improvements in machinery and shop practices have reduced some noise and vibration. For example, many forge shops have heat deflectors and ventilating fans to reduce heat and smoke. Also, labor and management cooperate to encourage good work practices through safety training and the required use of protective equipment such as face shields, ear plugs, safety glasses, metal-toed shoes, helmets, and machine safety guards.

Most forge-shop workers are union members. Many are members of the International Brotherhood of Boilermakers, Iron Shipbuilders, Blacksmiths, Forgers and Helpers. Others are members of the United Steelworkers of America; the International Union, United Automobile, Aerospace and Agricultural Implement Workers of America; the International Association of Machinists and Aerospace Workers; and the International Die Sinkers' Conference (Ind).

Sources of Additional Information

For information on employment opportunities in forging, contact local offices of the State employment service, personnel departments of forge shops, locals of the labor organizations listed above, or:

The Forging Industry Association, 55 Public Square, Cleveland, Ohio 44113.

The Open Die Forging Institute, 102 Pageant Ave., Rogers, Ark. 72756.

FURNITURE UPHOLSTERERS

(D.O.T. 780.381)

Nature of the Work

Whether restoring a treasured antique or simply giving an old living room couch a facelift, upholsterers combine artistic flair and skill to recondition sofas, chairs, and other upholstered furniture. These craft workers repair or replace fabrics, springs, padding, and other parts that are worn or damaged. (Workers employed in the manufacture of upholstered furniture are not included in this statement.)

The tasks involved in upholstering any piece of furniture are basically the same, although each job is unique in some ways because of differences in furniture construction. As the first step, upholsterers usually place the furniture on padded wooden benches or some other type of support so that they may work at a convenient level. Using hammers and tack pullers, they remove tacks holding the old fabric to the wooden frame. After stripping the old fabric, they remove the burlap and padding that cover the springs. Upholsterers examine the springs and remove broken or bent ones. If the nylon or cotton webbing—which hold the springs in place—is worn, upholsterers remove all the springs and all the webbing.

To rebuild the furniture, upholsterers may reglue loose sections of the frame and refinish exposed wooden parts. They then tack webbing to one side of the frame, stretch it tight, and tack it to the opposite side. Other webbing is woven across the first and attached to the frame in a similar fashion to form a mat. After putting springs on the mat so they compress evenly, upholsterers sew or staple each spring to the webbing or frame and tie each spring to the ones next to it. Burlap then is stretched over the springs, cut and smoothed, and tacked to the frame. To form a smooth rounded surface over the springs and frame, upholsterers cover all surfaces of the furniture with foam rubber, cotton pads, or other filling material. After sewing the padding to the burlap, they cover it with heavy cloth and tack the cloth to the frame. Finally, upholsterers put the new fabric cover, which has been cut to size and temporarily stitched together for fitting, on the furniture. After checking that the cover fits tightly and smoothly—or noting where adjustments are necessary—they remove the cover and sew it together. To complete the job, upholsterers put the cover back on the furniture; sew or tack on fringe, buttons, or other ornaments; and make pillow covers.

Upholsterers use a variety of handtools including tack and staple removers, pliers, hammers, and hand or power shears. They use special

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Over three-fourths of all furniture upholsterers own and operate, or work in, small upholstery shops.

tools such as webbing stretchers and upholstery needles. They also use sewing machines.

Sometimes upholsterers pick up and deliver furniture. Those who own and manage shops order supplies and equipment and keep business records.

Places of Employment

About 27,000 people worked as furniture upholsterers in 1976. Over three-fourths of all furniture upholsterers own and operate, or work in small upholstery shops. These shops generally have less than three workers. Some upholsterers are employed by furniture stores. A few work for businesses, such as hotels, that maintain their own furniture.

Upholsterers work in all parts of the country. However, employment is concentrated in metropolitan areas, where the large population provides the greatest demand for the upholsterer's services.

Training, Other Qualifications, and Advancement

The most common way to enter this trade is to start as a helper in an upholstery shop and learn on the job. Helpers learn by upholstering furniture under the direction of experienced workers. Much time and practice are needed to learn complex tasks such as measuring and cutting the new fabric and sewing and attaching it to the frame with a minimum of waste. Usually about 3 years of on-the-job training are required to become a fully skilled upholsterer.

Inexperienced persons may get valuable training from vocational or high school courses in upholstery. However, additional training and experience in a shop are usually required before these workers can qualify as skilled upholsterers. In a few large cities, locals of the Upholsterers' International Union of North America run formal apprenticeship programs that last from 3 to 4 years. The programs place graduates of local vocational schools in upholstery shops where they receive on-the-job training.

Persons interested in becoming upholsterers should have good manual dexterity, coordination, and be able to do occasional heavy lifting. An eye for detail, good color sense, patience, and a flair for creative work are helpful in making upholstered furniture as attractive as possible.

The major form of advancement for upholsterers is opening their own shop. It is easy to open a shop because only a small investment in handtools is needed. However, the business is extremely competitive, so operating a shop successfully is difficult.

Employment Outlook

Little or no change is expected in employment of upholsterers through the mid-1980's. Most job openings will arise because of the need to replace experienced workers who retire, die, or transfer to other occupations.

More upholstered furniture will be used as population, personal income, and business expenditures grow. However, the demand for upholsterers will be limited because more people are buying less expensive furniture and replacing rather than reupholstering it.

Earnings and Working Conditions

Hourly wages for experienced furniture upholsterers ranged from $4.25 to $8 in 1976. Some highly skilled upholsterers earned over $10 an hour. Wages for inexperienced trainees ranged from $2.50 to $4 an hour. Upholsterers generally work 40 hours a week.

Working conditions in upholstery shops vary—many shops are spacious, adequately lighted, well-ventilated, and well-heated; others are small and dusty. Upholsterers stand while they work and do a considerable amount of stooping and bending and some heavy lifting.

Upholsterers usually buy their own handtools; employers provide power tools.

Some upholsterers are members of the Upholsterers' International Union of North America.

Sources of Additional Information

For more details about work opportunities for upholsterers, contact local upholstery shops or the local office of the State employment service.

INSPECTORS (MANUFACTURING)

Nature of the Work

Most products—including the things we eat, drink, wear, and ride in—are checked by inspectors sometime during the manufacturing process to make sure they are of the desired quality. Inspectors also check the quality of the raw materials and parts that make up finished goods.

A variety of methods are used to make certain that products meet specifications. Inspectors may taste-test a soft drink or examine a jacket for flaws, imperfections, or defects. They may use tools such as micrometers, protractors, gauges, and magnifying glasses to make sure that airplanes are assembled properly. Inspectors frequently make simple calculations to measure parts and examine work orders or blueprints to verify that products conform to standards.

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Inspectors use a variety of instruments to test product quality.

Semiskilled inspectors usually work under close supervision, whereas skilled inspectors generally have more responsibility and less supervision. For example, skilled inspectors usually have authority to accept or reject most products, and often analyze the reasons for faulty construction and recommend corrective action. Skilled inspectors also may know how to use a wider variety of complex testing instruments.

Some inspectors make minor repairs and adjustments, such as filing a rough edge or tightening a bolt, and grade products for quality. In many plants, when the number of rejected items rises above a certain proportion, inspectors notify their supervisors.

Places of Employment

About 692,000 inspectors were employed in 1976. Two-thirds worked in plants that produced durable goods such as machinery, transportation equipment, electronics equipment, and furniture. Others worked in plants that produced goods such as textiles, apparel, and leather products.

Inspectors worked in every part of the country, although they were concentrated in the industrialized States. Almost two-thirds were found in Ohio, New York, Michigan, Illinois, Pennsylvania, California, New Jersey, North Carolina, and Indiana.

Training, Other Qualifications, and Advancement

Inspectors generally are trained on the job for a brief period—from a few hours or days to several months, depending upon the skill required.

Employers look for applicants who have good health and eyesight—with or without glasses—and who can follow directions and concentrate on details. Applicants should be able to get along with people since inspectors occasionally work as part of a team. A few large companies give preemployment tests to check skills such as the ability to work with numbers. Some employers may hire applicants who do not have a high school diploma but who have qualifying aptitudes or related experience. Other employers prefer experienced workers for inspection jobs. Many inspectors acquire the necessary skills and experience by working at various production line jobs, especially assembling.

Some semiskilled inspectors—particularly in metalworking industries—who take courses, such as blueprint reading and shop mathematics, may advance to skilled inspectors. After acquiring sufficient experience and knowledge, a few become quality control technicians or supervisors.

Employment Outlook

Employment of inspectors is expected to increase faster than the average for all occupations through the mid-1980's, with thousands of openings each year. As population and personal incomes grow, most manufacturing industries are expected to increase their output, and thus employment in the long run. This business growth will create a need for more industrial machinery and equipment. Additionally, the growing complexity of manufactured products should result in a need for more inspectors. Many openings will result as workers retire, die, or transfer to other occupations.

Inspectors seeking jobs in companies that produce durable goods, which are particularly sensitive to changes in business conditions, may find jobs scarce in some years, plentiful in others.

Earnings and Working Conditions

Wages for inspectors ranged from $2.70 to $7.02 an hour in 1976, according to information from a limited number of union contracts. Most inspectors covered by these contracts earned between $3.50 and $5.50 an hour.

Working conditions vary considerably for inspectors. For example, some have well lighted, air-conditioned workplaces in an aircraft or

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missile plant; others, who work on the production floor of a machinery or metal fabricating plant, often are exposed to high temperatures, oil, grease, and noise.

Many inspectors are members of labor unions, including the International Union, United Automobile, Aerospace and Agricultural Implement Workers of America; the International Association of Machinists and Aerospace Workers; the International Union of Electrical, Radio and Machine Workers; the International Brotherhood of Electrical Workers; United Steelworkers; and the Allied Industrial Workers of America.

Sources of Additional Information

Information about employment opportunities in this field may be available from State employment service offices.

The American Society for Quality Control certifies quality technicians. They also publish a careers booklet called "Careers in the Quality Sciences," which describes the occupation of inspector and includes information on quality engineering and management careers as well. For information about the test required for certification, or for a free copy of the booklet, write to:

American Society for Quality Control, 161 West Wisconsin Ave., Milwaukee, Wis. 53203.

MILLWRIGHTS

(D.O.T. 638.281)

Nature of the Work

With the coming of the Industrial Revolution, machines replaced many handcrafted items and new and bigger factories became necessary. The textile industry in England was one of the first to use machinery to mass produce its goods. The workers who planned and built these textile mills, and set up the equipment that was needed, were called millwrights. The occupation gradually expanded to other factories, and today the millwright installs all types of machinery in almost every industry.

The millwright is a skilled craftworker who may perform any or all of the tasks involved in preparing machinery for use in a plant. This often includes construction of concrete foundations or wooden platforms on which heavy machines are mounted. As they either personally prepare or supervise the construction of these structures, millwrights must know how to read blueprints and work with various building materials.

Millwrights also may have to dismantle existing equipment, for instance when it becomes obsolete or to make better use of factory space. Wrenches, hammers, pliers, metal cutting torches, and other hand and power tools are used to loosen and disassemble parts.

To aid in moving machinery, the millwright may use any number of rigging devices. For example, to install a new oven in a food processing plant, millwrights may use a hoist or a small crane to move the oven from the truck on which it arrived to a conveyor which would carry it into the plant. Then it may be lifted, with the aid of a crowbar for leverage, onto a dolly and taken to a foundation for proper positioning.

In assembling machinery, millwrights fit bearings, align gears and wheels, attach motors and connect belts to prepare a machine for use. Mounting and assembling a piece of equipment requires tools similar to those used in the dismantling process. When precision leveling is necessary, many measuring devices must be used. To set up automatic pinsetting equipment in a bowling alley, for example, plumb bobs—or weights which determine perpendicularity—must be attached. Millwrights also use squares to test right angles and calipers to measure diameter and thickness.

Many of the millwright's duties also are performed by industrial machinery repairers. (See the statement on industrial machinery repairers elsewhere in the *Handbook*.) This includes preventative maintenance, such as keeping machinery regularly oiled and greased, and fixing or replacing worn parts.

Millwrights employed by contract installation and construction companies do a variety of installation work. Those employed in factories usually specialize in installing the particular types of machinery used by their employers. They also may maintain plant equipment such as conveyors and cranes.

Places of Employment

Most of the estimated 96,000 millwrights employed in 1976 worked for manufacturing companies; the majority were in transportation equipment, metal, paper, lumber, and chemical products industries. Others worked for contractors in the construction industry. Machinery manufacturers employed a small number to install equipment in customers' plants.

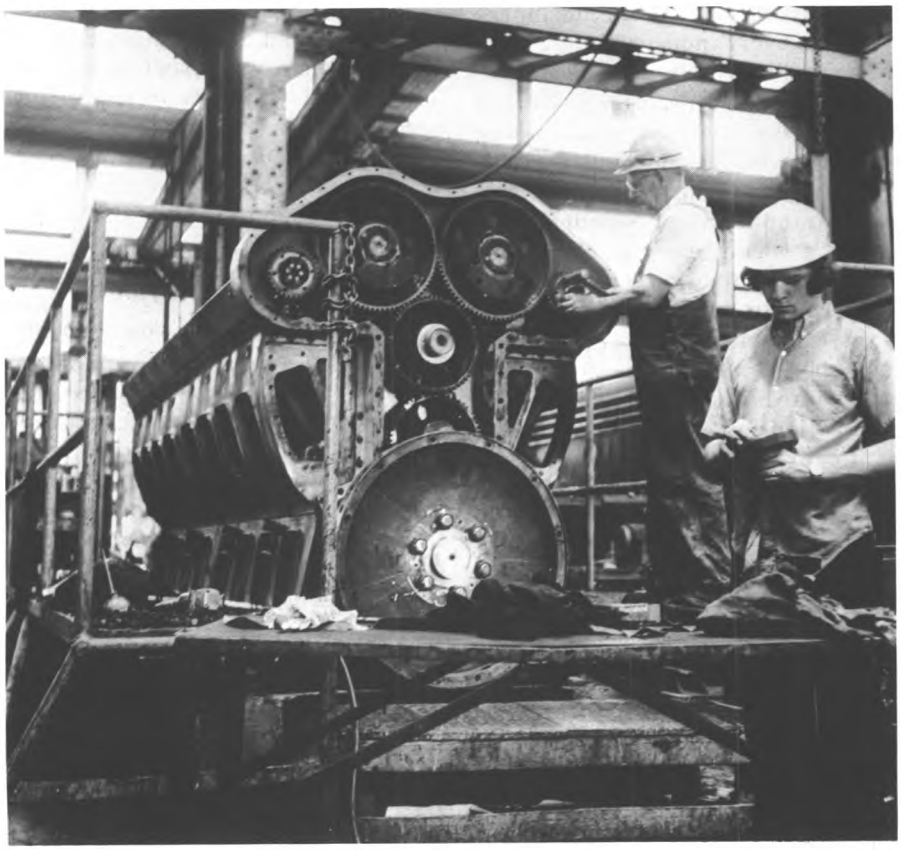
Millwrights work in every State. However, employment is concentrated in heavily industrialized areas such as Detroit, Pittsburgh, Cleveland, Buffalo, and the Chicago-Gary area.

Training, Other Qualifications, and Advancement

Some millwrights start as helpers to skilled workers and learn the trade informally on the job. This process generally takes 6 to 8 years. Others learn through formal apprenticeship programs which last 4 years. Apprenticeship programs include training in dismantling, moving, erecting, and repairing machinery. Helpers also may work with concrete and receive instruction in related skills such as carpentry, welding, and sheet-metal work. Classroom instruction is given in shop mathematics, blueprint reading, hydraulics, electricity, and safety.

Applicants for apprentice or helper jobs must be at least 17 years old. Some employers prefer to hire high school or vocational school graduates. Courses in science, mathematics, mechanical drawing, and machine shop practice are useful. Because millwrights often put together and take apart complicated machinery, mechanical aptitude is important. Strength and ability also are important, because the work requires a considerable amount of lifting and climbing.

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Apprenticeship programs for millwrights generally last 4 years.

Employment Outlook

Employment of millwrights is expected to increase about as fast as the average for all occupations through the mid-1980's. Employment will increase as new plants are built, as existing plant layouts are improved, and as increasingly complex machinery is installed and maintained. Besides job openings from employment growth, thousands of openings will arise annually as experienced millwrights retire, die, or transfer to other occupations.

Earnings and Working Conditions

According to a survey of metropolitan areas, hourly wages for millwrights averaged $7.25 in 1976—more than one-third higher than the average wage for all nonsupervisory workers in private industry, except farming. Earnings for millwrights in 11 areas that represent various regions of the country appear in the accompanying tabulation:

Area	*Hourly rate*
Indianapolis	$7.81
Detroit	7.63
Houston	7.33
Baltimore	7.30
Cincinnati	7.21
Chicago	6.99
St. Louis	6.90
Minneapolis—St. Paul	6.75
New York	6.68
New Orleans	6.11

Millwrights employed by factories ordinarily work year round. Those employed by construction companies and companies that manufacture and install machinery may experience periods of unemployment; however, they usually are compensated with a higher hourly wage rate. Frequently these millwrights must travel.

The work of millwrights involves some hazards. For example, there is the danger of being struck by falling objects or machinery that is being moved. There also is the danger of falling from high workplaces, for millwrights must often climb up walkways and platforms to install equipment. In addition, millwrights are subject to usual shop hazards such as cuts and bruises. Accidents have been reduced by the use of protective devices such as safety belts and hats.

Most millwrights belong to labor unions, among which are the International Association of Machinists and Aerospace Workers; United Brotherhood of Carpenters and Joiners of America (construction millwrights); United Steelworkers of America; International Union, United Automobile, Aerospace and Agricultural Implement Workers of America; United Paperworkers International Union; the International Union of Electrical, Radio and Machine Workers; and the International Brotherhood of Firemen and Oilers.

Sources of Additional Information

For further information on apprenticeship programs, write to the Apprenticeship Council of your State's labor department, local offices of your State employment service, local firms that employ millwrights or:

United Brotherhood of Carpenters and Joiners of America, 101 Constitution Ave. NW., Washington, D.C. 20001.

MOTION PICTURE PROJECTIONISTS

(D.O.T. 960.382)

Nature of the Work

Projectionists are key behind-the-scenes workers in motion picture theaters. From a booth in the back of the theater, projectionists operate movie projectors and sound equipment. Their duties vary with the type of equipment used.

In theaters with older equipment, projectionists use two projectors, sound equipment, a film rewinding machine, and seven reels of film or more. Before the movie begins, they examine the film, check the equipment to see that it works properly, and load the projectors with the first and second reels. After igniting and adjusting the extremely bright projector lamp which provides light for the screen, projectionists start the

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first reel. If the picture is out of focus or unsteady, they adjust the projector lens. Volume controls also may be adjusted if the sound is too loud or too soft.

A reel of film lasts 20 minutes or more. When the reel is almost complete, cue marks (small circles in the upper right corner of the picture) signal that it is time to start the second projector. After a second series of cue marks appears, the projectionist simultaneously closes the shutter on the first projector and opens the second one. This changeover happens so quickly that the audience does not notice an interruption on the screen. Next, the projectionist removes the first reel and rewinds it on the rewinding machine. The entire process is repeated until all the reels have been shown. When the film breaks, the projectionist must rethread it rapidly so that the show may continue.

Almost all new theaters and many renovated theaters have automated or semi-automated equipment. When the film is properly programed or "set-up," the machines automatically can dim houselights, open curtains, start the show with picture and sound, change from one projector to another, and rewind the film. This equipment also uses larger reels, which lessen the number of projector changeovers. In theaters with automated equipment, the projectionist's main job is the "setup" of the film.

A movie comes from a film exchange company on 7 to 12 individual reels of film. The projectionist splices the film from these reels and rewinds it on 2 to 3 reels or on one "platter." The projectionist also cues the program by placing small metallic tabs on the film that activate the various functions of the machinery such as the film changeover. The film must then be carefully inspected for flaws, which may cause the film to break during the showing. The projectionist loads the projector, ignites the light, adjusts the sound and picture, and starts the show.

In case of trouble such as a break in the film, the equipment shuts off until the projectionist can correct the problem. When a movie has finished its run in a theater, the projectionist must replace the film on the smaller reels for return to the film exchange company.

Projectionists also clean and lubricate equipment, check for defective parts and damaged film, and make minor repairs and adjustments. For example, they may replace a badly worn projector sprocket. Major repairs are usually made by service technicians who specialize in repairing projection and sound equipment. However, employers sometime seek a projectionist who can do all the repair work.

Places of Employment

An estimated 16,500 motion picture projectionists were employed full time in 1976. The majority worked for indoor theaters; most of the remainder worked for drive-ins. Some projectionists worked for large manufacturing companies, colleges, television studios, and Federal, State, and local governments.

Projectionists work in cities and towns of all sizes throughout the country. However, most jobs are in large metropolitan areas.

Training, Other Qualifications, and Advancement

Most theaters in urban areas are unionized and young people seeking jobs as projectionists generally must meet union membership requirements. The union locals establish these membership requirements, and they vary considerably among the locals. In nonunion theaters young people may start as ushers or helpers and learn the trade by working with an experienced projectionist.

Generally, unions prefer that applicants be high school graduates. In a few cities and States, projectionists must be licensed. The license often must be obtained before applying for union membership.

Some locals only admit applicants who have had experience with projection equipment. These applicants may work for a trial period in several theaters under the supervision of the regular projectionist. If they demonstrate an adequate knowledge of the projection equipment and its operation, they may join the union. The trial period usually lasts several weeks and during that time the applicant receives no pay.

Some locals conduct training programs which usually require no previous experience with projection equipment. Trainees learn the trade by working with projectionists. They first learn simple tasks such as threading and rewinding film, and progress to more difficult assignments such as adjusting and repairing equipment. A trainee often works in several theaters to become familiar with different types of equipment. Some training programs include classroom instruction in basic electronics and mechanics. After training, the applicant must pass a written exam about equipment use and maintenance; the applicant then becomes a union member. Trainees are not paid for their work in the theaters.

Persons interested in becoming projectionists should have good eyesight—including normal color perception—and good hearing. They should be temperamentally suited to working alone. Manual dexterity and mechanical aptitude also are important qualifications. High school courses in mechanics and electronics or practical experience gained from operating 16-millimeter projectors at school or in the Armed Forces is helpful.

Advancement opportunities for projectionists are limited. Some, however, become projectionist-managers and run many of the theater's daily operations.

Employment Outlook

Little change is expected in employment of motion picture projectionists through the mid-1980's. Most job openings will occur as experienced workers retire, die, or transfer to other fields of work. Applicants may face keen competition for the jobs that become available. Because earnings of motion picture projectionists are relatively high, applicants frequently outnumber job openings. In some areas, new union members may only be able to work part time as replacements for full-time projectionists.

The number of movie theaters is expected to increase more slowly than in recent years, because lack of new films will hurt the theaters' ability to compete with other forms of entertainment such as television.

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Furthermore, because of laborsaving innovations in equipment and theater design, employment of projectionists will not keep pace with theater growth. While older theaters had one screen and employed at least one projectionist, many new theaters are built with several screens side by side so that one projectionist, aided by automated projection machines and longer film reels, can run films for more than one auditorium at a time. The replacement of single screen theaters by those with multiple screens will slow the growth of projectionist jobs caused by new theater construction.

Earnings and Working Conditions

Average hourly earnings for projectionists in large metropolitan areas ranged from $5.18 to $16.50 in 1976, according to information from several union contracts. Wages vary among locals, the specific rate being determined by the type of theater, movie, and equipment involved. Generally, downtown theaters pay higher hourly rates than suburban or drive-in theaters. Projectionists who work more than one screen also receive extra pay.

Most projectionists work evenings; generally 4 to 6 hours on weekdays, and 10 hours or more on Saturday or Sunday. In theaters with weekday matinees, projectionists usually work 6 hours a day, 6 days a week. Some projectionists work at several theaters. For example, a weekly schedule may call for two evenings in each of three theaters. In small towns, projectionists usually work only part time because of the small number of shows. Projectionists employed at drive-ins—particularly in northern States—may be laid off for several months during the winter.

Projection rooms usually have adequate lighting and ventilation, and some are air-conditioned. The work is not strenuous and is relatively hazard free, but there is danger of electrical shock and acid burns from the projector's lamp if proper safety precautions are not taken. Although projectionists must stand a lot, they may sit for short periods while the equipment is operating. Most projectionists work without direct supervision and have infrequent contact with other theater employees.

Sources of Additional Information

Details about training programs and employment opportunities may be obtained from any local of the International Alliance of Theatrical Stage Employees and Moving Picture Machine Operators of the United States and Canada.

OPHTHALMIC LABORATORY TECHNICIANS

(D.O.T. 711.381 and 713.884)

Nature of the Work

Ophthalmic laboratory technicians (also called *optical mechanics*) make eyeglasses ordered by dispensing opticians, eye physicians (ophthalmologists), and optometrists. The two types of ophthalmic laboratory technicians are surfacer (or lens grinder) and bench technician (or finisher). In small laboratories, one person may perform the tasks of both a surfacer and a finisher. Starting with standard size lens blanks, which large optical firms mass-produce, they set up and operate machines to grind and polish eyeglass lenses according to prescription specifications. Surfacers use precision instruments to measure the lenses and make sure that they fit the prescription. In large laboratories, work is divided into separate operations which are performed mainly by workers who operate power grinding and polishing machines.

Bench technicians mark and cut lenses and smooth their edges to fit frames. They then assemble the lenses and frame parts into finished glasses. Bench technicians use special tools, such as lens cutters and glass drills, as well as small files, pliers, and other handtools. They also use automatic edging machines



Technician grinds lens to prescription specifications.

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to shape lens edges and precision instruments to detect imperfections. In large laboratories, the duties of bench technicians are divided into several operations which are performed mainly by semiskilled workers.

Places of Employment

About 22,000 persons worked as ophthalmic laboratory technicians in 1976. Most ophthalmic laboratory technicians work in ophthalmic laboratories. Some work for retail optical dispensaries or other stores that sell prescription lenses. A few work for eye physicians or optometrists who dispense glasses directly to patients.

Ophthalmic laboratory technicians are found in every State. However, employment is concentrated in large cities and in populous States.

Training, Other Qualifications, and Advancement

The vast majority of all ophthalmic laboratory technicians learn their skills on the job. At first, technician trainees do simple jobs such as processing lenses through a grinding machine. As they gain experience, they progress to other operations such as lens cutting and eyeglass assembly. When the trainees have acquired experience in all types of work, which usually takes about 3 years, they are considered all-round optical mechanics. Some technicians specialize in one type of job, such as surfacing or bench work. The training time required to become a specialist is less than that needed to become an all-round technician.

High school graduates also can prepare to become a technician through 3- to 4-year formal apprenticeship programs. Apprentices with exceptional ability may complete their training in a shorter period. Most training authorities agree that technicians who learn as apprentices have more job opportunities and more opportunities for advancement than those without such training.

Apprentices are generally trained to be either ophthalmic surfacers or finishers. All apprentices receive instruction in optical mathematics and optical physics. Ophthalmic surfacers receive training in lens grinding and ophthalmic finishers learn to assemble eyeglasses into frames and to do frame repair.

Some technicians receive training while in the Armed Forces or by attending vocational schools which offer 9-month full-time optical technician courses. Graduates from these types of programs generally need additional on-the-job training.

Employers prefer applicants for entry jobs as ophthalmic laboratory technicians to be high school graduates who have had courses in the basic sciences. A knowledge of physics, algebra, geometry, and mechanical drawing is particularly valuable. Interest in and ability to do precision work are essential.

Some States require licenses for ophthalmic laboratory technicians. To obtain a license, the applicant generally must meet certain minimum standards of education and training, and must also pass either a written or practical examination, or both. For specific requirements, the licensing boards of individual States should be consulted.

Ophthalmic laboratory technicians can become supervisors and managers. Some technicians become dispensing opticians, although the trend is to train specifically for optician jobs. Some technicians, especially those receiving their training in both shop and dispensing work, may go into business for themselves.

Employment Outlook

Employment of ophthalmic laboratory technicians is expected to increase faster than the average for all occupations through the mid-1980's. In addition to the job openings from employment growth, some openings will arise from the need to replace experienced workers who retire, die, or leave the occupation for other reasons.

More technicians will be needed due to the rising demand for eyeglasses. The demand for eyeglasses is expected to increase as a result of increases in population and a greater awareness of the need for eyeglasses. State programs to provide eye care for low-income families, union health insurance plans, and Medicare also will stimulate demand. Moreover, the growing variety of frame styles and colors may encourage individuals to buy more than one pair of glasses.

Earnings and Working Conditions

Hourly wage rates for ophthalmic technicians ranged from $4.60 to $7.50 in 1976, based on information from a small number of union contracts.

Apprentices start at about 60 percent of the skilled worker's rate; their wages are increased periodically so that upon completion of the apprenticeship program, they receive the beginning rate for experienced workers.

Most ophthalmic laboratory technicians work a 5-day, 40-hour week.

Work surroundings of the ophthalmic technician are pleasant, well-lighted, and well-ventilated, but noisy because of the power-grinding and polishing machines.

Some ophthalmic laboratory technicians are members of unions. The principal union in this field is the International Union of Electrical, Radio and Machine Workers (AFL-CIO).

Sources of Additional Information

A list of schools offering courses for people who wish to become ophthalmic laboratory technicians is available from:

National Academy of Opticianry, 514 Chestnut St., Big Rapids, Mich. 49307.

National Federation of Opticianry Schools, 300 Jay St., Brooklyn, N.Y. 11202.

For general information about the occupation, contact:

International Union of Electrical, Radio and Machine Workers, 1126 16th St. NW., Washington, D.C. 20036.

Opticians Association of America, 1250 Connecticut Ave. NW., Washington, D.C. 20036.

PHOTOGRAPHIC LABORATORY OCCUPATIONS

(D.O.T. 970.281, 976.381, .687 through .887)

Nature of the Work

Amateur snapshots, home movies, professional portraits, and photo-

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graphs to illustrate publications require the skills of thousands of photographic laboratory employees. These workers develop film, make prints and slides, and perform related tasks, such as enlarging and retouching photographs. (This chapter does not discuss employees of laboratories who specialize in processing professional motion picture film.)

All-round darkroom technicians (D.O.T. 976.381) can perform all tasks necessary to develop and print film. They know how to develop film manually, as well as how to operate and maintain any automatic equipment used in processing film. The technician varies the developing process according to the type of film—black-and-white negative, color negative, or color positive. For example, a developing process for black-and-white negative film covers five steps: developer, stop bath, fixing bath, washing, and drying. The first three steps use chemical solutions and are performed in darkness. In a hand operation, the technician first immerses unwound film in the developer, a solution that brings out the image on exposed film. When the film has remained in the developer for a specified period, the technician transfers it to a stop bath to prevent overdevelopment. Next, the film is placed in a fixing bath that makes it insensitive to light to prevent further exposure. Finally, the technician washes the film with water to remove the fixing solution and places the film in a drying cabinet. Although hand operations are performed in some small photographic studios, in many photographic labs technicians regulate machines that automatically perform the steps described above.

Processes for developing color films are more complex than those used for black-and-white. Thus, some labs employ *color technicians* (D.O.T. 976.381)—highly skilled workers who specialize in processing color film.

The darkroom technician makes a photograph by transferring the image from a negative to photographic paper. Printing frequently is performed on a projection printer, which consists of a fixture for holding negatives and photographic paper, an electric lamp, and a magnifying lens. The technician places the negative between the lamp and lens, and the paper below the lens. When the technician turns on the lamp, light passes through the negative and lens and records a magnified image of the negative on the paper. During printing, the technician may vary the contrast of the image or remove unwanted background by using paper patterns to shade part of the photographic paper from the projected image. After removing the exposed photographic paper from the printer, the technician develops it in much the same way as the negative. If the customer desires, the technician mounts the finished print in a frame or on a paper or cardboard back.



Some high schools and trade schools offer photography courses that include training in film processing.

In addition to working in the laboratory, darkroom technicians may set up lights and cameras or otherwise assist experienced photographers. Many technicians, particularly those who work in portrait studios and aspire to become professional photographers, divide their time between taking and processing pictures. In some labs, helpers assist technicians. They also may be assisted by workers who specialize in a particular activity, such as *developers* (D.O.T. 976.381), *printers* (D.O.T. 976.381), and *retouchers* (D.O.T. 970.281).

In most large photo labs where the film-developing processes are largely automated, darkroom technicians supervise semiskilled workers who do specialized assignments requiring only a limited knowledge of developing and printing. Included are *film numberers* (D.O.T. 976.887), who sort film according to the type of processing needed and number each roll for identification; *film strippers* (D.O.T. .976.884), who unwind rolls of film and place them in developing machines; *printer operators* (D.O.T. 976.782), who operate machines that expose rolls of photographic paper to negatives; *print developers, machine* (D.O.T. 976.885), who operate machines that develop these rolls of exposed photographic paper; *chemical mixers* (D.O.T. 976.884), who measure and combine the various chemicals that make up developing solutions; *slide mounters* (D.O.T. 976.885), who operate machines that cut, insert, and seal slides in cardboard or plastic mounts; and *photocheckers and assemblers* (D.O.T. 976.687), who inspect the finished slides and prints and package them for customers.

Places of Employment

In 1976, about 35,000 persons worked in photo lab occupations.

Most semiskilled workers are employed by large photofinishing labs that specialize in processing film for amateur photographers. A large proportion of darkroom technicians work in photo labs operated by portrait and commercial studios and by manufacturers, newspaper and magazine publishers, advertising agencies, and other organizations. Darkroom technicians also work in commercial labs that specialize in processing the work of professional photographers.

Photo lab workers are situated in all parts of the country, but employment is concentrated in the more populous areas such as New York, Los Angeles, Chicago, and other large cities.

Training, Other Qualifications, and Advancement

Most darkroom technicians learn their skills through informal on-the-job training. Beginners start as helpers and gradually learn to develop and print film by assisting experienced technicians. It generally takes

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about 3 years to become a fully qualified darkroom technician. Some helpers become specialists in a particular activity, such as printing or developing. Generally, the training time required in order to become a specialist is less than is needed to become an all-round darkroom technician.

When hiring darkroom technician helpers, employers prefer applicants who are high school graduates. Courses in chemistry and mathematics are helpful to people interested in this trade. Some high schools and trade schools offer courses in photography that include training in film processing. The Armed Forces also offer training for darkroom technicians. Experience gained through processing film as a hobby is helpful.

Two-year curricula leading to an associate degree in photographic technology are offered by a few colleges. Completion of college level courses in this field is helpful to people who are interested in supervisory and managerial jobs in photo labs.

Many darkroom technicians eventually become professional photographers. (See statement on photographers elsewhere in the *Handbook*.) Others advance to supervisory positions in laboratories.

Training for workers in semiskilled photolab occupations ranges from a few weeks to several months of on-the-job training. For example, film numberers and slide mounters usually can learn their jobs in a few weeks, but printer operators and chemical mixers may need several months or longer. For many semiskilled jobs, manual dexterity, good vision including normal color perception, and good hand-eye coordination are important qualifications.

Employment Outlook

Employment in photo lab occupations is expected to increase faster than the average for all occupations through the mid-1980's. In addition to jobs from employment growth, many openings will result from the need to replace experienced workers who retire, die, or transfer to other occupations.

The need for semiskilled workers is tied closely to the growth of amateur photography. Film purchases by amateur photographers are expected to increase as a result of rising population and personal income. Improvements in still and movie cameras that make them easier to load and operate also should contribute to an increase in the use of film. However, due to the growing popularity of self-processing instant cameras and the increased use of mechanized film-processing equipment in photo labs, employment will not grow as fast as the amount of film used.

The need for all-round darkroom technicians is expected to increase as a result of the growing demand for photography in business and government. A major factor contributing to this demand will be the increasing variety of printed matter that is illustrated with photographs. The growing use of photography in research and development activities also will contribute to the demand for darkroom technicians.

Earnings and Working Conditions

Earnings of photo lab workers vary greatly and depend on factors such as skill level, experience, and geographic location. Inexperienced photo lab workers generally earned between $2.40 and $3.50 an hour in 1976, according to the limited information available. Workers in semiskilled occupations earned from $2.40 to $5 an hour. Among these workers, printer operators and chemical mixers generally had the highest earnings. In general, darkroom technicians and those in supervisory positions earned more than the semiskilled specialized workers. Most of the experienced darkroom technicians earned between $4.50 and $7.50 an hour in 1976.

The majority of photo lab employees work a 40-hour week and get premium pay for overtime. In labs that specialize in processing film for amateur photographers, employees may work a considerable amount of overtime during the summer and for several weeks after Christmas. Many labs employ temporary workers during these seasonal peaks.

Photo lab jobs are not physically strenuous, but in many of the semiskilled occupations the work is repetitious and the pace is rapid. Some workers (for example, printer operators and photocheckers and assemblers) are subject to eye fatigue. Photofinishing labs are generally clean, well-lighted, and air-conditioned.

Sources of Additional Information

For information about employment opportunities in photographic laboratories and schools that offer degrees in photographic technology, write to:

Photo Marketing Association, 603 Lansing Ave., Jackson, Mich. 49202.

Professional Photographers of America, Inc., 1090 Executive Way, Des Plaines, Ill. 60018.

Photographic Art and Science Foundation, 111 Stratford Rd., Des Plaines, Ill. 60016.

POWER TRUCK OPERATORS

(D.O.T. 922.883)

Nature of the Work

In the past, workers usually did the hard physical labor of moving materials and products. Today, many materials and products are moved by workers who operate various types of power trucks.

A typical power truck has a hydraulic lifting mechanism and forks to carry a load on a wooden skid or pallet, or other attachments to make it more versatile. For example, a truck may have a clamp lift to move cartons, bales, or paper rolls, a scoop to lift coal, or a tow bar to pull warehouse trailers.

Because the trucks are steered by the rear wheels and start and stop very quickly, operators must use care and skill in driving. Power trucks are relatively easy to operate; however, operators usually must follow special procedures when using a truck at a plant, warehouse, or construction site. For example, forks must be kept down if the truck is driven without a load. If the load is too high or wide to see around, the operator must drive the truck in reverse. When loading or removing materials that are stacked

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on the floor or a platform, drivers must judge distance accurately and operate the truck smoothly so that no damage occurs to the stock. Operators also must know the lifting capacity of the truck and the kinds of jobs it can do.

Operators may have to keep records of materials moved and do some manual loading and unloading. They also may be responsible for keeping their trucks in good working condition by cleaning and oiling them, checking the water in batteries, making simple adjustments, and reporting any mechanical problems.

Places of Employment

About 360,000 persons worked as power truck operators in 1976. About three-fourths of them worked in manufacturing industries. Large numbers were employed in plants that made automobiles, machinery, fabricated metal products, paper, building materials, and iron and steel. Many power truck operators also were employed in warehouses, depots, freight and marine terminals, and mines.

Power truck operators are employed in all parts of the country. Although some are employed in small towns, most work in heavily populated areas where large factories are located.

Training, Other Qualifications, and Advancement

Power truck operators train on the job. Most workers can learn to operate a power truck in a few days. It takes several weeks, however, to learn the layout of the plant, the rules for operating a truck in the plant, and the most efficient way of handling materials.

Many companies have training programs that include classroom instruction and practice with the power truck. In the classes, trainees learn how the vehicle and its lift operate, proper methods of transporting materials, simple maintenance procedures, and safe driving rules. The programs stress practice with the power trucks. Trainees even may be required to operate them on an obstacle course. Training programs last 1 to 5 days. Because power trucks are becoming more versatile and expensive, firms are expected to place greater emphasis on training programs to increase the skills of their operators in order to avoid damage to trucks and materials from accidents.

Employers seek applicants who have average manual dexterity, strength, and stamina because operators must get on and off the truck frequently and occasionally load and unload material. Good eyesight, including good depth preception, is required to pick up, move, and deposit loads with the power truck. Large companies generally require applicants to pass a physical examination. Some mechanical ability is helpful because operators often are required to perform minor maintenance on their power trucks.

Opportunities for advancement are limited. A few operators may become supervisors.

Employment Outlook

Employment of power truck operators is expected to increase about as fast as the average for all occupations through the mid-1980's. In addition to jobs resulting from employment growth, many operators will be needed to replace those who retire, die, or transfer to other occupations.

More goods will be manufactured as the population grows and our standard of living rises, and more power truck operators will be needed to move these goods and the materials used to produce them. The need for operators also will increase as more firms use power trucks in place of hand labor to move materials. The number of jobs available annually will vary, because the occupation is sensitive to changes in the demand for manufactured goods.

Earnings and Working Conditions

In 1976, power truck operators in manufacturing earned an average of $5.30 an hour, slightly above the average for nonsupervisory workers in private industry, except farming. Earnings of operators varied slightly by region and by industry.

Power truck operators are subject to hazards such as collisions and falling objects. They may operate their trucks outdoors where they are exposed to all kinds of weather. Some operators transport loose material that is dirty or dusty.

A trend toward quieter, more comfortable, and better handling trucks and emphasis on training in safe operation have improved working conditions. For example, all rider type power trucks now have overhead guards and many which are used outdoors are equipped with all-weather cabs. Also, the increasing use of the relatively noiseless and pollutant-free



Power truck operators are employed in many industries.

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battery-powered trucks is doing much to improve the comfort of the operator. Moving materials throughout a plant also is likely to be less routine and boring than many other production jobs.

Sources of Additional Information

Information on work opportunities for power truck operators may be available from the local office of the State employment service.

PRODUCTION PAINTERS

Nature of the Work

Almost every metal or wood product manufactured gets a coating of paint or other finish before it leaves the factory. Automobiles, for example, usually receive rust preventative, primer, and paint totaling at least 10 coats. Even pencils are dipped in paint several times before they are packed into boxes.

The workers who apply the varnish, lacquer, paint, and other finishes used in factories are called production painters. Because they generally work on assembly lines, production painters' skills are different from those of painters who repair damaged cars in body shops and from those who paint newly constructed buildings. (Information on these painters can be found in separate statements elsewhere in the *Handbook*.) The majority of production painters use sprayguns to apply finishes; while the rest operate automatic painting machinery, such as spraying machines, dipping tanks, and tumbling barrels. Since painters may spray hundreds of identical items a day, the work may become repetitious.



Most paint is applied with spray guns.

Painters mix the paint at the beginning of the process. They first figure areas to be covered, and then follow directions to blend paint to its correct color and thickness. These steps require simple arithmetic involving decimals and fractions. Viscosity meters are used to make sure the paint is the right consistency, for if it is too thick or too thin, the paint has to be mixed over. Pressure of the spray gun nozzles and spray pattern controls also must be adjusted properly to ensure that the paint is evenly applied.

Besides spraying, painters are responsible for other duties on the production line. If an object is to be multi-colored, masking tape must be applied to keep colors from overlapping. Production painters who operate machinery set up the painting equipment at the beginning of the shift and are responsible for keeping it running. Other machines used in the painting process may also be operated by the painters. For example, washing tanks are used to clean items prior to painting and baking ovens dry the painted articles. At the end of the shift, painters must clean spray guns and other equipment used, such as mixing paddles or gauges which check paint consistency.

An increasing number of production lines use automatic painting machinery. Here, production painters are necessary to check for imperfections and to paint parts of an article that the machine misses. For example, some modern applicators cannot paint inside surfaces, such as the interior of a bucket. Painters use spray guns to paint these areas. As production lines become more automated, painters must learn to handle all types of modern painting machinery, such as electrostatic applicators and powder-type painting systems.

Places of Employment

About 104,000 production painters were employed in 1976. About two-thirds of the total worked in plants that made automobiles, machinery, furniture and other wood products, or manufactured metal products such as cans, tinware, and handtools. Although production painters are scattered geographically, large numbers are employed in industrialized States. A fourth of all furniture painters were employed in North Carolina and Pennsylvania, while one-third of all automobile painters worked in Michigan—over half of these in Detroit. Over a quarter of the painters employed by companies making machinery and metal products worked in Ohio and Illinois.

Training, Other Qualifications, and Advancement

Because no formal apprenticeship or training program exists, new production painters acquire their skills on the job. Inexperienced workers often start off loading and unloading items from conveyor lines. After they become familiar with the production process and as openings arise, they may be taught new painting skills. They usually learn the work by watching and helping experienced painters. Training varies from a few days to several months. Some modern painting processes, such as those used to apply powdered coatings, demand more skill than others and thus a correspondingly longer training period. As painters gain experience they can advance to higher skill categories, assume more responsibility, and receive higher wages.

Production painters usually have to stand for long periods of time to do their job. Although they seldom have to lift heavy objects, the production line nature of the job demands good physical condition, since the painters may be exposed to fumes or have to bend or stoop in their work. For example, to paint the underside or top of an object, such as a car, may require reaching or crouching. Good eyesight is an asset to distinguish colors and check that paint has been applied evenly. High school graduation is generally not required for entry level positions, but a diploma or its equivalent may be needed to advance to higher skill levels.

Opportunities for advancement are limited, although a small number

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of production painters become supervisors.

Employment Outlook

Employment of production painters is expected to increase at about the same rate as the average for all occupations through the mid-1980's. Many job openings also will result as experienced workers retire, die, or transfer to other occupations.

Most manufacturing industries are expected to increase their output in the years ahead. Demand for consumer products, such as automobiles and furniture, will increase as population and personal income grow. Business growth will create a need for more industrial machinery and equipment. Employment of painters, however, is not expected to keep pace with manufacturing output because increased use of automatic painting processes and other labor-saving innovations should raise output per worker.

Most production painters work in plants that produce durable goods, such as automobiles, where employment is particularly sensitive to changes in general economic and business conditions. Therefore, these painters may be subject to occasional layoffs.

Earnings and Working Conditions

Hourly wage rates for production painters ranged from $2.63 to $6.12 in 1976, based on information from a limited number of union contracts. Most painters covered by these contracts earned between $4 and $5 per hour.

Because painters are exposed to fumes from paint and paint-mixing ingredients, they may wear masks which cover the nose and mouth. Many wear coveralls to protect their clothes. They also may need earplugs, since noisy factory conditions often exist. When painting large objects, such as a car or refrigerator, they may have to work in awkward and cramped positions.

Among unions organizing production painters are the International Union, United Automobile, Aerospace and Agricultural Implement Workers of America; International Association of Machinists and Aerospace Workers; and the United Steelworkers of America

Sources of Additional Information

More facts about job opportunities in this field may be available from local offices of the State employment service. General information on production painters may be obtained from:

Materials Marketing Associates, Inc., Shepard-Benning Building, 520 Pleasant, St. Joseph, Mich. 49085.

Federation of Societies for Coatings Technology, 1315 Walnut St., Philadelphia, Pa. 19107.

STATIONARY ENGINEERS

(D.O.T. 950.782)

Nature of the Work

Stationary engineers operate and maintain the machinery that provides power for industry; heat and air-conditioning for factories, hospitals, and other buildings; and light for every city and town. Among the equipment they tend and control are steam boilers, diesel engines, turbines, generators, pumps, condensers, and air compressors.

Stationary engineers monitor the various meters and gauges that are attached to equipment to make sure they are running properly, and make adjustments whenever necessary. On a steam boiler, for example, they check the meters and gauges that indicate steam pressure and the amount of fuel being consumed.

Stationary engineers, or power engineers as they often are called, check the equipment regularly to make sure that adequate power is provided without wasting fuel. They can control both the flow of fuel to the boiler and the steam pressure by adjusting throttles or valves. Other types of equipment may be regulated using switches or levers.

Stationary engineers also protect equipment from soot and corrosion. Boiler water, for example, frequently is tested for purity and treated with chemicals.

These workers detect and identify any trouble that develops. They watch and listen to machinery and routinely check the safety controls. Often stationary engineers make minor repairs, such as replacing defective valves, gaskets, or bearings.

In a large plant, the stationary engineer may be in charge of the boiler room, and direct the work of assistant stationary engineers, turbine operators, boiler tenders, and air-conditioning and refrigeration mechanics. In a small plant, the stationary engineer may be the only person operating and maintaining equipment.

Places of Employment

In 1976, 194,000 stationary engineers were employed in a wide variety of places, including power stations, factories, sewage and water-treatment plants, office and apartment buildings, hotels, and hospitals. Federal, State, and local governments also employed large numbers of these workers. Usually, plants that operate on three shifts employ four to eight stationary engineers, but some have more. In many plants, only one engineer works on each shift.

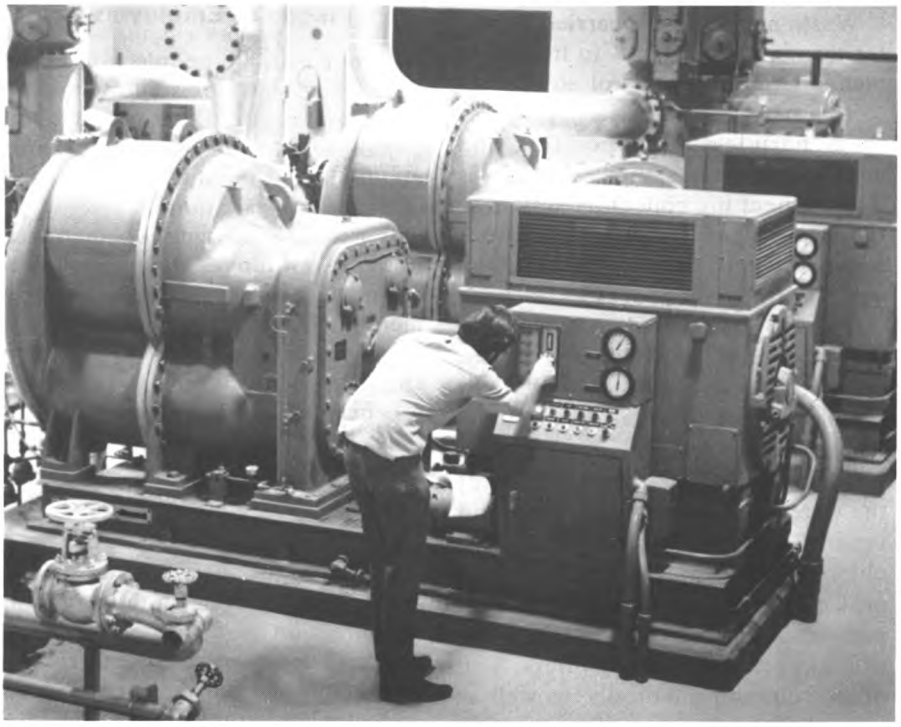
Because stationary engineers work in so many different kinds of industries, they are employed in all parts of the country. Although some are employed in small towns and in rural areas, most work in the more heavily populated areas where large industrial and commercial businesses are located.

Training, Other Qualifications, and Advancment

Many stationary engineers start as helpers or oilers and acquire their skills through informal on-the-job experience. A good background also can be obtained in the Navy or Merchant Marine. However, most training authorities recommend formal apprenticeship programs because of the increasing complexity of the machines and systems.

In selecting apprentices, most joint labor-management apprenticeship committees prefer high school or trade school graduates who have received instruction in mathematics, mechanical drawing, machine-shop

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Stationary engineers operate generators and turbines.

practice, physics, and chemistry. Mechanical aptitude, manual dexterity, and good physical condition also are important qualifications.

The apprenticeship usually lasts 4 years. In addition to on-the-job training, apprentices receive classroom instruction in practical chemistry, elementary physics, blueprint reading, applied electricity, and other technical subjects.

Becoming a stationary engineer without going through a formal apprenticeship program usually takes many years of experience as an assistant to licensed stationary engineers or as a boiler tender. This practical experience can be supplemented by technical or other school training or home study.

Many States, the District of Columbia, and many large and medium-sized cities have licensing requirements for stationary engineers. Although requirements for a license differ from place to place, applicants usually must be at least 18 years of age, reside for a specified period in the State or locality in which the examination is given, meet the experience requirements for the class of license requested, and pass a written examination.

Generally, there are several classes of stationary engineer licenses. Each class specifies the steam pressure or horsepower of the equipment the engineer can operate. The chief engineer license permits the stationary engineer to operate equipment of all types and capacities. An applicant for this license may be required to have a high school education and an approved apprenticeship or on-the-job training. The lower class licenses limit the capacity of the equipment the engineer may operate without the supervision of a higher rated engineer.

Because of regional differences in licensing requirements, a stationary engineer who moves from one State or city to another may have to pass an examination for a new license. However, the National Institute for Uniform Licensing of Power Engineers is now assisting many States in adopting a standardized licensing program that would eliminate this problem by establishing reciprocity of licenses.

Stationary engineers advance to more responsible jobs by being placed in charge of larger, more powerful, or more varied equipment. Generally, engineers advance to these jobs as they obtain higher class licenses. Advancement, however, is not automatic. For example, an engineer who has a first-class license may work for some time as an assistant to another first-class engineer before a vacancy occurs. Some stationary engineers eventually advance to jobs as plant engineers and as building and plant superintendents. A few obtain jobs as examining engineers and technical instructors.

Employment Outlook

Employment of stationary engineers is expected to show little change through the mid-1980's. Nevertheless, several thousand job openings will arise annually because of the need to replace experienced workers who retire, die, or transfer to other occupations.

Industrial growth will result in an increased use of large boilers and auxiliary equipment in factories, powerplants, and other buildings. The need for additional stationary engineers, however, will be limited by she trend toward more powerful and more centralized equipment. For example, a large boiler operated by one stationary engineer can supply heat and refrigeration for several buildings, instead of each building having its own small boiler and its own engineer.

Earnings and Working Conditions

Stationary engineers had average hourly earnings of $7.03 in 1976, according to a survey of 21 metropolitan areas. This was almost 50 percent higher than the average for all nonsupervisory workers in private industry, except farming. Averages for engineers in individual cities ranged from $4.69 in Greenville, S.C. to $7.99 in the San Francisco area.

Stationary engineers generally have steady year-round employment. They usually work a 5-day, 40-hour week. In plants that operate around the clock, they may be assigned to any one of three shifts—often on a rotating basis—and to Sunday and holiday work.

Engine rooms, powerplants, or boiler rooms usually are clean and well-lighted. Even under the most favorable conditions, however, some

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stationary engineers are exposed to high temperatures, dust, and dirt from the equipment. General maintenance duties may cause contact with oil and grease, and fumes or smoke. Workers also may have to crawl inside boilers and work in crouching or kneeling positions to inspect, clean, or repair the interiors.

Because stationary engineers often work around boilers and electrical and mechanical equipment, they must be alert to avoid burns, electric shock, and injury from moving machinery.

Among the unions to which these workers belong are the International Union of Operating Engineers and the International Brotherhood of Firemen and Oilers.

Sources of Additional Information

Information about training or work opportunities is available from local offices of State employment services, locals of the International Union of Operating Engineers, and from State and local licensing agencies.

Specific questions about the occupation may be referred to:

International Union of Operating Engineers, 1125 17th St. NW., Washington, D.C. 20036.

National Association of Power Engineers, Inc. 176 West Adams St., Chicago, Ill. 60603.

For questions concerning licensing requirements, contact:

National Institute for Uniform Licensing of Power Engineers, 176 West Adams St., Chicago, Ill. 60603.

WASTEWATER TREATMENT PLANT OPERATORS (Sewage-Plant Operators)

(D.O.T. 955.782)

Nature of the Work

Clean water is essential for our health and recreation and for the existence of fish and wildlife. Wastewater treatment plant operators help keep America's water clean by removing harmful domestic and industrial waste.

Waste materials are carried by water through sewer pipes to treatment plants. Operators control equipment to remove these materials or render them harmless. By operating and maintaining pumps, pipes, and valves that connect the collection system to the treatment facility, operators move the wastewater through the various treatment processes.

Operators read and interpret meters and gauges to make sure plant equipment is working properly. Other jobs include operating chemical feeding devices to remove pollutants from wastewater; taking samples of the water for laboratory analysis; and testing and adjusting the level of chlorine in the water. Operators also make minor repairs on valves, pumps, and other equipment. They use gauges, wrenches, pliers, and other common handtools, as well as special tools. Occasionally operators must work under emergency conditions—for example, a heavy rainstorm may cause abnormal amounts of wastewater to flow into sewer pipes and threaten to exceed a plant's treatment capacity.

The duties of operators vary depending on the type and size of plant. For example, the treatment process in an industrial plant, such as a food-processing company, may be simple since the wastewater is of a known content. Treatment plants that serve entire cities, on the other hand, must be equipped to treat a mixture of waste products that varies daily, thus making the operator's job more complicated. In smaller plants, one operator may be responsible for the entire system—making repairs, keeping plant records, handling complaints, and doing the maintenance work for the facility. In larger plants, the staff may include chemists, laboratory technicians, mechanics, helpers, supervisors, and a superintendent.

As a result of the passage of the Federal Water Pollution Control Act of 1972, water pollution standards will become increasingly stringent in the future. In order to meet these higher requirements, operators will have to be able to operate more sophisticated systems.

Places of Employment

About 100,000 people worked full time as wastewater treatment plant operators in 1976, of whom about 58,000 worked in municipal plants, 40,000 in private industry, and 2,000 in Federal installations.

Wastewater treatment plant operators are employed throughout the country. Geographically, employment is distributed much like the Nation's population, with most jobs in larger towns and cities. Many operators in small towns are employed part time.

Training, Other Qualifications, and Advancement

Trainees usually start as helpers and learn their skills on the job under the direction of an experienced operator. They learn by doing routine tasks such as recording meter readings; taking samples of wastewater and sludge; and doing simple maintenance and repair work on pumps, electric motors, and valves. They also are expected to perform housekeeping tasks such as cleaning and maintaining plant equipment and property.

Persons interested in entering the field should have some mechanical aptitude and should be competent in basic mathematics. Employers generally prefer trainees who have a high school diploma or its equivalent, and in some States this is a minimum educational requirement. Some positions, particularly in larger cities and towns, are covered by civil service regulations, and applicants may be required to pass written examinations testing elementary mathematics skills, mechanical aptitude, and general intelligence. Operators must be agile, since they have to climb ladders and move easily around heavy machinery.

Some 2-year programs leading to an associate degree in wastewater technology are available; these provide a good general knowledge of the water pollution control field as well as basic preparation for becoming an operator. Since plants are becoming more complex, completion of such courses increases an applicant's chances for employment and promotion.

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Most State water pollution control agencies offer training courses to improve the skills of treatment plant operators. These courses cover principles of sludge digestion, odors and their control, chlorination, sedimentation, biological oxidation, and flow measurements. Some operators take correspondence courses on subjects related to wastewater treatment, and some employers will pay part of the tuition for courses leading to a college degree in science or engineering.

Operators may be promoted to positions such as supervisor and superintendent. A high school diploma and increasingly responsible operator experience may be sufficient to qualify as superintendent of a small plant, since at many small plants the superintendent also serves as an operator. Educational requirements, however, are rising as larger, more complex treatment plants are being built to meet new water pollution control standards. Superintendents of large plants are expected to have an engineering or science degree. Training in management techniques is becoming increasingly important for operators seeking positions with supervisory responsibilities. A limited number of operators may become technicians employed by State water pollution control agencies to monitor and provide technical assistance to plants throughout the State. Some technical-vocational school or junior college training generally is preferred for technician jobs.

In 40 States, supervisors and certain operators must pass an examination to certify that they are capable of overseeing treatment plant operations. Voluntary certification programs are in effect in the remaining States, with the exception of Alaska.

Under a typical program, there are different classes of certification for different sizes of treatment plants. For example, to be certified a "class I operator" capable of operating a small plant with simple equipment, an applicant should be a high school graduate, demonstrate general knowledge of treatment operations by passing a written test, and complete 1 year of satisfactory employment at a treatment plant. Requirements for certification as a class IV operator who supervises a large plant employing complex technology may require a bachelor's degree in science or engineering; 4 years of treatment plant experience, 2 years of which were in a position of major responsibility; and specific knowledge of the entire field of wastewater treatment as demonstrated through a written test. Typically, a large plant would employ mostly operators certified for operating small or medium-sized plants, but always under the supervision of a class IV operator.

Employment Outlook

Employment of wastewater treatment plant operators is expected to increase much faster than the average for all occupations through the mid-1980's, mainly as a result of the construction of new treatment plants to process the increasing amount of domestic and industrial wastewater. Also, more highly trained operators will be needed as existing plants expand and modernize their facilities to cope more effectively with water pollution. In addition to new jobs from employment growth, many job openings will occur as experienced operators retire, die, or transfer to other occupations.

People who enter this field should have fairly steady employment in the years ahead. Even during economic downturns, treatment plants seldom lay off employees.

Earnings and Working Conditions

Operators employed at small and medium-sized wastewater treatment plants generally earned between $9,000 and $13,000 a year in 1976. Some experienced operators earned more than $20,000 a year in large plants. Superintendents of small plants earned about the same as operators, but superintendents of medium-sized plants generally earned between $13,000 and $20,000 and as much as $25,000 or more in large plants. Salaries for trainees were roughly 80 percent of operators' salaries in most cities.

Because pollution control is a never-ending task, operators work different shifts and in an emergency may have to work overtime. Operators may be exposed to unpleasant odors, as well as noise from the operation of electrical motors and pumps. However, odor is kept to a minimum by the use of chlorine or other chemicals.

Sources of Additional Information

People interested in a career in wastewater treatment should contact their local or State water pollution control agencies. Additional information is available from:

Water Pollution Control Federation, 2626 Pennsylvania Ave., NW., Washington, D.C. 20037.

Manpower Planning and Training Branch (WH-596), Office of Water Programs, Environmental Protection Agency, Washington, D.C. 20460.

WELDERS

(D.O.T. 810. through 819.887)

Nature of the Work

Welding consists of joining pieces of material, usually metal, by fusing or bonding them together. It is the most common method of permanently connecting metal parts that go into the construction of automobiles, spacecraft, ships, household appliances, construction equipment, and thousands of other products. Beams and steel reinforcing rods in bridges, buildings, and roads frequently are joined by welding. In addition, a growing number of plastic parts are welded to make a variety of products.

Welding processes differ in the way heat is created and applied to the parts being joined. In arc welding, the most frequently used process, heat is created as electricity flows across a gap from the tip of the welding electrode to the metal. In resistance welding, heat is created by resistance to the flow of current through the metal. In gas welding, the combustion of burning gases melts the metal. As part of many welding processes, filler materials, called welding electrodes or welding

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rods, are melted and added to the joint to give it greater strength. When the heat is removed, the metal and filler material solidify and join the parts. It is the welder's job to control the heat and the weld pool size and to add the filler material so that together they form a strong joint.

Since welding processes differ and are used for a wide variety of purposes, the equipment used and the skill levels of welders vary. Jobs vary from those of highly skilled manual welders who can use gas and electric arc welding equipment in more than one position and who can plan their work from drawings or other specifications to those of unskilled welding machine tenders who simply press a button to start the welding machine. Skilled welders know the material characteristics and properties of steel, aluminum, and other metals and can weld joints in all positions. For example, maintenance welders, pipe welders, and many of the welders who construct ships are skilled welders.

Ship welders join the steel plates, beams, and pipes used to build ships. Some welded joints are on the floor, some are on the wall, and some are overhead. All must be carefully welded to insure that the ship will not break apart in rough seas.

Ship welders generally use arc welding equipment, although gas equipment also is used in many areas. After reading instructions or specifications to learn which materials and welding method to use and obtaining supplies from the storage area, ship welders are ready to begin work. When employing shielded metal arc welding they use a rod in a holder attached to an electric cable coming from a welding power supply. The other power supply cable is attached to the metal being welded which completes the electrical circuit and controls are adjusted to provide the correct amount of welding current. When the power is turned on they "strike an arc" by briefly touching the rod to the metal to start the electricity flowing and then pulling the rod back to create a small gap which the current must jump. If the distance between the rod and the metal is correct, an arc will jump across the space; the heat from the electric arc melts the rod and the metal. Welders control the arc movement along the joint. As the rod melts and becomes shorter they move the holder closer to the metal to keep the correct arc length. When the rod becomes very short, it is discarded and replaced with a new one.

Maintenance welders repair tools, machines, and equipment—for example, a leaking pipe. In such cases, welders may bring their equipment to the job. Gas welding is used in many cases because electrical power may not be available and the torch, hoses, and tanks of gas are portable.

After examining the pipe and preparing the break for repair—usually by grinding—maintenance welders select the proper welding filler rod for the job. Next, they light the torch and adjust regulators on the tanks of fuel gas, such as acetylene, hydrogen, etc., and oxygen to obtain the right gas mixtures and flame. With the filler rod in one hand and the torch in the other, they heat the edges of the break and apply the heat. As the metal begins to melt, the welders periodically melt the end of the filler rod in the hot, liquid metal while they carefully move the torch and rod along the crack to complete the repair. Welders must be careful to keep the torch at the right distance from the metal in order to apply the heat correctly and to add filler material, as needed, to fill the crack.

Not all welders have the skills required of shipbuilding or maintenance welders. For example, less skilled workers use semiautomatic arc welding equipment to speed up the job of welding automobile frames. Semiautomatic equipment consists of a welding gun that welders must manipulate but which automatically supplies the proper amount of arc heat and filler material to the joint. In this case, assembly lines bring car frames to welders and put them in place. Welders then position their welding guns on the parts to be welded and operate a switch on the handle which automatically "strikes an arc". They guide the arc to complete one or two joints before the assembly line takes the frame to another worker. Like other welders, they are responsible for the soundness of the joint. However, they need less skill because all parts they weld are identical and each is welded in the same position.

If the factory is large, and many identical parts are to be welded, the company may save money by using automatic welding machines. Such machines may be used, for example, in making automobile mufflers and washing machines. The workers who operate these machines need little knowledge of welding and are frequently called welding machine operators to distinguish them from more skilled, manual welders. Welding machine operators place the parts to be joined in holders on the machine. To complete the weld, operators simply push a button. The machine then clamps the part in place and rotates it, as necessary, to complete the welding cycle. After



Jobs for welders are concentrated in the manufacturing centers of the Great Lakes States.

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the welding cycle is finished, operators remove the welded parts and load the machine again.

Closely related to welders are cutters. Cutters use the heat from burning gases or an electric arc to cut and trim metal rather then join it. Some cutters operate electrically or mechanically controlled machines that automatically follow the proper guideline.

Places of Employment

About 660,000 welders and flame cutters were employed in 1976, including a relatively small number of cutters who used both flame and arc-cutting equipment. Almost two-thirds of all welders help manufacture durable goods; for example, boilers, bulldozers, trucks, ships, and heavy machinery. Most of the rest repair metal products or help construct bridges, large buildings, and pipelines.

Welders are concentrated in the manufacturing centers of the Great Lakes States. About one-third work in Pennsylvania, Ohio, Michigan, Indiana, and Illinois. Because of the widespread use of welding, the rest are distributed much the same as the population is with large numbers working in New York, Texas, Wisconsin, and California.

Training, Other Qualifications, and Advancement

Generally, it takes several years of training to become a skilled welder. Some of the less skilled jobs, however, can be learned on the job in a few months. Some welding machine operators, for example, learn to operate a machine in a few hours and become completely qualified in a week.

Beginners often start in simple production jobs where the type and thickness of the metal and the position of the welding operation rarely change. As the need arises, supervisors or experienced workers teach new employees how to weld different types of metals, and how to weld vertical and overhead joints. Many large companies conduct programs to train people as welders. After completing the course, individuals are offered jobs. A few companies offer employees welder apprenticeship programs that last several years, including classroom and on-the-job training.

Persons planning careers as welders or cutters need manual dexterity, good eyesight, and good eye-hand coordination. They should be able to concentrate on detailed work for long periods, and should be free of any physical disabilities that would prevent them from bending, stooping, and working in awkward positions. Most employers prefer applicants who have high school or vocational school training in welding. Courses in shop mathematics, mechanical drawing, blueprint reading, physics, and chemistry also are helpful.

New developments are requiring new skills of welders. This is particularly true in fields such as atomic energy or aerospace manufacturing, which have high standards for the reliability of welds. Before being assigned to work on buildings, bridges, pipelines, or other jobs where the strength of the weld is highly critical, welders may be required to pass an examination of their welding skills given by an employer or government agency. Welders who pass such examinations generally are referred to as "certified welders."

Promotion opportunities for welders are good. Some welding machine operators learn skilled welding jobs; skilled welders may be promoted to welding inspectors, technicians, or supervisors. Experienced workers who have obtained college training on the properties of metals often become welding engineers and are in great demand to develop new application for welding. A small number of experienced welders open their own welding repair shops.

Employment Outlook

Job opportunities for welders should be very good in the years ahead. Employment in this large field is expected to increase faster than the average for all occupations through the mid-1980's. The faster increase will be caused by the generally favorable long run outlook for metalworking industries and by the greater use of welding in particular. In addition to openings created by employment growth, many jobs should arise each year because of the need to replace experienced welders who retire, die, or transfer to other occupations. Job opportunities may vary from year to year, however, because employment of welders in the manufacturing and construction industries fluctuates with ups and downs in the economy.

Increases in population and income are expected to stimulate demand for cars, buildings, heavy machinery, appliances, and thousands of other products that welders help make. Employment of welders also is expected to increase as welding replaces other methods of joining metals. Welding generally is cheaper than other methods of joining metal parts, and it is being used more frequently in the manufacturing and construction industries.

Earnings and Working Conditions

National wage data on welders are not available. However, the limited data available indicate that welding machine operators earned from $3.93 to $5.10 in 1976. Welders in the construction industry earned $6 to $12 an hour, depending on location.

Welders and cutters use protective clothing, safety shoes, goggles, helmets with protective lenses, and other devices to prevent burns and eye injuries. Although lighting and ventilation usually are adequate, welders occasionally work in the presence of toxic gases and fumes created when some metals melt. They are often in contact with rust, grease, and dirt on metal surfaces. Welding machine operators are largely free from the hazards associated with manual welding. A face shield or goggles generally offer adequate protection to these workers.

Many welders are union members. However, because welding also is done by other craft workers, for example by pipefitters, and only recently has received recognition as a distinct craft, welders belong to many different unions. Among these are

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the International Association of Machinists and Aerospace Workers; the International Brotherhood of Boilermakers, Iron Shipbuilders, Blacksmiths, Forgers and Helpers; the International Union, United Automobile, Aerospace and Agricultural Implement Workers of America; the United Association of Journeymen and Apprentices of the Plumbing and Pipe Fitting Industry of the United States and Canada; and the United Electrical, Radio and Machine Workers of America (Ind.).

Sources of Additional Information

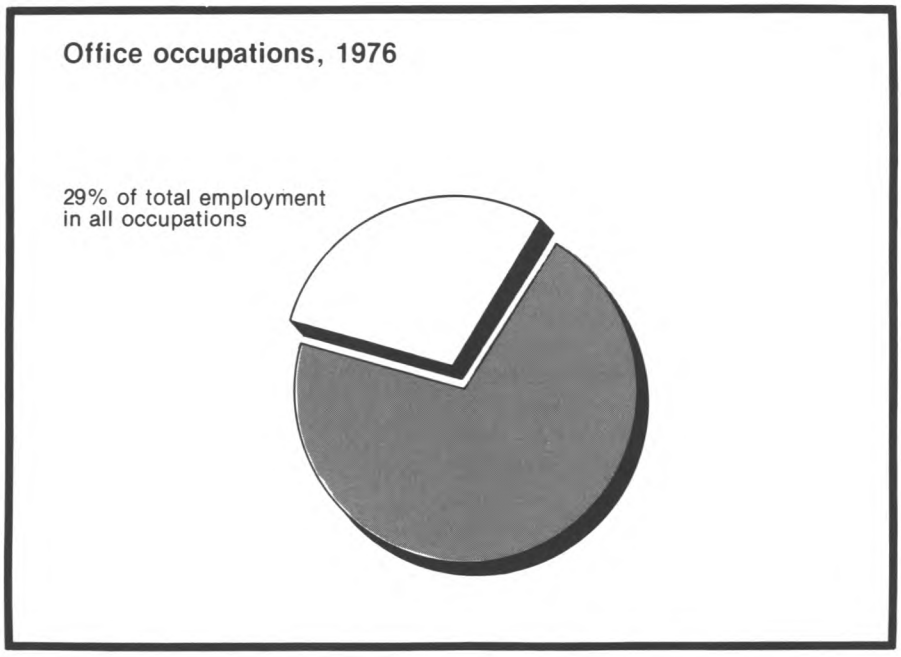
For further information on training and work opportunities for welders, contact local employers or the local office of the State employment service. For general information about welders, write to:

The American Welding Society, 2501 NW. 7th St., Miami, Fla. 33125.

International Union, United Automobile, Aerospace and Agricultural Implement Workers of America, 8000 East Jefferson Ave., Detroit, Mich. 48214.

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OFFICE OCCUPATIONS



Office workers perform a wide range of tasks that are needed to keep business and other organizations running on a day to day basis. Clerical workers, such as secretaries and typists, maintain files, type, and operate office machines. Professional and technical employees give legal advice, prepare and analyze financial reports, design computer systems, and arrange bank loans.

Opportunities in office work exist for people with widely different educational backgrounds. Some jobs can be entered with only a high school education; many others, however, require at least a college degree.

Many clerical employees work with things and often do detailed, repetitive tasks. Most professional office workers, on the other hand, work with ideas; they apply their skills to solving problems and devising ways to provide better services to those who depend on them. Besides the technical skills required to do their jobs, office workers need judgment and the ability to communicate their ideas to others.

This chapter of the *Handbook* describes office work in clerical occupations, computer and related occupations, banking occupations, insurance occupations, and administrative and related occupations.

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CLERICAL OCCUPATIONS

About 16 million people worked in clerical jobs in 1976. Many keep records and do other office paperwork. Others handle communications, operate office machines, ship and receive merchandise, and ring sales on cash registers.

Workers in clerical jobs have a wide variety of skills and experience. They include highly skilled title searchers in real estate firms and executive secretaries in business offices as well as relatively unskilled messengers and file clerks. Despite the diversity of jobs and duties, much clerical employment is concentrated in just a few familiar jobs. Roughly 1 of every 5 clerical workers is a secretary or stenographer. One in 10 is a bookkeeper. The accompanying chart shows employment in these and other major clerical occupations discussed in the *Handbook*.

Training, Other Qualifications, and Advancement

Clerical workers need high school diplomas for all but the most routine jobs, and many employers prefer applicants who have had business courses. Some companies cooperate with local high schools and business schools in office education programs that enable students to work part time while attending school. This experience is helpful for beginners seeking jobs after graduation. Many States and localities sponsor programs to train unemployed and low-skilled workers for entry-level clerical jobs.

Beginning clerical workers often receive on-the-job training. They learn how their employers keep records and become familiar with the kinds of business forms used. Some new workers learn to operate adding and duplicating machines and other kinds of office equipment. They may attend classes to learn how to operate tabulating machines and other specialized equipment. Secretaries, stenographers, and typists need special skills that must be learned in schools or formal training programs.

Many clerical jobs require reading comprehension, a knowledge of spelling and grammar, and arithmetic skills. Employers prefer applicants for almost all clerical jobs to have basic typing skills. Some employers test applicants for clerical aptitude.

Advancement opportunities for clerical workers are good, and many employers provide courses so that their employees can learn the skills needed for more demanding jobs. As workers become more highly skilled, they are assigned more difficult tasks. For example, junior typists may be promoted to more responsible jobs as senior typists as their typing speed and accuracy improves. Receptionists who learn typing and office procedures may become secretaries or typists. Promotion to supervisor or manager generally depends on leadership ability, work experience, and knowledge of the overall operations of the organization.

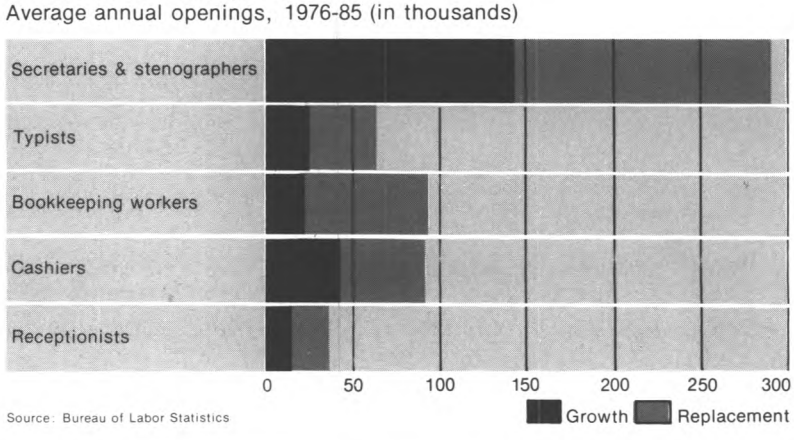
Employment Outlook

Employment of clerical workers is expected to increase faster than the average for all occupations through the mid-1980's. In addition to the new jobs created by this growth, many other openings will occur as employees die, retire, or leave their jobs.

Future growth in the number of clerical workers is expected to result primarily from the increasing paperwork that will accompany the expansion of large and complex organizations. A great deal of this paperwork is handled by computer. The impact of automation on office equipment and procedures is considerable, but it is more important in some jobs than in others. In general, long-term employment prospects are best in clerical occupations that are not affected by automation, in those that are compatible with computer applications, and in jobs that have developed as a result of new technologies. Job opportunities are especially favorable for receptionists, secretaries, and typists. Demand for these workers will be particularly strong in banks, insurance companies, manufacturing firms, and professional service organizations.

As more firms use computers and business machines, routine clerical

Openings for secretaries are expected to be more than three times the number of openings for any other clerical occupation through 1985



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jobs such as payroll, bank, and file clerk may be reduced or eliminated. Also, as work is shifted from clerks to machines, many clerical workers will have to become familiar with computer operations, particularly in large firms.

Persons with clerical skills, particularly secretarial and typing skills, should find extensive opportunities for temporary or part-time work as more employers use these workers during peak business periods.

Earnings and Working Conditions

Clerks in routine jobs earned as little as $113 a week, while many highly skilled workers were paid $200 or more, according to a 1976 survey. Salary variations within an occupation are relatively common and these usually reflect differences in educational level, work experience, and level of responsibility.

Salaries in different parts of the country also vary; earnings generally are lowest in southern cities and highest in northeastern and western urban areas. For example, secretaries averaged $197 a week in the Northeast, $201 in the West, and $181 in southern cities.

Clerical employees work a 40-hour week in most cities. In some, especially in the Northeast, the scheduled workweek is 35 hours.

Most clerical workers in large cities receive 7 paid holidays or more a year and 2 weeks' vacation after working 1 year. Longer vacations, based on added years of service, may range to 4 weeks or more. Group life and health insurance plans, sick benefits, and retirement plans often are available.

Sources of Additional Information

Many State employment service offices can provide information about earnings, hours, and employment opportunities in clerical jobs.

Information concerning training for clerical occupations in your State is available from:

State Supervisor of Office Occupations Education, State Department of Education, State capital.

A directory of private business schools located in cities throughout the country may be obtained from:

United Business Schools Association, 1730 M St., NW., Washington, D.C. 20036.

BOOKKEEPING WORKERS

(D.O.T. 210.368 through .588, 216.388, and 219.388 and .488)

Nature of the Work

Every business needs systematic and up-to-date records of accounts and business transactions. Bookkeeping workers maintain these records in journals, ledgers, and on other accounting forms. They also prepare periodic financial statements showing all money received and paid out. The duties of bookkeeping workers vary with the size of the business.

In many small firms, *general bookkeepers* (D.O.T. 210.388) are the only bookkeeping workers. They analyze and record all financial transactions, such as orders and cash sales. They also check money taken in against that paid out to be sure accounts "balance," and calculate the firm's payroll. Although most of this work is done by hand, bookkeeping workers generally use simple office equipment such as calculating machines. General bookkeepers also prepare and mail customers' bills and answer the telephone.

In large businesses, a number of bookkeepers and accounting clerks work under the direction of a head or supervisory bookkeeper. In these organizations bookkeepers often specialize in certain types of work. For example, some prepare statements on a company's income from sales or its daily operating expenses. Others may post payments and charges on cards using bookkeeping machines, or feed information on accounts receivable and accounts payable into the computer. *Accounting clerks* (D.O.T. 219.488), sometimes known as bookkeeping clerks, perform a variety of routine duties. They record details of business transactions, including deductions from payrolls and bills paid and due. They also may type vouchers, invoices, and other financial records.



Bookkeeping workers need a knack for working with numbers.

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Places of Employment

Bookkeeping workers numbered almost 1.7 million persons in 1976. Jobs for bookkeeping workers are found in all kinds of firms, with an especially large number in wholesale and retail trade. More than 1 of every 3 bookkeepers work for a retail store or wholesale firm. In addition, many work in factories, banks, insurance companies, hospitals, and schools.

Training, Other Qualifications, and Advancement

High school graduates who have taken business arithmetic, bookkeeping, and principles of accounting meet the minimum requirements for most bookkeeping jobs. Some employers, however, prefer applicants who have completed business courses at a junior college or business school and have had some experience working with accounts payable and receivable. A knowledge of how computers are used to perform bookkeeping operations is an asset.

Persons also may qualify for bookkeeping jobs through on-the-job training. In some areas, companies cooperate with business schools and high schools in work-study programs. These programs offer part-time experience that helps students get jobs soon after graduation.

Bookkeeping workers need above average aptitude for working with numbers and a knack for concentrating on details. They should be able to type and operate various office machines. Because they depend on other office workers for information, bookkeepers should be able to work as part of a team.

Newly hired bookkeeping workers begin by recording routine transactions in accounts receivable or accounts payable units. They advance to more responsible assignments, such as preparing income statements and operating complex bookkeeping machines or computers. Some workers are promoted to supervisory jobs. Bookkeepers who complete courses in college accounting may become accountants. (The occupation of accountant is discussed elsewhere in the *Handbook*.)

Employment Outlook

Thousands of job openings for bookkeepers are expected every year through 1985. Jobs will be numerous even though employment of bookkeepers is expected to grow slowly over this period, for the occupation is large and turnover is high. Most job openings will occur because of the need to replace workers who die, retire, or stop working for other reasons.

Future employment growth in this occupation will be slowed by the increasing use of various types of bookkeeping machines and electronic computers that process data more accurately, rapidly, and economically than workers doing it by hand.

Earnings and Working Conditions

Beginning accounting clerks in private firms averaged $637 a month in 1976, according to a Bureau of Labor Statistics survey of clerical occupations. They had higher salaries, on the average, than beginning file clerks or typists, but earned less than beginning secretaries or stenographers. Experienced accounting clerks earned $805 a month, about the same as the average for all nonsupervisory workers in private industry, except farming.

In 1977, starting salaries in the Federal Government ranged from $6,572 (GS-2) to $7,408 (GS-3) for bookkeeping workers right out of high school. Starting salaries were higher for bookkeeping workers with at least 2 years' work experience or 2 years of college education. These salaries ranged from $8,316 (GS-4) to $9,303 (GS-5) per year. Average salaries in the Federal Government in 1977 for general accounting clerks were $13,443 per year.

Working conditions for bookkeepers are similar to those of other office workers in the same firms. (See introductory section to this chapter for more information on earnings and working conditions and for sources of additional information.)

CASHIERS

(D.O.T. 211.138, .368, .468, .488, and 299.468)

Nature of the Work

Supermarkets, movie theaters, and restaurants are among the many businesses that employ cashiers to handle payments from customers. Most cashiers receive money, make change, fill out charge forms, and give receipts. The related occupation of bank teller is discussed elsewhere in the *Handbook*.

In addition to these duties, cashiers, depending on their employers, may do other jobs and have different job titles. Those who work in theaters, for example, are often called *box office cashiers* or *ticket sellers*. They operate ticket-dispensing machines and answer telephone inquiries. Restaurant cashiers, sometimes called *cashier checkers*, may handle reservations for meals and special parties, type menus, or sell items at the candy and cigarette counter. In supermarkets and other self-service stores, cashiers known as *checkout clerks*, *checkers*, or *grocery clerks* wrap or bag purchases. They also may restock shelves and mark prices, rearrange displays of merchandise, and take inventory. In many offices, cashiers known as *agency* or *front-office cashiers*, type, operate the switchboard, do bookkeeping, and act as receptionists.

Cashiers operate several types of machines. Many use cash registers that print the amount of the sale on a paper tape. A rapidly growing number of cashiers operate electronic registers, computerized point-of-sale registers, or computerized scanning systems. Depending upon its complexity, a computerized system may automatically calculate the necessary taxes and record inventory numbers and other information. Such registers are replacing less versatile, conventional models in many stores. Cashiers who work in hotels and hospitals use machines that record charges for telephone, medical, and other services and prepare itemized bills. Cashiers also operate adding and change-dispensing machines.

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Places of Employment

In 1976, about 1,250,000 persons worked as cashiers. More cashiers work in supermarkets and other food stores than in any other kind of store. However, cashiers are needed in businesses and organizations of all types and sizes, and many find jobs in department stores, drugstores, shoestores, hardware stores, furniture stores, and in other kinds of retail stores. Restaurants, theaters, schools, and hospitals also employ a large number of cashiers. Businesses employing cashiers are located in large cities, in suburban shopping centers, in small towns, and in rural areas. The Federal Government employs a small number, primarily in the Department of Defense.

Opportunities for part-time work are very good. Nearly half of all cashiers work part time; about 1 in 4 is a student.

Training, Other Qualifications, and Advancement

Employers prefer beginning cashiers with high school diplomas. Courses in business arithmetic, bookkeeping, typing, and other business subjects are good preparation for cashier jobs. Cashier training is offered as part of many public school vocational programs.

Many employers offer on-the-job training for cashiers. In a small firm, the beginning cashier is trained on the job by an experienced worker. In large firms, cashier training programs often include classroom instruction in the use of electronic or computerized registers and in other phases of cashiers' jobs.

Many persons enter cashier positions without significant prior work experience. For some cashier jobs, however, employers seek persons who have special skills or business experience, such as typing or selling. Many cashier openings also are filled by promoting other qualified workers who are already employed by the firm.

Persons who want to become cashiers should be able to do repetitious work accurately. They need finger dexterity, a high degree of eye-hand coordination, and an aptitude for working with figures. Because they meet the public, cashiers should be neat in appearance and able to deal tactfully and pleasantly with customers.

Promotion opportunities as cashiers tend to be limited. However, the cashier's job affords a good opportunity to learn an employer's business and so may serve as a steppingstone to a more responsible clerical job, such as bookkeeper or sales clerk, or to a managerial position. Cashiers working in chainstores and other large retail businesses, for example, may advance to department or store managers.



Nearly half of all cashiers work part time.

Employment Outlook

Job openings for cashiers are expected to be plentiful through 1985. Employment is expected to grow faster than the average for all occupations. Some new jobs will result from future growth in retail trade. However, much more important than growth as a source of jobs for cashiers is the need to replace workers who die, retire, or stop working for other reasons. Because the occupation is large and turnover is high, many cashier jobs will be available over the next 10 years.

Future employment of cashiers is likely to be affected by the use of computerized checkout systems, which are beginning to replace cash registers in some supermarkets. An optical or magnetic scanner transmits the code number (Universal Product Code-UPC) of each purchase to a computer that is programmed to record a description and price of the item, add the tax, and print out a receipt. The computer also keeps track of the store's inventory and places orders with the warehouse when stock is needed. The widespread adoption of automated checkout systems in supermarkets and other establishments is expected to slow employment growth of cashiers and other workers. However, resistance from consumer and labor groups may slow the adoption of such systems.

Earnings and Working Conditions

Beginning cashiers often earn the minimum wage required by law. In establishments covered by the Federal law, the minimum was $2.30 an

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hour in early 1977. In addition, minimum wages in many establishments are governed by State law. Cashiers earn wages ranging from the minimum in a given establishment to several times that amount. According to a 1975 Bureau of Labor Statistics Survey of grocery stores, head cashiers averaged $5.78 an hour; other full-time cashiers, $5.32 an hour; and part-time cashiers, $4.31 an hour. Wages tended to be highest in the West and North Central Regions and lowest in the South; wages generally were higher in large metropolitan areas than in smaller cities.

Cashiers belong to a number of unions, principally the Retail Clerks International Association; International Brotherhood of Teamsters; and Retail, Wholesale, and Department Store Union. They generally receive health insurance, annual and sick leave, pension benefits, and other benefits available to other workers.

Cashiers often work during rush periods such as holidays, weekends, late afternoons, and evenings. Work at these times often is required in theaters, restaurants, and foodstores. Many cashiers in these places work part time or on split shifts. Full-time cashiers in supermarkets and other large retail stores usually work a 5-day, 40-hour week; however, they may work on weekends and have time off during the week.

Most cashiers work indoors, often in small booths or behind counters located near store entrances. In some cases, they are exposed to cold drafts in the winter and considerable heat during the summer. (See introductory section of this chapter for sources of additional information.)

COLLECTION WORKERS

(D.O.T. 240.368)

Nature of the Work

Companies that lend money or extend credit expect to be repaid. However, customers who "buy now" are not always able to "pay later." Collection workers, often called bill collectors, help maintain a company's financial well-being by keeping bad debts to a minimum.

A collector's primary job duty is to convince people to make good on unpaid bills. The collector usually receives a bad debt file after normal billing methods, such as monthly statements and collection form letters, have failed to elicit payment. The file contains information about the debtor, the nature and amount of the unpaid bill, and the last time payment was made.

The collector then contacts the debtor, determines why the bill is unpaid, and tries to get the debtor to pay or make new arrangements for payment.

The approach that collectors use depends on the type of payment problem they are handling. Sometimes customers feel that the bill is incorrect, or that the merchandise they bought is faulty, or that services they were billed for were not properly performed. Collectors normally recommend that the debtors resolve these disagreements by contacting the original sellers. In large stores, problems are referred to special "customer service" departments, set up to deal with disputed accounts. If the problems are not settled, the collectors again contact the customers to convince them that they were properly charged and should pay the debts.

When customers have met with financial emergencies or mismanaged their money, collectors may work out new payment schedules. If collectors find customers fraudulently avoiding payment of their bills, they may recommend that the files be turned over to an attorney.

When a debtor moves without leaving a forwarding address, the collector may inquire at the post office, search telephone directories, and call on the person's friends and former neighbors. In large collection operations, this may be done by collection workers known as "tracers."

In small organizations, bill collectors may perform other functions besides contacting delinquent customers. They may advise customers with financial problems, or contact customers to determine if they are satisfied with the way their accounts are being handled. Some collectors supervise the repossession procedure for businesses that reclaim goods when payment is not made.

Although most collectors do their work by phone, some make personal visits to the debtor. These visits usually are necessary when a large amount of money is involved and the debtor has been unresponsive to phone contact.

Places of Employment

About 64,000 persons were collection workers in 1976. Although collectors work for a variety of businesses, most are employed by banks, loan companies, and collection agencies. Many others work for retail and wholesale businesses.

Jobs for collectors are found throughout the United States, but opportunities are best in heavily populated urban centers. Many firms with branch offices in rural areas locate their collection departments in the business district of nearby cities.

Training, Other Qualifications, and Advancement

A high school education usually is sufficient for entry into the collection field. Because a collector handles delinquent accounts on a person-to-person basis, high school courses in psychology and speech may be useful. Previous employment as a sales clerk can help the collection worker learn how credit transactions originate and how they are handled at the point of sale. Knowledge of a foreign language may be an asset for persons seeking collection jobs in areas with large non-English-speaking populations.

Most of a collector's training is on the job. The employer may provide training manuals that explain collection procedures, but more often the new employee gains collection skills informally. For example, the new collector learns telephone techniques by listening as experienced workers make collection calls.

A collector's most important asset is the ability to get along with different people. He or she must be alert, imaginative, and quick-witted to handle the difficult situations that are a part of collection work. While collec-

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tors should be sympathetic to the billpayers' problems, they also must be persuasive to overcome some debtors' reluctance to fulfill their financial obligations. Because a collector spends most of the day on the telephone, a pleasant speaking voice and manner are important.

The collector's job generally offers limited opportunities for advancement; competition for the few supervisory positions is keen. The collector with above-average abilities, however, may become a collection manager or supervisor of a staff of collectors. Some collection workers progress to other positions in the credit field, such as bank loan officer or outside representative for a collection agency. Further education, such as that available through professional associations of collectors or college courses, may be helpful for advanced positions in the credit and collection field.

Employment Outlook

The applicant with a background of high school business courses who can demonstrate effective telephone skills should find good job opportunities in the collection field. Demand is strongest for people who are personable, outgoing, and aggressive, for traits such as these are likely to lead to success on the job.

In the past, some jobseekers have been reluctant to accept collection work. More recently, however, the image of the occupation has improved. The role of the collector has expanded to include customer debt counseling, and collection methods have been modified in line with modern management techniques and recent consumer legislation. Despite this improved image, the number of persons seeking collection jobs is expected to fall short of the need for additional workers. Employers will need large numbers of collectors to fill vacancies created by turnover, which is relatively high in this occupation. In addition, new positions will open up as the occupation grows.

Employment opportunities should be best in collection agencies, where replacement needs continue to be high, and in retail trade firms, where earnings often are somewhat lower than the average. The strongest competition for collection positions will be in large metropolitan banks that generally offer higher salaries and better opportunities for advancement than other employers.



The demand for collection workers will be spurred by the expansion of credit card services.

The demand for collection workers will be spurred by the expansion of credit card services and the further growth of suburban retail stores. Delinquent accounts, unfortunately, are an unavoidable aspect of the credit system. As businesses extend attractive credit terms for the purchase of greater numbers of goods and services to more and more people, the number of delinquent accounts can be expected to increase. Additional collection workers will be required to service these accounts on a person-to-person basis.

Earnings and Working Conditions

Although earnings for collectors vary among employers, the limited information available indicates that beginning collectors earned about $125 a week in 1976, or about $6,500 a year. Managers of collection departments often earned $17,000 a year and more.

A survey by the American Collectors Association showed that telephone collectors working for collection agencies had an average monthly income of $823, or about $9,900 a year. Incomes of individual workers can vary substantially because collection agencies generally use some form of salary plus commission plan as an incentive to their collectors.

Commission schedules vary widely from agency to agency. A collector may be paid a relatively high salary with a low commission percentage or receive a low salary and a high rate on the money he or she collects for the agency. In some agencies, a quota is assigned to a collector or group of collectors and a bonus paid if the quota is reached. Earnings of a few collection workers are only from commissions.

In addition to salary, collectors receive the benefits common to other office occupations, such as paid vacations and health insurance. Those who occasionally make visits outside the office usually are furnished a company car or are paid expenses for using their own automobile.

Sources of Additional Information

Information on jobs as collection workers as well as other positions in a credit collection office is available from:

American Collectors Association, 4040 W. 70th St., Minneapolis, Minn. 55435.

FILE CLERKS

(D.O.T. 132.388, 205.368, 206.388, 219.588, 920.887)

Nature of the Work

An orderly file system is often the key to an efficient office. In most offices, records are arranged so that information can be located quickly. This creates many job opportunities for file clerks, who keep records accurate, up to date, and properly placed.

File clerks classify, store, update, and retrieve office information on request. To do this, they read incoming material and put it in order for future use by means of some system, such as by number, letter of the alphabet, or subject matter. When these records are requested, file clerks locate them and turn them over to the borrower. They keep track of materials removed from the files and make sure that those given out are returned.

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File clerk operating a mechanical filer.

Some clerks operate mechanized files that rotate to bring the needed records to them. Others retrieve documents or spools of microfilm and place them in an electronic transmitter that displays the information on video terminals located elsewhere in the organization. Records also must be up to date in order to be useful. File clerks make sure that new information is added to existing files shortly after it is received.

From time to time, file clerks may destroy outdated file materials or transfer them to inactive storage. They check files at regular intervals to insure that all items are correctly placed. Whenever data cannot be located, the file clerk searches for the missing records. As an organization's needs for information change, file clerks modify old filing systems or establish new ones.

In small offices, file clerks often type, sort mail, or operate duplicating machines. Those who work with automated filing systems may code and microfilm all incoming documents.

Places of Employment

About 270,000 persons worked as file clerks in 1976. In addition, many other clerical workers perform some filing tasks in connection with their work. Opportunities for part-time work are abundant in this occupation; in 1976, approximately 1 of every 4 file clerks worked part time.

Although filing jobs are found in almost every kind of organization, about one-half of all file clerks work in banks, insurance companies, factories, or government agencies.

Training, Other Qualifications, and Advancement

Employers prefer high school graduates for beginning file clerk positions. Most seek applicants who can type, and many prefer those who have some knowledge of office practices as well. High schools, junior colleges, and private business schools teach these and other skills that help a beginner get a job. Many States and localities sponsor programs to train unemployed and low-skilled workers who can read and spell well for entry level clerical jobs such as file clerk.

Some on-the-job training usually is necessary because each organization has its own filing systems and office procedures. In organizations that have their own filing procedures, clerks learn their jobs in a few weeks. Learning to operate mechanical filing systems usually takes more time. Where file clerks have a variety of related duties, training may take up to 3 months.

File clerks must read accurately and rapidly, spell well, and like detailed work. Most file clerks must be able to type. They should be neat, able to work as part of a team, and not be easily bored by repeated tasks.

File clerks can advance to more difficult filing duties and to jobs supervising other file clerks. Those who learn additional skills may be promoted to office machine operators, receptionists, and typists.

Employment Outlook

Employment of file clerks is expected to grow about as fast as the average for all occupations through the mid-1980's as business expansion creates a need for more and better recordkeeping. In addition, a large number of file clerks will be needed each year to replace those who die, retire, or transfer to other jobs.

The growing volume of paper work and continued expansion of those businesses that traditionally have employed many file clerks should assure steady employment growth. However, this growth should be slower than in past years as computers are used more extensively to arrange, store, and transmit information. Jobseekers who have typing and other secretarial skills and are familiar with a wide range of office machines should have better opportunities than less experienced applicants. File clerks should find many opportunities for temporary or part-time work, especially during peak business periods.

Earnings and Working Conditions

According to a recent survey, beginning file clerks in urban areas averaged $113 a week in 1976. Those with some experience averaged $128; those with a great deal of experience, $158. File clerks earned somewhat less than three-fourths of the average earnings of nonsupervisory workers in private industry, except farming.

In the Federal Government, beginning file clerks without high school diplomas started at about $112 a week in 1977, and high school graduates began at $126 a week. Experienced file clerks in the Federal Government averaged about $171 a week in 1977.

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Working conditions for file clerks usually are similar to those for other office workers in the same organization. Although they do not do heavy lifting, they often must stoop, bend, and reach. (See the statement on Clerical Occupations for information on fringe benefits and sources of additional information.)

HOTEL FRONT OFFICE CLERKS

(D.O.T. 242.368)

Nature of the Work

Hotels and motels employ front office clerks to handle room reservations, greet guests, issue keys, and collect payments. In small hotels and in many motels, front office clerks also may work as bookkeepers, cashiers, or telephone operators. Large hotels usually employ several front office clerks to handle different jobs, such as receiving mail, providing information, or issuing keys. In the largest hotels, floor clerks distribute mail, packages, and telegrams to guests. About 62,000 persons worked as front office clerks in 1976.

Room or *desk clerks* assign rooms to guests and answer questions about hotel services, checkout time, or parking facilities. In assigning rooms, they must consider guests' preferences while trying to maximize hotel revenues. These clerks fill out guests' registration forms and sometimes collect payments. Room clerks are always in the public eye and through their attitude and demeanor, greatly influence guests' impressions and promote a hotel's reputation.

Reservation clerks record written or telephoned requests for rooms, prepare registration forms, and notify room clerks of guests' arrival times.

Rack clerks keep records of room assignments to advise housekeepers, telephone operators, and maintenance workers that rooms are occupied.

Training, Other Qualifications, and Advancement

Employers usually select high school graduates who have some clerical aptitude as front office clerks. A knowledge of bookkeeping is helpful for work in a small hotel or on the night shift, because clerks often have a wider range of duties under these circumstances. Occasionally, employees in other hotel occupations, such as bellhops or elevator operators, may be transferred to front office jobs.

Front office work traditionally has been the pathway to managerial positions in the hotel industry. Although education beyond high school generally is not required for front office work, college training is an asset for advancement to managerial jobs. Neatness, a courteous and friendly manner, and a desire to help people are important traits for front office clerks. Knowledge of a foreign language can be helpful for work in large hotels or resorts that receive many foreign guests.

Newly hired workers usually begin as mail, information, or key clerks and receive their training on the job. The training period is usually brief and includes an explanation of the job's duties and information about the hotel, such as room locations and services offered. Once on the job, they receive help and supervision from the assistant manager or an experienced front office worker. Some clerks may need additional training in data processing or office machine operation because of the increased use of computerized reservation systems.

Most hotels promote front office workers from within so that a key or mail clerk may be promoted to room clerk, then to assistant front office manager, and later to front office manager. Clerks may improve their opportunities for promotion by taking home study courses in hotel management such as those sponsored by the Educational Institute of the American Hotel and Motel Association. (See the statement on Hotel Managers and Assistants elsewhere in the *Handbook*.)



Neatness, a courteous and friendly manner, and a desire to help people are important for front office clerks.

Employment Outlook

Employment of front office clerks is expected to grow more slowly than the average for all occupations through the mid-1980's. Employ-

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ment growth will be limited by the use of computerized reservation systems in most hotel and motel chains, and most job openings will result from the need to replace workers who die, retire, or leave the occupation.

See the statement on the Hotel Industry elsewhere in the *Handbook* for information on earnings and working conditions, sources of additional information, and more information on employment outlook.

OFFICE MACHINE OPERATORS

(D.O.T. 207.782, .884, and .885; 208.782; 213.782; 214.488; 215.388; 216.488; and 234.)

Nature of the Work

To speed the paperwork involved in operating a business, most firms employ office machine operators to record information, determine bills and inventories, and perform other calculations. This statement describes some of the more common machine operating jobs.



Advances in data transmission devices will enable large employers to centralize recordkeeping.

Billing machine operators (D.O.T. 214.488) prepare customer statements by typing information, such as customers' names, purchases, and amount of sales, on a billing machine that automatically computes the balances and required payments.

Bookkeeping machine operators (D.O.T. 215.388) record a firm's financial transactions on a bookkeeping machine and calculate trial balances, summary reports, and other necessary data.

Adding and calculating machine operators (D.O.T. 216.488) use mechanical adding machines and electronic calculators to compute payrolls and invoices and do other statistical work. Some calculators can also be used to compute square roots and percent distributions.

Mail preparing and mail handling machine operators (D.O.T. 234.) use machines to open incoming mail and prepare bills and letters for mailing. Some machines fold and insert enclosures, while others address, seal, and stamp envelopes. Addressing machines print addresses on envelopes using stencils or metal plates prepared by *embossing machine operators* (D.O.T. 208.782) using special typewriters.

Duplicating machine operators (D.O.T. 207.782, .884, and .885) operate equipment that can reproduce letters, bills, invoices, and other documents. Included are mimeograph, stencil, and copying machines. These workers keep the machines loaded with paper, see that they are properly adjusted for the number of copies to be made, and may collate—put together—pages of lengthy documents by hand or machine.

Tabulating machine operators (D.O.T. 213.782) operate machines that sort and total large quantities of accounting and statistical information and print the results on special business forms.

Information about workers in several other occupations that use office machines can be found elsewhere in the *Handbook*, in the statements on computer and peripheral equipment operators, typists, and statistical clerks.

Places of Employment

In 1976, about 163,000 people worked as office machine operators. About one-fifth worked for manufacturing companies; large numbers also were employed by banks, insurance companies, and wholesale and retail stores. Many office machine operators work for service firms that prepare monthly bills and mailing circulars for businesses that do not have their own office machinery.

Training, Other Qualifications, and Advancement

Employers prefer high school or business school graduates for jobs as office machine operators. Most newly hired workers are expected to be able to type and operate adding machines and calculators. A knowledge of business arithmetic is helpful.

The amount of instruction and on-the-job training beginners receive depends on the types of machines they operate. Although a few days of training usually are sufficient to train duplicating machine operators, several weeks may be needed to train bookkeeping machine operators. Some office machine operators are trained at company expense in schools run by equipment manufacturers.

Finger dexterity, good eye and hand coordination, and good vision are important for most office machine operator jobs. Billing and calculating machine operators should know simple arithmetic so they can detect obvious errors in computations. Some mechanical ability is advantageous, especially for duplicating and tabulating machine operators.

Most employers promote from within and give strong consideration to seniority and job performance as shown by supervisors' ratings. Promotion may be from a routine machine job to a more complex one, or to a related clerical job. Employers often provide any additional training that may be required. In firms having large clerical staffs, office machine operators may advance to jobs where they train beginners or to supervisory

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positions as section or department heads.

Employment Outlook

Employment of office machine operators is expected to grow more slowly than the average for all occupations through the mid-1980's. Most openings will result from the need to replace workers who die, retire, or leave the occupation.

Despite expected growth in the volume of billing, computing, and duplicating work, the occupation will expand slowly as computerized recordkeeping and processing systems spread. In addition, advances in data transmission devices will enable large employers to centralize recordkeeping, and to reduce the requirements for operators in branch offices.

Earnings and Working Conditions

A 1975 Bureau of Labor Statistics survey of earnings for several office machine operator occupations in urban areas showed that the lowest salaries were paid in the South and the highest in the North and West.

For some occupations averages are given separately for different skill groups. Operators in Class A were very experienced and performed comparatively difficult work. Those in Classes B and C had some or no experience, worked on more routine assignments, and used simpler equipment. The average weekly salaries reported in this survey are shown in the accompanying tabulation:

	Average weekly salaries, 1976
Billing machine operators	$160
Bookkeeping machine operators:	
Class A	170
Class B	140
Tabulating machine operators:	
Class A	240
Class B	200
Class C	160

Billing and bookkeeping machine operators earned slightly less than the average for all nonsupervisory workers in private industry, except farming.

Because some types of office machines are very noisy, operators may work in special areas apart from other company offices. In other respects, their working conditions are similar to those of other office workers in the same firms. (See the statement on clerical occupations for further information on working conditions and for sources of additional information.)

POSTAL CLERKS

(D.O.T. 231.388 and 688, 232.138 and .368)

Nature of the Work

Most people are familiar with the post office window clerk who works behind the counter selling stamps or accepting parcel post. However, the majority of postal clerks are distribution clerks who sort incoming and outgoing mail in workrooms.

Postal clerks work either at local post offices or at large central mail processing facilities. At local post offices postal clerks sort the mail for delivery to individual customers. Incoming mail collected from the local neighborhood boxes is forwarded to the nearest mail processing center where clerks continue the process of sorting and preparing the mail for delivery.

There are more than 300 mail processing centers throughout the country which service the local post offices in designated geographic areas. Once mail is received at a center, letter sorting machine clerks, distribution clerks, and mailhandlers separate the mail into groups of letters, parcel post, magazines, and newspapers. Then mailhandlers feed the letters through stamp-canceling machines. After this step is completed, mailhandlers take the mail into other workrooms to be sorted according to destination. There, clerks read the ZIP codes and simply push keys corresponding to the letters' destinations on electronic mail-sorting machines; the letters drop into the proper slots. Finally, the mail is sent from the mail processing center to local post offices or to other centers for further sorting.

The clerks at post office windows provide a variety of services in addition to selling stamps and money orders. They weigh packages to determine postage and check to see if their condition is satisfactory for mailing. Clerks also register and insure mail and answer questions about postage rates, mailing restrictions, and other postal matters. Occasionally they may help a customer file a claim for a damaged package. In large post offices, a window clerk may provide only one or two of these services and may be called a registry, stamp, or money order clerk.

Places of Employment

Two out of every five employees of the U.S. Postal Service were postal clerks in 1976. The majority of the 270,000 postal clerks work at mail processing centers, although many still sort mail and provide window services at local post offices throughout the country.

Training, Other Qualifications, and Advancement

Postal clerks must be at least 18 (at least 16 if they have a high school diploma) and qualify on a four-part written examination. The first part tests clerical accuracy by asking the applicant to compare pairs of addresses and indicate which are identical. The second part tests ability to memorize mail distribution systems. The third measures reading ability, including vocabulary, and the fourth tests ability to do simple arithmetic. Applicants must also pass a physical examination and may be asked to show that they can lift and handle mail sacks weighing up to 70 pounds. Applicants who are to work with an electronic sorting machine must pass

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Postal clerks sorting incoming mail.

a special examination which includes a machine aptitude test

Applicants should apply at the post office or sectional center where they wish to work because each keeps a separate list of those who have passed the examination. Applicants' names are listed in order of their scores. Five extra points are added to the score of an honorably discharged veteran, and 10 extra points to the score of a veteran wounded in combat or disabled. Disabled veterans who have a compensable, service-connected disability of 10 percent or more are placed at the top of the list. When a vacancy occurs, the appointing officer chooses one of the top three applicants; the rest of the names remain on the list for future appointments.

New clerks are trained on the job. Most clerks begin with simple tasks to learn regional groupings of States, cities, and ZIP codes. To help clerks learn these groups, many post offices offer classroom instruction.

A good memory, good coordination, and the ability to read rapidly and accurately are important. Distribution clerks work closely with other clerks, frequently under the tension and strain of meeting mailing deadlines. Window clerks must be courteous and tactful when dealing with the public, especially when answering questions or receiving complaints.

Postal clerks are classified as casual, part-time flexible, part-time regular, or full time. Casual workers are hired to help handle the large amounts of mail during peak mailing periods at various times throughout the year, such as the Christmas season. Part-time flexible employees do not have a regular work schedule, but replace absent workers or help with extra work loads as the need arises. Part-time regular workers have a set work schedule—for example, 4 hours a day.

Most clerks begin as part-time flexible employees and become full-time workers as vacancies occur. Full-time clerks may bid for preferred assignments such as the day shift, a window job, or a higher level nonsupervisory position as expediter or window service technician. Clerks may qualify to become supervisors.

Employment Outlook

Employment of postal clerks is expected to decline through the mid-1980's due to falling mail volume and installation of more efficient sorting machines. The amount of mail handled by the postal service is expected to decrease because of rising postal rates, greater use of telephones, and development of other ways of distributing advertising circulars. Nevertheless, many job openings will result from the need to replace clerks who retire, die, or transfer to other occupations.

Earnings and Working Conditions

Postal clerks working full time started at $12,422 a year in 1976, but

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could advance to $15,007 after 8 years with satisfactory performance. Clerks working part-time flexible schedules started at $6.18 an hour and could advance to $7.46 an hour after 8 years. Clerks working part-time regular schedules started at $5.97 an hour and could advance to $7.21 an hour after 8 years. All clerks who work night shifts receive 10 percent additional pay. Besides good pay, full-time postal employees have more job security than workers in most other industries. (For information on fringe benefits, see statement on Postal Service occupations elsewhere in the *Handbook*.)

Working conditions of clerks differ according to the specific work assignments and the amount and kind of laborsaving machinery in the post office. In small post offices, clerks may carry heavy mail sacks from one part of the building to another, and sort the mail by hand. In large post offices and mail processing centers, chutes and conveyors move the mail and much of the sorting is done by machine. In either case, clerks are on their feet most of the time, reaching for sacks and trays of mail and placing packages and bundles into sacks and trays while walking around the workroom.

Distribution clerks may become bored with the routine of sorting mail unless they enjoy trying to improve their speed and accuracy. They also may have to work at night or on weekends, because most large post offices process mail around the clock.

A window clerk, on the other hand, has a greater variety of duties, has frequent contact with the public, generally has a less strenuous job, and rarely has to work a night shift.

Sources of Additional Information

Local post offices and State employment service offices can supply details about entrance examinations and employment opportunities for postal clerks.

RECEPTIONISTS

(D.O.T. 235.862, 237.368)

Nature of the Work

All organizations want to make a good first impression on the public. This is an important part of the job of the receptionist, who generally is the first person a caller sees.

Receptionists greet customers and other visitors, determine their needs, and refer callers to the official who can help them. Receptionists in hospitals, after obtaining personal histories, direct patients to the proper waiting rooms; in beauty shops, they arrange appointments and show customers to the operator's booth; and in large plants, they provide callers with identification cards and arrange escorts to take them to the proper office.

Many receptionists keep business records of callers, the times at which they called, and the persons to whom they were referred. When they are not busy with callers, receptionists may type, file, or operate a switchboard. Some receptionists open and sort mail and collect and distribute messages. Still others prepare travel vouchers and do simple bookkeeping.

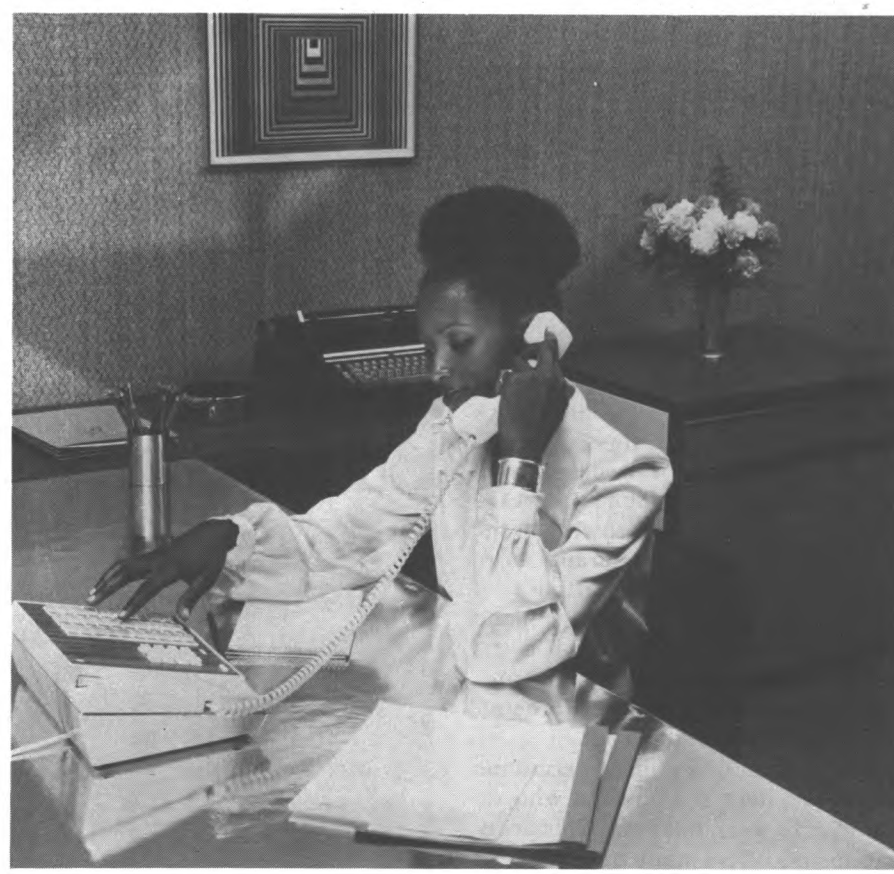
Places of Employment

About 500,000 persons worked as receptionists in 1976. Part-time employment is readily available for receptionists, and about 1 in 3 works part time.

Although receptionists work in almost every kind of organization, about half work for doctors, dentists, hospitals, and other health service providers. Large numbers of receptionists also work in insurance companies, banks, factories, and firms providing business and personal services.

Training, Other Qualifications, and Advancement

A high school diploma generally is required for work as a receptionist. Courses in English, spelling, typing,



Liking people and wanting to help them are important assets for receptionists.

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elementary bookkeeping, and business practices are helpful to the beginner.

Liking people and wanting to help them are assets to the receptionist. A neat appearance, a pleasant voice, and an even disposition also are important. Because receptionists do not work under close supervision, common sense and a thorough understanding of how the business is organized help them handle various situations that arise.

Promotion opportunities for receptionists are limited, especially in small offices. In large workplaces, however, a receptionist who has clerical skills may advance to a better paying job as a secretary, administrative assistant, or bookkeeper. Many companies have their own training programs so that the skills needed for advancement can be learned on the job. College or business school training also can be helpful in advancing to better paying office jobs.

Employment Outlook

Employment of receptionists is expected to grow faster than the average for all occupations through the mid-1980's. Thousands of openings will result each year as businesses expand and as receptionists who die, retire, or transfer to other jobs are replaced. The number of replacements will be quite large because the occupation is large and turnover is high.

Within the fast-growing clerical field, receptionist employment is expected to grow rapidly. This is largely because so many receptionists work for firms providing business, personal, and professional services—a sector of the economy which is expected to show very strong growth in the future. In addition, more and more firms recognize the importance of the receptionist in promoting good public relations. Also, because the receptionist's work is of a person-to-person nature, it is unlikely to be affected by office automation.

Job opportunities should continue to be excellent for persons who do not wish to work full time. This occupation also offers many opportunities for those without prior work experience.

Earnings and Working Conditions

Full-time switchboard operator-receptionists working in urban areas averaged $141 a week in 1976. This was about three-quarters as much as the average earnings for nonsupervisory workers in private industry, except farming. Receptionists working in the western United States had average weekly earnings of $149. Those in southern cities averaged $133 a week. In the Federal Government, beginning information receptionists averaged $171 a week in 1977.

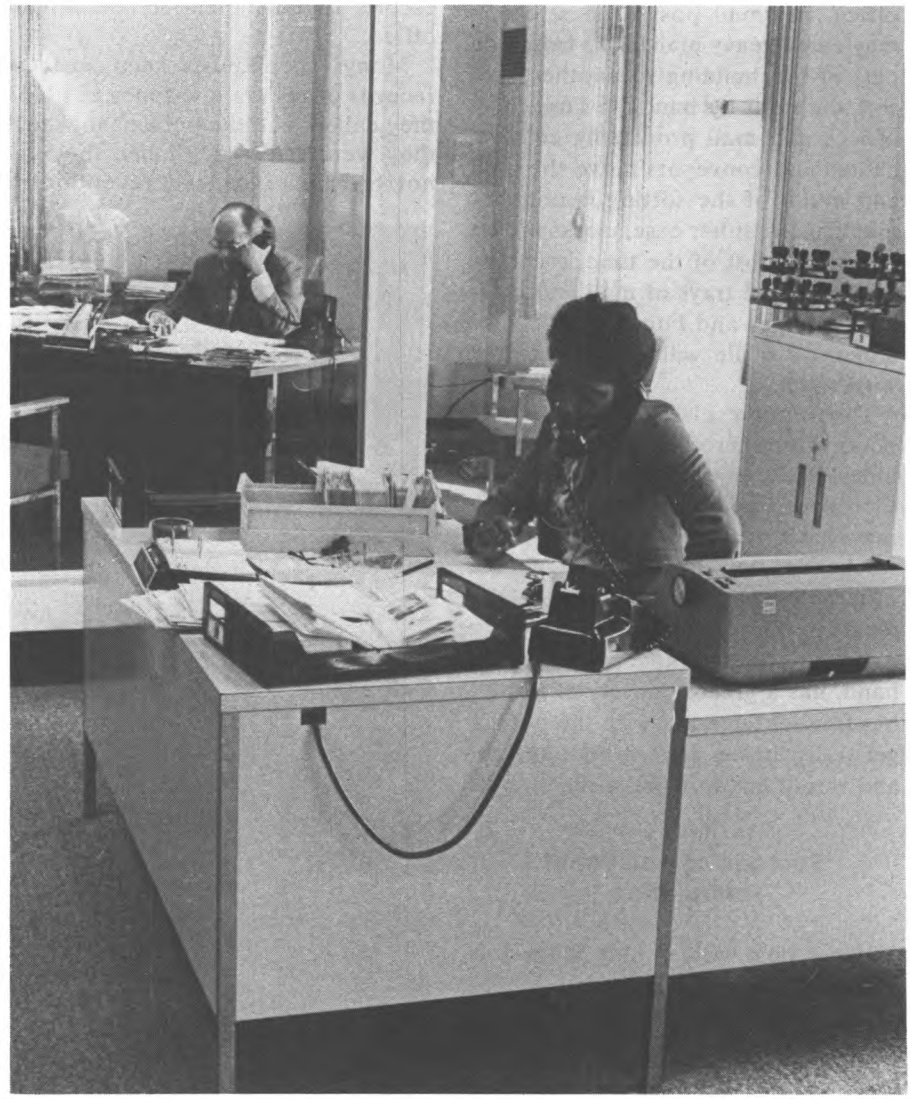
Receptionists usually work in areas that are comfortably furnished. Although most have regular hours, receptionists in hospitals and beauty shops may work evenings and weekends. (See the statement on clerical occupations for sources of additional information.)

SECRETARIES AND STENOGRAPHERS

(D.O.T. 201.268 and .368, 202.388, and 209.138)

Nature of the Work

The efficiency of any organization depends upon *secretaries* and *stenographers*, who are at the center of communications within their firm. They transmit information to the staff and to persons in other organizations.



Secretaries and stenographers are at the center of communications within their firms.

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Secretaries (D.O.T. 201.368) relieve their employers of routine duties so that they can work on more important matters. Although most secretaries type, take shorthand, and deal with callers, the time spent on these duties varies in different types of organizations.

In offices where dictation and typing are handled in word processing centers, *administrative secretaries* handle all other secretarial duties. (For more information on these centers, see the statement on typists elsewhere in the *Handbook*.) They often work in clusters of three or four so that they can readily help each other. Because they are released from dictation and typing, they can serve several members of the professional staff. Their duties range from filing, routing mail, and answering telephones to more responsible jobs such as answering letters, doing statistical research, and writing reports.

Some secretaries are trained in specific skills needed in certain types of work. *Medical secretaries* prepare case histories and medical reports; *legal secretaries* do legal research and help prepare briefs; and *technical secretaries* assist engineers or scientists in drafting reports and research proposals. Another specialized secretary is the *social secretary* (D.O.T. 201.268), who arranges social functions, answers personal correspondence, and keeps the employer informed about all social activities.

Stenographers (D.O.T. 202.388) take dictation and then transcribe their notes on a typewriter. They may either take shorthand or use a stenotype machine that prints symbols as certain keys are pressed. *General stenographers*, including most beginners, take routine dictation and do other office tasks such as typing, filing, answering telephones, and operating office machines. Experienced and highly skilled stenographers take difficult dictation and do more responsible clerical work. They may sit in on staff meetings and give a summary report or a word-for-word record of the proceedings. They also supervise other stenographers, typists, and clerical workers. *Technical stenographers* must know the terms used in a particular profession. They include medical, legal, and engineering or scientific stenographers. Some experienced stenographers take dictation in foreign languages; others work as public stenographers serving traveling business people and others.

Shorthand reporters are specialized stenographers who record all statements made in a proceeding. Nearly half of all shorthand reporters work as *court reporters* attached to courts of law at different levels of government. They take down all statements made at legal proceedings and present their record as the official transcript. Many other shorthand reporters work as *free-lance reporters* who record out-of-court testimony for attorneys, meetings and conventions, and other private activities. Still others record the proceedings in the Congress of the United States, in State legislatures, and in both State and Federal agencies.

Most reporters dictate notes on magnetic tapes that a typist can transcribe later. Because the reporter's transcript is the official record of a proceeding, accuracy is vitally important.

Places of Employment

About 3.5 million persons worked in jobs requiring secretarial or stenographic skills in 1976; most were secretaries. Only about 100,000 persons worked as stenographers in 1976.

Opportunities for part-time work are increasing in these and other clerical occupations. In 1976, approximately one of every five secretaries and one in six stenographers worked part time.

Secretaries and stenographers are employed throughout the economy. About two-thirds of them, however, work in banks, insurance companies, real estate firms, government agencies, and other establishments providing services to the public. Most specialized stenographers and secretaries work for doctors, lawyers, and other professional people.

Training, Other Qualifications, and Advancement

Generally, graduation from high school is required for a job as a secretary or stenographer. Many employers prefer applicants who have additional secretarial training at a college or private business school. Courses vary from a few months' instruction in basic shorthand and typing to longer programs teaching specialized skills such as shorthand reporting or legal or medical secretarial work. Shorthand reporters generally must complete a 2-year course in a shorthand reporting school.

An increasing number of private firms and government agencies have their own training facilities where employees can upgrade their skills and broaden their knowledge of the organization. Also, many State and local governments sponsor programs to train unemployed and low-skilled workers for entry jobs as secretaries.

Fourteen States require court reporters to be a Certified Shorthand Reporter (CSR). In some of these States, reporters can be hired with the understanding that they will be certified within 1 year. Certification is administered by a board of examiners in each of the 14 States. The National Shorthand Reporters Association confers the designation Registered Professional Reporter (RPR) upon those who pass a two-part examination and participate in continuing education programs. The RPR designation is recognized as the mark of excellence in the profession.

Employers usually have no preferences among the many different shorthand methods. The most important factors in hiring and promotion are speed and accuracy. To qualify for jobs in the Federal Government—and for employment in many private firms—stenographers must be able to take dictation at 100 words per minute and type 50 to 60 words per minute. Many shorthand reporting jobs require more than 225 words of dictation per minute; shorthand reporters in the Federal Government generally must take 175 words a minute.

Secretaries and stenographers should have good hearing; a knowledge of spelling, punctuation, and grammar and a good vocabulary are essential. The ability to concentrate amid distractions is vital for shorthand reporters. Employers look for

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persons who are poised and alert, and who have pleasant personalities. Discretion, judgment, and initiative are important for the more responsible secretarial positions.

Many stenographers who improve their skills advance to secretarial jobs; others who acquire the necessary speed through additional training can become shorthand reporters. Secretaries can increase their skills and broaden their knowledge of their company's operations by taking courses offered by the company or by local business schools, colleges, and universities. As secretaries gain knowledge and experience, they can qualify for the designation Certified Professional Secretary (CPS) by passing a series of exams given by the National Secretaries Association. This designation is recognized by a growing number of employers as the mark of achievement in the secretarial field. Many executive secretaries are promoted to management positions on the basis of their extensive knowledge of their employer's operations.

Employment Outlook

Employment of secretaries is expected to increase faster than the average for all occupations through the mid-1980's as the continued expansion of business and government creates a growing volume of paperwork. Hundreds of thousands of jobs will become available each year due to growth and the need to replace those who die, retire, or stop working for other reasons.

Demand for secretaries will rise mainly as those organizations that require large secretarial staffs expand their operations. New government agencies, particularly at the State and local level; insurance companies offering new forms of protection; and banks providing financial counseling for an increasingly affluent population are just a few of the organizations that will need well-trained and versatile secretaries in the years ahead. Although many new types of automatic office equipment have been introduced in recent years, no adverse impact on employment of secretaries is expected. However, jobseekers who are familiar with a wide range of office machines and procedures are likely to have better prospects than other workers.

Persons with secretarial skills should find extensive opportunities for temporary or part-time work as employers increasingly turn to these workers during peak business periods. Such arrangements may be especially attractive to students, persons with family responsibilities, retired persons, and others interested in flexible work schedules.

Employment of stenographers is expected to continue the decline of recent years. The increased use of dictation machines has severely reduced the need for office stenographers, and fewer jobs will be available than in the past. Demand for skilled shorthand reporters, in contrast to the overall outlook for stenographers, should remain strong as State and Federal court systems expand to handle the rising number of criminal court cases and civil lawsuits. Competition for entry level jobs is increasing as more students enter the field. Opportunities will be best for those who have earned certification by the National Shorthand Reporters Association.

Earnings and Working Conditions

According to a Bureau of Labor Statistics (BLS) survey, general stenographers working in urban areas averaged $706 a month in 1976; experienced workers who were highly skilled averaged $788. Shorthand reporters generally earn higher salaries than other stenographic workers. According to a survey conducted by The National Shorthand Reporters Association, shorthand reporters averaged about $15,000 a year in 1976.

According to the BLS survey, secretaries to supervisors in small offices earned monthly salaries of $741. Secretaries to officers in small companies had average monthly salaries of $804; those working for middle management in large companies averaged $868. Secretaries having greater responsibilities, such as executive secretaries to corporate officers, earned average monthly salaries of $954.

Beginning clerk-stenographers in the Federal Government earned from $548 to $775 a month in 1977 depending on education, training, and experience. Earnings of beginning shorthand reporters ranged from $864 to $1,175 a month depending on speed, education, and experience. Starting salaries for secretaries in the Federal Government ranged from $775 to $960 a month, while the average for all secretaries was $982 a month. In 1976, earnings of stenographers were slightly less and those of secretaries slightly more than average earnings for all nonsupervisory workers in private industry, except farming.

Working conditions for secretaries and stenographers generally are similar to those of other office workers in the same organization. Shorthand reporters, however, often sit for long periods of time while recording an event. (See the statement on clerical occupations for more information on earnings and working conditions.)

Sources of Additional Information

For information on careers in secretarial work, write to:

National Secretaries Association (International), 2440 Pershing Rd., Suite G10, Kansas City, Mo. 64108.

Additional information on careers in secretarial work and a directory of business schools are available from:

Association of Independent Colleges and Schools, 1730 M St. NW., Washington, D.C. 20036.

For information about shorthand reporting, contact:

National Shorthand Reporters Association, 2361 South Jefferson Davis Hwy., Arlington, Va. 22202.

SHIPPING AND RECEIVING CLERKS

(D.O.T. 209.688, 219.388, 222.138 through .687, 223.387, 239.588, 910.368 and 920.887)

Nature of the Work

Shipping and receiving clerks keep track of goods transferred between businesses and their customers and suppliers. In small companies, one

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clerk may keep records of all shipments sent out and received; in larger companies, many clerks take care of this recordkeeping.

Shipping clerks are responsible for all shipments leaving a business place. Before goods are sent to a customer, these clerks check to be sure the order has been filled correctly. Some shipping clerks fill orders themselves. They obtain merchandise from the stockroom and wrap it or pack it in shipping containers. Clerks also put addresses and other identifying information on packages, look up and compute either freight or postal rates, and record the weight and cost of each shipment. They also may prepare invoices and furnish information about shipments to other parts of the company, such as the accounting department. Once a shipment is checked and ready to go, shipping clerks may move it to the shipping dock and direct its loading on trucks according to its destination. Shipping and receiving clerks working in small businesses may combine these tasks with the various duties of stock clerks. (For more information about the additional duties of shipping clerks in small firms, see the statement on stock clerks elsewhere in the *Handbook*.)

When shipments arrive, receiving clerks perform tasks similar to those of shipping clerks. They determine whether their employer's orders have been correctly filled by verifying incoming shipments against the original order and the accompanying bill of lading or invoice. They record the receipt and condition of incoming shipments. Clerks also make adjustments with shippers for lost and damaged merchandise. Routing or moving shipments to the proper department, warehouse section, or stockroom and providing information that is needed to compute inventories also may be part of their job.

Places of Employment

About 440,000 persons worked as shipping and receiving clerks in 1976. More than half worked in factories; large numbers also were employed by wholesale houses or retail stores. Although jobs for shipping and receiving clerks are found in all localities, most clerks work in urban areas, where many factories and wholesale houses are located.



Receiving clerk carefully checks manifest.

Training, Other Qualifications, and Advancement

High school graduates are preferred for beginning jobs in shipping and receiving departments. Business arithmetic, typing, and other high school business subjects are helpful. The ability to write legibly is important. Dependability and an interest in learning about the firm's products and business activities also are qualities that employers seek. In addition, shipping and receiving clerks should be able to work under close supervision at repetitive tasks.

New employees usually are trained on the job by an experienced worker. As part of their training they often file, check addresses, attach labels, and check items included in shipments. As clerks gain experience, they may be assigned tasks requiring a good deal of independent judgment, such as handling problems of damaged merchandise, or supervising other workers in shipping or receiving rooms.

A job as a shipping or receiving clerk offers a good opportunity for new workers in a firm to learn about their company's products and business practices. Some clerks may be promoted to head shipping or receiving clerk or warehouse manager. Others may enter related fields such as industrial traffic management or purchasing. (Industrial traffic managers and purchasing agents are discussed elsewhere in the *Handbook*.)

Employment Outlook

Employment of shipping and receiving clerks is expected to rise about as fast as the average for all occupations through the mid-1980's as business expands and there are more goods to be distributed. Several thousand jobs will become available each year as employment grows and as workers retire, die, or transfer to other occupations.

Although substantial growth is expected in the volume of goods to be moved, employment of shipping and receiving clerks will not increase as rapidly because of changes in technology that enable fewer clerks to handle more goods. Growing numbers of firms are using computers to keep track of shipping and receiving

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records, and moving belts to handle shipments once lifted by hand.

Earnings and Working Conditions

Shipping and receiving clerks in urban areas averaged $200 a week, according to a 1976 survey. This is about as much as the average earnings for all nonsupervisory workers in private industry, except farming. Salaries varied substantially, however, by type of employer. Shipping and receiving clerks employed by manufacturing firms averaged $200, those working for wholesale houses averaged $210, and those employed by public utilities averaged $248.

Most shipping and receiving clerks receive time-and-a-half for work over 40 hours. Night work and overtime, including work on Saturdays, Sundays, and holidays, may be necessary when shipments have been unduly delayed or when materials are needed immediately on production lines. Although shipping and receiving clerks do much of their work in warehouses or in shipping and receiving rooms, they may do some of it on outside loading platforms. Workplaces often are large, unpartitioned areas that may be drafty, cold, and littered with packing materials.

Most clerks must stand for long periods while they check merchandise. Locating numbers and descriptions on cartons often requires a great deal of bending, stooping, and stretching. Also, under the pressure of getting shipments moved on time, clerks sometimes may help load or unload materials in the warehouse. (See the statement on clerical occupations for additional information on fringe benefits.)

Sources of Additional Information

Information about the work and earnings of shipping and receiving clerks in wholesale establishments is available from:

National Association of Wholesaler-Distributors, 1725 K St. NW., Washington, D.C. 20006.

STATISTICAL CLERKS

(D.O.T. 205.368, 206.588, 209.388, 219.388, .488, and .588, 222.687, 223.588, 913.368, and 953.168)

Nature of the Work

Administrators and managers in all types of organizations depend on numerical records to help make decisions. Statistical clerks prepare and insure the accuracy and completeness of these records. Although the occupational title "statistical clerk" covers a number of different jobs performed by statistical workers, the jobs in this field can be grouped into four categories: recording, compiling and coding, computing and tabulating, and scheduling.

Recording. This work involves collecting and verifying the accuracy of information. *Shipping checkers* (D.O.T. 222.687) in manufacturing companies and wholesale and retail businesses insure that merchandise to be shipped is properly labeled and contains the desired number of items. *Car checkers* (D.O.T. 209.588) keep records of shipments as they arrive at or leave a railroad freight terminal. They check the number of railroad cars and verify their contents with the specifications on the invoice. *Counters* (D.O.T. 223.588), who may have a title specifying their work or the items that they count, record the number of materials received, transferred, or produced. For example, lumber talliers or lumber checkers record the amount and type of lumber processed in sawmills; pit recorders collect production data in the steel industry.

Compiling and coding. In organizations of all types, information must be properly filed, verified, or analyzed for data processing. *Posting clerks* (D.O.T. 219.588) do this work by making entries in registers and journals. They receive and sort records of shipments, production, and financial transactions to provide company officials with current information on business activities. *Record keepers* (D.O.T. 206.588), also known as classification clerks, record data systematically for easy location. *Coding clerks* (D.O.T. 219.388) convert information obtained from records and reports into computer codes for data processing. *Personnel clerks* (D.O.T. 205.368) gather and file information on the employees of a business; their work may include some typing and preparation of reports.

Computing and tabulating. Organizations frequently use numerical records for reports and research. Statistical clerks gather information from records to present in a chart or table for analysis. *Actuary clerks* (D.O.T. 219.388) use certain formulas, statistical charts, and insurance rate books to assist actuaries in determining insurance rates for company customers. They also prepare charts and tables for studies on general insurance practices. *Policy checkers* (D.O.T. 219.488) verify the accuracy of insurance company records. *Statistical assistants* (D.O.T. 219.388), also known as tabulating clerks, calculate and compute numerical data on the population and its characteristics for government and business research projects. *Demurrage clerks* (D.O.T. 219.388), employed by railroads, use rate tables to compute railway freight charges and calculate the weight of shipments or distance railroad cars have traveled.

Scheduling. Statistical clerks may schedule business activities that involve the movement of people and things. Through planning, they assure that these activities run smoothly and efficiently. For example, *assignment clerks* (D.O.T. 913.368) work for bus companies and assign drivers to meet riders' transportation needs. Drivers are selected on the basis of experience, seniority, and nature of the assignment. *Crew schedulers* (D.O.T. 219.388) do similar work for airlines; they assign pilots to scheduled flights and log the mileage each pilot has flown. *Gas dispatchers* (D.O.T. 953.168) determine the proper pressure in a natural gasline to meet customers' requirements after considering information such as the weather, time of day, and other factors that affect the use of gas.

Places of Employment

About 337,000 persons worked as statistical clerks in 1976. Although

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Statistical clerks compile the numerical records often used by management to make decisions.

statistical clerks are employed in nearly every industry, over half worked in finance, insurance, and real estate companies; manufacturing firms; and Federal, State, and local government.

Because businesses of almost every size require numerical records, statistical clerks work throughout the United States. Jobs are concentrated, however, in heavily populated cities that are centers of industry and government activities.

Training, Other Qualifications, and Advancement

Most employers prefer to hire high school graduates for statistical clerk jobs. They also seek applicants who have an aptitude for working with numbers and the ability to do detailed work. High school students may prepare for jobs as statistical clerks by taking courses in general mathematics, algebra, and geometry. Also recommended are courses in data processing, office procedures, bookkeeping, and typing.

In many companies, general clerks who have become familiar with their employers' record systems and office procedures are promoted to statistical clerk positions. On-the-job training that equips the employee to specialize in numerical work may include the use of calculators, tabulating machines, and typewriters.

Statistical clerks must be familiar with the items or information which they observe and record. For example, lumber checkers must know the various types and qualities of wood products. In preparing data for processing, coding clerks must use the proper computer codes to avoid errors.

Statistical clerks should be able to do prompt and accurate work under close supervision. Also, they should be tactful and even tempered when working with others in the same office.

Most employers follow a promotion-from-within policy that allows experienced workers to qualify for more responsible jobs as they become available. Qualified statistical clerks may perform more difficult assignments or advance to supervisory positions. Some statistical clerks are able to advance to a technician level where they may deal with the technical problems of statistical research projects. Some clerks become computer programmers.

Employment Outlook

Employment of statistical clerks is expected to grow about as fast as the average for all occupations through the mid-1980's. In addition to job opportunities arising from this growth, many additional openings will occur as clerks die, retire, or leave the occupation for other reasons.

This occupation includes a wide range of jobs, and the prospects for statistical clerks are better in certain areas than in others. Some routine jobs, for example, may be eliminated as computers are increasingly used to collect and process information. However, statistical clerks in jobs such as those that require personal contact or involve the preparation of data for computer analysis are expected to be in great demand.

Among the factors that will contribute to the demand for statistical clerks is the expected increase in business and government activities, including projects requiring the collection and processing of large amounts of numerical data. In addition, administrators increasingly will rely on numerical records to analyze and control all aspects of their organization's work.

Earnings and Working Conditions

Limited information indicates that beginning statistical clerks earn about as much as workers in other entry level clerical jobs such as office clerks or file clerks; salaries for these workers ranged between $110 and $130 a week in 1976. The entrance salary for beginning statistical assis-

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tants employed by the Federal Government was $142 a week in 1977.

Most experienced workers doing statistically related clerical work, including the operation of tabulating machines or calculators, earned between $155 and $200 a week in 1976. Top level clerks and supervisors averaged about $235 a week. Earnings usually are highest in manufacturing, transportation, and utilities industries; they are lower in retail trade, finance, insurance, and real estate, and service industries.

Nearly every employer of statistical clerks offers some form of health plan, life insurance coverage, and retirement benefits. Most statistical clerks work in clean, well-lighted and well-ventilated offices. (See the statement on clerical occupations for sources of additional information.)

STOCK CLERKS

(D.O.T. 223.138, .368, .387, .388, .588, .687; 910.388; 969.387)

Nature of the Work

Most employers recognize the importance of keeping well-balanced inventories to prevent sales losses or slowdowns in production.

Stock clerks (D.O.T. 223.387) help protect against such losses by controlling the flow of goods received, stored, and issued. They usually receive and unpack incoming merchandise or material. They report damaged or spoiled goods and process papers necessary for obtaining replacements or credit. On outgoing orders, they may check the items for quality and quantity and sometimes make minor repairs or adjustments.

Materials are stored in bins, on the floor, or on shelves according to the plan of the stockroom. Stock clerks organize and mark items with identifying codes or prices so that inventories can be located quickly and easily. They keep records of items entering or leaving the stockroom. Sometimes they label, pack, crate, or address goods for delivery.

Stock clerks working in small firms also may perform various duties usually handled by shipping and receiving clerks. (For more information about the additional duties of stock clerks in small firms, see the statement on shipping and receiving clerks elsewhere in the *Handbook*.) In large firms with specialized jobs, *inventory clerks* (D.O.T. 223.388) periodically count items on hand and make reports showing stock balances. *Procurement clerks* (D.O.T. 223.368) work in factories and prepare orders for the purchase of new equipment.

The duties of stock clerks also depend on the items they handle. For example, stock clerks who work with food and drugs must maintain proper temperature and humidity conditions to prevent spoilage; those who handle construction items such as lumber and bricks must do much walking and climbing to note the condition and quantity of that stock.

Places of Employment

About 490,000 persons worked as stock clerks in 1976. About three-fourths of them worked in factories, wholesale firms, and retail stores. Many others were employed by airlines, government agencies, hospitals, and other organizations that keep large quantities of goods on hand. Although jobs for stock clerks are found in all parts of the country, most work in urban areas where factories, warehouses, and stores are concentrated.

Training, Other Qualifications, and Advancement

Although there are no specific educational requirements for beginning stock clerks, employers prefer high school graduates. Reading and writing skills and a basic knowledge of mathematics are necessary; typing and filing abilities also are useful. Good health, especially good eyesight, is important. Generally, those who handle jewelry, liquor, or drugs must be bonded.

Stock clerks usually receive on-the-job training. New workers begin with simple tasks such as counting and marking stock. Basic responsibilities of the job usually are learned within several weeks. As they prog-



Some competition is likely for stock clerk positions because many young people seek this work as a first job.

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ress, stock clerks learn to keep records of incoming and outgoing materials, take inventories, and order supplies. In small firms, stock clerks may advance to sales positions or become assistant buyers or purchasing agents. In large firms, stock clerks can advance to more responsible stock handling jobs such as invoice clerk, stock control clerk, or procurement clerk. A few may be promoted to stockroom supervisor, but additional education often is required.

Employment Outlook

Employment of stock clerks is expected to increase about as fast as the average for all occupations through the mid-1980's. Many thousands of job openings will occur each year as employment grows and as workers die, retire, or transfer to other occupations.

Growth in employment of stock clerks probably will be slower than in the past as computers are used increasingly for inventory control. Because entrance into this occupation is relatively easy and many young people seek this work as a first job, some competition for openings is likely.

Earnings and Working Conditions

Experienced stock clerks earned average weekly salaries of $192 in 1976, according to the limited data available. This was slightly above the average for nonsupervisory workers in private industry, except farming.

In the Federal Government, beginning stock clerks without experience were paid $126 a week in late 1976; those with general work experience received $142 a week. Experienced stock clerks in the Federal Government averaged about $203 a week in 1976.

Stock clerks generally receive time-and-one-half for work over 40 hours. Overtime may be required when large shipments are delivered and when inventory is taken.

Although stock clerks usually work in relatively clean, heated, and well-lighted areas, some stockrooms may be damp and drafty. Clerks handling refrigerated goods may spend some time in cold storage rooms. Stock clerks are on their feet much of the working day, often on a concrete floor. The job also involves considerable bending, lifting, and climbing. (See the statement on clerical occupations for additional information on working conditions and fringe benefits.)

Sources of Additional Information

Information about the work and earnings of stock clerks in wholesale establishments is available from:

National Association of Wholesaler-Distributors, 1725 K St. NW., Washington, D.C. 20006.

TYPISTS

(D.O.T. 203.138 through .588; 208.588; and 209.382 through .588)

Nature of the Work

A rapid flow of written communication is essential to the modern office. The typist helps to maintain this flow by making neat, typed copies of handwritten, printed, and recorded words.

Beginning or *junior typists* usually type headings on form letters, copy directly from handwritten drafts, and address envelopes. Often, they do other office tasks, including answering telephones, filing, and operating office machines such as copiers and calculators.

More experienced typists do work that requires a high degree of accuracy and independent judgment. *Senior typists* work from rough drafts which are difficult to read or which contain technical material. They may plan and type complicated statistical tables, combine and rearrange materials from different sources, or prepare master copies to be reproduced on copying machines.

Clerk typists (D.O.T. 209.388) combine typing with filing, sorting mail, answering telephones, and other general office work. *Varitypists* (D.O.T. 203.582) produce master copies, such as stencils, on machines similar to typewriters.

Transcribing machine operators (D.O.T. 208.588) type letters and reports as they listen to dictation recorded on magnetic tape. Other typists who have special duties include *policy writers* (D.O.T. 203.588) in insurance companies, *waybill clerks* (D.O.T. 209.588) in railroad offices, and *mortgage clerks* (D.O.T. 203.588) who work in banks.

In some offices, many typists are grouped in a specialized word processing center that handles all the transcription and typing for several departments. These workers, usually called *correspondence secretaries*, operate various kinds of high-speed typewriters equipped with a programmed memory which enables them to produce final copy with a minimum of retyping.

Places of Employment

About 1 million persons worked as typists in 1976. In addition, many other workers—including secretaries, newspaper reporters, writers, and editors—use typing skills in the performance of their jobs.

Part-time employment is readily available for workers with clerical skills, and nearly one typist out of four works part time. Typists are employed throughout the entire economy. Over half of them work in factories, banks, insurance companies, real estate firms, and government agencies.

Training, Other Qualifications, and Advancement

Typists generally need a high school diploma. Good spelling, punctuation, and grammar are essential. Ability to operate office equipment, such as copying and adding machines, and also a knowledge of office procedures, are assets.

An increasing number of companies and government organizations have their own typist training programs. These give employees a chance to learn or upgrade skills so that they can advance to more responsible positions within the organization. Many States and localities sponsor programs to train unemployed and low-skilled workers for entry jobs as typists.

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Nearly 1 out of 4 typists works part time.

Many employers require applicants for typing jobs to take a test that shows their speed and accuracy. For most jobs, a speed of 50 to 60 words per minute is required. All typists who transcribe recorded dictation need sharp hearing and must be especially good in spelling. Successful typists are neat, accurate, and able to concentrate amid distractions.

As beginners increase their skills, they often advance to higher level typing jobs. Some typists are promoted to supervisor jobs in word processing centers. Others who master additional skills can move into secretarial jobs.

Employment Outlook

The number of typists is expected to grow about as fast as the average for all occupations through the mid-1980's as business expansion increases the volume of paperwork. Many job openings will occur every year because turnover in this occupation is very high. Jobs for typists also will become available as employment continues to grow.

Continued growth of the economy, particularly those industries that generate vast quantities of written records and correspondence, will assure very good prospects for typists in the years ahead. Demand should be particularly strong for highly skilled workers and those who can handle other office jobs in addition to typing. Many employers will prefer typists who are familiar with new kinds of word processing equipment. Because an increasing number of employers are using temporary and part-time workers during peak business periods, opportunities should continue to be excellent for typists who do not wish to work full time.

Earnings and Working Conditions

According to a recent survey, beginning typists averaged $142 a week in 1976. Those with experience earned $166 a week, slightly less than the average earnings for nonsupervisory workers in private industry, except farming.

In the Federal Government, the starting salary for typists without experience was $126 a week in 1977, compared with $160 a week for those with experience. Average weekly earnings for all typists in the Federal Government were $157.

Working conditions for typists usually are similar to those for other office employees. Typists, like other clerical workers, sit for periods of time and often must contend with high noise levels caused by office machines located nearby. (See the statement on clerical occupations for more information on working conditions and also for a list of places to write for additional information on clerical jobs.)

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COMPUTER AND RELATED OCCUPATIONS

Since 1951 when the first computer was installed for commercial use, computer systems have become an increasingly important part of everyday life. Today these machines bill customers, pay employees, record airline and hotel reservations, and monitor factory production processes. Scientific and engineering research relies on computer systems to solve complex equations as well as to collect, store, and sort vast amounts of data.

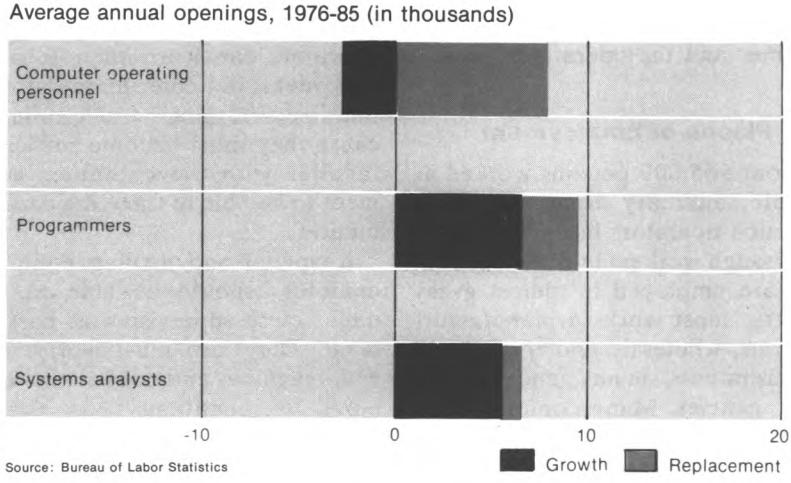
Workers in computer and related occupations design systems for processing information, write instructions and translate them into machine-readable language, and operate computers and peripheral equipment.

Most computer careers require some type of specialized training. Although not a universal requirement, a college degree is increasingly important for systems analysts and programmers—especially for those working in scientific and technical research operations. Computer operators usually need a high school diploma, but specialized training and experience are more important than formal education. For all computer occupations, employers stress the importance of learning on the job.

In addition to technical knowledge and skills, computer personnel must be able to concentrate on their work and should enjoy working with details. Those who operate equipment—keypunchers or console operators, for example—must have manual dexterity and some mechanical aptitude. Programmers and systems analysts must be able to think logically and should enjoy solving problems.

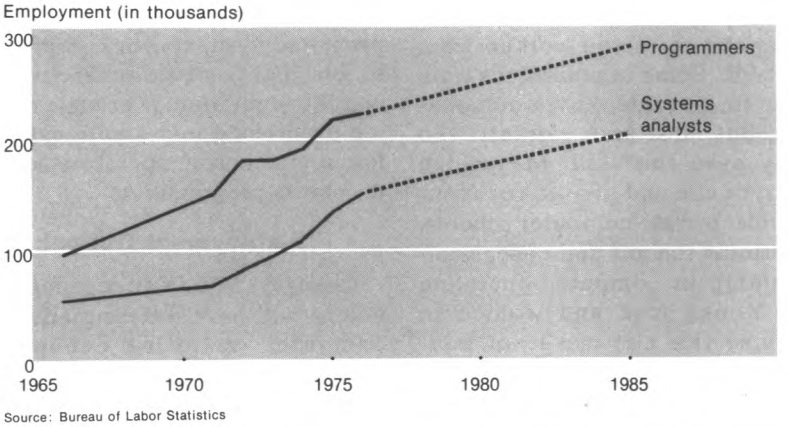
This chapter describes three computer occupations: Computer Operating Personnel, Programmers, and Systems Analysts.

Most openings for programmers and systems analysts will result from growth



Source: Bureau of Labor Statistics

Employment of programmers and systems analysts, negligible in 1960, is expected to grow to half a million workers by 1985



Source: Bureau of Labor Statistics

COMPUTER OPERATING PERSONNEL

(D.O.T. 213.138, .382, .582, .588, and .885, and 223.387)

Nature of the Work

All data systems require specialized workers to enter data and instructions, operate the computer, and retrieve the results. The data to

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be processed and the instructions for the computer are called "input;" the results are called "output."

Information is entered into a computer system in a variety of ways. In many systems, *keypunch operators* (D.O.T. 213.582) prepare input by punching patterns of holes in cards to represent different letters, numbers, and special characters, using a machine similar to a typewriter. In others, *data typists* (D.O.T. 213.588) use special machines that convert the information they type to holes in cards or magnetic impulses on tapes or disks. Many newer systems are capable of remote data entry. The user sits at a machine equipped with a typewriter keyboard and an electronic screen that displays the data as it is entered directly into the computer.

Once the input is coded, prepared in a form the computer can read, it is ready to be processed. *Console operators* (D.O.T. 213.382) examine the programmer's instructions for processing the input, make sure the computer has been loaded with the correct cards, magnetic tapes, or disks and then start the computer. While it is running, they watch the machine, paying special attention to the error lights that could signal a malfunction. If the computer stops or one of the lights goes on, operators must locate the problem and remove the faulty input materials.

In some systems, machines directly connected to the computer translate output into the form desired by the programmer. In others, high-speed printers or converters run by auxiliary equipment operators—*high-speed printer operators* (D.O.T. 213.382) and *converter operators* (D.O.T. 213.382)—perform this function.

Frequently, data on punched cards, magnetic tape, or disks are kept for future use. *Tape librarians* (D.O.T. 223.387) classify and catalog this material and maintain files of current and previous versions of programs, listings, and test data. In smaller organizations, librarians may do some keypunching as well as coordinate activities between the programmer and the operations department.



Some operators work evenings or night shifts because computers are used 24 hours a day.

Places of Employment

About 565,000 persons worked as console, auxiliary equipment, and keypunch operators in 1976.

Although workers in these occupations are employed in almost every industry, most work in manufacturing firms, wholesale and retail trade establishments, banks, and government agencies. Many computer and peripheral equipment operators work for insurance companies and firms that provide data processing services for a fee.

Training, Other Qualifications, and Advancement

In firms that have just installed a new computer system, tabulating and bookkeeping machine operators may be transferred to jobs as keypunch or auxiliary equipment operators, or console operators. Most often, however, employers recruit workers from the outside. Some organizations train typists to operate keypunch machines, but most seek workers who already have this skill. Many high schools, public and private vocational schools, private computer schools, and business schools and colleges offer training in computer operating skills. Young men and women in military service also can learn valuable skills in computer operations. In addition, a growing number of business firms across the country hold weekend seminars on data processing for high school students.

Employers in private industry usually require applicants to have a high school education, and many prefer console operators to have some college training, especially in data processing. The Federal Government requires a high school diploma, unless applicants have had specialized training or experience. Many employers test applicants to determine their aptitude for computer work, particularly their ability to reason logically. Keypunch operators and other data entry personnel often are tested for their ability to work quickly and accurately.

Beginners usually are trained on the job. The length of training needed varies—auxiliary equipment operators can learn their jobs in a few weeks, but console operators require several months of training because they must become sufficiently familiar with the computer equipment to be able to trace the causes of failures.

Keypunch and auxiliary equipment operators should be able to work under close supervision as part of a team. They also must like working with machines and not become easily bored by repetitious tasks. Console operators must be capable of independent judgment, especially when working without supervision on second and third shifts.

Although advancement opportunities for keypunch and auxiliary equipment operators are limited, promotion to a supervisory position is possible after several years on the job. With additional training, often including college study, a few advance to jobs as console operators.

Console operators also may be promoted to supervisory positions, or to jobs that combine supervision and console operation. Through on-the-job-experience and additional training, some console operators advance to jobs as programmers.

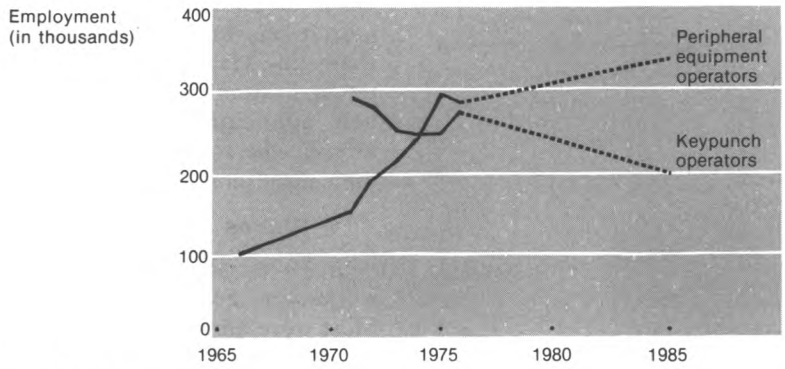
Employment Outlook

Changes in data processing technology will have differing effects on computer operating occupations over the next decade. Employment of console and peripheral equipment operators is expected to rise about as fast as the average for all occupations while employment of keypunch operators should continue the decline

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The discovery of new ways to prepare and enter data into computers has contributed to the growing need for peripheral equipment operators, but has caused demand for keypunch operators to decline

Advances in technology create some jobs and eliminate others



Source: Bureau of Labor Statistics

of recent years. Recent advances in miniaturizing circuits have enabled manufacturers to reduce both the size and the cost of computer components. As this technology develops, a continued expansion in the use of computers is expected, especially by small businesses. Employment of console and peripheral equipment operators in data processing service firms may grow less rapidly than in the past as more small firms install their own computer systems, but overall demand for these workers should remain strong.

This same technology will further reduce demand for keypunch operators. The primary reason for this decline is the increased use of computer terminals. As direct data entry techniques become more efficient, the importance of punched cards as a form of input will diminish. Despite the anticipated decline in employment, several thousand openings will occur each year as workers die, retire, or transfer out of the occupation.

Earnings and Working Conditions

Average weekly earnings of keypunch operator trainees in private industry ranged from $120 to $140 in 1976, according to surveys conducted in urban areas by the Bureau of Labor Statistics and firms engaged in research on data processing occupations. Lead operators earned from $150 to $180 weekly.

Average weekly earnings of beginning console operators averaged about $150. Experienced workers earned from $205 to $215, and lead operators earned from $230 to $260 weekly. The average weekly earnings for tape librarians in 1976 was $160.

In the Federal Government, console operators and keypunch operators without work experience started at $126 a week, and the average weekly salary was $245 for console operators and $160 for keypunch operators. Throughout the economy in 1976, console operators earned slightly more and keypunch operators earned slightly less than average earnings for all nonsupervisory workers in private industry, except farming.

Because electronic computers must be operated at carefully controlled temperatures, operators work in air-conditioned rooms. One disadvantage, however, is the high noise level generated by some auxiliary equipment. Some console and auxiliary equipment operators work evening or night shifts because many organizations use their computer 24 hours a day. Tape librarians usually work only day shifts.

Sources of Additional Information

Further information on data processing careers is available from:

American Federation of Information Processing Societies, 210 Summit Ave., Montvale, N.J. 07645.

PROGRAMMERS

(D.O.T. 020.188)

Nature of the Work

Computers can process masses of information rapidly and accurately, but only if they are given step-by-step instructions to follow. Because the machines cannot think for themselves, computer programmers must write detailed instructions called programs that list in a logical order the steps the machine must follow to solve a problem.

Programmers usually work from problem descriptions prepared by systems analysts who have examined the problem and determined the steps necessary to achieve the desired results. (Systems analysts are described elsewhere in the *Handbook*.) In organizations that do not employ systems analysts, workers called programmer-analysts may be responsible for both systems analysis and programming. Once this analysis has been completed, a specialist called an applications programmer writes detailed instructions for processing the data, using one of the languages developed especially for computers.

Programs vary with the type of problem to be solved. For example, the mathematical calculations involved in payroll accounting procedures are different from those required to determine the flight path of a space probe. A business applications programmer developing instructions for billing customers would first decide what company records the computer would need and then draw a flow chart or diagram showing the steps the computer must follow to obtain old balances, add new charges, calculate finance charges, and deduct payments before

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Computer programmers write instructions that list the steps the computer must take to solve a problem.

determining a customer's bill. Using the flow chart, the programmer codes the actual instructions the computer will follow.

The programmer then checks the operation of the program to be sure the instructions are correct and will produce the desired information. This check is called "debugging." The programmer tries a sample of the data with the program and reviews the results to see if any errors are made. If errors occur, the program must be changed and rechecked until it produces the correct results.

Finally, an instruction sheet is prepared for the computer operator who will run the program. (The work of computer operators is described in the statement on Computer Operating Personnel.)

Although simple programs can be written in a few days, programs that use complex mathematical formulas or many data files may require more than a year of work. In such cases, several programmers may work together under an experienced programmer's supervision.

Applications programmers usually specialize in either business or scientific operations. A different type of specialist, the systems programmer, maintains the general instructions (called software) that control the operation of the entire computer system. These workers make changes in these sets of instructions that determine how the computer's resources are to be allotted among the various jobs it has been given. Because of their knowledge of operating systems, systems programmers often help applications programmers determine the source of problems with their programs.

Places of Employment

In 1976, about 230,000 persons worked as computer programmers. Most were employed by manufacturing firms, banks and insurance companies, data processing service organizations, and government agencies.

Programmers usually work in large firms that need and can afford extensive computer systems. Small firms generally require computers only for payroll or billing purposes and frequently pay data processing service organizations to do this work. Systems programmers usually work in research organizations, computer manufacturing firms, and large computer centers.

Training, Other Qualifications, and Advancement

There are no universal training requirements for progammers because employers' needs vary. Most programmers are college graduates; others have taken special courses in computer programming to supplement their experience in fields such as accounting or inventory control.

Employers using computers for scientific or engineering applications prefer college graduates with degrees in computer science, mathematics, engineering, or the physical sciences. Graduate degrees are required for some jobs. Very few scientific organizations are interested in applicants with no college training.

Although some employers who use computers for business applications do not require college degrees, they prefer applicants who have had college courses in data processing, accounting, and business administra-

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tion. Occasionally, workers who are experienced in computer operation or payroll accounting but have no college training are promoted to programming jobs; however, they need additional data processing courses to become fully qualified programmers. Prior work experience is not essential for a job as a programmer; in fact, about half of all entrants to the occupation have no significant work experience.

Computer programming is taught at public and private vocational schools, colleges, and universities. Instruction ranges from introductory home study courses to advanced courses at the graduate level. High schools in many parts of the country also offer courses in computer programming.

In hiring programmers, employers look for people who can think logically and are capable of exacting analytical work. The job calls for patience, persistence, and the ability to work with extreme accuracy even under pressure. Ingenuity and imagination are particularly important when programmers must find new ways to solve a problem.

Beginning applications programmers usually spend their first weeks on the job attending training classes. After this initial instruction, they work on simple assignments while completing further specialized training programs. Programmers generally must spend at least several months working under close supervision before they can handle all aspects of their job. Because of rapidly changing technology, programmers must continue their training by taking courses offered by their employer and software vendors. For skilled workers, the prospects for further advancement are good. In large organizations, they may be promoted to lead programmers and be given supervisory responsibilties. Some applications programmers advance to systems programming. Both applications programmers and systems programmers often are promoted to the more demanding occupation of systems analyst.

Employment Outlook

Employment of programmers is expected to grow faster than the average for all occupations through the mid-1980's as computer usage expands, particularly in firms providing accounting and business management services and organizations involved in research and development. In addition to job openings resulting from growth of the occupation, several thousand openings will arise each year from the need to replace workers who leave the occupation. Because many programmers are relatively young, few openings will result from deaths or retirements. However, many vacancies will be created as experienced workers transfer into jobs as systems analysts.

The demand for applications programmers will increase as many processes once done by hand are automated, but employment will not grow as rapidly as in the past for several reasons. Improved software, such as utility programs that can be used by other than data processing personnel will simplify or eliminate some programming tasks. Also, employment of programmers in data processing firms is not expected to rise as fast as in recent years. Technology has reduced both the size and cost of computer hardware, bringing a computer system within reach of small businesses. As more small firms install their own computer, rather than rely on a data processing firm, employment growth in these data processing firms may slow somewhat. Demand throughout the economy, however, should remain strong over the next decade. Prospects should be brightest for college graduates who have had computer-related courses, particularly for those with a major in computer science or a related field. Graduates of 2-year programs in data processing technologies also should find ample opportunities, although generally limited to business applications.

Earnings and Working Conditions

Average weekly earnings of programmer trainees in private industry ranged from $190 to $200 in 1976, according to surveys conducted in urban areas by the Bureau of Labor Statistics and firms engaged in research on data processing occupations. Systems programmers generally earn more than applications programmers. For example, experienced systems programmers averaged about $360 a week compared to $310 for applications programmers. Average salaries for lead programmers were $385 and $355, respectively. In general, programmers earn about twice as much as average earnings of all nonsupervisory workers in private industry, except farming.

In the Federal Civil Service, the entrance salary for persons with a college degree was about $180 a week in 1977. Salaries for Federal Government programmers at all levels are generally comparable to those in private industry.

Programmers working in the North and West earned somewhat more than those working in the South. Those working for data processing services and public utilities had higher earnings than programmers employed in banks, advertising, or educational institutions.

Programmers work about 40 hours a week, but their hours are not always from 9 to 5. Once or twice a week a programmer may report early or work late to use the computer when it is available. Occasionally, they work on weekends or are telephoned to advise computer operators working a second or third shift.

Sources of Additional Information

Additional information about the occupation of programmer is available from:

American Federation of Information Processing Societies, 210 Summit Ave., Montvale, N.J. 07645.

Association for Computing Machinery, 1133 Avenue of the Americas, New York, N.Y. 10036.

SYSTEMS ANALYSTS

(D.O.T. 003.187, 012.168, 020.081 and 020.088)

Nature of the Work

Many essential business functions and scientific research projects depend on systems analysts to plan effi-

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System analysts devising a new system.

cient methods of processing data and handling the results. Analysts begin an assignment by discussing the data processing problem with managers or specialists to determine the exact nature of the problem and to bre4akit down into its component p4artsIf a new inventory system is desired, for example, systems analysts must determine what new data need to be collected, the equipment needed for computation, and the steps to be followed in processing the information.

Analysts use various techniques, such as cost accounting, sampling, and mathematical model building to analyze a problem and devise a new system. 0nce a system has been developed, they prepare charts and diagrams that describe its operation in terms that managers or customers can understand. They also may prepare a cost-benefit analysis to help the client decide whether the proposed system is satisfactory.

If the system is accepted, systems analysts translate the logical requirements of the system into the capabilities of the computer machinery or "hardware." They also prepare specifications for programmers to follow and work with them to "debug," or eliminate errors from the system. (The job of the computer programmer is described elsewhere in the *Handbook.*)

The problems systems analysts must solve range from monitoring nuclear fission in a powerplant to forecasting sales for an appliance manufacturing firm. Because the work is so varied and complex, analysts specialize in either business or scientific and engineering applications.

Some analysts improve systems already in use by developing better procedures or adapting the system to handle additional types of data. Others do research, called advanced systems design, to devise new methods of systems analysis.

Places of Employment

About 160,000 persons worked as systems analysts in 1976. Employment of these workers is concentrated in two geographic regions—more than one-third of the total are employed in the Midwest and about one-fourth work in the northeastern portion of the United States. Most systems analysts worked in urban areas for manufacturing firms, banks, insurance companies, and data processing service organizations. In addition, large numbers worked for wholesale and retail businesses and government agencies.

Training, Other Qualifications, and Advancement

There is no universally acceptable way of preparing for a job as a systems analyst because employers' preferences depend on the work being done. However, college graduates generally are sought for these jobs, and for some of the more complex jobs, persons with graduate degrees are preferred. Employers usually want analysts with a background in accounting, business management, or economics for work in a business environment while a background in the physical sciences, mathematics, or engineering is preferred for work in scientifically oriented organizations. A growing number of employers seek applicants with a degree in computer science, information science, or data processing. Regardless of college major, most employers look for people who are familiar with programming languages. Courses in computer concepts, systems analysis, and data retrieval techniques offer good preparation for a job in this field.

Prior work experience is important. Nearly half of all persons entering this occupation have transferred from other occupations, especially from computer programmer. In many industries, all systems analysts begin as programmers and are promoted to analyst positions after gaining experience.

Systems analysts must be able to think logically and should like working with ideas. The ability to concentrate and pay close attention to details also is important. Although most systems analysts work independently, they sometimes work in teams on large projects. They must be able to communicate effectively with technical personnel such as programmers as well as with clients who have no computer background.

In order to advance, systems analysts must continue their technical education. Technological advances come so rapidly in the computer field that continuous study is necessary to keep one's skills up to date. Training usually takes the form of 1-and 2-week courses offered by employers and software vendors.

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An indication of experience and professional competence is the Certificate in Data Processing (CDP). This designation is conferred by the Institute for Certification of Computer Professionals upon candidates who have completed 5 years' experience and passed a five-part examination.

In large data processing departments, persons who begin as junior systems analysts may be promoted to senior or lead systems analysts after several years of experience. Systems analysts who show leadership ability also can advance to jobs as managers of systems analysis or data processing departments.

Employment Outlook

Employment of systems analysts is expected to grow faster than the average for all occupations through the mid-1980's as computer usage expands, particularly in accounting firms and organizations engaged in research and development. In addition to opportunities that will result from growth, some openings will occur as systems analysts advance to managerial positions or enter other occupations. Because many of these workers are relatively young, few positions will result from retirement or death.

The demand for systems analysts is expected to rise as computer capabilities are increased and computers are used to solve problems in a larger variety of areas. Sophisticated accounting systems, telecommunications networks, and complex mathematical systems used in scientific research are examples of new approaches in problem-solving. Over the next decade, we can expect systems analysts to be harnessing the computer's resources to solve problems we have not yet recognized. Advances in technology that have drastically reduced the size and cost of computer hardware will have differing effects on employment of systems analysts. Employment in data processing firms may not grow as rapidly as in recent years as more small businesses install their own computer rather than rely on a data processing service. This will be offset, however, by a rising demand for analysts to design systems especially for the small computer and geared specifically for the problems of small firms.

The outlook for graduates of computer-related curriculums should be excellent. College graduates who have had courses in computer programming, systems analysis, and other data processing areas should also find many opportunities. Persons without a college degree and college graduates unfamiliar with data processing may face competition from the large number of experienced workers seeking jobs as systems analysts.

Earnings and Working Conditions

Earnings for beginning systems analysts in private industry averaged $250 a week in 1976, according to surveys conducted in urban areas by the Bureau of Labor Statistics and private firms engaged in research on computer occupations. Experienced workers earned from $340 to $380, and lead systems analysts earned from $385 to $400 weekly. Overall, systems analysts earn well over twice as much as the average for all nonsupervisory workers in private industry, except farming.

In the Federal Government, the entrance salary for recent college graduates was about $180 a week in 1977. Salaries for systems analysts at all levels of responsibility generally are comparable to those in private industry.

Systems analysts working in the North and West earned somewhat more than those in the South and generally their earnings were greater in data processing service firms or in heavy manufacturing than in insurance companies or educational institutions.

Systems analysts usually work about 40 hours a week—the same as other professional and office workers. Unlike many computer operators, systems analysts are not assigned to evening or night shifts. Occasionally, however, evening or weekend work may be necessary to complete emergency projects.

Sources of Additional Information

Further information about the occupation of systems analyst is available from:

American Federation of Information Processing Societies, 210 Summit Ave., Montvale, N.J. 07645.

Association for Systems Management, 24587 Bagley Rd., Cleveland, Ohio 44138.

Information about the Certificate in Data Processing is available from:

The Institute for Certification of Computer Professionals, 35 E. Wacker Dr., Suite 2828, Chicago, Ill. 60601.

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BANKING OCCUPATIONS

Commercial banks constitute one of the fastest growing industries in our economy. To keep pace with requirements of the community, they offer a variety of services: Checking, savings, and credit card accounts, commerical and consumer loans, trust fund management, and financial counseling.

Banks employ highly specialized techniques and equipment in very detailed work. Consequently, most employees gain experience and skill through on-the-job training. Although banks usually seek college graduates for officer trainee jobs, many openings exist for high school graduates in other bank positions. Bank employees generally have good opportunities for advancement. They can qualify for better positions by enrolling in programs offered by the American Bankers Association, American Institute of Banking, or State banking associations, or by taking college courses in finance and business.

Bank employees should enjoy working with numbers and be able to perform detailed work. Personal qualifications such as honesty and the ability to communicate with customers are important.

This section discusses three categories of banking occupations: Clerks, officers and managers, and tellers.

BANK CLERKS

(D.O.T. 209.388, 210.388, 215.388 217.388, 219.388 and .488)

Nature of the Work

All organizations need clerks to handle paperwork. Because of the specialized nature of banking, some clerical duties in banks differ from those of other businesses. (Secretaries, typists, receptionists, file clerks, and other clerical workers whose jobs are much the same in banks as in other businesses are discussed in greater detail elsewhere in the *Handbook*.)

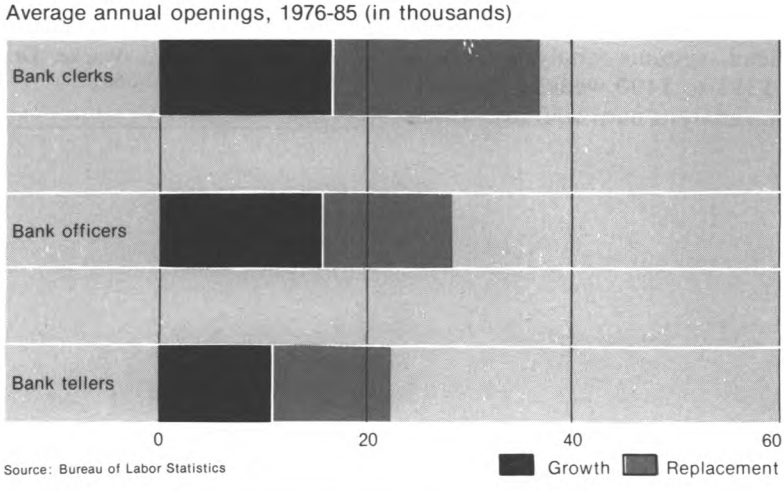
In a small bank, one clerk may do several jobs, such as sorting checks, totaling debit and credit slips, and preparing monthly statements for depositors. In a large bank, however, each clerk usually specializes and frequently has a special job title, as well.

Many bank clerks use office machines unique to banking. Clerks known as *sorters* (D.O.T. 219.388) separate documents—checks, deposit slips, and other items—into different groups and tabulate each "batch" so they may be charged to the proper accounts. Often clerks use canceling and adding machines in their work. *Proof machine operators* (D.O.T. 217.388) use equipment that sorts checks and deposit slips, adds their amounts, and records the tabulations.

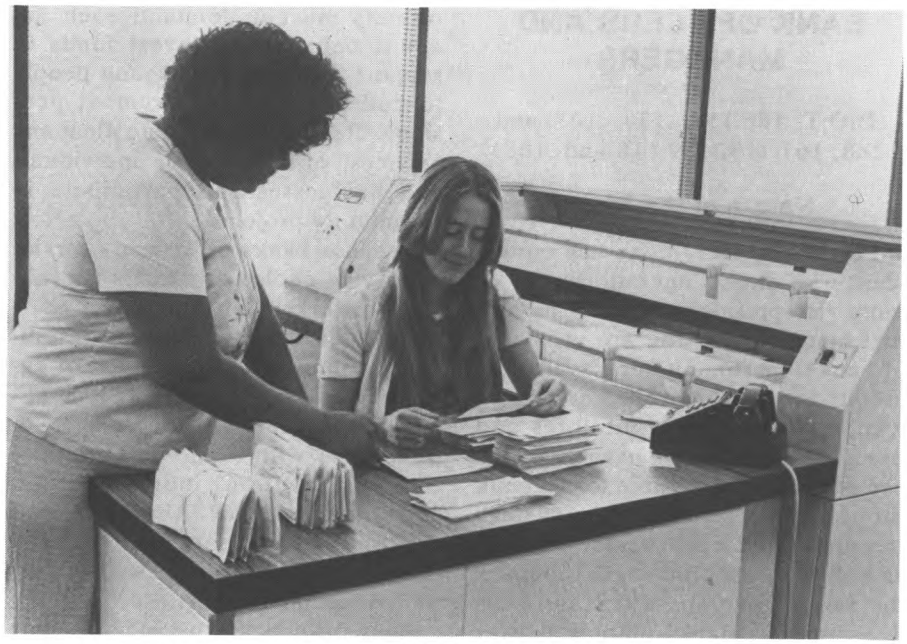
Bookkeeping workers are the largest single group of bank clerks. *Bookkeeping machine operators* (D.O.T. 215.388) may use conventional bookkeeping machines or electronic posting machines to record financial transactions. In banks, these workers are sometimes known as account clerks, posting machine operators, or recording clerks. The job titles of *bookkeepers* (D.O.T. 210.388) sometimes relate to the kinds of records they keep—for example, Christmas club bookkeeper, discount bookkeeper, interest-accrual bookkeeper, trust bookkeeper, and commodity loan clerk. Thousands of *bookkeeping and accounting clerks* (D.O.T. 219.488) also do routine typing, calculating, and posting. Included in this group are reconcilement clerks, who process statements from other banks to aid the auditing of accounts, and trust investment clerks, who post the daily investment transactions of bank customers.

Other clerical employees whose duties and job titles are unique to banking include *country collection clerks* (D.O.T. 219.388), who sort thousands of pieces of mail daily and determine which items must be held at the main office and which should be routed to branch banks for collection. Also employed are *transit clerks* (D.O.T. 217.388), who sort checks

Many employment opportunities are expected in banking occupations



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Clerks in large banks are usually assigned specialized duties.

and drafts on other banks, list and total the amounts involved, and prepare documents to be mailed for collection; *exchange clerks* (D.O.T. 219.388), who service foreign deposit accounts and determine charges for cashing or handling checks drawn against such accounts; *interest clerks* (D.O.T. 219.388), who keep records on interest-bearing items that are due to or from the bank; and *mortgage clerks* (D.O.T. 209.388), who type legal papers dealing with real estate upon which money has been loaned, and maintain records relating to taxes and insurance on these properties.

Electronic data-processing has created several new clerical occupations unique to banking. These include the electronic reader-sorter operator who runs electronic check sorting equipment; the check inscriber or encoder who operates machines that print information in magnetic ink on checks and other documents for machine reading; and the control clerk who keeps track of the large volume of documents flowing in and out of the computer division. Other occupations include card-tape converter operator, coding clerk, console operator, data typist, data converting machine operator, data examination clerk, high speed printer operator, tape librarian, teletype operator, and verifier operator.

Banks employed approximately 456,000 clerical workers in 1976; almost one-fifth were bookkeepers; one-fourth were stenographers, typists or secretaries; and almost one-fifth were office machine operators.

Training, Other Qualifications, and Advancement

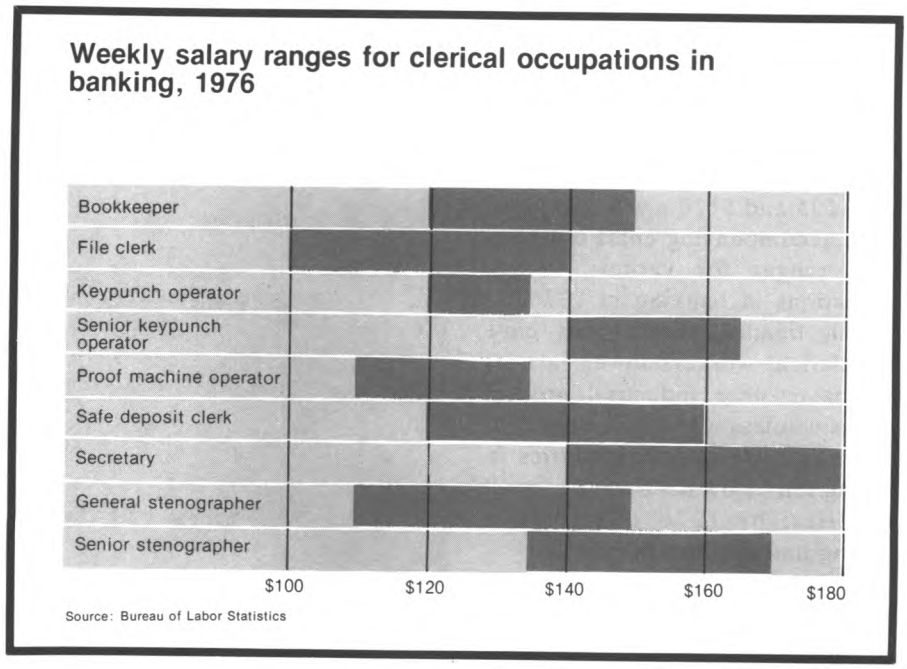
High school graduation is considered adequate preparation for most beginning clerical jobs in banks. Courses in bookkeeping, typing, business arithmetic, and office machine operation are desirable. Applicants may be given brief tests to determine their ability to work rapidly and accurately, and to communicate effectively with others. They should be able to work under close supervision as part of a team.

Beginners often are hired as file clerks, keypunch operators, transit clerks, or clerk-typists. Some are trained by the bank to operate various office machines. A few start as messengers.

A clerk in a routine job may be promoted to a clerical supervisory position, to teller or credit analyst, and eventually to senior supervisor. Advancement to a bank officer position is a possibility for outstanding clerks who have had college training or have taken specialized courses in banking. Additional education—particularly courses offered by the American Institute of Banking—may help workers advance. (See statement on the banking industry for information on the Institute's educational program.) In general, promotion depends upon the worker's performance, qualifications, and motivation as well as the available openings.

Employment Outlook

Employment of bank clerks is expected to grow faster than the aver-



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age for other occupations through the mid-1980's. In addition to opportunities stemming from employment growth, many jobs will open up from the need to replace the large number of clerks who leave their jobs each year. As a result, banking should continue to be a good source of employment opportunities for clerical workers.

Jobs for clerks will arise as established banks expand their services and new banks and branches open. Future employment growth will differ markedly among individual clerical occupations. Nearly all banks use electronic equipment that lessens demand for workers such as check sorters and bookkeeping machine operators. Moreover, the need for keypunch operators is declining as banks shift from punched card- to magnetic tape-based computer systems.

No evidence suggests, however, that new technologies will displace large numbers of workers. Overall, the banking industry and employment of clerks in the banking industry are expected to grow. Workers whose duties are given to a machine most likely will be reassigned to new jobs created by the change or to duties related to new banking services.

Earnings

Beginning salaries for clerical workers depend upon the worker's actual position and length of experience, as well as the size and location of the bank. For reference, an inexperienced typist usually earned between $95 and $120 a week in 1976.

The accompanying chart indicates salary ranges for various clerical occupations in banking in 1976. In general, financial institutions have paid clerical workers lower salaries than have other industrial groups, such as wholesale trade or manufacturing. In 1973, clerical salaries in banking ran below the average for all industries; by 1976 this relative standing had not improved.

See the statement on the banking industry for additional information.

BANK OFFICERS AND MANAGERS

(D.O.T. 186.118, .138, .168, and .288; 161.118, 189.118 and .168)

Nature of the Work

Practically every bank has a president who directs operations; one or more vice presidents who act as general managers or who are in charge of bank departments such as trust or credit; and a comptroller or cashier who, unlike cashiers in stores and other businesses, is an executive officer generally responsible for all bank property. Large banks also may have treasurers and other senior officers, as well as junior officers, to supervise the various sections within different departments. Banks employed over 300,000 officers and managers in 1976.

Bank officers make decisions within a framework of policy set by the board of directors and existing laws and regulations. They must have a broad knowledge of business activities to relate to the operations of their department. For example, loan officers evaluate the credit and collateral of individuals and businesses applying for a loan. Similarly, trust officers must understand each account before they invest funds to support families, send young people to college, or pay retirement pensions. Besides supervising financial services, officers advise individuals and businesses and participate in community projects.

Because banks offer many services, a wide choice of careers is available to workers who specialize.

Loan officers may handle installment, commercial, real estate, or agricultural loans. To evaluate loan applications properly, officers need to be familiar with economics, production, distribution, merchandising, and commercial law. Also, they need to know business operations and should be able to analyze an industry's financial statements.

Bank officers in trust management require knowledge of financial planning and investment for investment research and for estate and trust administration.

Operations officers plan, coordinate, and control the work flow, update systems, and strive for administrative efficiency. Careers in bank operations include electronic data processing manager and other positions involving internal and customer services.



A loan officer evaluates an individual's credit rating before approving a loan.

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A correspondent bank officer is responsible for relations with other banks; a branch manager, for all functions of a branch office; and an international officer, for advising customers with financial dealings abroad. A working knowledge of a foreign country's financial system, trade relations, and economic conditions is beneficial to those interested in international banking.

Other career fields for bank officers are auditing, economics, personnel administration, public relations, and operations research.

Training, Other Qualifications, and Advancement

Bank officer and management positions generally are filled by management trainees, and occasionally by promoting outstanding bank clerks or tellers. College graduation usually is required for management trainees. A business administration major in finance or a liberal arts curriculum including accounting, economics, commercial law, political science, and statistics serves as excellent preparation for officer trainee positions. In fact, a Master of Business Administration (MBA) in addition to a social science bachelor's degree comes closest to the "ideal" college education. However, banks do hire people with diverse backgounds such as chemical engineering, nuclear physics, and forestry to meet the needs of complex, high-technology industries with which they deal. Valuable experience may be gained through summer employment programs.

A management or officer trainee may spend a year or two learning the various banking areas before choosing a permanent position. This practice is common but not universal. A bank may hire an applicant with specific skills for a position that is clearly defined at the outset.

Persons interested in becoming bank officers should like to work independently and to analyze detailed information. They also need tact and good judgment to counsel customers and supervise employees.

Advancement to an officer or management position may come slowly in small banks where the number of positions is limited. In large banks that have special training programs, promotions may occur more quickly. For a senior officer position, however, an employee usually needs many years of experience.

Although experience, ability, and leadership are emphasized for promotion, advancement may be accelerated by special study. The American Bankers Association (ABA) offers courses, publications, and other training aids to officers on every phase of banking. The American Institute of Banking, an arm of the ABA, has long filled the same educational need among bank support personnel. (See the statement on the banking industry elsewhere in the *Handbook* for more information on these and other training programs sponsored by universities and local bankers' associations.)

Employment Outlook

Through the mid-1980's, employment of bank officers is expected to increase faster than the average for all occupations. Rising costs due to expanded banking services and the increasing dependence on computers will require more officers to provide sound management and effective quality control. Opportunities also will arise as experienced officers leave their jobs. College graduates who meet the standards for management trainees should find good opportunities for entry positions.

Earnings

Officer trainees at the bachelor's level generally earned between $800 and $900 a month in 1976. Those with an M.A. or M.S. started at between $1,000 and $1,200 a month. A Master of Business Administration, however, appears to be worth more in salary terms: graduates with an MBA were offered starting salaries of $1,300 to $1,400 a month in 1976.

Salaries of senior bank officers may be several times as much as starting salaries. The actual salary level depends upon the particular position and the size and location of the bank. For officers, as well as for other bank employees, earnings are likely to be lower in small towns than in big cities.

See the statement on the banking industry elsewhere in the *Handbook* for additional information on banking occupations.

BANK TELLERS

(D.O.T. 212.368)

Nature of the Work

Most bank customers have contact with the teller, the man or woman behind the window who cashes checks and processes deposits or withdrawals. Many banks employ one or two "all-purpose" tellers; larger banks employ tellers in more specialized functions. One teller, for example, sells saving bonds; another accepts payment for customers' utility bills. A third receives deposits for Christmas club accounts; and a fourth keeps records and performs the necessary paperwork for customer loans. Still other tellers handle foreign currencies, sell travelers' checks, or compute interest on savings accounts.

Commercial tellers, the most common, cash customers' checks and handle deposits and withdrawals from checking and savings accounts. Before cashing a check, the teller must see that the written and numerical amounts agree, verify the identity of the person to receive payment, and be certain that the payee's account has sufficient funds to cover the check. The teller must carefully count out the cash to avoid errors. Often a customer withdraws money in the form of a cashier's check, which the teller types up and verifies. When accepting a deposit, the teller checks the accuracy of the deposit slip and enters the total in a passbook or on a deposit receipt. Tellers may use machines to make change and total deposits. In some banks, tellers use computer terminals to record deposits and withdrawals In other banks, they write deposit receipts and passbook entries by hand.

Tellers' duties begin before and continue after banking hours. A teller begins the day by receiving and counting an amount of working cash

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for his or her drawer; this amount is verified by a supervisor, usually the head teller. The tellers use this cash for payments during the day and are responsible for its safe and accurate handling. After banking hours, tellers count cash on hand, list the currency-received tickets on a settlement sheet, and balance the day's accounts. They also sort checks and deposit slips. Paying and receiving tellers may supervise one clerk or more. A teller generally works 37 to 40 hours per week.

For many young people just out of school, working as a teller is their first job. Because the job involves repetitive work with great attention to detail and long periods of time on one's feet, this occupation does not suit some people. The high rate of turnover suggests that, after a couple of years' work, many tellers seek other positions.

About 310,000 tellers were employed in 1976. A large number worked part time.

Training, Other Qualifications, and Advancement

In hiring tellers, banks seek people with basic qualities: clerical skills, friendliness, attentiveness. Although not required, a high school diploma is generally preferred. Maturity, neatness, tact, and courtesy are important because customers deal with tellers far more frequently than with other bank employees. Although tellers work independently, their recordkeeping is closely supervised. They work with detail and are confined to a small work area.

New tellers usually observe experienced workers for a few days before doing the work themselves. Training may last from a few days to 3 weeks or longer. Beginners usually start as commercial tellers; in large banks which have a separate savings teller's "cage," they may start as savings tellers. Often banks simultaneously train tellers for other clerical duties.

The conditions governing advancement of tellers are much the same as those for clerks. The teller interested in promotion has access to courses and other sources of additional training. Such self-improvement efforts, coupled with satisfactory performance on the job, would make a teller an attractive candidate for promotion. After gaining experience, a teller in a large bank may advance to head teller; those who have had some college or specialized training offered by the banking industry may be promoted to an officer's or managerial position. (See the statement on the banking industry for information about the educational programs of the American Institute of Banking.)

Employment Outlook

The number of bank tellers is expected to increase faster than the average for all occupations through the mid-1980's as banks expand services. Thousands of openings will occur each year as a result of employment growth and the need to replace tellers who retire, die, or stop working for other reasons. The relatively high replacement needs in this occupation are expected to be an important source of job opportunities. Qualified applicants should find good employment prospects.

Although increased use of mechanical and electronic equipment may eliminate some routine duties and speed other work, total employment is not likely to be adversely affected.

Earnings

Most beginning tellers earned between $95 and $120 a week in 1976. Experienced tellers generally earned between $125 and $175 a week. The actual salary depends upon the length of service, the location and size of the bank, and the worker's specific duties. Most savings tellers, for example, earned between $125 and $145 a week in 1976, while note tellers usually earned between $150 and $170 a week. In general, the greater the range of responsibilities the teller performs, the higher his or her salary.

See the statement on the banking industry elsewhere in the *Handbook* for additional information on this and other banking occupations.



An increasing number of tellers will be needed to work part time.

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INSURANCE OCCUPATIONS

Insurance protection is an integral part of our lives. It frees policyholders and their beneficiaries from worry about the enormous financial burdens that sometimes result from death, illness, or other losses. Businesses could not operate, nor could most people buy homes or other major items, without the assurance of protection from sudden disaster. Insurance workers adapt policies to meet changing needs, decide which applications can be accepted and establish premium rates on the policies, and investigate and settle claims.

A college degree is increasingly important for managerial, professional, and sales jobs in insurance, although some positions are open to high school graduates who have appropriate experience. Insurance workers in clerical positions need a high school diploma. Regardless of their previous training, insurance workers must continually learn while on the job. Many professional associations sponsor courses in all phases of insurance work; employees are encouraged to participate to prepare themselves for more responsible jobs.

This section describes three insurance occupations: actuaries, claim representatives, and underwriters. (Statements on the insurance industry and insurance agents and brokers are included elsewhere in the *Handbook*.)

ACTUARIES

(D.O.T. 020.188)

Nature of the Work

Why do young persons pay more for automobile insurance than older persons? How much should an insurance policy cost? Answers to these and similar questions are provided by actuaries who design insurance and pension plans that can be maintained on a sound financial basis. They assemble and analyze statistics to calculate probabilities of death, sickness, injury, disability, unemployment, retirement, and property loss from accident, theft, fire, and other potential hazards. Actuaries use this information to determine the expected insured loss. For example, they may calculate how many persons who are 21 years old today can be expected to live to age 65—the probability that an insured person might die during this period is a risk to the company. They then calculate a price for assuming this risk that will be profitable to the company yet be competitive with other insurance companies. Finally, they must make sure that the price charged for the insurance will enable the company to pay all claims and expenses as they occur. In the same manner, the actuary calculates premium rates and determines policy contract provisions for each type of insurance offered. Most actuaries specialize in either life and health insurance or property and liability (casualty) insurance; a growing number specialize in pension plans.

To perform their duties effectively, actuaries must keep informed about general economic and social trends, and legislative, health, and other developments that may affect insurance practices. Because of their broad knowledge of insurance, company actuaries may work on problems arising in their company's investment, group underwriting, or pension planning departments. Actuaries in executive positions help determine general company policy. In that role, they may be called upon to explain complex technical matters to company executives, government officials, policyholders, and the public. They may testify before public agencies on proposed legislation affecting the insurance business, for example, or explain intended changes in premium rates or contract provisions.

Actuaries who work for the Federal Government usually deal with a particular insurance or pension program, such as social security or life insurance for veterans and members of the Armed Forces. Actuaries in State government positions regulate insurance companies, supervise the operations of State retirement or pension systems, and work on problems connected with unemployment insurance or workers' compensation. Consulting actuaries set up pension and welfare plans for private compa-



Employment of actuaries is influenced by the volume of insurance sales.

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nies, unions, and government agencies. They calculate future benefits and determine the amount of the annual employer contribution. Actuaries who are enrolled under the provisions of the Employee Retirement Income Security Act of 1974 (ERISA) evaluate these pension plans and submit reports certifying their financial soundness.

Places of Employment

Approximately 9,000 persons worked as actuaries in 1976. Four of every 10 actuaries worked in five major cities—New York, Hartford, Chicago, Philadelphia, and Boston.

About two-thirds of all actuaries worked for private insurance companies. Almost 90 percent of these worked for life insurance companies; the rest worked for property and liability (casualty) companies. The number of actuaries employed by an insurance company depends on the volume of its business and the number and types of insurance policies it offers. Large companies may employ over 100 actuaries on their staffs; others, generally smaller companies, may rely instead on consulting firms or rating bureaus (associations that supply actuarial data to member companies).

Consulting firms and rating bureaus employ about one-fifth of all actuaries. Other actuaries work for private organizations administering independent pension and welfare plans or for Federal and State government agencies. A few teach in colleges and universities.

Training, Other Qualifications, and Advancement

A good educational background for a beginning job in a large life or casualty company is a bachelor's degree with a major in mathematics or statistics; a degree in actuarial science is even better. Some companies hire applicants with a major in engineering, economics, or business administration, provided they demonstrate a thorough foundation in calculus, probability, and statistics (20-25 hours). Other desirable courses are insurance law, economics, and accounting. Although only 25 colleges and universities offer a degree in actuarial science, several hundred schools offer a degree in mathematics or statistics.

A strong background in mathematics is essential for persons interested in a career as an actuary. Of equal importance, however, is the need to pass while in school one or more of the examinations offered by professional societies. Three societies sponsor programs leading to full professional status in their speciality. The Society of Actuaries gives 9 actuarial examinations for the life and health insurance and pension field, the Casualty Actuarial Society gives 10 examinations for the property and liability field, and the American Society of Pension Actuaries gives nine examinations covering the pension field. Because the first parts of the examination series of each society cover similar materials, students need not commit themselves to a career specialty until they have taken about four examinations. Success in passing the first few examinations helps students evaluate their potential as actuaries. Those who pass these examinations usually have better opportunities for employment and receive a higher starting salary.

Actuaries are encouraged to complete an entire series of examinations as soon as possible. It generally takes from 5 to 10 years to complete the series required for full professional status. Examinations are given twice each year. Extensive home study is required in order to pass the advanced examinations; many actuaries spend as much as 20-25 hours a week studying. Actuaries who complete five examinations in either the life insurance series or the pension series or seven examinations in the casualty series are awarded "associate" membership in their respective society. Those who have passed an entire series receive full membership and the title "fellow."

Consulting pension actuaries who service private pension plans and certify their solvency must be enrolled by the Joint Board for the Enrollment of Actuaries. Applicants for enrollment must meet certain experience and education requirements as stipulated by the Joint Board.

Beginning actuaries often rotate among different jobs to learn various actuarial operations and to become familiar with different phases of insurance work. At first, their work may be rather routine, such as preparing calculations or tabulations for actuarial tables or reports. As they gain experience, they may supervise actuarial clerks, prepare correspondence and reports, and do research.

Advancement to more responsible work as assistant, associate, and chief actuary depends largely on job performance and the number of actuarial examinations passed. Many actuaries, because of their broad knowledge of insurance and related fields, are selected for administrative positions in other company activities, particularly in underwriting, accounting, or data processing departments. Many actuaries advance to top executive positions.

Employment Outlook

Employment of actuaries is expected to rise faster than the average for all occupations through the mid-1980's. In addition to job openings resulting from this growth, several hundred actuaries will be needed each year to replace those who retire, die, or transfer to other occupations. Job opportunities will be best for new college graduates who have passed at least two actuarial examinations while still in school and have a strong mathematical and statistical background. However, because of the large number of persons expected to receive degrees in actuarial science, mathematics, and statistics, and the large number of students taking actuarial examinations, competition for beginning jobs should remain keen.

Employment in this occupation is influenced to a great extent by the volume of insurance sales, which will continue to grow over the next decade. Shifts in the age distribution of the population through the mid-1980's will result in many more people with established careers and family responsibilities. This is the group that traditionally has accounted for the bulk of private insurance sales.

Increased sales, however, are only one determinant of the demand for actuaries. In addition, changes in existing insurance practices are creating a need for more actuarial services. As more and more insurance

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companies branch out into more than one kind of insurance coverage, a greater number of actuaries will be needed to establish the rates for the variety of insurance offered. Growth in sales of relatively new forms of protection, such as dental, prepaid legal, and kidnap insurance will create additional demand for actuaries. As more States pass competitive rating laws, many companies that previously relied on rating bureaus for actuarial data can be expected to expand existing actuarial departments or create new ones.

Recent court decisions concerning product liability have focused much attention on this complex area. In the years ahead, actuaries will be spending a lot of time developing better ways to provide product liability, medical malpractice, and workers' compensation insurance protection.

Adoption of a "no-fault" automobile insurance plan requires companies writing automobile insurance to reevaluate their pricing structures in light of no-fault requirements. It is uncertain whether Federal no-fault legislation will be enacted soon; however, the growing number of States enacting no-fault plans or revising existing ones indicates continued strong demand for actuaries to make the required analyses.

ERISA has imposed strict responsibilities on actuaries for the operation and funding of pension plans. As the number of pension plans continues to grow, there will be an increasing need for pension specialists to develop adequately financed plans and to prepare the reports that certify their solvency.

Earnings and Working Conditions

In 1976, actuaries had average salaries more than twice as high as the average for all nonsupervisory workers in private industry, except farming. New college graduates entering the life insurance field without having passed any actuarial exams averaged $10,600 in 1976, according to a survey of U.S. companies by the Life Office Management Association (LOMA). Applicants who had successfully completed the first exam received $11,200 and those who had passed two exams averaged $11,800.

In the Federal Government, new graduates with the bachelor's degree could start at $9,300 a year in 1977. Applicants with either 1 year of graduate study or relevant work experience were hired at $11,500, and those with the master's degree or 2 years' experience started at $14,100 a year. Actuaries in the Federal Government averaged $25,100 a year in 1977.

Beginning actuaries can look forward to a marked increase in earnings as they gain professional experience and advance in an actuarial society's examination program. Life insurance companies usually give merit increases averaging from $500 to $850 to their actuaries as they pass each successive examination leading to membership in the Society of Actuaries. Associates who received that designation in 1976 averaged $16,500 a year; salaries for actuaries who were awarded a full fellowship during that year averaged $24,800. Fellows with additional years of experience earned substantially more—top actuarial executives averaged about $43,000 in 1976.

Although data are not available for salaries paid actuaries in casualty companies or consulting firms, it is believed that salaries for these specialists generally are comparable to those paid by life insurance companies.

Sources of Additional Information

For facts about actuarial opportunities and qualifications, contact:

American Society of Pension Actuaries, 1700 K St., NW., Washington, D.C. 20006.

Casualty Actuarial Society, 200 East 42nd St., New York, N.Y. 10017.

Society of Actuaries, 208 South LaSalle St., Chicago, Ill. 60604.

CLAIM REPRESENTATIVES

(D.O.T. 168.288, 241.168, and 249.268)

Nature of the Work

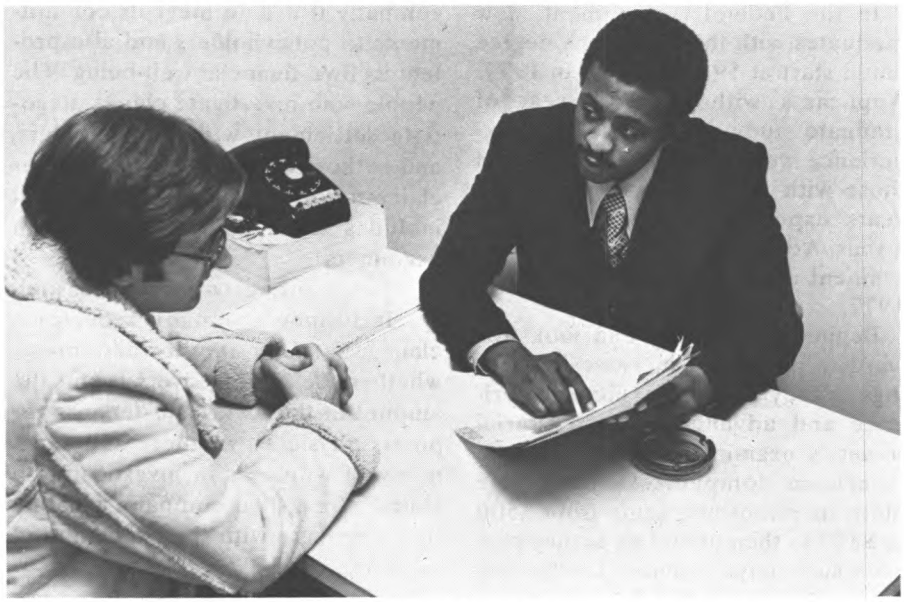
Fast and fair settlement of all claims is essential to any insurance company if it is to meet its commitments to policyholders and also protect its own financial well-being. The people who investigate claims, negotiate settlement with policyholders, and authorize payment are known as claim representatives—a group that includes claim adjusters and claim examiners.

When a property-liability (casualty) insurance company receives a claim, the *claim adjuster* determines whether the policy covers it and the amount of the loss. Adjusters use reports, physical evidence, and testimony of witnesses in investigating a claim. When their company is liable, they negotiate with the claimant and settle the case.

Adjusters must make sure that settlements are in line with the real extent of the loss. They must protect their company from false or inflated claims but, at the same time, settle valid claims fairly and promptly. Some adjusters are allowed to issue checks on company funds; most, however, submit their findings to claim examiners who review them to insure that proper procedures have been followed and then authorize payment.

Some adjusters work with all lines of insurance. Others specialize in claims from property damage by fire, marine loss, automobile damage, workers' compensation loss, or product liability. Several States have "no-fault" automobile insurance plans that relieve the adjuster from determining responsibility for a loss. Adjusters in these States still must decide the amount of loss, however. A growing number of casualty companies employ special claims people to settle small claims, usually minor automobile or homeowner damage claims. These claim workers, generally called "inside adjusters" or "telephone adjusters," contact claimants by telephone or mail and have the policyholder send repair costs, medical bills, and other statements to the company. Many companies centralize this operation in a drive-in claims center where the cost of repair is determined and a check is issued on the spot.

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Claims adjuster gathering evidence in investigating a claim.

Adjusters work away from the office most of the time. They may be called to the site of an accident or to the location of a fire or burglary. Adjusters make their own schedules of the activities needed to dispose of a claim properly. They also keep written or taped records of information obtained from witnesses and other sources and prepare reports of their findings.

In life insurance companies, the counterpart of the claim adjuster is the *claim examiner*, who investigates the details surrounding questionable claims or those exceeding a specified amount. They may check claim applications for completeness and accuracy, interview medical specialists, consult policy files to verify information on a claim, or calculate benefit payments. Generally, examiners are authorized to investigate and approve payment on all claims up to a certain limit; larger claims are referred to a senior examiner.

Examiners checking incorrect or questionable claims may correspond with investigating companies, field managers, agents, or the family of the insured. Claim examiners occasionally travel to obtain information by personal interview, or contact State insurance departments and other insurance companies. In addition to verifying claims and approving payment, examiners also maintain records of settled claims and prepare reports to be submitted to their company's data processing department. Some experienced examiners serve on committees, conduct surveys of claim practices within their company, and help devise more efficient ways to process claims. They, like claim adjusters, sometimes testify in court on contested claims.

Places of Employment

About 155,000 persons worked as claim representatives in 1976.

The majority of claim adjusters worked for insurance companies that sell property and liability coverage. Some were employed by independent adjusting firms that contract their services for a fee. These independent firms range from national companies employing hundreds of adjusting specialists to small 3- or 4-person local operations. A relatively small number of adjusters represent the insured rather than the insurance company. These "public adjusters" usually are retained by banks, financial organizations, and other business firms to handle fire and other losses to property. They negotiate claims against insurance companies and deal with adjusters for such companies.

Most claim examiners worked for life insurance companies in large cities such as New York, San Francisco, Chicago, Dallas, and Philadelphia, where most home offices are located.

Adjusters may travel to almost any area of the United States, since claims must be settled locally. Occasionally, an experienced adjuster may travel to the scene of a disaster, such as a hurricane or a riot, to work with local personnel. Some cases result in travel outside the United States.

Training, Other Qualifications, and Advancement

Although a growing number of insurance companies prefer claim representatives to have a college degree, many hire those without college training, particularly if they have specialized experience. For example, persons experienced in automobile repair work may qualify as auto adjusters, and those with clerical work experience might be hired as inside adjusters.

No specific field of college study is recommended. Although courses in insurance, economics, or other business subjects are helpful, a major in almost any college field is adequate preparation. An adjuster who has a business or accounting background might specialize in loss from business interruption or damage to merchandise. Those with college training in engineering will find their education helpful in adjusting industrial claims. A legal background is most helpful to those handling workers' compensation and product liability cases.

Most large insurance companies provide beginning claim adjusters and examiners on-the-job training and home study courses. Claim representatives are encouraged to take courses designed to enhance their professional skills. For example, the Insurance Institute of America offers a six-semester study program leading to an associate degree in claims adjusting upon successful completion of six examinations. Adjusters can prepare for these examinations by independent home study or through company or public classes. A professional Certificate in Insurance Adjusting also is available from the College of Insurance in New York City.

The Life Office Management Association (LOMA) in cooperation with the International Claim Associ-

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ation offers a claims education program for life and health examiners. The program is part of the LOMA Institute Insurance Education Program leading to the professional designation, FLMI (Fellow, Life Management Institute) upon successful completion of eight written examinations.

About three-fourths of the States require adjusters to be licensed. Despite wide variation in State licensing requirements, applicants usually must comply with one or more of the following: Pass a written examination covering the fundamentals of adjusting; furnish character references; be 20 or 21 years of age and a resident of the State; offer proof that they have completed an approved course in insurance or loss adjusting; and file a surety bond.

Because they often work closely with claimants, witnesses, and other insurance professionals, representatives must be able to adapt to many different persons and situations. They should be able to communicate effectively and gain the respect and cooperation of people from different backgrounds. For example, when adjusters' evaluations of claims differ from those of the persons who have suffered the loss, they should be able to explain their conclusions tactfully. Examiners need to be familiar with medical and legal terms and practices and Federal and State insurance laws and regulations. Because they may have to check premium payments, policy values, and other numerical items in processing a claim, examiners should be adept at making mathematical calculations. Both adjusters and examiners should have a good memory and enjoy working with details.

Beginning adjusters and examiners work on small claims under the supervision of an experienced worker. As they learn more about claim investigation and settlement, they are assigned claims that are higher in loss value and more difficult. Trainees are promoted as they demonstrate competence in handling assignments and progress in the courses they take. Because of the complexity of insurance regulations and claims procedures, workers who lack formal academic training may advance more slowly than those with 2 years or more of college. Employees who show unusual competence in claims work or outstanding administrative skills may be promoted to department supervisor in a field office or to a managerial position in the home office. Qualified adjusters and examiners sometimes transfer to other departments, such as underwriting or sales.

Employment Outlook

Employment of claim representatives is expected to grow about as fast as the average for all occupations through the mid-1980's as the number of insurance claims continues to increase. In addition to jobs created by growth of the occupation, many others will result from the need to replace workers who die, retire, or transfer to other jobs.

Several factors point to a growing volume of insurance and a resulting need for claim adjusters. Over the next decade a steadily rising number of workers will be entering their most productive years. These workers and their families are likely to seek insurance protection as they purchase homes, automobiles, and other consumer durables. New or expanding businesses will need protection for new plants and equipment and for insurance covering their employees' health and safety. As more people live and work in densely populated areas, the increased risk of automobile accident, fire, or theft should result in a greater number of claims.

As ways of doing business continue to change, the demand for certain kinds of claim adjusters will be stronger than for others. For example, the growing trend toward drive-in claim centers and claim handling by telephone should reduce the demand for automobile adjusters while it stimulates demand for inside adjusters. Independent adjusters who specialize in automobile damage claims should continue to suffer some loss of business. Prospects should be very good, however, for adjusters who specialize in highly complex types of business insurance such as marine cargo, workers' compensation, and product liability.

A similar situation exists for claim examiners. Employment of examiners in casualty companies should rise about as fast as for adjusters; however, much slower growth is expected for life insurance examiners as increased use of computers enables them to process more claims, especially routine ones and those that arise under group policies.

Earnings and Working Conditions

According to a recent survey of property and liability companies, claim adjusters averaged about $13,000 a year in 1976; inside adjusters earned average salaries of about $9,900. Most public adjusters are paid a percentage of the amount of the settlement—generally 10 percent. Adjusters are furnished a company car or are reimbursed for use of their own vehicles for business purposes. Salaries of claim adjusters are about one and one-half times the average earnings for all nonsupervisory workers in private industry, except farming; salaries of inside adjusters are slightly above the average for all nonsupervisory work

A survey of life insurance companies by the Life Office Management Association revealed that claim examiners earned average salaries of $13,300 a year in 1976. According to the survey of property and liability companies, casualty claim examiners averaged $15,280. Claim supervisors in casualty companies and life companies averaged $17,300 a year. Claim examiners earn more than 1 1/2 times the average for all nonsupervisory workers in private industry, except farming.

Claim adjusting is not a desk job. It requires that a person be physically fit because much of the day may be spent in traveling from one place to another, walking about outdoors, and climbing stairs. Adjusters may have to work evenings or weekends in order to interview witnesses and claimants when they are available. Since most companies provide 24-hour claim service to their policyholders, some adjusters always must be on call. (See the statement on the Insurance Industry for additional information on working conditions and employee benefits.)

Claim examiners have desk jobs that require no unusual physical ac-

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tivity. Although the average workweek for examiners is 35 to 40 hours, they may work longer at times of peak claim loads or when quarterly and annual statements are prepared. They also may need to travel occasionally.

Sources of Additional Information

General information about a career as a claim examiner or adjuster is available from the home offices of many life and property and liability insurance companies.

Information about licensing requirements for claim adjusters may be obtained from the department of insurance in each State.

Information about career opportunities in these occupations also may be obtained from:

Insurance Information Institute, 110 William St., New York, N.Y. 10038.

American Mutual Insurance Alliance, 20 N. Wacker Dr., Chicago, Ill. 60606.

The National Association of Independent Insurers, Public Relations Department, 2600 River Rd., Des Plaines, Ill. 60018.

For information about public insurance adjusting, contact:

National Association of Public Adjusters, 1613 Munsey Building, Baltimore, Md. 21202.

Career information on life insurance claim examining is available from:

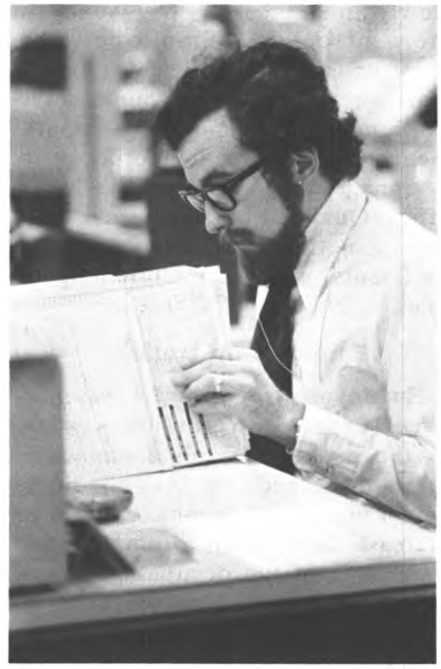
American Council of Life Insurance, 1850 K St., NW., Washington, D.C. 20006.

UNDERWRITERS

(D.O.T. 169.188)

Nature of the Work

Insurance companies assume millions of dollars in risks each year by transferring chance of loss from their policyholders to themselves. Underwriters appraise and select the risks their company will insure. (The term underwriter sometimes is used in referring to insurance agents; see the statement on insurance agents and brokers elsewhere in the *Handbook* for a discussion of that occupation.)



Underwriters analyze information presented on policy applications.

Underwriters decide whether their companies will accept risks after analyzing information in insurance applications, reports from loss control consultants, medical reports, and actuarial studies (reports that describe the probability of insured loss). Some routine applications that require very little independent judgment are handled by computers. Generally, however, underwriters use considerable personal judgment in making decisions. Because these decisions are seldom reviewed at a higher level, underwriters have great responsibility. Their companies may lose business to competitors if they appraise risks too conservatively or may have to pay many future claims if their underwriting actions are too liberal.

When deciding that a policy is an acceptable risk, an underwriter may outline the terms of the contract, including the amount of the premium. Underwriters frequently correspond with policyholders, agents, and managers about policy cancellations or requests for information. In addition, they sometimes accompany salespeople on appointments with prospective customers.

Most underwriters specialize in one of three major categories of insurance: life, property and liability, or health. They further specialize in group or individual policies. The property and liability underwriter specializes by type of risk insured, such as fire, automobile, marine, or workers' compensation. Some underwriters, called commercial account underwriters, handle business insurance exclusively. They often must evaluate a firm's entire operation in appraising its insurance application. There is a growing trend in casualty companies toward "package" underwriting, where various types of risks are insured under a single policy. In such a situation, the underwriter would have to be familiar with several different lines of insurance rather than specializing in a single line.

An increasing proportion of total insurance sales is being made through group contracts. A standard group insurance policy insures all persons in a specified group through a single contract at uniform premium rates; this type of group policy generally provides life or health insurance protection. The group underwriter analyzes the overall composition of the group to be sure that total risk is not excessive. A different type of group policy finding increasing acceptance is the policy that provides the members of a group—a labor union, for example—with individual policies geared to their own circumstances. These policies generally are in the casualty field, covering automobiles, pleasure boats, and homes. The casualty underwriter analyzes the application of each group member and makes individual appraisals. Some group underwriters attend meetings with union or employer representatives to discuss the types of policies available to their groups.

Places of Employment

An estimated 25,000 persons worked as insurance underwriters in 1976. Over three-fourths were property and liability underwriters working in regional or home offices throughout the United States; most life insurance underwriters are in home offices in a few large cities, such as New York, San Francisco, Chicago, Dallas, and Philadelphia.

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Training, Other Qualifications, and Advancement

For beginning underwriting jobs, most large insurance companies seek college graduates who have a degree in liberal arts or business administration, but a major in almost any field provides a good general background. Some small companies hire persons with less than a college degree for underwriter trainee positions. In addition, some high school graduates who begin as underwriting clerks may be trained as underwriters after they demonstrate an aptitude for the work.

Underwriter trainees begin by evaluating routine applicants under the close supervision of an experienced risk appraiser. They study claim files to become familiar with factors associated with certain types of losses. As they develop the sound judgment that is required, they are assigned policy applications that are more complex and have a greater face value.

Continuing education is a necessity if the underwriter expects to advance to senior level positions. Insurance companies generally place great emphasis on completion of one or more of the recognized independent study programs. Many companies pay tuition and the cost of books for those who satisfactorily complete underwriting courses; some offer salary increases as an additional incentive. Independent study programs are available through the American Institute of Property and Liability Underwriters, the American College of Life Underwriters, the Academy of Life Underwriters, the Health Insurance Association of America, and the Life Office Management Association.

Underwriting can be a satisfying career for persons who like working with details and enjoy relating and evaluating information. In addition to analyzing problems, underwriters must make prompt decisions and be able to communicate their ideas to others. They must also be imaginative and aggressive, especially when they have to get additional information from outside sources.

Experienced underwriters who complete study courses may advance to chief underwriter or underwriting manager. Some underwriting managers are promoted to senior managerial jobs after several years.

Employment Outlook

Employment of underwriters is expected to rise about as fast as the average for all occupations through the mid-1980's as insurance sales continue to expand. Each year many jobs will become available as the occupation grows and as those who die, retire, or transfer to other work are replaced.

Several factors underlie the expected growth in the volume of insurance and the resulting need for underwriters. Over the next decade, a much larger portion of our population will enter their most productive years. As this traditional market for life insurance expands, the volume of insurance sales also should rise. This will occur as more individuals purchase life insurance to protect their families' standard of living, finance their children's education, or provide retirement income. Property and liability insurance sales also should expand as purchases of automobiles, pleasure boats, and other consumer durables increase. Both spending for new home construction and the American public's growing security consciousness should contribute to demand for more extensive insurance protection. New or expanding businesses will need protection for new plants and equipment and insurance for workers' compensation and product liability. Heightened competition among insurance companies and changes in regulations affecting investment profits also are expected to increase the insurance industry's need for competent underwriters.

Earnings and Working Conditions

Underwriters in life insurance who had 2 to 4 years' experience averaged $12,600 a year in 1976, according to a Life Office Management Association (LOMA) survey. Senior life underwriters (those with 5 to 8 years' experience) averaged $16,600, while senior group underwriters earned average salaries of $17,400. Supervisors of underwriting in life insurance companies averaged $17,500 to $23,000. In most cases, underwriters in larger companies earned higher salaries.

A recent survey of companies that sell property and liability insurance showed that underwriters with 2 to 4 years' experience averaged $12,300 a year in 1976. Earnings varied substantially by underwriting specialty, however: personal lines underwriters earned average salaries of $11,700, while those specializing in surety bonds averaged $14,300. Senior underwriters earned substantially higher incomes—personal lines underwriters averaged $15,200 while those specializing in commercial lines received an average of $15,000 a year. Experienced underwriters earn about 1 1/2 times the average earnings of nonsupervisory workers in private industry, except farming. Underwriting supervisors in property and liability companies averaged $17,500 a year in 1976.

Most underwriters have desk jobs that require no unusual physical activity. Although the average week is 37 hours, underwriters sometimes work overtime. Most insurance companies have liberal vacation policies and other employee benefits. (See the statement on the Insurance Industry for additional information on working conditions and employee benefits.)

Sources of Additional Information

General information about a career as an insurance underwriter is available from the home offices of many life insurance and property and liability insurance companies. Information about career opportunities as an underwriter also may be obtained from:

American Council of Life Insurance, 1850 K St., NW., Washington, D.C. 20006

Insurance Information Institute, 110 William St., New York, N.Y. 10038.

American Mutual Insurance Alliance, 20 N. Wacker Dr., Chicago, Ill. 60606.

The National Association of Independent Insurers, Public Relations Department, 2600 River Rd., Des Plaines, Ill. 60018.

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ADMINISTRATIVE AND RELATED OCCUPATIONS

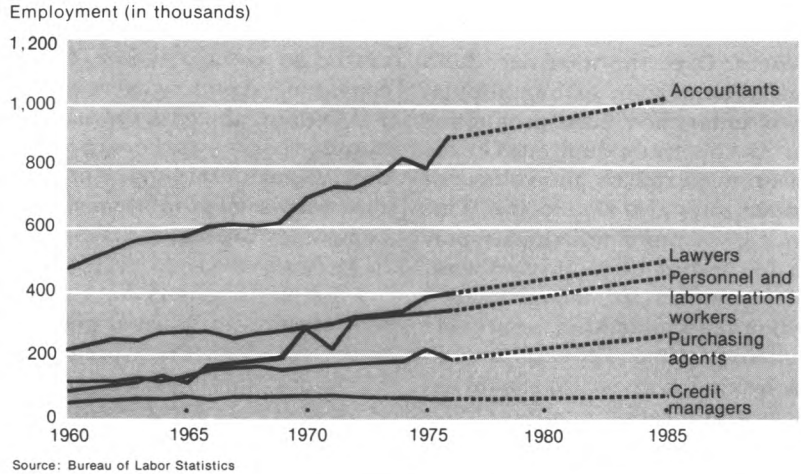
Most administrative workers are professional office employees who run, or help run, business and other organizations. Some are managers, who supervise, plan operations, and make company policy. Others provide assistance to managers, such as personnel workers who recruit and hire staff members or accountants, whose information helps managers make difficult decisions. The success or failure of an organization depends heavily on the way administrative workers do their jobs.

Nearly all administrative jobs require a college degree, although employers vary in the specific area of study they prefer. Some seek business administration or liberal arts graduates; others want a background in a technical area such as engineering or science.

Many administrative workers solve problems and make decisions using numbers and technical data. In addition, these workers must be tactful and able to get along with others. They also must be able to handle the uneven flow of work in offices.

This section describes several administrative occupations including city managers, accountants, credit officials, and personnel and labor relations workers.

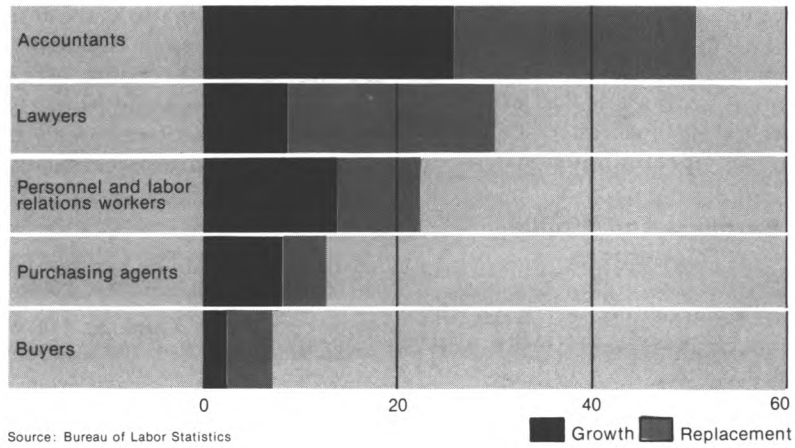
The number of employees in administrative occupations varies widely by occupation



Source: Bureau of Labor Statistics

Openings vary greatly among administrative and related occupations

Selected administrative and related occupations
Average annual openings, 1976-85 (in thousands)



Source: Bureau of Labor Statistics

ACCOUNTANTS

(D.O.T. 160.188)

Nature of the Work

Managers must have up-to-date financial information to make important decisions. Accountants prepare and analyze financial reports that furnish this kind of information.

Three major accounting fields are public, management, and government accounting. Public accountants have their own businesses or work for accounting firms. Management accountants, also called industrial or private accountants, handle the financial records of the company they work for. Government accountants examine the records of government agencies and audit private businesses and individuals whose dealings are subject to government regulations.

Accountants often concentrate on one particular phase of accounting. For example, many public accountants specialize in auditing (reviewing a client's financial records and reports to judge their reliability). Others specialize in tax matters, such as preparing income tax forms and advising their clients of the advantages and disadvantages of certain business

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Traveling auditor reviewing financial records at a company plant.

decisions. Still others become specialists in management consulting and give advice on a variety of matters. They might develop or revise an accounting system to serve the needs of clients more effectively or give advice about different types of accounting equipment.

Management accountants provide the financial information executives need to make sound business decisions. They may choose to work in areas such as taxation, budgeting, or investments. Internal auditing is an area of specialization within management accounting that is rapidly growing in importance. Accountants who work as internal auditors examine and evaluate their firm's financial systems and management control procedures to ensure efficient and economical operation.

Many accountants in the Federal Government work as Internal Revenue agents, investigators, and bank examiners; other government accountants have regular accounting positions.

Places of Employment

About 865,000 people worked as accountants in 1976. Almost 20 percent were Certified Public Accountants (CPA's) and nearly 12 percent were Certified Internal Auditors (CIA's).

About 60 percent of all accountants do management accounting work; one-fifth of these work as internal auditors. An additional 25 percent are engaged in public accounting as proprietors, partners, or employees of independent accounting firms. Other accountants work for Federal, State, and local government agencies, and a small number teach in colleges and universities. Opportunities are plentiful for part-time work in accounting, particularly in smaller firms.

Accountants are found in all business, industrial, and government organizations. Most, however, work in large urban areas where many public accounting firms and central offices of large businesses are concentrated. For example, over 20 percent of all accountants are employed in just four major cities: Chicago; Los Angeles; New York; and Washington, D.C.

Training, Other Qualifications, and Advancement

Training in accounting is available at colleges and universities, accounting and business schools, and correspondence schools. Although many graduates of business and correspondence schools are successful in small firms, most large public accounting and business firms require applicants for accountant and internal auditor positions to have at least a bachelor's degree in accounting or a closely related field. Many employers prefer those with the master's degree in accounting. A growing number of large employers prefer applicants who are familiar with computer technology for both accounting and internal auditor positions. For beginning accounting positions, the Federal Gov-

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ernment requires 4 years of college training (including 24 semester hours in accounting) or an equivalent combination of education and experience. For teaching positions, most colleges and universities require at least the master's degree or the Certified Public Accountancy Certificate.

Previous work experience in accounting can help an applicant get a job. Many colleges offer students an opportunity to gain experience through internship programs conducted by public accounting or business firms.

Anyone working as a "certified public accountant" must hold a certificate issued by the State board of accountancy. All states use the CPA examination, prepared by the American Institute of Certified Public Accountants, to establish certification. Most successful candidates have college degrees, and three-fourths of the States require CPA candidates to be college graduates. Nearly all States require applicants to have at least 2 years of public accounting experience for a CPA certificate.

Requirements vary, but more than half the States restrict the title "public accountant" to those who are licensed or registered. Some States require only a high school diploma while others require 2 years of college or more. Information on requirements may be obtained directly from individual State boards of accountancy or from the National Society of Public Accountants.

The recognized mark of competence and experience in the field of internal auditing is the designation, Certified Internal Auditor (CIA). The Institute of Internal Auditors, Inc., confers this designation upon candidates who have completed 3 years' experience in internal auditing and who have passed a four-part examination. Beginning in 1978, a bachelor's degree from an accredited college or university also will be required.

Persons planning a career in accounting should have an aptitude for mathematics. Neatness and accuracy also are necessary. Employers seek applicants who can handle responsibility and work with little supervision.

To get to the top in the profession, accountants usually must continue their study of accounting even though they already have a college degree or professional certificates. They may participate in seminars sponsored by various professional associations or take courses offered by their employers. A growing number of States require both CPA's and licensed public accountants to complete a certain number of hours of continuing education courses before their licenses can be renewed. An increasing number of accountants study computer operation and programming to adapt accounting procedures to new data processing methods. Although capable accountants should advance rapidly, those having inadequate academic preparation may be assigned routine jobs and find promotion difficult.

Junior public accountants usually start by assisting with auditing work for several clients. They may advance to intermediate positions with more responsibility in 1 or 2 years and to senior positions within another few years. In larger firms, those who deal successfully with top industry executives often become supervisors, managers, or partners, or transfer to executive positions in private firms. Some open their own public accounting offices.

Beginning management accountants often start as ledger accountants, junior internal auditors, or as trainees for technical accounting positions. They may advance to jobs such as chief plant accountant, chief cost accountant, budget director, or manager of internal auditing. Some become controllers, treasurers, financial vice-presidents, or corporation presidents. In the Federal Government, beginners are hired as trainees and usually are promoted in a year or so. In college and university teaching, those having minimum training and experience may receive the rank of instructor without tenure; advancement and permanent faculty status depend upon further education and teaching experience.

Employment Outlook

Employment is expected to increase about as fast as the average for all occupations through the mid-1980's as businesses and government agencies continue to expand in size and complexity. In addition to jobs resulting from growth, many thousands of openings will result each year when workers die, retire, or leave the occupation.

Demand for skilled accountants will rise as managers rely more on accounting information to make business decisions. For example, officers of large corporations base their decisions concerning proposals such as plant expansion, mergers, or foreign investments on information about the financial condition of the firm, tax implications of the proposed action, and other considerations. On a smaller scale, owners of small businesses are expected to rely more and more on the expertise of public accountants in planning their operations. Government legislation to monitor business activity also is expected to add to the demand for accountants. An example is the Pension Reform Act of 1974, which establishes minimum standards for private pension plans. This and other legislation should create many new jobs for management accountants to maintain new systems and public accountants to audit them.

Because of the growing complexity of business, college graduates will be in greater demand than applicants who lack this training. Many employers prefer graduates who have worked part time in a business or accounting firm while in school. Those who have been trained in a specific phase of accounting should find ample opportunities.

As data processing systems continue to replace manual preparation of accounting records and statements, the need for some accountants to perform routine tasks, particularly in large firms, may be reduced. However, many opportunities will arise for accountants without a college degree, mainly in small businesses and public accounting firms.

Earnings and Working Conditions

Starting salaries of beginning accountants in private industry were $11,500 a year in 1976, according to a survey in urban areas. Earnings of

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experienced accountants ranged between $15,400 and $23,400, depending on their level of responsibility and the complexity of the accounting system. In general, experienced accountants earn about twice as much as nonsupervisory workers in private industry, except farming. Chief accountants who direct the accounting program of a company or one of its establishments earned between $20,500 and $33,900, depending upon the scope of their authority and size of professional staff.

According to the same survey, beginning auditors averaged $11,800 a year in 1976, while experienced auditors' earnings ranged between $16,100 and $20,000.

In the Federal Civil Service, the entrance salary for junior accountants and auditors was about $9,300 in 1977. Candidates who had a superior academic record received a starting salary of about $11,500. Applicants with a master's degree or 2 years' professional experience began at about $14,100. Accountants in the Federal Government averaged about $21,800 a year in 1977.

Accountants who specialize in income tax preparation work long hours under heavy pressure during the tax season; those employed by national accounting firms may travel extensively to conduct audits and perform other services for their clients. The majority, however, work in one office between 35 and 40 hours a week, under the same general conditions as fellow office workers.

Sources of Additional Information

Information about CPA's and about aptitude tests in high schools, colleges, and public accounting firms may be obtained from:

American Institute of Certified Public Accountants, 1211 Avenue of the Americas, New York, N.Y. 10036.

Further information on specialized fields of accounting is available from:

National Association of Accountants, 919 Third Ave., New York, N.Y. 10022.

National Society of Public Accountants, 1717 Pennsylvania Ave. NW., Washington, D.C. 20006.

Institute of Internal Auditors, 249 Maitland Ave., Altamonte Springs, Fla. 32701.

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ADVERTISING WORKERS

(D.O.T. 050.088; 132.088; 141.081 and .168; 162.158; and 164.068 through .168)

Nature of the Work

Almost every business, from a small grocery store to a large bank, does some form of advertising to pursuade people to buy its products or use its services. Advertising requires the talents of people in many different kinds of jobs. Creative workers such as writers, artists, and designers develop and produce advertisements, while people with business and sales ability handle the arrangements for broadcasting the advertisements on radio and television, publishing them in newspapers or magazines, mailing them directly, or posting them on billboards. The following occupations are those most commonly associated with advertising.

Advertising managers direct the advertising program of the businesses for which they work. They determine the size of the advertising budget, the type of ad and the media to use, and what advertising agency, if any, to employ. Managers who decide to employ an agency work closely with the advertising specialists from the agency. These managers may supervise the preparation of pamphlets, brochures, or other materials developed to promote the firm's products or services. Advertising managers working for newspapers, radio stations, and other communications media have somewhat different duties. They are responsible for selling advertising time or space, and do work that is similar to the work of sales managers in other businesses.

Account executives are employed by advertising agencies to develop advertising programs for client firms and individuals. They first study the client's sales, public image, and advertising problems, and then create a program that suits the client's needs. In most agencies, artists and copywriters are responsible for developing the actual artwork and advertising copy, but in some small agencies, the account executives have this responsibility.

Research directors and their assistants study the market. They review possible uses for the product or service being sold, compare its advantages or disadvantages with those of competitors, and suggest ways of reaching potential buyers. To develop market information, these workers may survey buying habits and motives of customers, or try out sample ads to find the theme or medium that best sells the product. (See the statement on marketing research workers for more information on this occupation.)

Advertising copywriters develop the headlines and text to be used in the ads. By studying information about the product and its potential customers, they are able to write copy aimed at the particular group of customers the advertiser seeks to attract. They may specialize in writing copy for a certain group of people, such as business managers, teenagers, or sports lovers, or for a class of products, such as cars or computer equipment. Copywriters usually work closely with account executives. In some agencies, they may be supervised by copy chiefs.

Artists and *layout workers* create the visual impact of an ad by selecting photographs, drawing illustrations or figures, and selecting the size or type of print to be used in a magazine or newspaper ad. When television commercials are planned, they usually sketch sample scenes for the client to consider. (See the statements on commerical artists and photographers for more information on this type of work.)

Media directors (or *space buyers* and *time buyers*) negotiate contracts for advertising space or air time. They determine the day and time when a television commercial will reach the largest group of prospective buyers at the lowest cost. To select the best medium for the advertiser, media directors must know the costs of using various media and the characteristics of the audience reached by specific publications or television stations.

Production managers and their assistants arrange to have the ad printed for publication, filmed for television, or recorded for radio. They

must know which firms or freelance workers will be able to produce the best ad for the least cost.

Places of Employment

In 1976, about 180,000 people worked in jobs requiring considerable knowledge of advertising. Those employed in advertising agencies were heavily concentrated in New York City, Los Angeles, and Chicago.

Many others worked in the advertising departments of manufacturing firms, retail stores, banks, power companies, professional and trade associations, and many other organizations. Some people had advertising jobs with television or radio stations, newspapers, and magazines. Still other people in the advertising field worked for printers, art studios, letter shops, package design firms, and similar businesses.

Training, Other Qualifications, and Advancement

Most employers prefer college graduates. Some employers seek persons with degrees in advertising with heavy emphasis on marketing, business, and journalism; others prefer graduates with a liberal arts background (social science, literature, art, and other disciplines); some employers place little emphasis on the type of degree.

No particular educational background is equated with success in advertising. In fact, relevant work experience may be more important than educational background. Experience selling ads for school publications or radio stations, or on a summer job with a marketing research service, can be a distinct advantage to the jobseeker.

Some organizations recruit outstanding college graduates for training programs that cover all aspects of advertising work. In other firms, employees immediately enter a specialty and do not gain such all-round experience. Some beginners start as research or production assistants or as space or time buyers. A few begin as junior copywriters.

Many advertising jobs require imagination, creativity, and a flair for language. These traits are especially important to artists, layout workers, and account executives. All creative effort must be directed toward the sales function. People interested in becoming advertising managers, account executives, media buyers, and production managers must be able to get along well with people and be able to sell their ideas. Research directors and their assistants must have an understanding of human behavior. All advertising workers must be able to accept criticism of their work and be able to function as part of a team.

Opportunities for advancement in this field generally are excellent for creative, talented, and hard-working people. For example, copywriters and account executives may advance to more responsible work in their specialties, or to managerial jobs, if they demonstrate ability in dealing with clients. Some especially capable workers may become partners in an existing agency, or they may establish their own agency.

Employment Outlook

Employment of advertising workers is expected to increase faster than the average for all occupations through the mid-1980's. Most openings, however, will result from the need to replace workers who die, retire, or leave the occupation for other reasons.

The growing number of consumer and industrial goods and increasing competition in many product and service markets will cause advertising expenditures to rise. Such expenditures also may be spurred by the growing tendency toward self service in retail marketing. An additional factor is the growing need of small businesses for professional advertising services. Employment in advertising occupations is strongly affected by general business conditions because firms expand or contract their advertising budgets according to their financial success. Although opportunities should be favorable for highly qualified applicants, particularly in retail advertising, others seeking entry jobs will face keen competition because the glamorous nature of the field attracts many people.

Local television, radio, and newspapers are expected to increase their share of total advertising expenditures while direct mail, magazines, and national newspapers continue to lose ground. The few very large agencies that account for nearly all national advertising are expected to maintain fast growth because of their expanding international business.



Advertising can be a satisfying career for persons who enjoy variety, creative challenges, and competition.

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Earnings and Working Conditions

Based on limited information, annual salaries for beginning advertising workers with bachelor's degrees ranged from $8,000 to $10,000 in 1976. Higher starting salaries generally were paid by the largest firms or advertising agencies to outstanding applicants, particularly those with advertising experience.

Salaries of experienced advertising workers varied by size and type of firm as well as by type of job. According to a survey of advertising agencies taken in 1975, average annual salaries of workers in selected occupations were as follows: Chief executive officer, $45,300; account supervisor, $28,400; account executive, $18,500; executive art director, $24,400; art director, $17,100; senior layout artist, $12,900; junior layout artist, $9,300; copy chief, $22,300; senior copywriter, $16,600; junior copywriter, $10,500; media director, $16,800; space or time buyer, $9,400; research director, $24,000; research analyst, $13,500; production manager, $14,400. Several other surveys yielded these results: In 1976, the top advertising officers in large retail firms averaged over $32,000 a year; in 1975, the median salary of advertising directors in large banks ranged from $16,000 to $17,000 a year; in 1975, the average salary of advertising managers in a wide variety of companies ranged from $18,000 to $34,000 a year, depending upon the annual sales volume of the firm. Salaries of advertising managers generally are higher in consumer than industrial products firms, and many receive incentive compensation.

People in advertising work under great pressure, and do not have the job security enjoyed by workers in many other occupations. These workers are expected to produce quality ads in as short a time as possible. Sometimes they must work long or irregular hours to meet deadlines or make last-minute changes. Account executives, copywriters, and layout workers may become frustrated by a client's inability to define the type of ad he or she wants for a product.

Advertising can be a satisfying career for persons who enjoy variety, excitement, creative challenges, and competition. Unlike workers in many other occupations, advertising workers experience the satisfaction of having their work in print, on television, or on radio, even though they remain unknown to the public at large.

Sources of Additional Information

Information on advertising agencies and the careers they offer is available from:

American Association of Advertising Agencies, 200 Park Ave. New York, N.Y. 10017.

For additional information on careers and a list of colleges that provide training in advertising, contact:

American Advertising Federation, 1225 Connecticut Ave. NW., Washington, D.C. 20036.

BUYERS

(D.O.T. 162.158 and 185.168)

Nature of the Work

The Americans have been invited to a private showing in Paris. Representing a major New York department store, they sit with a select group in an elegantly furnished room. They watch closely as graceful models float down the runway before them to display the latest creations by the world's most famous designers. After some consultation, they make choices involving thousands, perhaps millions of dollars. All in a day's work.

The job of retail buyer often brings to mind the glamour of high fashion; indeed, many fashion buyers do lead exciting, fast-paced lives involving frequent travel abroad. Not every buyer, however, deals in fashion. All merchandise sold in a retail store—garden furniture, automobile tires, toys, aluminum pots, and canned soups alike—appears in that store on the decision of a buyer. Although all buyers seek to satisfy their stores' customers and sell at a profit, the kind and variety of goods they purchase depend on the store where they work. A buyer for a small clothing store, for example, may purchase its complete stock of merchandise from sportswear to formal evening clothes. Buyers who work for larger retail businesses often handle one or a few related lines of goods, such as men's wear, ladies' sportswear, or children's toys. Some, known as *foreign buyers*, purchase merchandise outside the United States.

In order to purchase the best selection of goods for their stores, buyers must be familiar with the manufacturers and distributors who handle the merchandise they need. They also must keep informed about changes in existing products and the development of new ones. To learn about merchandise, buyers attend fashion and trade shows and visit manufacturers' showrooms. They usually order goods during buying trips, and also place orders with wholesale and manufacturers' sales workers who call on them to display their merchandise.

Buyers must be able to assess the resale value of goods after a brief inspection and make a purchase decision quickly. They are aware of their stores' profit margins and try to select merchandise that will sell quickly at well above the original cost. Since most buyers work within a limited budget, they must plan their purchases to keep needed items always in stock but also allow for unexpected purchases when a "good buy" presents itself.

Because buyers purchase merchandise for their firms to resell (unlike purchasing agents who buy goods for direct use by the firm—see the statement on purchasing agents elsewhere in the *Handbook*), they must know what motivates customers to buy. Before ordering a particular line of merchandise, buyers study market research reports and analyze past sales records to determine what products are currently in demand. They also work closely with assistant buyers and sales clerks whose daily contact with customers furnishes information about consumer likes and dislikes. In addition, buyers read fashion and trade magazines to keep abreast of style and manufacturing trends; follow ads in newspapers and

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Buyer in a large department store discusses quality of merchandise with manufacturer's representative.

other media to check retail competitors' sales activities; and watch general economic conditions to anticipate consumer buying patterns.

Merchandise managers (D.O.T. 185.168) plan and coordinate buying and selling activities for large and medium-sized stores. They divide the budget among buyers, decide how much merchandise to stock, and assign each buyer to purchase certain goods. Merchandise managers may review buying decisions to insure that needed categories of goods are in stock, and help buyers to set general pricing guidelines.

Buyers and merchandise managers usually have very busy schedules and deal with many different people in the course of a day. They work with manufacturers' representatives, other store personnel including store executives and sales workers, and customers. Assisting with sales promotions and creating enthusiasm among sales personnel are part of the buyer's job, and he or she may be asked to provide information such as dress sizes and product descriptions to the advertising department for a sales promotion, or to meet with floor sales workers before a new line of merchandise is introduced. Some buyers direct assistants who handle routine aspects of purchasing such as verifying shipments; others supervise department managers.

Some buyers represent large stores or chains in cities where many manufacturers are located. The duties of these "market representatives" vary by employer; some purchase goods, while others supply information and arrange for store buyers to meet with manufacturers when they are in town.

New technology has altered the buyer's role in retail chain stores. In the past, firms employed a buyer for each store or group of stores in a local area. Now cash registers connected to a computer, known as point-of-sale terminals, allow retail chains to maintain centralized, up-to-the-minute inventory records. With these records, a single garden furniture buyer, for example, can purchase lawn chairs and picnic tables for the entire chain.

Places of Employment

In 1976, approximately 109,000 buyers and merchandise managers worked for retail firms. Although jobs for buyers are found in all parts of the country, most jobs are in major metropolitan areas where retail stores are concentrated. Market representatives work for buying offices in major market areas such as New York, Chicago, and Dallas.

Training, Other Qualifications, and Advancement

Distributive education programs at thousands of high schools have launched careers in retailing leading to a buyer's position. (Additional information on distributive education appears in the statement on retail trade sales workers elsewhere in the *Handbook*.) Indeed, many a good buyer began in a stockroom or behind a counter and worked up the ladder without any college training. However, new buyers will find a college degree increasingly necessary. Many junior and 4-year colleges offer programs in marketing and purchasing and confer thousands of degrees each year. In addition, numerous trade schools train students for careers in fashion merchandising. Courses in merchandising or marketing may help in getting a first job, but most employers accept graduates in any field of study and train them on the job.

Many stores, especially the larger ones, have formal training programs for management or executive trainees, including buyers. These programs usually last from 6 to 8 months and combine classroom instruction in merchandising and purchasing with short rotations to various jobs in the store. This training introduces the new worker to store operations and policies, and provides the fundamentals of merchandising and management as well.

The trainee's first job is likely to be that of assistant buyer. The duties include supervising sales workers, checking invoices on material received, and keeping account of stock on hand. Assistant buyers gradually assume purchasing responsibilities, depending upon their individual abilities and the size of the department where they work. Training as an assistant buyer usually lasts at least a year. After years of working as a buyer, those who show exceptional ability may advance to merchandise

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manager. A few find further promotion to top executive jobs such as general merchandise manager for a retail store or chain. The length of time it takes to reach any of these levels depends not just on the individual's ability but on the store's need for management personnel. The faster the company grows, the greater the opportunity for a worker to acquire responsibility.

Buyers should be good at planning and decisionmaking and have an interest in merchandising. They need leadership ability and communications skills to supervise sales workers and assistant buyers and to deal effectively with manufacturers' representatives and store executives. Because of the fast pace and constant pressure of their work, buyers need physical stamina and emotional stability.

Employment Outlook

Employment of buyers is expected to grow more slowly than the average for all occupations through the mid-1980's. Centralized buying is gaining popularity among chain stores, which are expected increasingly to dominate general merchandise retailing. Although anticipated growth of independent food stores should partially offset these trends, they will still reduce the number of openings for buyers. Most job openings will arise each year from the need to replace workers who leave the occupation. Competition for these jobs is expected to be keen, for merchandising attracts large numbers of college graduates every year. Prospects are likely to be best for qualified applicants who enjoy the competitive nature of retailing and work best in a demanding, fast-paced job.

Earnings and Working Conditions

Buyers for discount department stores and other mass merchandising firms are among the most highly paid in the industry, as are those who buy centrally for large chain department stores. Most earned between $15,000 and $25,000 a year in 1976, though many earned salaries outside this range. Merchandising managers earned considerably more. The actual income depends upon the product line purchased, the sales volume of the store, and the individual's seniority.

Buyers often earn large bonuses for exceptional performance. In addition, many stores have incentive plans, such as profit sharing and stock options.

Buyers regulate their own hours, and often work more than 40 hours a week because of special sales, conferences, and travel. The amount of traveling a buyer does varies with the type of merchandise bought and the location of suppliers, but most spend 4 or 5 days a month on the road. Merchandise managers also travel frequently, averaging several trips a month in many cases.

Sources of Additional Information

General information about a career in retailing is available from:

National Retail Merchants Association, 100 West 31st St., New York, N.Y. 10001.

Information on schools that teach retailing is available from:

United States Office of Education, Division of Vocational/Technical Education, Washington, D.C. 20202.

National Association of Trade and Technical Schools, 2021 L St. NW., Washington, D.C. 20036.

CITY MANAGERS

(D.O.T. 188.118 and 188.168)

Nature of the Work

Population growth and industrial expansion place increasing pressure on housing, transportation, and other facilities of cities. Problems associated with growing modern communities, such as air and water pollution and rising crime rates, also demand attention. To cope effectively with these problems, many communities hire a specialist in management techniques—the city manager.

A city manager usually is appointed by the community's elected officials and is responsible directly to



A city manager often deals with members of the community.

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them. Although duties vary by city size, city managers generally administer and coordinate the day-to-day operations of the city. They are responsible for functions such as tax collection and disbursement, law enforcement, and public works. They also hire department heads and their staffs and prepare the annual budget to be approved by elected officials. In addition, they study current problems, such as traffic congestion, crime, or urban renewal, and report their findings to the elected council.

City managers must plan for future growth and development of cities and surrounding areas. To provide for an expansion of public services, they frequently appear at civic meetings to advocate certain programs or to inform citizens of current government operations.

City managers work closely with planning departments to coordinate new and existing programs. In smaller cities that have no permanent planning staff, coordination may be done entirely by the manager.

To aid the city manager, many cities employ *management assistants*: assistant city managers, department head assistants, and administrative assistants. Under the manager's direction, management assistants administer programs, prepare reports, receive visitors, answer correspondence, generally help to keep the city government functioning smoothly. Assistant city managers organize and coordinate city programs, supervise city employees, and act for the city manager upon occasion. They also may assume responsibility for some projects, such as the development of a preliminary annual budget. Department head assistants generally are responsible for one activity, such as personnel, finance, or law enforcement, but they also may assist in other areas. Administrative assistants, also called executive assistants or assistants to the city manager, usually do administrative and staff work in all departments under the city manager. For instance, they may compile operating statistics or review and analyze work procedures.

Places of Employment

About 3,000 city managers were employed in 1976. In addition, nearly 9,000 persons worked as administrative assistants, department head assistants, and assistant city managers. Most city managers worked for cities and counties that had a council-manager form of government. Under this type of government, an elected council appoints a manager who is responsible for the day-to-day operation of the government as well as for the hiring and firing of assistants, department heads, and other staff. Many other city managers worked for municipalities that had the mayor-council form of government, in which the mayor appoints the city manager as his or her chief administrative officer. A few city managers also worked for county governments, metropolitan or regional planning organizations, and councils of governments. All types of local governments employed management assistants, but larger jurisdictions generally employed them in greater numbers.

Although over three-quarters of all city managers work for small cities having less than 25,000 inhabitants, many larger cities also employ a city manager. About half of the cities having a population of between 10,000 and 500,000 have city managers. City managers work in all States, but one-half are concentrated in the eastern part of the Nation.

Training, Other Qualifications, and Advancement

A master's degree, preferably in public or business administration, is becoming essential for those seeking a career in city management. Although some applicants with only a bachelor's degree may find employment, strong competition for positions, even among master's degree recipients, will make the graduate degree a requirement for most entry level jobs. In some cases, employers may hire a person with training in a field related to public administration, such as engineering, recreation, social work, or political science.

In 1976, 185 colleges and universities offered graduate degree programs in public or municipal administration. Degree requirements in some schools include successful completion of an internship program in a city manager's office. During this internship period, which may last from 6 months to a year, the degree candidate observes local government operations and does research under the direct supervision of the city manager.

Nearly all city managers begin as management assistants. Most new graduates work as administrative assistants to city managers for several years to gain experience in solving urban problems, coordinating public services, and applying management techniques. Others work in a government department such as finance, public works, or public planning. They may acquire supervisory skills and additional experience by working as assistant city manager or department head assistant. City managers often are first employed in small cities, but during their careers they may work in several cities of increasing size.

Persons who plan a career in city management should like to work with detail and to be a part of a team. They must have sound judgment, self-confidence, and the ability to perform well under stress. To handle emergency situations, city managers must quickly isolate problems, identify their causes, and provide a number of possible solutions. City managers should be tactful and able to communicate and work well with people.

City managers also must be dedicated to public service since they often put in long, hard hours in times of crisis.

Employment Outlook

Employment of city managers and local government management assistants is expected to expand faster than the average for all occupations through the mid-1980's as management of our governments becomes more complex. Examples of more sophisticated management techniques include computerized tax and utility billing, electronic traffic control, and application of systems analysis to urban problems. The demand for city managers also will increase as more cities convert to the council-manager form of government, currently the fastest growing form of city government. Furthermore, city managers and management assistants will be

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employed by other types of local government to help elected officials with day-to-day operations of government. Increased emphasis on regional solutions to urban problems should result in additional job opportunities for city managers and management assistants in councils of government.

Persons who seek beginning management assistant jobs may face strong competition through the mid-1980's, especially if they do not have a graduate degree in public administration or related management experience. Competition should be keen among the growing number of administrative assistants, department head assistants, and assistant city managers for the relatively few city manager positions. However, many of those unable to find employment in this area should find jobs in other fields of public administration.

Earnings and Working Conditions

Salaries of city managers and management assistants vary according to education, experience, job responsibility, and city size. Generally, city managers' earnings are very high relative to the average earnings for nonsupervisory workers in private industry, except farming. In 1976, average annual salaries of city managers ranged from about $20,000 in cities of 5,000 inhabitants to more than $40,000 in cities of over 100,000 inhabitants, according to the International City Management Association. The average annual salary for all city managers was more than $23,000. City managers in cities not having council-manager governments received slightly less.

Salaries of management assistants averaged $17,000 in 1976, and ranged from about $12,000 in small cities to more than $20,000 in large ones. Salaries of assistant city managers generally were higher than those of other management assistants.

City managers often work more than 40 hours a week. Emergency problems may require evening and weekend work and meetings with individuals and citizen's groups consume additional time.

Fringe benefits usually include health and life insurance programs, pension plans, sick leave, vacation time, and often a car for official business. Managers generally are reimbursed for expenses incurred while attending professional meetings and seminars.

Sources of Additional Information

For information on a career in city management, contact:

International City Management Association, 1140 Connecticut Ave. NW., Washington, D.C. 20036.

COLLEGE STUDENT PERSONNEL WORKERS

(D.O.T. 045.108, 090.118 and .168, 129.108, and 166.168)

Nature of the Work

A student's choice of a particular institution of higher education is influenced by many factors. Availability of a specific educational program, quality of the school, cost, and location all may play important roles.

For many students, however, an equally important factor is the institution's ability to provide for their housing, social, cultural, and recreational needs. Developing and administering these services are the tasks of college student personnel workers. The admissions officer, the registrar, the dean of students, and the career planning and placement counselor are probably the best known among these. Other workers that make up this broad occupational field include student activities and college union personnel, student housing officers, counselors in the college counseling center, financial aid officers, and foreign student advisers.

Titles of student personnel workers vary from institution to institution and from program to program within a single school. Titles also vary with the level of responsibility within a student personnel program. The more common titles include dean, director, officer, associate dean, assistant director, and counselor.

The *dean of students*, or the vice president for student affairs, heads the student personnel program at a school. Among his or her duties are evaluating the changing needs of the students and helping the president of the college develop institutional policies. For example, to meet the needs of an increasing number of older, part-time students, colleges and universities have been changing policies in areas such as student housing and student participation in decisions on graduation requirements and course offerings. In addition, the dean of students generally coordinates a staff



Student financial aid personnel help students obtain financial support for their education.

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of associate or assistant deans who are in charge of the specific programs that deal directly with the students.

At some schools, the admissions office and the records office are separate. *Admissions counselors* interview and evaluate prospective students and process their applications. They may travel extensively to recruit high school, junior college, and older students and to acquaint them with opportunities available at their college. They work closely with faculty, administrators, financial aid personnel, and public relations staff to determine policies for recruiting and admitting students. Personnel in the office of the *registrar* maintain the academic records of students and provide current enrollment statistics to those who require them both within the college and in the community.

Student financial aid personnel help students obtain financial support for their education. Workers in this field must keep well-informed about the sources and management of all forms of financial aid—scholarships, grants, loans, employment, fellowships, and teaching and research assistantships. They work closely with administrators and the admissions, counseling, business, and academic office staffs.

Career planning and placement counselors, sometimes called college placement officers, assist students in career selections and also may help them get part-time and summer jobs. On many campuses, they arrange for prospective employers to visit the school to discuss their personnel needs and to interview applicants. (For further information on this field, see statement on college career planning and placement counselors.)

The student personnel staff in charge of *student activities* work with members of proposed and established student organizations, especially with student government. They help the student groups to plan, implement, and evaluate their activities. Often, the student activities staff will assist in the orientation of new students.

College union staff members work with students to provide intellectual, cultural, and recreational programs. Many college union staff members direct the operation of the physical facilities and services of the building, such as food and recreational services, building maintenance, fiscal planning, and conference facilities.

Student housing officers sometimes live in the dormitories and, in general, help the students to live together in harmony. They may serve as counselors to individual students with personal problems. Housing officers also may be involved in managing the fiscal, food service, and housekeeping operations of student residences.

Counselors help students with personal, educational, and vocational problems. Students may come to the counselors on their own or be referred by a faculty member, a residence hall counselor, or a friend. Counseling needs may arise from lack of self-confidence or motivation on the part of the student, failure in academic work, desire to leave college or transfer to another college, inability to get along with others, loneliness, drug abuse, or marriage problems. In addition, there is a growing trend for counselors to try to reach more students by establishing group sensitivity sessions and telephone "hotlines." Counselors often administer tests that indicate aptitudes and interests to students having trouble understanding themselves. Some also teach in the college or assist with admissions, orientation, and training of residence hall staff. (For further information on this field, see statement on psychologists.)

Foreign student advisers administer and coordinate many of the services that help to insure a successful academic and social experience for students from other countries. They usually assist with foreign student admissions, orientation, financial aid, housing, English as a foreign language, academic and personal counseling, student-community relationships, job placement, and alumni relations. In addition, they may be an adviser for international associations and nationality groups and for U.S. students interested in study, educational travel, work, or service projects abroad.

Places of Employment

An estimated 57,000 college student personnel workers were employed in 1976. Every college and university, whether a 2-year or a 4-year school, has a staff performing student personnel functions. They are not always organized as a unified program. Large colleges and universities generally have specialized staffs for each personnel function. In many small colleges a few persons may carry out the entire student personnel program.

Training, Other Qualifications, and Advancement

Because of the diversity in duties, the education and backgrounds of college student personnel workers vary considerably. Generally, however, a master's degree is preferred and a doctoral degree may be necessary for advancement to top-level positions. Schools often prefer persons with a bachelor's degree in a social science, such as economics or history, and a master's degree in student personnel work. In 1976, 120 colleges and universities offered graduate programs in this area.

Other specialized training may also be required for some student personnel occupations. A master's degree in clinical or counseling psychology usually is required for work as a college counselor. This degree also is helpful in other student personnel fields such as career planning and placement. Familiarity with data processing is an asset, especially for work in admissions, records, or financial aid. Social science and recreation degrees also are useful, as is work experience in business, government, or educational associations.

College student personnel workers must be interested in, and able to work with, people of all backgrounds and ages. They must have the patience to cope with conflicting viewpoints of students, faculty, and parents. People in this field often deal with the unexpected and the unusual; therefore emotional stability and the ability to function while under pressure are necessities.

Entry level positions usually are those of student activities advisers, admissions counselors, financial aid

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counselors, residence hall directors, and assistants to deans. Persons without graduate degrees may find advancement opportunities limited. A doctorate usually is necessary for the top student personnel positions.

Employment Outlook

The employment outlook for college student personnel workers is likely to be somewhat competitive through 1985. Tightening budgets in both public and private colleges and universities, are expected to limit growth in employment. Student personnel positions least likely to be affected if some reduction becomes necessary are those in admissions, financial aid, and records. Most openings will result from the need to replace personnel who transfer to other positions, retire, or leave the field for other reasons.

Any employment growth that does occur is expected to be in junior and community colleges. Enrollment at this level of education has been rising and many new schools have opened. If these recent trends continue, some additional student personnel workers will be needed in 2-year institutions.

Earnings and Working Conditions

Salaries vary greatly depending on geographic location and the size of the school. According to the limited data available, top administrators with at least 5 years of experience averaged between $28,000 and $30,000 a year in 1976. In the larger colleges and universities, salaries reached as high as $46,000.

College student personnel workers frequently wok more than a 40-hour week; often irregular hours and overtime work are necessary. Employment in these occupations usually is on a 12-month basis. In many schools, they are entitled to retirement, group medical and life insurance, and sabbatical and other benefits.

Sources of Additional Information

A pamphlet, *Careers in Higher Education*, is available from:

The American Personnel and Guidance Association, 1607 New Hampshire Ave. NW., Washington, D.C. 20009.

CREDIT MANAGERS

(D.O.T. 168.168)

Nature of the Work

Both businesses and individuals may require credit (the postponement of payment until a future date) to meet their daily needs for a variety of goods and services. For most forms of credit, a credit manager has final authority to accept or reject a credit application.

In extending credit to a business (commercial credit), the credit manager, or an assistant, analyzes detailed financial reports submitted by the applicant, interviews a representative of the company about its management, and reviews credit agency reports to determine the firm's record in repaying debts. The manager also checks at banks where the company has deposits or previously was granted credit. In extending credit to individuals (consumer credit), detailed financial reports usually are not available. The credit manager must rely more on personal interviews, credit bureaus, and banks to provide information about the person applying for credit.

Particularly in large organizations, executive level credit managers are responsible for formulating a credit policy. They must establish financial standards to be met by applicants and thereby determine the amount of risk that their company will accept when offering its products or services for sale on credit. Managers usually cooperate with the sales department in developing a credit policy liberal enough to allow the company's sales to increase and yet strict enough to deny credit to customers whose ability to repay their debts is questionable. Many credit managers establish office procedures and supervise workers who gather information, analyze facts, and perform general office duties in a credit department; they include application clerks, collection workers, bookkeepers, and secretaries.

In smaller companies that handle a limited number of accounts, credit managers may do much of the work of granting credit themselves. They may interview applicants, analyze the information gained in the interview, and make the final approval. They frequently must contact customers who are unable or refuse to pay their debts. They do this through writing, telephoning, or personal contact. If these attempts at collection fail, credit managers may refer the account to a collection agency or assign an attorney to take legal action.

Places of Employment

About 53,000 persons worked as credit managers in 1976. About one-half were employed in wholesale and retail trade, but many others, about one-third of the total, worked for manufacturing firms and financial institutions.

Although credit is granted throughout the United States, most credit managers work in urban areas where many financial and business establishments are located.

Training, Other Qualifications, and Advancement

A college degree is becoming increasingly important for entry level jobs in credit management. Employers usually seek persons who have majored in business administration, economics, or accounting, but may also hire graduates holding liberal arts degrees. Some employers promote high school graduates to credit manager positions if they have experience in credit collection or processing credit information.

Newly hired workers normally begin as management trainees and work under the guidance of more experienced personnel in the credit department. Here they gain a thorough understanding of the company's credit procedures and policies. They may analyze previous credit transactions to learn how to recognize which applicants should prove to be good customers. Trainees also learn to deal with credit bureaus, banks, and other businesses that can provide information on the past credit dealings of their customers.

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A college degree is becoming increasingly important for entry level jobs in credit management.

Many formal training programs are available through the educational branches of the associations that serve the credit and finance field. This training includes home study, college and university programs, and special instruction to improve beginners' skills and keep experienced credit managers aware of new developments in their field.

A person interested in a career as a credit manager should be able to analyze detailed information and draw valid conclusions based on this analysis. Because it is necessary to maintain good customer relationships, a pleasant personality and the ability to speak and write effectively also are characteristics of the successful credit manager.

The work performed by credit managers allows them to become familiar with almost every phase of their company's business. Highly qualified and experienced managers can advance to top-level executive positions. However, in small and medium-sized companies, such opportunities are limited.

Employment Outlook

Through the mid-1980's employment is expected to grow more slowly than the average for all occupations. Despite this relatively slow growth, many jobs will become available each year due to the need to replace persons who leave the occupation. Although there will be opportunities throughout the country, employment prospects should continue to be best for well-qualified jobseekers in metropolitan areas.

The volume of credit extended rose very rapidly during the past decade. In the years ahead, businesses can be expected to require increasing amounts of credit to secure raw materials for production and obtain finished goods for eventual resale. It is in the area of business credit where demand for credit managers will be strongest.

Consumers, whose personal incomes have risen, are expected to finance greater numbers of high-priced items. In addition, the use of credit for everyday purchases is expected to grow as demand increases for recreation and household goods as well as for consumer services. Despite increases in consumer debt, the use of computers for storing and retrieving information will enable this greater volume of information to be processed more efficiently. The use of telecommunications networks enables retail outlets to have immediate access to a central credit office, regardless of distance.

Another factor that is expected to slow the growth in the number of credit managers is the increased use of bank credit cards. As stores substitute bank credit cards for their own charge accounts, credit departments may be reduced or eliminated.

Earnings and Working Conditions

In 1976, credit manager trainees who had a college degree earned annual salaries that ranged from about $10,000 to $11,000, depending on the type of employer and the geographic location of the job.

Assistant credit managers averaged about $12,000 to $14,000 a year and credit managers had average earnings of about $17,000. Individuals in top-level positions often earn over $40,000 a year.

Credit managers normally work the standard workweek of their company—35-40 hours, but some work longer hours. In wholesale and retail trade, for example, a seasonal increase in credit sales can produce a greater work volume. Some credit managers attend conferences sponsored by industry and professional organizations where managers meet to develop and discuss new techniques for the management of a credit department.

Sources of Additional Information

Information about a career in consumer credit may be obtained from:

International Consumer Credit Association, 375 Jackson Ave., St. Louis, Mo. 63130.

National Consumer Finance Association, 1000 16th St., NW., Washington, D.C. 20036.

For information about training programs available in commercial credit, write:

National Association of Credit Management, 475 Park Ave. South, New York, N.Y. 10016.

HOTEL MANAGERS AND ASSISTANTS

(D.O.T. 163.118 and 187.118, .168)

Nature of the Work

Hotel managers are responsible for operating their establishments profit-

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ably and satisfying guests. They determine room rates and credit policy, direct the operation of the kitchen and dining rooms, and manage the housekeeping, accounting, and maintenance departments of the hotel. Handling problems and coping with the unexpected is an important part of the job.

Managers who work in small hotels may do much of the front office clerical work, such as taking room reservations and assigning rooms. In some small hotels and many motels, the manager is also the owner and may be responsible for all aspects of the business.

General managers of large hotels usually have several assistants who manage various parts of the operation. Because the hotel restaurant and cocktail lounge are important to the success of the entire establishment, they almost always are operated by managers with experience in the restaurant field. Other areas that usually are handled separately are advertising, rental of banquet and meeting facilities, personnel, and accounting.

Large hotel and motel chains often centralize some activities, such as purchasing and advertising, so that individual hotels in the chain may not need managers for these departments. Managers who work for chains may be assigned to organize a newly built or purchased hotel or to reorganize an existing hotel or motel that is not operating successfully.



General managers of large hotels usually have several assistants who manage various parts of the operation.

About 137,000 hotel and motel managers worked in 1976. More than a third were self-employed.

Training, Other Qualifications, and Advancement

Experience generally is the most important consideration in selecting managers. However, employers increasingly are emphasizing college education. A bachelor's degree in hotel and restaurant administration provides particularly strong preparation for a career in hotel management. In 1976, about 30 colleges and universities offered 4-year programs in this field. However, applicants to these programs may face increasing competition in the coming years. The courses in hotel work that are available in many junior colleges and technical institutes and through the American Hotel and Motel Association also provide a good background.

A college program in hotel management usually includes courses in hotel administration, accounting, economics, data processing, food service management and catering, and hotel maintenance engineering. Students are encouraged to work in hotels or restaurants during summer vacations because the experience gained and the contacts made with employers may help them to get better hotel jobs after graduation.

Managers should have initiative, self-discipline, and the ability to organize work and direct the work of others. They must be able to concentrate on details and solve problems.

Some large hotels have special on-the-job management trainee programs in which trainees rotate among various departments to acquire a thorough knowledge of the hotel's operation. Outstanding employees who have not had college training may receive financial assistance to help them acquire a degree.

Most hotels promote employees with proven ability, usually front office clerks, to assistant manager and eventually to general manager. Newly built hotels, particularly those without well-established on-the-job training programs, often prefer experienced personnel for managerial positions. Hotel chains may offer better opportunites for advancement than independent hotels, because employees can transfer to another hotel in the chain or to the central office if an opening occurs.

Employment Outlook

Employment of hotel managers is expected to grow more slowly than the average for all occupations through the mid-1980's. Some job openings will occur as additional hotels and motels are built and chain and franchise operations spread. However, most openings will occur as experienced managers die, retire, or leave the occupation. Applicants having college degrees in hotel administration will have an advantage in seeking entry positions and later advancement.

See the statement on the Hotel Industry elsewhere in the *Handbook* for information on earnings and working conditions, sources of additional information, and more information on employment outlook.

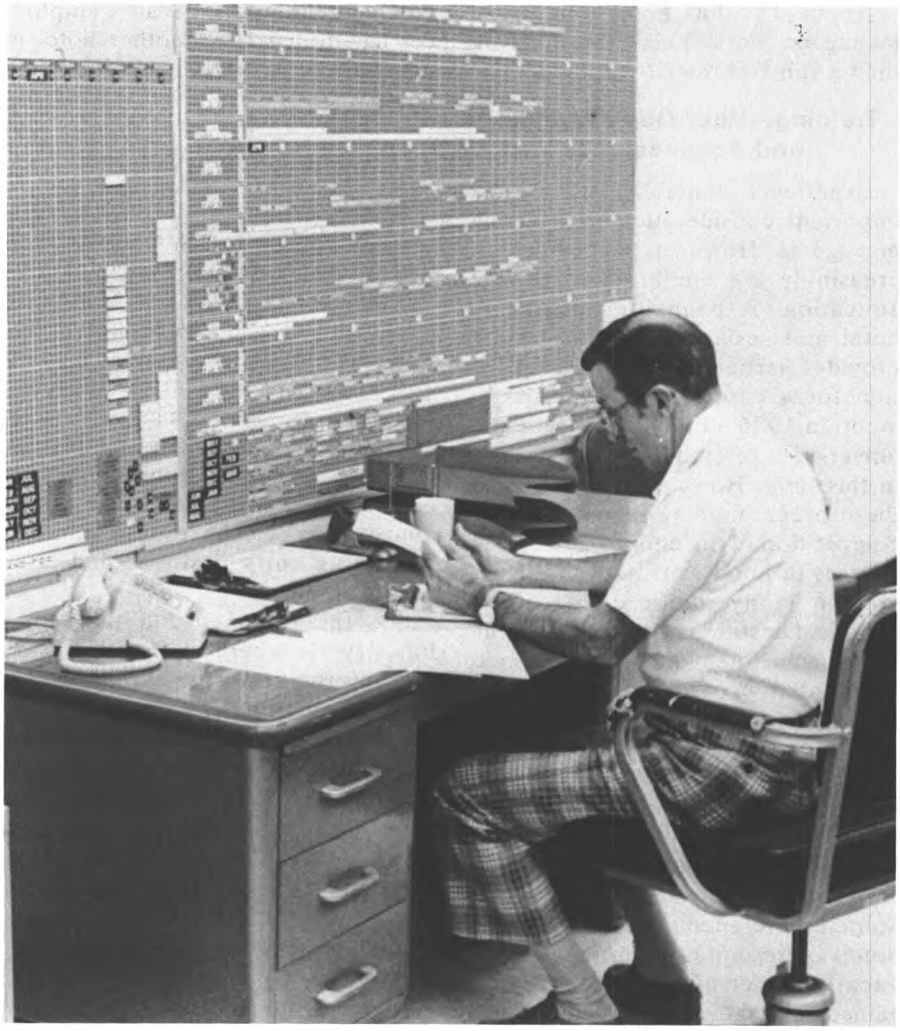
INDUSTRIAL TRAFFIC MANAGERS

(D.O.T. 184.168)

Nature of the Work

Industrial firms want to receive raw materials and deliver customers' goods promptly, safely, and with minimum cost. Arranging for the transportation of materials and finished products is the job of an industrial traffic manager. Industrial traffic managers analyze various transportation possibilities and choose the most efficient type for their companies' needs—rail, air, road, water, pipeline, or some combination. Then they select the route and the particular carrier. To make their decision, traffic managers consider factors such as freight classifications and regulations, freight charges, time schedules, size of shipments, and loss and damage ratios. (This statement does not cover traffic managers who sell transportation services for railroads, airlines, trucking firms, and other freight carriers.)

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Industrial traffic managers arrange the transportation of materials and finished products.

Activities of industrial traffic managers range from checking freight bills to deciding whether the company should buy its own fleet of rail cars or trucks or contract for services. They route and trace shipments, arrange with carriers for transportation services, prepare bills of lading and other shipping documents, and handle claims for lost or damaged goods. Traffic managers keep records of shipments, freight rates, commodity classifications, and applicable government regulations. They also must stay informed about changing transportation technology.

Traffic managers often consult with other company officials about the firm's transportation needs. They may, for example, work with production department personnel to plan shipping schedules, or with members of the purchasing department to determine what quantities of goods can be transported most economically.

Since many aspects of transportation are subject to Federal, State, and local government regulations, traffic managers must know about these and any other legal matters that apply to their companies' shipping operations. High level traffic managers represent their companies before ratemaking and regulatory bodies such as the Interstate Commerce Commission, State commissions, and local traffic bureaus.

Places of Employment

More than 21,000 persons were involved in industrial traffic management in 1976. Although most jobs are found in manufacturing firms, some traffic managers work for wholesalers or for large retail stores. Some traffic managers work for consulting firms that handle transportation problems for clients; a few run their own consulting businesses.

Training, Other Qualifications, and Advancement

Although high school graduates with experience in traffic departments sometimes are hired as traffic managers, a college education is increasingly important in this field. For some kinds of work, college training is required. To argue cases before the Interstate Commerce Commission, for example, a traffic manager must meet standards that include at least 2 years of college. Some employers prefer graduates of technical and trade school programs in traffic management. Others seek college and university graduates who have either majored, or taken courses, in transportation, logistics, physical distribution, management, economics, statistics, marketing, computer science, and commercial law.

Industrial traffic training is available through colleges and universities, technical and trade schools, and seminars sponsored by professional associations. More than 100 colleges and universities offer programs or courses in traffic management. College courses in this field often are offered as part of a major program in business administration. In some colleges and universities, however, traffic management is taught in departments of logistics, transportation, or marketing and distribution. In addition to degree programs at the associate, baccalaureate, and graduate levels, a number of colleges and universities offer workshops, seminars, and other short-term programs in transportation and traffic management.

Industrial traffic managers should be able to analyze numerical and technical data such as freight rates and classifications to solve transportation problems. The job also requires the ability to work independently and to present facts and figures in a convincing manner.

Newly hired traffic specialists often complete shipping documents and calculate freight charges. After gaining experience, they do more technical work such as analyzing

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transportation statistics. A competent worker may advance to a supervisory job such as supervisor of rates and routes; a few are promoted to assistant traffic manager and eventually to traffic manager. Industrial traffic managers can sometimes help their chances for advancement by participating in company-sponsored training programs or taking advanced courses in traffic management. A growing number are certified by the American Society of Traffic and Transportation, Inc.

Employment Outlook

Industrial traffic management is a relatively small occupation and is expected to grow about as fast as the average for all occupations through the mid-1980's. Openings will occur each year as new jobs are created, and as traffic managers die, retire, or leave the field for other reasons. College graduates with a major in traffic management or transportation can expect first consideration for the available jobs.

Growth in the occupation will stem from an increasing emphasis on reducing the cost of receiving raw materials and distributing finished products. As the distance between markets becomes greater and rate schedules and regulations governing transportation more complex, manufacturers increasingly will require the expertise of the traffic manager.

Earnings and Working Conditions

Industrial traffic specialists' salaries started at about $11,000 a year in 1976, according to the limited information available. Although earnings of experienced traffic managers vary, in general they are much higher than the average for all nonsupervisory workers in private industry, except farming. Some traffic executives earned $50,000 a year or more.

Although industrial traffic managers usually have a standard workweek, some of them have to spend time outside regular working hours preparing reports, attending meetings, and traveling to hearings before State and Federal regulatory agencies.

Sources of Additional Information

Answers to specific questions about a career in traffic management are available from:

American Society of Traffic and Transportation, Inc., 547 West Jackson Blvd., Chicago, Ill. 60606.

For a list of colleges, universities, and technical institutes that offer instruction in transportation and related areas, see: *Directory of Transportation Education*, published in 1976 by the U.S. Department of Transportation (Washington, D.C., U.S. Government Printing Office). The directory is available in many school and public libraries.

For a copy of the American Trucking Association's *Directory of Transportation Education in U.S. Colleges and Universities*, write:

American Trucking Associations, Inc., 1616 P St. NW., Washington, D.C. 20036.

For information on proprietary schools that offer programs in traffic management, contact:

National Association of Trade and Technical Schools, 2021 L St. NW., Washington, D.C. 20036.

LAWYERS

(D.O.T. 110.108, .118, and 119.168)

Laws permeate every aspect of our society. They regulate the entire spectrum of relationships among individuals, groups, businesses, and governments. They define rights as well as restrictions, covering such diverse human activities as judging and punishing criminals, granting patents, drawing up business contracts, paying taxes, settling labor disputes, constructing buildings, and administering wills.

Because social needs and attitudes are continually changing, the legal system that regulates our social, political, and economic relationships also is subject to change. The task of keeping the law responsive to human needs is the work of lawyers. Also called attorneys, lawyers are the link between the legal system and society. To perform this role, they must understand the world around them and be sensitive to the numerous aspects of society that are touched by the law. They must comprehend not only the words of a particular statute, but the human circumstances it addresses as well.

As our body of laws grows more voluminous and complex, as the legal system takes on new regulatory tasks in social welfare, racial integration, energy conservation, and other areas, the work of lawyers takes on wider significance.

Nature of the Work

Lawyers perform a wide variety of tasks, but certain basic activities are common to nearly every attorney's work. Probably the most fundamental of all is interpretation of the law. Every attorney, whether representing the defendant in a murder trial or the plaintiff (suing party) in a lawsuit, combines an understanding of the relevant laws with knowledge of the facts in the particular case in order to determine how the first affects the second. Based on this determination, the attorney decides what courses of action would best serve the interests of the party he or she represents.

In order to interpret the law knowledgeably, lawyers do research. They must stay abreast of their field, in both legal and nonlegal matters. An attorney representing electronics manufacturers, for example, must follow trade journals as well as the latest Federal regulations affecting his or her clients. Attorneys in the State Department must remain well-versed in current events and international law, while divorce lawyers spend a certain portion of their time reading about the changing role of the family in modern society. Research also includes specific, in-depth reading on the legal questions or substantive matters of an individual case. In any event, the overwhelming volume of literature to be digested requires a lawyer to conduct research efficiently, quickly picking out and evaluating the substance of a particular article or court case.

Usually a lawyer's work also involves contact with people. Attorneys consult with their clients to determine the details of their specific

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problems, advise them of the law, and suggest actions that might or must be taken. To be effective, a lawyer learns to deal with people in a courteous, efficient fashion.

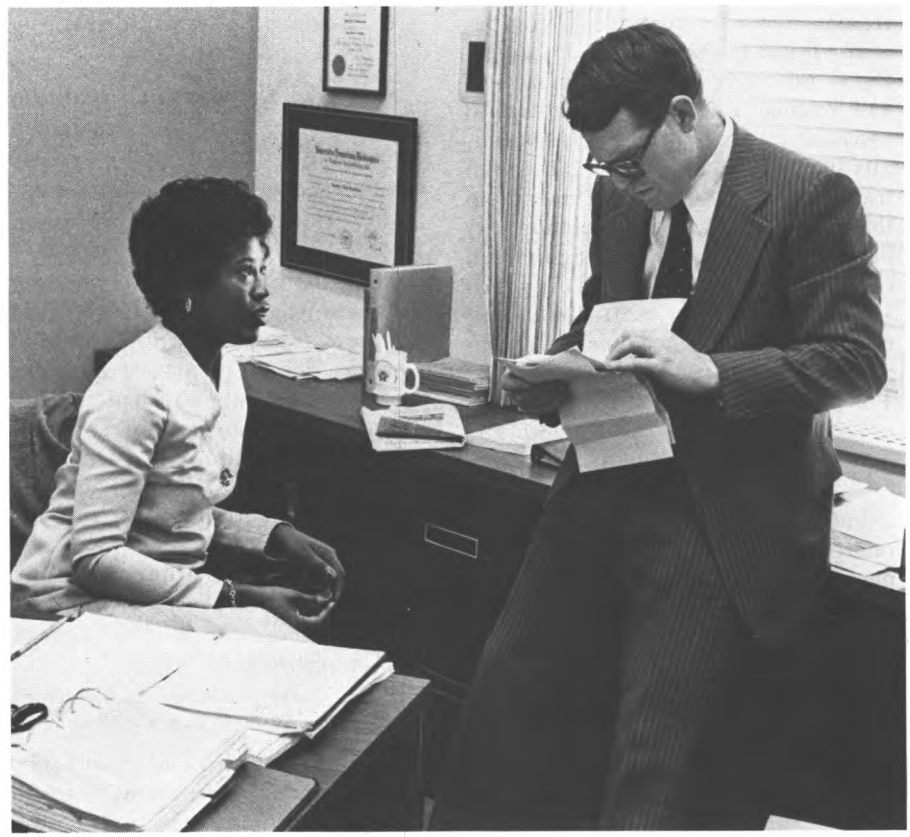
Finally, most lawyers must do some writing in the course of their work. This may take the form of reports, legal briefs, or administrative paperwork. In all cases, the attorney calls upon his or her ability to communicate clearly and precisely.

The more detailed aspects of the legal profession depend upon the lawyer's individual field and position. Most lawyers are engaged in general practice and handle all kinds of legal work for clients. They counsel the individual who wants to buy property, make a will, sign a contract, or settle an estate. These lawyers perform whatever tasks are necessary to help their client comply with the law.

A significant number specialize in one branch of law, such as corporate, criminal, labor, patent, real estate, tax, or international law. Communications lawyers, for example, may represent radio and television stations in their dealings with the Federal Communications Commission (FCC). They help established stations prepare and file license renewal applications, employment reports, and other documents required by the FCC on a regular basis. They also keep their clients informed of changes in FCC regulations. Communications lawyers give similar assistance to individuals or corporations wishing to buy or sell a station or establish a new one.

Other lawyers specialize in representing public utilities before the Federal Power Commission (FPC) and other regulatory agencies. For example, they handle matters involving the reasonableness of utility rates. They help a firm develop its case, assist in preparing strategy, arguments, and testimony, prepare the case for presentation at a trial or administrative hearing, and argue the case. These lawyers also keep clients informed about changes in regulations and advise them as to the legality of their actions.

Private practitioners specialize in other areas, too. Some draw up wills, trusts, contracts, mortgages, and other legal documents; conduct out-of-court negotiations; and do investigative and other legal work to prepare for trials. Some may act as trustees by managing a person's property and funds, or as executors by seeing that the provisions of their client's will are carried out. A small number of lawyers devote themselves entirely to courtroom work. An increasing number handle only so-called public interest cases. These cases, either civil or criminal, have a potential impact extending well beyond the individual client. Attorneys who take these cases hope to use them as a vehicle for legal and social reform.



Corporate lawyers reviewing legal matters pertaining to the company.

Some lawyers are employed full time by a single client. Known as house counsel, these lawyers usually work for a corporate firm, advising and acting on legal questions that arise from the company's business activities. These questions may involve patents for new productions, FTC regulations, a business contract with another company, or a collective bargaining agreement with a union.

Attorneys employed at the various levels of government constitute still another category. Criminal lawyers may work in the office of a State attorney general; they also may be employed by a prosecutor's or public defender's office, or by the court itself. At the Federal level, attorneys perform investigations for the Justice Department and regulatory agencies. Lawyers at every level of government also help develop laws and programs; they prepare drafts of proposed legislation, establish law enforcement procedures, and argue cases.

Many people who have legal training do not work as lawyers but use their knowledge of law in other occupations. They may, for example, be journalists, management consultants, financial analysts, insurance claim adjusters, tax collectors, probation officers, and credit investigators. A legal background also is an asset to those seeking or holding public office.

Places of Employment

About 396,000 persons worked as lawyers in 1976. Almost three-fourths of them, 280,000, practiced privately, with about 40 percent in

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solo practice and the other 60 percent working in law firms. Of the remaining 116,000, about one-third were employed as house counsel by various business firms; one-fourth worked in the Federal Government; the remainder held positions in State and local government. In addition, about 8,000 lawyers taught full or part time in law schools. Some salaried lawyers also have independent practices; others do legal work part time while in another occupation.

Training, Other Qualifications, and Advancement

In order to practice law in the courts of any State, a person must be admitted to its bar. Applicants for admission to the bar must pass a written examination; however, a few States drop this requirement for graduates of their own law schools. Lawyers who have been admitted to the bar in one State occasionally may be admitted in another without taking an examination provided they meet that State's standards of good moral character and have a specified period of legal experience. Each Federal court or agency sets its own qualifications for those practicing before it.

To qualify for the bar examination in most States, an applicant must have completed 3 years of college and have graduated from a law school approved by the American Bar Association (ABA) or the proper State authorities. (ABA approval signifies that the law school meets the minimum standards necessary to allow its graduates to take the bar exam and practice law in any State. Graduates of nonapproved schools are restricted to the State in which the school is located.) A few States accept the study of law wholly in a law office or in combination with study in a law school; only California accepts the study of law by correspondence as qualification for taking the bar exam. Several States require registration and approval of students by the State Board of Examiners, either before they enter law school or during the early years of legal study. In a few States, candidates must complete clerkships before they are admitted to the bar.

Although there is no nationwide bar exam, most States and the District of Columbia participate in the Multistate Bar Examination (MBE). The MBE, covering issues of broad interest, is given in addition to the State bar exam; how the MBE score is treated varies from State to State.

The required college and law school education usually takes 7 years of full-time study after high school—4 years of undergraduate study followed by 3 years in law school. Although a number of law schools accept students after 3 years of college, an increasing number require applicants to have a bachelor's degree. To meet the needs of students who can attend only part time, a number of law schools have night or part-time divisions which usually require 4 years of study. In 1976, about one-fifth of all graduates of ABA-approved schools were part-time students.

Competition for admission to law school has become intense in the last few years. Enrollments rose very rapidly between 1969 and 1972, and, according to one estimate, applications outnumbered available openings by almost 10 to 1 in the mid-1970's. Although the increase in enrollments is expected to slow by the 1980's, law school admission will remain the first of several hurdles for prospective lawyers.

Preparation for a career as a lawyer really begins in college. Although there is no such thing as a "prelaw major," the undergraduate program almost always makes a difference. Certain courses and activities are desirable because they give the student the skills needed to succeed both in law school and in the profession. Essential skills—the ability to write, to read and analyse, to think conceptually and logically, and to communicate verbally—are learned during high school and college. The best undergraduate program is one that cultivates these skills while at the same time broadening the student's view of the world. Majors in the social sciences, natural sciences, and humanities all fill the bill, as long as the student does not specialize too narrowly.

Students interested in a particular aspect of the law may find it helpful to take related courses; for example, engineering and science courses for the prospective patent attorney, and accounting for the future tax lawyer. In addition, typing is advisable simply for convenience in law school.

Acceptance by most law schools depends on the applicant's ability to demonstrate an aptitude for the study of law, usually through good grades and the Law School Admission Test (LSAT), administered by the Educational Testing Service. In 1976, 163 law schools had American Bar Association approval. Others—chiefly night schools—were approved by State authorities only.

The first year or year and a half of law school generally is devoted to fundamental courses such as constitutional law, contracts, property law, and judicial procedure. In the remaining time, students may elect specialized courses in fields such as tax, labor, or corporation law. Practical experience often is acquired by participation in school-sponsored legal aid activities, in the school's practice court where students conduct trials under the supervision of experienced lawyers, and through writing on legal issues for the school's law journal. Graduates receive the degree of *juris doctor* (J.D.) from most schools as the first professional degree. Advanced study often is desirable for those planning to specialize, do research, or teach in law schools.

The practice of law involves a great deal of responsibility. Persons planning careers in law should like to work with people and ideas, and be able to win the confidence of their clients.

Most beginning lawyers start in salaried positions, although some go into independent practice immediately after passing the bar examination. Newly hired salaried attorneys usually act as research assistants (law clerks) to experienced lawyers or judges. After several years of progressively responsible salaried employment, many lawyers go into practice for themselves. Some lawyers, after years of practice, become judges.

Employment Outlook

A rapid increase in the number of law school graduates has created

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keen competition for the available jobs. In the years ahead, the number of graduates is expected to increase further and intensify this competition.

Employers will be selective in hiring new lawyers. Graduates of well-known law schools and those who rank high in their classes should find salaried positions with law firms, on the legal staffs of corporations and government agencies, and as law clerks for judges. Graduates of less prominent schools and those with lower scholastic ratings will experience some difficulty in finding salaried jobs. However, many will find opportunities in fields where legal training is an asset but not normally a requirement.

The employment of lawyers is expected to grow faster than the average for other occupations through the mid-1980's as increased business activity and population create a demand for attorneys to deal with a growing number of legal questions. Supreme Court decisions extending the right to counsel for persons accused of lesser crimes, the growth of legal action in the areas of consumer protection, the environment, and safety, and an expected increase in the use of legal services by middle-income groups through prepaid legal service programs also should provide employment opportunities. Other jobs will be created by the need to replace lawyers who die, retire, or leave the occupation for other reasons.

Prospects for establishing a new practice probably will continue to be best in small towns and expanding suburban areas, as long as there already exists an active market for legal services in which the new lawyer can find clients. In such communities competition is likely to be less than in big cities and new lawyers may find it easier to become known to potential clients; also, rent and other business costs are somewhat lower. Nevertheless, starting a new practice will remain an expensive and risky proposition that should be weighed carefully. Salaried positions will be limited largely to urban areas where the chief employers of legal talent—government agencies, law firms, and big corporations—are concentrated.

Earnings and Working Conditions

Lawyers entering practice in 1976 earned a wide range of starting salaries—from about $10,000 to $23,000 a year. Most fell in the $15,000 to $18,000 range. Factors affecting the salaries offered to new graduates include: their academic records; type, size, and location of their employers; and whether the new lawyer has any specialized educational background that the employer requires. The field of law makes a difference, too. Patent lawyers, for example, tend to earn more than general corporate attorneys. Lawyers with at least a year's experience working in manufacturing and business firms earned about $18,000 a year; those with a few years of experience earned $30,000 or more annually. In the Federal Government, annual starting salaries for attorneys in 1977 were $14,097 or $17,056, depending upon academic and personal qualifications. Federal attorneys with some experience earned $24,308 or more a year.

Beginning lawyers engaged in legal-aid work usually receive the lowest starting salaries. New lawyers starting their own practices may earn little more than expenses during the first few years and may need to work part time in other occupations.

Lawyers on salary receive increases as they assume greater responsibility. Incomes of lawyers in private practice usually grow as their practices develop. Private practitioners who are partners in law firms generally earn more than those who practice alone.

Lawyers often work long hours and are under considerable pressure when a case is being tried. In addition, they must keep abreast of the latest laws and court decisions. However, since lawyers in private practice can determine their own hours and workload, many stay in practice well past the usual retirement age.

Sources of Additional Information

Persons considering law as a career will find information on law schools and prelaw study in the *Prelaw Handbook*, published annually (Princeton, N.J.: Educational Testing Service). Copies may be available in public or school libraries. In addition, many colleges and universities have a prelaw advisor who counsels undergraduates about their undergraduate course work, the LSAT, law school applications, and other matters.

Information on law schools and law as a career is available from:

Information Services, The American Bar Association, 1155 East 60th St., Chicago, Ill. 60637. (There may be a slight charge for publications.)

Information on law school accreditation is available from:

Association of American Law Schools, Suite 370, 1 Dupont Circle NW., Washington, D.C. 20036.

For advice on financial aid, contact a law school financial aid officer.

The specific requirements for admission to the bar in a particular State may be obtained at the State capital from the clerk of the Supreme Court or the secretary of the Board of Bar Examiners.

MARKETING RESEARCH WORKERS

(D.O.T. 050.088)

Nature of the Work

Businesses require a great deal of information to make sound decisions on how to market their products. Marketing research workers provide much of this information by analyzing available data on products and sales. If additional information is required but not available, they conduct marketing surveys, by interviewing those likely to have the needed data. They also prepare sales forecasts and make recommendations on product design and advertising.

Most marketing research starts with the collection of facts from sources such as company records, published materials, and experts on the subject under investigation. For example, marketing research workers making sales forecasts may begin by studying the growth of sales volume in several different cities. This growth may then be traced to increases in population, size of the

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Market research workers often test reactions to a company's product.

company's sales force, or amount of money spent on advertising. Other marketing research workers may study changes in the quantity of company goods on store shelves or make door-to-door surveys to get information on company products.

Marketing research workers often are concerned with customers' opinions and tastes. For example, to help decide on the design and price of a new line of television sets, marketing research workers may survey consumers to find out what styles and price ranges are most popular. This type of survey usually is supervised by marketing researchers who specialize in consumer goods; that is, merchandise sold to the general public. They may be helped by statisticians who select a group (or sample) to be interviewed and "motivational research" specialists who phrase questions to produce reliable information. Once the investigation is underway, the marketing researcher may supervise the interviewers as well as direct the office workers who tabulate and analyze the information collected.

Marketing surveys on products used by business and industrial firms may be conducted differently from surveys for consumer goods. Marketing researchers often conduct the interviews themselves to gather opinions of the product. They also may speak to company officials about new uses for it. They must therefore have specialized knowledge of both marketing techniques and the industrial uses of the product.

Places of Employment

About 25,000 full-time marketing research workers were employed in 1976. Most jobs for marketing research workers are found in manufacturing companies, advertising agencies, and independent research organizations. Large numbers are employed by stores, radio and television firms, and newspapers; others work for university research centers and government agencies. Marketing research organizations range in size from one-person enterprises to firms with a hundred employees or more.

New York City has a large number of marketing research workers. Many major advertising agencies, independent marketing organizations, and central offices of large manufacturers are located there. Another large concentration is in Chicago. However, marketing research workers are employed in many other cities as well—wherever there are central offices of large manufacturing and sales organizations.

Training, Other Qualifications, and Advancement

Although a bachelor's degree usually is sufficient for trainees, graduate education is necessary for many specialized positions in marketing research. Graduate study usually is required for advancement, and a sizable number of market researchers have a master's degree in business administration or other graduate degree as well as a bachelor's degree in marketing. Some people qualify for jobs through previous experience in other types of research; university teachers of marketing or statistics, for example, may be hired to head marketing research departments in business firms or advertising agencies.

Bachelor's programs in marketing and related fields, including courses in statistics, English composition, speech, psychology, and economics, are valuable preparation for work in marketing research. Some marketing research positions require specialized skills such as engineering, or substantial sales experience and a thorough knowledge of the company's products. Knowledge of data processing is helpful because of the increasing use of computers in sales forecasting, distribution, and cost analysis.

College graduates may find their first job in any of a number of places: in the market research department of a large company, with a research firm, in a government planning agency, or even in a university marketing department.

Trainees usually start as research assistants or junior analysts. At first, they may do considerable clerical work, such as copying data from published sources, editing and coding questionnaires, and tabulating survey returns. They also learn to conduct interviews and write reports on survey findings. As they gain experience, assistants and junior analysts may assume responsibility for specific marketing research projects, or advance to supervisory positions. An exceptionally able worker may become marketing research director or vice president for marketing and sales.

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Either alone or as part of a team, marketing research workers must be able to analyze problems objectively and apply various techniques to their solution. As advisers to management, they should be able to write clear reports informing company officials of their findings.

Employment Outlook

Opportunities should be best for applicants with graduate training in marketing research or statistics. The growing complexity of marketing research techniques also may expand opportunities in this field for psychologists, economists, and other social scientists.

Marketing research employment rises as new products and services are developed, particularly when business activity and personal incomes are expanding rapidly. In periods of slow economic growth, however, the reduced demand for marketing services may limit the hiring of research workers.

Over the long run, population growth and the increased variety of goods and services that businesses and individuals will require are expected to stimulate a high level of marketing activity. As a result, employment of marketing research workers is expected to grow much faster than the average for other occupations through the mid-1980's.

Competition among manufacturers of both consumer and industrial products will make the appraising of marketing situations increasingly important. As techniques improve and statistical data accumulate, company officials are likely to turn more often to marketing research workers for information and advice.

Earnings and Working Conditions

Salaries for marketing research trainees were about $11,000 a year in 1976, according to the limited information available. Persons with master's degrees in business administration and related fields usually started with salaries around $15,000 a year. Starting salaries varied according to the type, size, and location of the firm as well as the exact nature of the position. Generally, though, starting salaries were somewhat higher and promotion somewhat slower than in other occupations requiring similar training.

Experienced workers such as senior analysts received salaries over $19,000 a year. Earnings were highest, however, for workers in management positions of great responsibility. Directors of marketing research earned well over $25,000 a year in 1976.

Marketing research workers usually work in modern, centrally located offices. Some, especially those employed by independent research firms, may travel for their work. Also, they may frequently work under pressure and for long hours to meet deadlines.

Sources of Additional Information

A pamphlet, "Careers in Marketing" (Monograph Series No. 4), may be purchased for $1.50 from:

American Marketing Association, 222 South Riverside Plaza, Chicago, Ill. 60606.

PERSONNEL AND LABOR RELATIONS WORKERS

(D.O.T. 166.088 through .268; 169.118)

Nature of the Work

Attracting the best employees available and matching them to the jobs they can do best is important for the success of any organization. Today, most businesses are much too large for close contact between owners and their employees. Instead, personnel and labor relations workers provide the link between management and employees—assisting management to make effective use of employees' skills, and helping employees to find satisfaction in their jobs and working conditions. Although some jobs in this field require only limited contact with people outside the office, most involve frequent contact with other people. Dealing with people is an essential part of the job.

Personnel workers and labor relations workers concentrate on different aspects of employer-employee relations. Personnel workers interview, select, and recommend applicants to fill job openings. They handle wage and salary administration, training and career development, and employee benefits. "Labor relations" usually means union-management relations, and people who specialize in this field work for the most part in unionized business firms and government agencies. They help officials prepare for collective bargaining sessions, participate in contract negotiations with the union, and handle labor relations matters that come up every day.

In a small company, personnel work consists mostly of interviewing and hiring, and one person usually can handle it all. By contrast, a large organization needs an entire staff, which might include recruiters, interviewers, counselors, job analysts, wage and salary analysts, education and training specialists, and labor relations specialists, as well as technical and clerical workers.

Personnel work often begins with the *personnel recruiter* or *employment interviewer* (D.O.T. 166.268), who works on a person-to-person basis with present and prospective employees. Recruiters travel around the country, often to college campuses, in the search for promising job applicants. Interviewers talk to applicants, and select and recommend those who appear qualified to fill vacancies. They often administer tests to applicants and interpret the results. Hiring and placement specialists need to be thoroughly familiar with the organization and its personnel policies, for they must be prepared to discuss wages, working conditions, and promotional opportunities with prospective and newly hired employees. They also need to keep informed about equal employment opportunity and affirmative action guidelines. Equal employment opportunity is a complex and sensitive area of personnel work which in some large organizations is handled by special EEO counselors or coordinators. The work of employment counselors, which is similar in a number of ways, is described in a separate statement elsewhere in the *Handbook*.

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Job analysts (D.O.T. 166.068) and *salary and wage administrators* (D.O.T. 169.118) do very exacting work. Job analysts collect and analyze detailed information on jobs, job qualifications, and worker characteristics in order to prepare job descriptions, sometimes called position classifications, that tell exactly what the duties of a job are and what training and skills it requires. Whenever a government agency or large business firm introduces a new job or evaluates existing ones, it calls upon the expert knowledge of the job analyst. Accurate information about job duties also is required when a firm evaluates its pay system and considers changes in wages and salaries. Establishing and maintaining pay systems is the principal job of wage administrators. They devise ways of making sure that pay rates within the firm are fair and equitable, and conduct surveys to see how their pay rates compare with those elsewhere. Being sure that the firm's pay system complies with laws and regulations is another part of the job, one that requires knowledge of compensation structures and labor law.

Training specialists supervise or conduct training sessions, prepare manuals and other materials for these courses, and look into new methods of training. They also counsel employees on training opportunities, which may include on-the-job, apprentice, supervisory, or management training.

Employee-benefits supervisors and other personnel specialists handle the employer's benefits program, which often includes health insurance, life insurance, disability insurance, and pension plans. These workers also coordinate a wide range of employee services, including cafeterias and snack bars, health rooms, recreational facilities, newsletters and communications, and counseling for work-related personal problems. Counseling employees who are approaching retirement age is a particularly important part of the job of these workers.

Occupational safety and health programs are handled in various ways. Quite often, in small companies especially, accident prevention and industrial safety are the responsibility of the personnel department—or of the labor relations specialist, if the union has a safety representative. Increasingly, however, there is a separate safety department under the direction of a safety and health professional, generally a safety engineer or industrial hygienist. (The work of occupational safety and health workers is discussed elsewhere in the *Handbook*.)

Labor relations specialists (D.O.T. 169.118) advise management on all aspects of union-management relations. When the contract is up for negotiation, they provide background information and technical support, a job that requires extensive knowledge of economics, labor law, and collective bargaining trends. Actual negotiation of the agreement is conducted at the top level, with the director of labor relations or other top-ranking official serving as the employer's representative, but members of the company's labor relations staff play an important role throughout the negotiations.

Much of the everyday work of the labor relations staff concerns interpretation and administration of the contract, the grievance procedures in particular. Members of the labor relations staff might work with the union on seniority rights under the layoff procedure set forth in the contract, for example. Later in the day, they might meet with the union steward about a worker's grievance. Doing the job well means staying abreast of current developments in labor law, including arbitration decisions, and maintaining continuing liaison with union officials.

Personnel workers in government agencies generally do the same kind of work as those in large business firms. There are some differences, however. Public personnel workers deal with employees whose jobs are governed by civil service regulations. Civil service jobs are strictly classified as to duties, training, and pay. This requires a great deal of emphasis on job analysis and wage and salary classification; many people in public personnel work spend their time classifying and evaluating jobs, or devising, administering, and scoring competitive examinations given to job applicants.

Knowledge of rules and regulations pertaining to affirmative action and equal opportunity programs is important in public personnel work. In 1972, the U.S. Civil Service Commission established a specialization for Federal personnel workers concerned with promoting equal opportunity in hiring, training, and advancement. Similar attention to equal employment opportunity, accompanied by a need for qualified staff, is evident in State and local government agencies.

Labor relations is an increasingly important specialty in public personnel administration. Labor relations in this field have changed considerably in recent years, as union strength among government workers has grown. This has created a need for more and better trained workers to handle negotiations, grievances, and arbitration cases on behalf of Federal, State, and local government agencies.

Places of Employment

In 1976, about 335,000 people were personnel and labor relations workers. Nearly 3 out of 4 worked in private industry, for manufacturers, banks, insurance companies, airlines, department stores, and other business concerns. Some worked for private employment agencies, including executive job-search agencies, "office temporaries" agencies, and others.

A large number of personnel and labor relations workers, over 90,000 in 1976, worked for Federal, State, and local government agencies. Most of these were in personnel administration; they handled recruitment, interviewing, testing, job classification, training, and other personnel matters for the Nation's 15 million public employees. Some were on the staff of the U.S. Employment Service and State employment agencies. Still others worked for agencies that oversee compliance with labor laws. Some, for example, were wage-hour compliance officers; their work is described in another part of the *Handbook*, in the statement on health and regulatory inspectors (Government). Other public employees in this field carried out research in economics, labor law, personnel practices, and related sub-

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jects, and sought new ways of ensuring that workers' rights under the law are understood and protected.

In comparison with private industry, labor unions do not employ a large number of professionally trained labor relations workers. An elected union official generally handles labor relations matters at the company level. At national and international union headquarters, however, the research and education staff usually includes specialists with a degree in industrial and labor relations, economics, or law.

A few personnel and labor relations workers are in business for themselves as management consultants or labor-management relations experts. In addition, some people in the field teach college or university courses in personnel administration, industrial relations, and related subjects.

Most jobs for personnel and labor relations workers are located in the highly industrialized sections of the country.

Training, Other Qualifications, and Advancement

Many employers seek to fill beginning positions in personnel and labor relations with college graduates. Some employers look for graduates who have majored in personnel administration or industrial and labor relations, while others prefer college graduates with a general business background. Still other employers feel that a well-rounded liberal arts education is the best preparation for personnel work. A college major in personnel administration, political science, or public administration can be an asset in looking for a job with a government agency.

At least 200 colleges and universities have programs leading to a degree in the field of personnel and labor relations. (While personnel administration is widely taught, the number of programs that focus primarily on labor relations is quite small.) In addition, many schools offer course work in closely related fields. An interdisciplinary background is appropriate for work in this area, and a combination of courses in the social sciences, behavioral sciences, business, and economics is useful.

Prospective personnel workers might include courses in personnel management, business administration, public administration, psychology, sociology, political science, economics, and statistics. Courses in labor law, collective bargaining, labor economics, labor history, and industrial psychology provide valuable backgound for the prospective labor relations worker.

Graduate study in industrial or labor relations is often required for work in labor relations. While a law degree seldom is required for jobs at the entry level, most of the people with responsibility for contract negotiations are lawyers, and a combination of industrial relations courses and a law degree is becoming highly desirable.

A college education is important, but it is not the only way to enter personnel work. Some people enter the field at the clerical level, and advance to professional positions on the basis of experience. They often find it helpful to take college courses part time, however.

New personnel workers usually enter formal or on-the-job training programs to learn how to classify jobs, interview applicants, or administer employee benefits. After the training period, new workers are assigned to specific areas in the company's employee relations department. After gaining experience, they usually can advance within their own company or transfer to another employer. At this point, some people move from personnel to labor relations work.

A growing number of people enter the labor relations field directly, as trainees. They usually are graduates of master's degree programs in industrial relations, or may have a law degree. Quite a few people, however, begin in personnel work, gain experience in that area, and subsequently move into a labor relations job.

Workers in the middle ranks of a large organization often transfer to a top job in a smaller one. Employees with exceptional ability may be promoted to executive positions, such as director of personnel or director of labor relations.

Personnel and labor relations workers should speak and write effectively and be able to work with people of all levels of education and experience. They also must be able to see both the employee's and the employer's points of view. In addition, they should be able to work as part of a team. They need supervisory abilities and must be able to accept responsibility. Integrity and fairmindedness are important qualities for people in personnel and labor relations work. A persuasive, congenial personality can be a great asset.

Employment Outlook

The number of personnel and labor relations workers is expected to grow faster than the average for all occupations through 1985, as employers, increasingly aware of the benefits to be derived from good labor-management relations, continue to support sound, capably staffed employee relations programs. In addition to new jobs created by growth of the occupation, many openings will become available each year because of the need to replace workers who die, retire, or leave their jobs for other reasons.

Legislation setting standards for employment practices in the areas of occupational safety and health, equal employment opportunity, and pensions has stimulated demand for personnel and labor relations workers. Continued growth is foreseen, as employers throughout the country review existing programs in each of these areas and, in many cases, establish entirely new ones. This has created job opportunities for people with appropriate expertise. The effort to end discriminatory employment practices, for example, has led to scrutiny of the testing, selection, placement, and promotion procedures in many companies and government agencies. The findings are causing a number of employers to modify these procedures, and to take steps to raise the level of professionalism in their personnel departments.

Substantial employment growth is foreseen in the area of public personnel administration. Opportunities probably will be best in State and local government, areas that are ex-

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pected to experience strong employment growth over the next decade. By contrast, Federal employment will grow slowly. Moreover, as union strength among public employees continues to grow, State and local agencies will need many more workers qualified to deal with labor relations. Enactment of collective bargaining legislation for State and local government employees could greatly stimulate demand for labor relations workers knowledgeable about public sector negotiations.

Although the number of jobs in both personnel and labor relations is projected to increase over the next decade, competition for these jobs also is increasing. Particularly keen competition is anticipated for jobs in labor relations. A small field, labor relations traditionally has been difficult to break into, and opportunities are best for applicants with a master's degree or a strong undergraduate major in industrial relations, economics, or business. A law degree is an asset.

Earnings and Working Conditions

Beginning job analysts in private industry started at $11,200 a year in 1976, according to a Bureau of Labor Statistics survey. Experienced job analysts earned $19,200 a year, about twice the average for all nonsupervisory workers in private industry, except farming. Wage and salary administrators earned about $19,800 and personnel managers averaged $21,100, according to a survey conducted by the Administrative Management Society. Top personnel and labor relations executives in large corporations earned considerably more.

Average salaries for personnel specialists employed by State governments ranged from $9,900 to $13,000 a year in 1976, according to a survey conducted by the U.S. Civil Service Commission. Personnel specialists who had supervisory responsibilities averaged from $14,800 to $19,500 and State directors of personnel earned average salaries ranging from $27,400 to $31,900 a year.

In the Federal Government, new graduates with a bachelor's degree generally started at $9,300 a year in 1977. Those with a master's degree started at about $14,100 a year. Average salaries of Federal employees in several different areas of personnel work ranged from about $19,300 to $24,500 in 1977, as follows:

Staffing specialists	$19,300
Position classifiers	21,100
Personnel management specialists	21,800
Employee development specialists	21,800
Salary and wage administrators	21.800
Occupational analysts	24,500
Mediators	30,800

Federal employees in the field of labor relations had generally comparable salaries. Labor-management and employee relations specialists and labor-management relations officers averaged $21,800 a year in 1977. Federal mediators' salaries were higher, about $30,800 a year, on the average.

Employees in personnel offices generally work 35 to 40 hours a week. As a rule, they are paid for holidays and vacations, and share in retirement plans, life and health insurance plans, and other benefits available to all professional workers in their organizations.

Sources of Additional Information

For general information on careers in personnel and labor relations work, write to:

American Society for Personnel Administration, 19 Church St., Berea, Ohio 44017.

For information concerning a career in employee training and development, contact:

American Society for Training and Development, P.O. Box 5307, Madison, Wis. 53705.

Information about careers in public personnel administration is available from:

International Personnel Management Association, 1313 E. 60th St., Chicago, Ill. 60637.

A brochure describing a career in labor-management relations as a field examiner is available from:

Director of Personnel, National Labor Relations Board, 1717 Pennsylvania Ave. NW., Washington, D.C., 20570.

PUBLIC RELATIONS WORKERS

(D.O.T 165.068)

Nature of the Work

Public relations workers apply their talent for communication in many different areas. They may handle press, community, or consumer relations, sales promotion, political campaigning, interest-group representation, fund raising, or employee recruitment. The role they play is crucial to improved understanding and cooperation among the diverse individuals, groups, organizations, and institutions that make up our society.

How successfully an organization presents goals and policies may affect its public acceptance, prosperity, and even its continued existence. Public relations workers help organizations build and maintain positive public reputations. Public relations is more than telling the employer's "story," however. Understanding the attitudes and concerns of customers, employees, and various other "publics"—and communicating this information to management—is an important part of the job.

Public relations departments are found in organizations of all kinds, and workers must tailor their programs to an employer's particular needs. A public relations director for a college or university, for example, may devote most of his or her energies to attracting additional students, while one in a large corporation may handle the employer's relations with stockholders, government agencies, and community groups.

Public relations workers put together information that keeps the public aware of their employer's activities and accomplishments and keeps management aware of public attitudes. After preparing the information, they may contact people in the media who might be interested in publicizing their material. Many radio or television public service announcements or special reports, newspaper items, and magazine arti-

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Public relations workers help organizations build and maintain a positive public image.

cles start at public relations workers' desks. Sometimes the subject is a company and its policies towards its employees or its role in the community. Often the subject is a public issue, such as health, nutrition, energy, or the environment.

Public relations workers also arrange and conduct programs in which company representatives will have direct contact with the public. Such work includes setting up speaking engagements for company officials and writing speeches for them. These workers often serve as an employer's representative during community projects or occasionally may show films at school assemblies, plan conventions, or manage fund-raising campaigns.

Public relations staffs in very large firms may number 200 or more, but in most firms the staff is much smaller. The director of public relations, who is often a vice president, may develop overall plans and policies with a top management executive. In addition, large public relations departments employ writers, research workers, and other specialists who prepare material for the different media, stockholders, and other publics.

Workers who handle publicity for an individual or direct public relations for a university or small business may handle all aspects of the job. They make contacts with people outside the organization, do the necessary planning and research, and prepare material for publication. These workers may combine public relations duties with advertising or sales promotion work; some are top-level officials and others have lower level positions. The most skilled public relations work of making overall plans and maintaining contacts usually is done by the department director and highly experienced staff members.

Places of Employment

About 115,000 persons were public relations workers in 1976. Manufacturing firms, public utilities and transportation companies, insurance companies, and trade and professional associations employ many public relations workers. A sizable number work for government agencies (the Federal Government alone employs several thousand public information specialists), or for schools, colleges, museums, and other educational, religious, and human service organizations. The rapidly expanding health field also offers opportunities for public relations work, in hospitals, pharmaceutical companies, and medical associations, for example. A number of public relations workers are employed by public relations consulting firms which furnish public relations services to clients for a fee. Some work for advertising agencies.

Public relations workers are concentrated in large cities where press services and other communications facilities are readily available, and where many businesses and trade associations have their headquarters. More than half of the estimated 2,000 public relations consulting firms in the United States are in New York, Los Angeles, Chicago, and Washington, D.C. A major trend, however, is the dispersal of public relations jobs throughout the Nation, including smaller towns.

Training, Other Qualifications, and Advancement

A college education combined with public relations experience is an excellent preparation for public relations work. Although most beginners have a college degree in journalism, communications, or public relations, some employers prefer a background in a field related to the firm's business—science, finance, or engineering, for example. Some firms want college graduates with experience working for the news media. In fact, many editors, reporters, and workers in closely related fields enter public relations work.

In 1976, about 90 colleges and more than 30 graduate schools offered degree programs or special curriculums in public relations, usually administered by the journalism or communications department. In addition, about 200 colleges offered at least one course in this field. Courses include public relations theory and

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techniques, organizational communication, public relations management and administration, practical courses in public relations, and others. Specialties are offered in public relations in business, government, and nonprofit organizations. Persons with a bachelor's degree in public relations or a related field generally enter staff positions whereas those with a graduate degree are more qualified for administrative and managerial jobs.

Public relations workers must have considerable ability to gather information, write, speak, and deal effectively with people. Courses in journalism, business administration, psychology, sociology, political science, advertising, English, and public speaking help in preparing for a public relations career. Extracurricular activities such as writing for a school publication or television or radio station provide valuable experience. Many schools help students gain part-time or summer internships in public relations which provide training that can help in competing for entry positions. Membership in the Public Relations Student Society of America provides an opportunity for students to exchange views with public relations practitioners and to make professional contacts that may be helpful in later securing a job in the field. A portfolio of published articles, television or radio programs, slide presentations, and other work samples usually is an asset in finding a job.

Creativity, initiative, and the ability to express thoughts clearly and simply are important to the public relations worker. Fresh ideas are so vital in public relations that some experts spend all their time developing new ideas, leaving the job of carrying out programs to others.

People who choose public relations as a career need an outgoing personality, self-confidence, and an understanding of human psychology. They should have the enthusiasm necessary to motivate people. Public relations workers need a highly developed sense of competitiveness and the ability to function as part of a team.

Public information specialist positions in the Federal Government generally require a college degree. Media, writing, or editing experience may be quite helpful in gaining such a position. Requirements for similar positions in State and local governments vary.

Some companies—particularly those with large public relations staffs—have formal training programs for new workers. In other firms, new employees learn by working under the guidance of experienced staff members. Beginners often maintain files of material about company activities, scan newspapers and magazines for appropriate articles to clip, and assemble information for speeches and pamphlets. After gaining experience, they work on more difficult assignments, such as writing press releases, speeches, and articles for publication. In some firms, workers get all-round experience whereas in other firms, public relations workers tend to specialize.

Promotion to supervisory jobs may come as workers show they can handle more demanding and creative assignments. Some experienced public relations workers start their own consulting firms.

The Public Relations Society of America accredits public relations workers who have at least 5 years' experience in the field and have passed a comprehensive 6-hour examination (4 hours written, 2 hours oral). However, because of disagreements over the appropriateness of formal licensing requirements in this field, such requirements are not expected in the immediate future.

Employment Outlook

Employment of public relations workers is expected to increase faster than the average for all occupations through the mid-1980's. In addition to new jobs created by this growth, openings will occur every year because of the need to replace workers who die, retire, or leave the field for other reasons.

Demand for public relations workers may be affected by economic conditions, slackening as employers delay expansion or impose staff cuts during business slowdowns. Over the long run, however, expenditures on public relations are expected to increase substantially. Corporations, associations, and other large organizations are likely to expand their public relations efforts to gain public support and approval.

Competition for beginning jobs is keen, for public relations work has an aura of glamour and excitement that attracts large numbers of jobseekers. Furthermore, the number of people who transfer into public relations from newspaper, advertising, or other closely related jobs is expected to exceed the number transferring out. This factor should serve to stiffen competition.

Prospects for a career in public relations are best for highly qualified applicants—talented people with sound academic preparation and some media experience. Most openings are expected to occur in large organizations—corporations, public relations consulting firms, manufacturing firms, educational institutions, and others.

Earnings and Working Conditions

Starting salaries for college graduates beginning in public relations work generally ranged from $7,500 to $10,000 a year in 1976; persons with a graduate degree generally started at a higher salary.

The salaries of experienced workers generally are highest in large organizations with extensive public relations programs. According to a 1976 survey, median annual salaries of public relations workers were as follows: Presidents of public relations consulting firms, $38,000; public information or relations directors and managers in the Federal Government, $23,500; in State government, $17,000; in local government, $22,000; in educational organizations, $23,500. According to a 1975 survey of a wide range of firms, public relations executives averaged $29,000-49,000 a year, while public relations managers averaged $21,000-31,000 a year, depending on the annual sales volume of the firm. Many firms offered incentive compensation. Based on a 1975 survey of advertising agencies, public relations directors averaged $20,100 a year, while public relations account executives averaged $15,100.

Public relations consulting firms often pay higher salaries than organi-

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zations with their own public relations departments. Salaries in manufacturing firms are among the highest while salaries in social welfare agencies, nonprofit organizations, hospitals, and universities are among the lowest.

In the Federal Government, bachelor's degree holders generally started at $9,303 or $11,523 a year in 1977, depending upon the applicant's academic record; master's degree holders generally started at $14,097 a year; additional education or experience could qualify applicants for a higher salary. Public information specialists averaged about $24,300 a year in 1977.

Although the workweek for public relations staffs usually is 35 to 40 hours, overtime often is necessary to prepare or deliver speeches, attend meetings and community activities, or travel out of town. Occasionally, the nature of their regular assignments or special events requires public relations workers to be on call around the clock.

Sources of Additional Information

For career information and a list of schools offering degrees and courses in the field, write to:

Career Information, Public Relations Society of America, Inc., 845 Third Ave., New York, N.Y. 10022.

Current information on the public relations field, salaries, and other items is available from:

PR Reporter, Dudley House, P.O. Box 600, Exeter, N.H. 03833.

For additional information on job opportunities and the public relations field in general, write to:

Service Department, *Public Relations News*, 127 East 80th St., New York, N.Y. 10021.

PURCHASING AGENTS

(D.O.T. 162.158)

Nature of the Work

If materials, supplies, or equipment are not on hand when needed, an organization's work may be interrupted or halted. Maintaining an adequate supply of items an organization needs to operate is the purchasing agent's job.

Purchasing agents, also called industrial buyers, obtain goods and services of the required quality at the lowest possible cost, and see that adequate supplies are available. Agents who work for manufacturing firms buy machinery, raw materials, product components, and services; those working for government agencies may purchase office supplies, furniture, and business machines. Information on retail buyers, who purchase merchandise for resale in its original form, is presented in the statement on buyers elsewhere in the *Handbook*.

Purchasing agents buy when stocks on hand reach a predetermined reorder point, or when a department in the organization requisitions items it needs. Because agents often can purchase from many sources, their main job is selecting the seller who offers the best value.

Purchasing agents use a variety of means to select among suppliers. They compare listings in catalogs and trade journals and telephone suppliers to get information. They also meet with salespersons to examine samples, watch demonstrations of equipment, and discuss items to be purchased. Frequently agents invite suppliers to bid on large orders; then they select the lowest bidder among those who meet requirements for quality of goods and delivery date.

In some cases, however, purchasing agents must deal directly with a manufacturer to obtain specially designed items made exclusively for their organization. These agents must have a high degree of technical expertise to insure that all product specifications are met.

It is important that purchasing agents develop good business relations with their suppliers. This can result in savings on purchases, favorable terms of payment, and quick delivery on rush orders or materials in short supply. They also work closely with personnel in various departments of their own organization. For example, they may discuss product design with company engineers or shipment problems with workers in the traffic department.

Once an order has been placed with a supplier, the purchasing agent makes periodic checks to insure that it will be delivered on time. This is necessary to prevent work flow interruptions due to lack of materials. After an order has been received and inspected, the purchasing agent authorizes payment to the shipper.



Purchasing agents must develop good business relations with their suppliers.

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Because of its importance, purchasing usually is designated as a separate responsibility within an organization. In a large firm or government agency, purchasing agents usually specialize in one or more specific items—for example, steel, lumber, cotton, or petroleum products. The agents are divided into sections, headed by assistant purchasing managers, that are responsible for a group of related commodities. In smaller organizations, agents generally are assigned certain categories of goods, such as all raw materials or all office supplies, furniture, and business machines.

Places of Employment

About 190,000 persons worked as purchasing agents in 1976. Over half worked in manufacturing industries. Large numbers also were employed by government agencies, construction companies, hospitals, and schools.

About half of all purchasing agents work in organizations that have fewer than five employees in the purchasing department. Many large business firms and government agencies, however, have much larger purchasing departments; some employ as many as 100 specialized buyers or more.

Training, Other Qualifications, and Advancement

Although there are no universal educational requirements for entry level jobs, most large companies now require a college degree, and prefer applicants with a master's degree in business administration. Training requirements vary with the needs of the firm. For example, companies that manufacture complex machinery or chemicals may prefer applicants with a background in engineering or science, while other companies hire business administration or liberal arts majors for trainee jobs. Courses in purchasing, accounting, econom cs, and statistics are very helpful. Familiarity with the computer and its uses also is desirable.

Small companies generally have less rigid educational requirements because they often purchase less complex goods in much smaller quantities. Some require a bachelor's degree; many others, however, hire graduates of associate degree programs in purchasing for entry level jobs. Promotion of clerical workers or technicians into purchasing jobs is much more common in small firms. Regardless of size of company, a college degree is becoming increasingly important for advancement to management positions.

The purchasing agent must be able to analyze numbers and technical data in order to make buying decisions and take responsibility for spending large amounts of money. The job requires the ability to work independently and a good memory for details. In addition, a purchasing agent must be tactful in dealing with salespersons and able to motivate others.

Regardless of their educational background, beginning purchasing agents initially spend considerable time learning about company operations and purchasing procedures. They may be assigned to the storekeeper's section to learn about the purchasing system, inventory records, and storage facilities. Next they may work with experienced buyers to learn about types of goods purchased, prices, and suppliers.

Following the initial training period, junior purchasing agents are given the responsibility for purchasing standard and catalog items. As they gain experience and develop expertise in their assigned areas, they may be promoted to purchasing agent, then senior purchasing agent. Workers with proven ability can move into a job as assistant purchasing manager in charge of a group of purchasing agents and then advance to manager of the entire purchasing department. Many purchasing managers move into executive positions as director of purchasing or director of materials management.

Continuing education is essential for purchasing agents who want to advance in their careers. Purchasing agents are encouraged to participate in frequent seminars offered by professional societies and to take courses in purchasing at local colleges and universities. The recognized mark of experience and professional competence in private industry is the designation Certified Purchasing Manager (CPM). This designation is conferred by the National Association of Purchasing Management, Inc., upon candidates who have passed four examinations and who meet educational and experience requirements. In government agencies, the indication of professional competence is the designation Certified Public Purchasing Officer (CPPO), which is conferred by the National Institute of Governmental Purchasing, Inc. The CPPO is earned by passing two examinations and meeting educational and experience requirements.

Employment Outlook

Employment of purchasing agents is expected to increase faster than the average for all occupations through the mid-1980's. Several thousand jobs will be open every year due to growth of the occupation and the need to replace those who die, retire, or transfer to other work.

Opportunities will be excellent for persons with a master's degree in business administration. Persons with a bachelor's degree in engineering, science, or business administration whose college program included one course or more in purchasing also should have bright prospects. Graduates of 2-year programs in purchasing should continue to find ample opportunities, although they will probably be limited to small firms.

Demand for purchasing agents is expected to rise as their importance in reducing costs is increasingly recognized. In large industrial organizations, the purchasing department will be expanded in order to handle the growing complexity of manufacturing processes. In companies that manufacture complex items such as industrial engines and turbines, electronic computer equipment, and communications equipment, there will be a growing need for persons with a technical background to select highly technical goods.

Many opportunities also should occur in firms providing personal, business, and professional services. Strong growth is expected for this sector of the economy, and a growing number of hospitals, school districts, and other relatively small employers

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are recognizing the importance of professional purchasers in reducing their operating costs.

Earnings and Working Conditions

College graduates hired as junior purchasing agents in large firms earned about $11,700 a year in 1976, according to surveys conducted by the Bureau of Labor Statistics and Purchasing Magazine. Experienced agents purchasing standard items averaged about $14,200 a year; senior purchasing agents specializing in complex or technical goods averaged about $17,000. Assistant purchasing managers received average salaries of about $20,000 a year, while managers of a purchasing department received about $24,700. Many corporate directors of purchasing or materials management earned well over $50,000 a year. Salaries generally are higher in large firms where responsibilities often are greater. In 1976, earnings of purchasing agents were about 1 1/2 times as much as the average for all nonsupervisory workers in private industry, except farming.

In the Federal Government, beginning purchasing agents who had college degrees earned $9,300 or $11,500 in 1977, depending on scholastic achievement and relevant work experience. The average salary for all purchasing agents in the Federal Service was $20,500. Salary levels vary widely among State governments; however, average earnings range from $10,600 to $13,900 for purchasers of standard items, $14,200 to $18,800 for senior buyers purchasing highly complex items, and $21,000 to $26,000 for State purchasing directors.

Sources of Additional Information

Further information about a career in purchasing is available from:

National Association of Purchasing Management, Inc., 11 Park Place, New York, N.Y. 10007.

National Institute of Governmental Purchasing, Inc., 1001 Connecticut Ave. NW., Washington, D.C. 20036.

URBAN PLANNERS

(D.O.T. 199.168)

Nature of the Work

Urban planners, often called community or regional planners, develop programs to provide for future growth and revitalization of urban, suburban, and rural communities. They help local officials make decisions to solve social, economic, and environmental problems.

Planners examine community facilities such as health clinics and schools to be sure these facilities can meet the demands placed upon them. They also keep abreast of the legal issues involved in community development or redevelopment and changes in housing and building codes. Because suburban growth has increased the need for better ways of traveling to the urban center, the planner's job often includes designing new transportation and parking facilities.

Urban planners prepare for situations or needs that are likely to develop as a result of population growth or social and economic change. They estimate, for example, the community's long-range needs for housing, transportation, and business and industrial sites. Working within a framework set by the community government, they analyze and propose alternative ways to achieve more efficient and attractive urban areas.



Urban planners view the present and future development of the east coast.

Before preparing plans for long-range community development, urban planners prepare detailed studies that show the current use of land for residential, business, and community purposes. These reports present information such as the arrangement of streets, highways, and water and sewer lines, and the location of schools, libraries, and playgrounds. They also provide information on the types of industries in the community, characteristics of the population, and employment and economic trends. With this information, urban planners propose ways of using undeveloped land and design the layout of recommended buildings and other facilities such as subways. They also prepare materials that show how their programs can be carried out and the approximate costs.

Urban planners often confer with private land developers, civic leaders, and officials of public agencies that do specialized planning. They may prepare materials for community relations programs, speak at civic meetings, and appear before legislative committees to explain and defend their proposals.

In small organizations, urban planners must be able to do several kinds of work. In large organizations, planners usually specialize in areas such as physical design, community relations, or the reconstruction of run-down business districts.

Places of Employment

About 16,000 persons were urban planners in 1976. Most work for city, county, or regional planning agencies. A growing number are employed by States or by the Federal Government in agencies dealing with housing, transportation, or environmental protection.

Many planners do consulting work, either part time in addition to a regular job, or full time working for a firm that provides services to private developers or government agencies. Urban planners also work for large land developers or research organizations and teach in colleges and universities.

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Training, Other Qualifications, and Advancement

Employers often seek workers who have advanced training in urban planning. Most entry jobs in Federal, State, and local government agencies require 2 years of graduate study in urban or regional planning, or the equivalent in work experience. Although the master's degree in planning is the usual requirement at the entry level, some people who have a bachelor's degree in city planning, architecture, landscape architecture, or engineering may qualify for beginning positions.

In 1976, over 80 colleges and universities gave a master's degree in urban planning. Although students holding a bachelor's degree in architecture or engineering may earn a master's degree after 1 year, most graduate programs in urban planning require 2 or 3 years to complete. Graduate students spend considerable time in workshops or laboratory courses learning to analyze and solve urban planning problems. Students often are required to work in a planning office part time or during the summer while they are earning the graduate degree.

Candidates for jobs in Federal, State, and local government agencies usually must pass civil service examinations to become eligible for appointment.

Planners must be able to think in terms of spatial relationships and to visualize the effects of their plans and designs. They should be flexible in their approaches to problems and be able to cooperate with others and reconcile different viewpoints to achieve constructive policy recommendations.

After a few years' experience, urban planners may advance to assignments requiring a high degree of independent judgment, such as outlining proposed studies, designing the physical layout of a large development, or recommending policy, program, and budget options. Some are promoted to jobs as planning directors, and spend a great deal of time meeting with officials in other organizations, speaking to civic groups, and supervising other professionals. Further advancement is more difficult at this level and often occurs through a transfer to a large city, where the problems are more complex and the responsibilities greater.

Employment Outlook

Employment of urban planners is expected to grow faster than the average for all occupations through the mid-1980's. In addition to openings created by future growth of this relatively small occupation, some jobs will open up because of the need to replace planners who leave their jobs.

Future growth of the occupation will depend to a great extent on the availability of money for urban planning projects. Growth in Federal support for State and local community development, urban restoration, and land use planning programs should increase requirements for urban planners. Many opportunities for planners should arise in fields in which they have not traditionally been employed, such as environmental and social service planning.

Earnings and Working Conditions

Starting salaries for urban planners ranged between $11,000 and $14,000 a year in 1976. Planners with a master's degree were hired by the Federal Government at $14,097 a year in 1977. In some cases, persons having less than 2 years of graduate work could enter Federal service as interns at yearly salaries of either $9,303 or $11,523.

State governments paid urban planners average beginning salaries of about $11,000 a year in mid-1976, although planners started at more than $14,000 in some States. Salaries of experienced State planners ranged from an average minimum of nearly $16,000 a year to an average maximum of more than $21,000 a year. Salaries of State planning directors ranged from an average minimum of about $24,000 to an average maximum of nearly $28,000 in mid-1976.

City, county, and other local governments paid urban planners average starting salaries exceeding $14,000 in 1976, although some communities in the East and South paid less. In 1976, experienced urban and regional planners generally earned more than one and one-half times as much as the average earnings for all nonsupervisory workers in private industry, except farming.

Most planners have sick leave and vacation benefits and are covered by retirement and health plans. Although most city planners have a scheduled workweek of 40 hours, they sometimes work in the evenings and on weekends to attend meetings with citizens' groups.

Sources of Additional Information

Facts about careers in planning and a list of schools offering training are available from:

American Institute of Planners, 1776 Massachusetts Ave. NW., Washington, D.C. 20036.

American Society of Planning Officials, 1313 East 60th St., Chicago, Ill. 60637.

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SERVICE OCCUPATIONS

Workers in service occupations perform a wide variety of tasks ranging from policing streets and fighting fires to serving food and cleaning buildings. In 1976, about 12 million people were employed in service jobs. The major groups of service occupations are discussed below:

Food service occupations. The largest group of service workers, almost 4 million persons in 1976, prepared and served food in restaurants, cafeterias, schools, hospitals, and other institutions. Workers in this group included cooks and chefs, waiters and waitresses, bartenders, and kitchen workers.

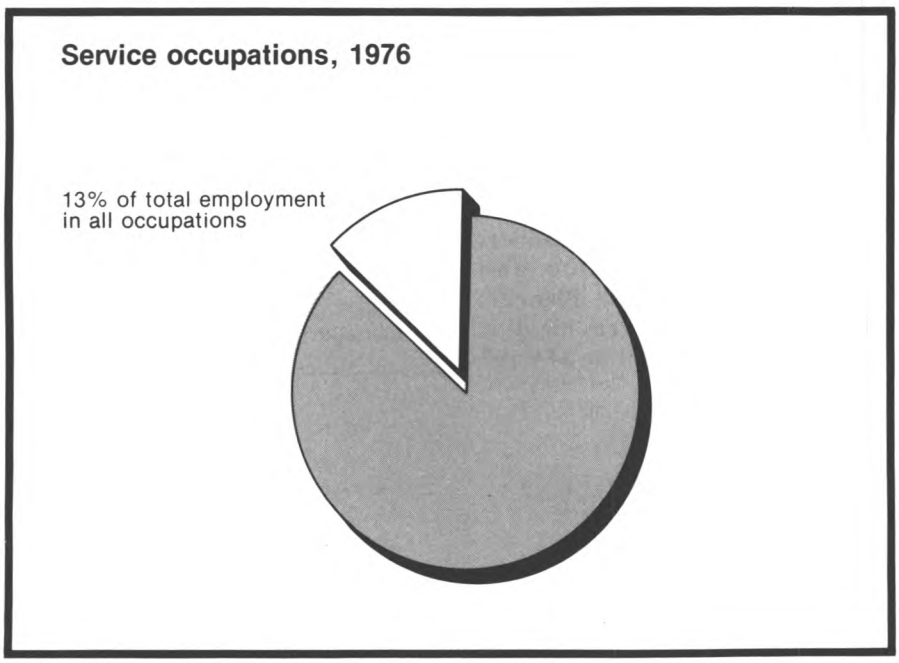
Cleaning and related occupations. Workers in these occupations clean and maintain buildings such as apartment houses, schools, and offices. Almost 2.3 million persons were employed in these jobs in 1976. The group included janitors, building custodians, and pest controllers.

Health service occupations. More than 1.7 million persons were employed as health service workers in jobs such as practical nurse or hospital attendant. Most of these workers were employed in hospitals, but some worked in doctors' or dentists' offices.

Personal service occupations. Workers in this group range from barbers and cosmetologists to ski instructors and theater ushers. About 1.6 million persons were employed in personal service jobs.

Protective and related service occupations. About 1.3 million persons were employed to safeguard lives and property in 1976. The majority were police officers, guards, or firefighters. Most police officers and detectives were government employees, but some worked for hotels, stores, and other businesses. Guards, another large group of protective service employees, worked chiefly for private companies to protect company property and enforce company rules and regulations. Firefighters worked mainly for city governments. The remaining protective service workers were sheriffs and bailiffs, crossing guards and bridge tenders, and marshals and constables.

Private household service occupations. Most of the 1.1 million private household workers employed in 1976 were domestic workers who cleaned their employer's home, prepared meals, and cared for children. Some worked as launderers, caretakers, and companions.



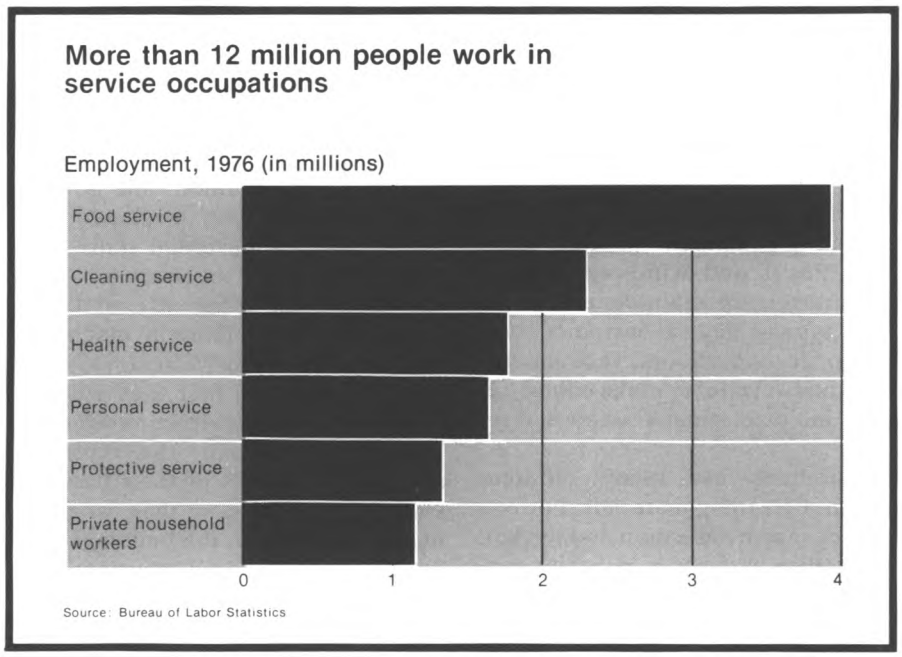
Training, Other Qualifications, and Advancement

Training and skill requirements differ greatly among the various service occupations. FBI special agents, for example, must have a college degree. Barbers and cosmetologists need specialized vocational training. Still other occupations—household worker, building custodian, and hotel bellhop, for example—have no specific educational requirements for entry, although a high school diploma is always an advantage.

For many service occupations, personality traits and special abilities may be as important as formal schooling. Thus, physical strength and endurance are a necessity for work as a porter, lifeguard, or window cleaner; and a pleasing manner and appearance are especially important for a waiter or waitress, elevator operator, or usher. Other service workers, such as store and hotel detectives and travel guides, need good judgment and should be skillful in dealing with people.

Some service workers eventually go into business for themselves as caterers or restaurant operators, for example, or proprietors of barber or beauty shops. Advancement from service occupations that require little training or skill may be difficult for people without a good basic education and some knowledge of the business in which they work.

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Employment Outlook

Employment in the service occupations is expected to grow at about the same rate as the average for all occupations through the mid-1980's. The number of private household workers, however, has declined since the mid-1960's and this trend is expected to continue despite a strong demand for these workers. If private household workers are excluded from the total, service workers show a faster than average rate of growth.

Most of the future employment increase is expected to be among the health care and protective service occupations. Population growth and the aging of the population will create more demand for all health care occupations. More police officers and guards will be needed in the future as population increases and the need for protection against crime, theft, and vandalism continues to grow. Rising incomes, increasing leisure time, and the growing number of women who combine family responsibilities and a job are likely to cause the number of cooks and chefs to grow faster than the average.

The following sections of the *Handbook* contain detailed information on most of the service occupations mentioned here. Others are described in the industry statements on government; transportation, communications, and public utilities; wholesale and retail trade; and service and miscellaneous industries. The health service occupations are included in the section on health care occupations, and statements on meatcutters, pest controllers, and funeral directors can be found elsewhere in the *Handbook*.

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CLEANING AND RELATED OCCUPATIONS

Every public building and apartment house needs to be kept clean and in good condition for the comfort and safety of the people who work or live there. Much of this work is done by persons in cleaning and related occupations. These workers may clean floors and windows in hospitals, change linens in hotels, repair broken faucets in apartments, or exterminate insects and rodents in office buildings.

Workers in these occupations usually learn their skills on the job, but other training is sometimes available. Building custodians may attend training programs offered by unions and government agencies; hotel housekeepers may take courses in housekeeping procedures and interior design offered by their employer. Workers who learn their jobs thoroughly and show that they can handle responsibility may advance to supervisory positions.

Besides a knowledge of their job, these workers must be courteous, tactful, and neat if their job requires contact with the public. Some perform monotonous and tiring tasks, such as scrubbing and waxing floors, and must be able to stand the boredom of the job.

This section describes three cleaning and related occupations: building custodians, pest controllers, and hotel housekeepers and assistants.

BUILDING CUSTODIANS

(D.O.T. 187.168, 381.137 and .887; 382.884, 891.138)

Nature of the Work

Building custodians, sometimes called janitors or cleaners, keep office buildings, hospitals, stores, and apartment houses clean and in good condition. They see that heating and ventilating equipment work properly, clean floors and windows, and do other necessary maintenance tasks. On a typical day, a custodian may wet- or dry-mop floors, vacuum carpets, dust furniture, make minor repairs, and exterminate insects and rodents.

Custodians use many different tools and cleaning materials. For one job they may need a mop and bucket; for another an electric polishing machine and a special cleaning solution. Chemical cleaners and power equipment have made many tasks easier and less time consuming, but custodians must know how to use them properly to avoid harming floors and fixtures.

Some custodians supervise a group of custodial workers and are responsible for maintaining a section of a building or an entire building. They assign tasks to each worker, give instructions, and see that jobs, such as floor waxing or window washing, are done well.

Places of Employment

In 1976, more than 2.1 million people worked as building custodians. One-third worked part time.

Most custodians worked in office buildings and factories, but schools, apartment houses, and hospitals also employed many. Some worked for firms supplying building maintenance services on a contract basis.

Although custodial jobs can be found in all cities and towns, most are located in highly populated areas where there are many office buildings, stores, and apartment houses.

Training, Other Qualifications, and Advancement

No special education is required for most custodial jobs, but the beginner should know simple arithmetic and be able to follow instructions. High school shop courses are helpful because minor plumbing or carpentry work may be a part of the job.

Most building custodians learn their skills on the job. Usually, beginners do routine cleaning and are given more complicated duties as they gain experience.

In some cities, unions and government agencies have developed programs to teach custodial skills. Students learn how to clean buildings thoroughly and efficiently, and how to operate and maintain machines, such as wet and dry vacuums, buffers, and polishers that they will use on the job. Instruction in minor electrical, plumbing, and other repairs is also given. As part of their training, students learn to plan their work, to deal with people in the buildings they clean, and to work without supervision.

Building custodians usually find work by answering newspaper advertisements, applying directly to a company where they would like to work, or applying to a building maintenance service. They also get jobs through State employment offices. Custodial jobs in the government are obtained by applying to the civil service personnel headquarters.

Advancement opportunities for custodial workers are usually limited because the custodian is the only maintenance worker in many buildings. Where there is a large mainte-



One-third of all building custodians work part time.

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nance staff, however, custodians can be promoted to supervisory jobs. A high school diploma improves the chances for advancement. Some custodians go into the maintenance business for themselves.

Employment Outlook

Employment opportunities in this occupation are expected to be good through the mid-1980's. The need to replace workers who die, retire, or leave the occupation will create many jobs each year. Construction of new office buildings, hospitals and apartment houses will cause employment of custodians to grow about as fast as the average for all occupations.

Persons seeking part-time or evening work can expect to find many opportunities.

Earnings and Working Conditions

In 1976, building custodians averaged $3.63 an hour, which is about three-fourths as much as the average earnings for all nonsupervisory workers in private industry, except farming. Earnings, however, vary by industry and area of the country. Workers in large cities of the Northeast and North Central regions usually earn the highest wages.

Custodians working in the Federal Government are paid at the same rates offered by private industries in the local area.

Most building service workers receive paid holidays and vacations, and health insurance.

Because most office buildings are cleaned while they are empty, custodians often work evening hours. In buildings requiring 24-hour maintenance, custodians may work a night shift.

Although custodians usually work inside heated, well-lighted buildings, they sometimes work outdoors sweeping walkways, mowing lawns, or shoveling snow. Working with machines can be noisy and some tasks, such as cleaning bathrooms and trash rooms, can be dirty. Custodial workers often suffer minor cuts, bruises, and burns from machines, handtools, and chemicals.

Building custodians spend most of their time on their feet, sometimes lifting or pushing heavy furniture or equipment. Many tasks, such as dusting or sweeping, require constant bending, stooping, and stretching.

Sources of Additional Information

Information about custodial jobs and training opportunities may be obtained from the local office of your State employment service.

For general information on job opportunities in local areas, contact:

Service Employees International Union, 2020 K St. NW., Washington, D.C. 20006.

HOTEL HOUSEKEEPERS AND ASSISTANTS

(D.O.T. 321.138)

Nature of the Work

A hotel's or motel's reputation depends on how well it serves its guests. Although some offer economical accommodations and others stress luxurious surroundings and attentive service, all are concerned with their guests' comfort. Hotel housekeepers are responsible for keeping hotels and motels clean and attractive and providing guests with the necessary furnishings and supplies. It is their job to hire, train, schedule, and supervise the housekeeping staff, including linen and laundry workers, and repairers. They also keep employee records and order supplies. About 17,000 persons worked as hotel housekeepers in 1976.

Housekeepers who work in small or middle-sized establishments may not only supervise the housekeeping staff, but perform some of these duties themselves. In large or luxury hotels, their jobs are primarily administrative and they are frequently called executive or head housekeepers.

Besides supervising a staff that may number in the hundreds, executive housekeepers prepare the budget for their departments; submit reports to the general manager on the condition of rooms, needed repairs, and suggested improvements; and purchase supplies and furnishings. Executive housekeepers are assisted by floor housekeepers, who supervise the cleaning and maintenance of one or several floors in the hotel, and assistant executive housekeepers, who help with the administrative work.

Some large hotel and motel chains assign executive housekeepers to special jobs, such as reorganizing housekeeping procedures in an established hotel or setting up the



Hotel housekeepers are responsible for keeping hotels and motels clean and attractive.

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housekeeping department in a new motel.

Training, Other Qualifications, and Advancement

Although there are no specific educational requirements for housekeepers, most employers prefer applicants who have at least a high school diploma. Experience or training in hotel housekeeping also is helpful in getting a job.

Several colleges, junior colleges, and technical insititutes offer instruction in hotel administration that includes courses in housekeeping; some of these courses are offered in summer or evening classes. Many schools have developed programs under the guidance and approval of the National Executive Housekeepers Association, an organization that confers certified membership status upon those members who complete certain education and experience requirements. In addition, the American Hotel and Motel Association offers courses for either classroom or home study. Most helpful are courses on housekeeping; personnel management; budget preparation; recordkeeping; interior decoration; safety practices; environmental controls; and the purchase, use, and care of different types of equipment and fabrics.

Executive housekeepers should be good at planning and organizing work and must be able to get along well with people, especially those they supervise. Housekeepers also should like to work independently and be able to keep records and analyze numbers.

Although assistant housekeepers may be promoted to executive housekeepers after several years of experience, opportunities are limited because only one executive housekeeper job is available in any hotel or motel. Those with degrees or courses in institutional housekeeping management may have the best advancement opportunities.

Employment Outlook

Employment of hotel housekeepers is expected to grow more slowly than the average for all occupations through the mid-1980's. Most openings will result from the need to replace workers who die, retire, or leave the occupation.

Because established hotels usually fill vacancies by promoting assistant housekeepers to executive housekeepers, beginners will find their best job opportunities in newly built motels or hotels.

See the statement on the Hotel Industry elsewhere in the *Handbook* for information on earnings and working conditions, sources of additional information, and more information on the employment outlook.

PEST CONTROLLERS

(D.O.T. 389.781 and 389.884)

Nature of the Work

Rats, mice, and common household insects such as flies and roaches contaminate food and spread sickness; termites can eat away houses. Protection of our health and property from these pests is the job of professional pest controllers, who are classified either as pest control route workers or termite specialists. Although these fields of work are separate, many controllers do both.

Often working alone, a pest control route worker usually begins the day by making sure the route truck has the necessary pesticides, sprayers, traps, and other supplies for servicing customers' facilities. With the supervisor's instructions, the route worker starts out to visit the 5 to 15 customers on the route list.

A route worker generally services restaurants, hotels, food stores, homes, and other facilities that have problems with rats, mice, or insects. Commercial customers commonly have service contracts calling for regular visits, such as once a month. Service to homes usually is less frequent, or only as required.

A route worker, who must know pests' habits and hiding places, carefully inspects the facility to determine the extent of the pest problem.



Pest controllers know the habits and hiding places of different insects.

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To eliminate pests and prevent their return, the route worker sprays pesticides in and around areas such as cabinets and sinks where insects usually live, and sets traps and poisonous bait near areas where rats or mice nest and along paths they travel.

While regular visits are of help, the route worker may suggest to customers ways to eliminate conditions that attract pests. They may, for example, recommend replacing damaged garbage containers, sealing open food containers, and repairing cracks in walls.

Termite specialists are pest controllers who work to eliminate termites and prevent them from reaching wood structures. Termites eat wood. Without proper controls, these insects can go virtually unnoticed while they severely undermine the wood structure of a home or other building.

Termite specialists, usually working in pairs, can effectively control termites by providing a barrier between the termites' underground colonies and the wood structure. The most common barrier is termite poison.

To provide a poisonous barrier, they stick a steel nozzle into the ground and pump poison through a hose attached to the nozzle. Pumping forces the poison through the holes in the nozzle and into the soil. They repeat the process at numerous points around the foundation. To reach soil beneath or behind cement or other surfaces, they drill holes through the surface, insert the nozzle into the soil, and pump in the poison. Workers then seal these holes with cement. Specialists also may spray poison directly to the wood's surface. This is done commonly on older, all-wood structures.

Since termites will not cross poisonous areas, those termites in the ground must find food elsewhere or starve while those trapped in the wood structure die from lack of moisture. Because barriers last for years, termite specialists seldom need to revisit a treated facility.

Termite specialists sometimes have to alter buildings to prevent pests from returning. For example, they may remove and rebuild foundations or insulate wood-to-earth contacts with concrete.

Helpers assist termite specialists by digging around and underneath houses, helping set up and operate equipment, mixing cement, and doing general cleanup work.

Some highly experienced specialists inspect houses for termites, estimate costs, and explain the proposed work to customers. In most exterminating firms, however, managers, supervisors, or pest control sales workers do these jobs.

Places of Employment

More than half of the estimated 27,000 pest controllers employed in 1976 were route workers; the rest were termite specialists and combination route workers-termite specialists.

Most pest controllers work for or own firms that specialize in this service. A small number work for Federal, State, and local governments.

Jobs in this field can be found throughout the country. Employment, however, is concentrated in major metropolitan areas and large towns.

Training, Other Qualifications, and Advancement

Beginning pest controllers are trained by supervisors and experienced workers. Many large firms also provide several weeks of training, which includes classes on the characteristics of termites or other pests, the safe and effective use of pesticides, customer relations, and the preparation of work records. To aid beginners, many employers provide training manuals. Beginners gain practical experience by helping pest control route workers or termite specialists on the job. They can learn many of the basic concepts for pest control within 2 or 3 months. At this stage, however, they lack the experience to work alone.

Almost all States require pest controllers to pass a written test demonstrating competent and safe use of pesticides. Those few States not requiring a written test are expected within the next 3 years to pass legislation that would require pest controllers to pass a similar test. Currently, about 30 States require pest controllers be licensed, which in most States is only for registration.

Employers prefer trainees who are high school graduates, have safe driving records, and are in good health. Many firms require their employees to be bonded; applicants for these jobs must have a record of honesty and respect for the law. Because route workers frequently deal with customers, employers look for applicants who are courteous, tactful, and well-groomed. Termite specialists need manual dexterity and mechanical ability. Some firms give aptitude tests to determine an applicant's suitability for the work.

High school courses in chemistry and business arithmetic provide a helpful background for pest controllers. Students interested in becoming route workers also may benefit from courses in sales. Those interested in becoming termite specialists can gain valuable experience by taking courses related to building construction such as carpentry.

Experienced workers with ability can advance to higher paying positions, such as service manager or pest-control sales worker.

Employment Outlook

Employment of pest controllers is expected to grow faster than the average for all occupations through the mid-1980's. In addition to the jobs resulting from employment growth, the need to replace experienced workers who retire or die or transfer to other occupations also will create many job openings.

Because pests reproduce rapidly and tend to develop resistance to pesticides, their control is a never-ending problem. Population growth and further congestion of metropolitan areas will add to the need for more pest controllers. The deterioration of older buildings also is increasing the need for these workers since buildings become more prone to infestation as they age.

Earnings and Working Conditions

The starting pay for inexperienced trainees ranged from $3 to $4 an

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hour in 1976, based on the limited information available. Earnings of experienced pest controllers ranged from $5 to $8 an hour.

Some route workers are paid an hourly rate or weekly salary. Others receive a commission based upon charges to customers. Nearly all termite specialists are paid an hourly rate or weekly salary.

On the average, pest controllers work 40 to 44 hours a week. During spring and summer, however, hours may be longer because pests are more prevalent. Most work is done during the day. Route workers, however, occasionally work nights because many restaurants and stores do not want them to work while customers are present.

Pest controllers work both indoors and outdoors in all kinds of weather. They frequently lift and carry equipment and materials, but most items weigh less than 50 pounds. Route workers also do a great deal of walking and driving. Termite specialists occasionally must crawl under buildings and work in dirty, cramped spaces. Workers in these occupations are subject to some hazards. Although most pesticides are not harmful to humans, some can cause injury if they are inhaled or left on the skin. Such injuries, however, are avoided if safety precautions are followed. Termite specialists risk injury from power tools and sharp or rough materials in buildings.

Pest controllers are on their own to a great extent. They do not work under strict supervision and, within limits, may decide how they will handle a job.

Sources of Additional Information

Further information about opportunities in this field is available from local exterminating companies and the local office of the State employment service. General information about the work can be obtained from:

National Pest Control Association, Inc., 8150 Leesburg Pike, Vienna, Va. 22180.

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waitresses, cooks and chefs, and bartenders are presented in the statements that follow.

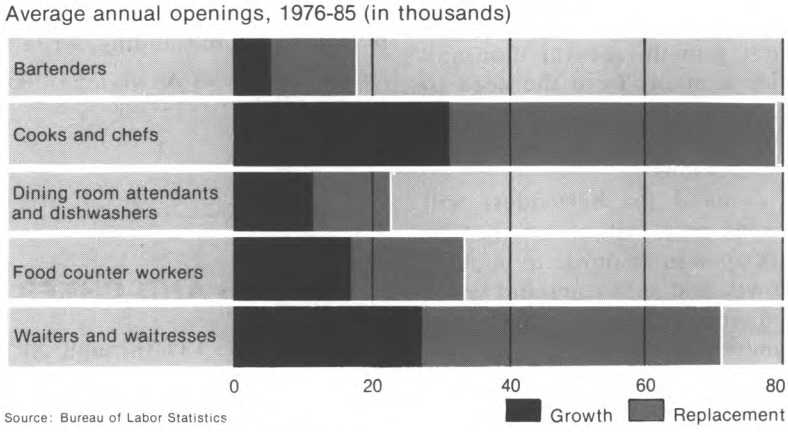
FOOD SERVICE OCCUPATIONS

Food service workers make up one of the largest and fastest growing occupational groups in the Nation's labor force. There are more than four times as many persons employed in food service as there are in automobile manufacturing and steel manufacturing combined. In 1976, about 3.9 million persons were employed in food service, mostly in restaurants, hotels, factory and school cafeterias, and catering firms. Job opportunities exist almost everywhere and for almost any interested person, including those with limited skills.

There are no specific educational requirements for most food service work and skills usually can be learned on the job. Many restaurants hire inexperienced persons for jobs as dining room attendants, dishwashers, food counter workers, waiters and waitresses, and bartenders. Experience sometimes is needed, however, to get one of these jobs in a large restaurant or catering firm. Persons who want to become cooks usually must have some prior experience in a food service occupation, such as kitchen helper or assistant cook. Experienced workers may advance to food service manager, maitre d'hotel, head cook, or chef.

Vocational schools, both public and private, offer courses in cooking, catering, and bartending. Employment of food service workers is expected to increase faster than the average for all occupations through the mid-1980's. The demand for these workers will increase as new restaurants, cafeterias, and bars open in response to population growth and increased spending for food and beverages outside the home. Higher average incomes and more leisure time will allow people to eat out more often. Also, as an increasing number of wives work, families are finding dining out a welcome convenience. Detailed discussions of the work, training, outlook, and earnings of dining room attendants and dishwashers, food counter workers, waiters and

A large number of jobs will open each year in the food service occupations, mainly to replace workers who leave



Source: Bureau of Labor Statistics

BARTENDERS

(D.O.T. 312.878)

Nature of the Work

Cocktails range from the ordinary to the exotic. Bartenders make these concoctions by combining different kinds of liquor with other ingredients such as soft drinks, soda water, bitters, fruit juices, and cream. There are dozens of combinations, and each one can be made in several ways. Because some people have preferences for certain cocktail receipes, bartenders often are asked to mix drinks to suit a customer's taste. Besides cocktails, bartenders serve wine, draft or bottled beer, and a wide variety of nonalcoholic beverages.

Most bartenders take orders, serve drinks, and collect payment from customers. Others simply make



Bartenders often are asked to mix drinks to suit a customer's taste.

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drinks for waiters and waitresses to serve.

Bartenders usually are responsible for ordering and maintaining an inventory of liquor, mixes, and other bar supplies. They also arrange bottles and glasses to form a display, wash glassware, and clean the bar.

Bartenders in large restaurants or hotels usually have *bartender helpers* (D.O.T. 312.887) to assist them with their duties. Helpers keep the bar supplied with liquor, mixes, and ice; stock refrigerators with wine and beer; and replace empty beer kegs with full ones. They also keep the bar area clean and remove empty bottles and trash.

Places of Employment

Most of the 261,000 bartenders employed in 1976 worked in restaurants and bars, but many also had jobs in hotels and private clubs. Roughly one-fifth were self-employed.

Several thousand people, many of whom have full-time jobs in other occupations or attend college, tend bar part time. Part-time workers often serve at banquets and private parties.

Most bartenders work in the urban population centers of New York, California, and other large States, but many are employed in small communities also. Vacation resorts offer seasonal employment, and some bartenders alternate between summer and winter resorts rather than remain in one area the entire year.

Training, Other Qualifications, and Advancement

Most bartenders learn their trade on the job. Although preparing drinks at home can be good practice, it does not qualify a person to be a bartender. Besides knowing a variety of cocktail recipes, bartenders must know how to stock a bar properly and be familiar with State and local laws concerning the sale of alcoholic beverages.

Persons who wish to become bartenders can get good experience by working as bartender helpers, dining room attendants, waiters, or waitresses. By watching the bartender at work, they can learn how to mix drinks and do other bartending tasks.

Some private schools offer short courses in bartending that include instruction on State and local laws and regulations, cocktail recipes, attire and conduct, and stocking a bar. Some of these schools help their graduates find jobs.

Bartenders should have pleasant personalities and be neat and clean in personal appearance because they deal with the public. They need physical stamina, since they stand while they work and also may have to lift heavy beer kegs or boxes of beverages.

Generally, bartenders must be at least 21 years of age, although some employers prefer those who are 25 or older. Some States require bartenders to have health certificates assuring that they are free from contagious diseases. In some instances, they must be bonded.

Small restaurants, neighborhood bars, and resorts usually offer a beginner the best entry opportunities. After gaining experience, a bartender may wish to work in a large restaurant or cocktail lounge where pay is higher and promotion opportunities are greater. Although promotional opportunities in this field are limited, it is possible to advance to head bartender, wine steward, or beverage manager. Some bartenders open their own business.

Employment Outlook

Employment of bartenders is expected to increase about as fast as the average for all occupations through the mid-1980's. In addition to the job openings caused by employment growth, several thousand will arise annually from the need to replace experienced bartenders who retire, die, or leave the occupation for other reasons.

The demand for bartenders will increase as new restaurants, hotels, and bars open in response to population growth and as the amount spent for food and beverages outside the home increases. Higher average incomes and more leisure time will allow people to go out for dinner or cocktails more often, and to take more vacations. Also, as more wives work, families are finding dining out a welcome convenience.

Job opportunities for bartenders should be especially favorable in States that have recently liberalized their drinking laws. In the early 1970's, 25 States either lowered the drinking age or legalized the sale of liquor by the drink, or both, and some other States may follow suit.

Earnings and Working Conditions

Hourly earnings of bartenders ranged from $2.86 to $5.33 in 1976, according to limited data from union contracts in the restaurant industry. Besides wages, bartenders may receive tips that increase their earnings.

Bartenders usually receive free meals at work and may be furnished bar jackets or complete uniforms.

Many bartenders work more than 40 hours a week, and night and weekend work and split shifts are common. For many bartenders, however, the opportunity for friendly conversation with customers and the possibility of someday managing or owning a bar or restaurant more than offset these disadvantages. For others, the opportunity to get part-time work is important.

Sources of Additional Information

Information about job opportunities may be obtained from the Hotel and Restaurant Employees and Bartenders International Union, which is the principal union organizing bartenders, and from the State employment service.

For general information on job opportunities in bartending, write to:

Culinary Institute of America, P.O. Box 53, Hyde Port, N.Y. 12538.

COOKS AND CHEFS

(D.O.T. 313.131 through .887; 314.381 through .878; and 315.131 through .381)

Nature of the Work

A reputation for serving fine food is an asset to any restaurant, whether

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A restaurant's reputation depends largely on the skills of its cooks.

it prides itself on "home cooking" or exotic foreign cuisine. Cooks and chefs are largely responsible for the reputation a restaurant acquires. Many chefs have earned fame for both themselves and the restaurants and hotels where they work because of their skill in creating new dishes and improving familiar ones.

A cook's work depends partly on the size of the restaurant. Many small restaurants offer a limited number of short order dishes that are relatively simple to prepare, plus pies and other baked goods bought from bakeries. One cook usually prepares all of the food with the aid of a short order cook and one or two kitchen helpers.

Large eating places usually have more varied menus and prepare more of the food they serve. Kitchen staffs often include several cooks, sometimes called assistant cooks, and many kitchen helpers. Each cook usually has a special assignment and often a special job title—pastry, fry, or sauce cook, for example. Head cooks or chefs coordinate the work of the kitchen staff, and often direct certain kinds of food preparation. They decide the size of servings, sometimes plan menus, and buy food supplies.

Places of Employment

About 1,065,000 cooks and chefs were employed in 1976. Most worked in restaurants and hotels, but many worked in schools, colleges, and hospitals. Government agencies, factories, private clubs, and many other kinds of organizations also employed cooks and chefs.

Training, Other Qualifications, and Advancement

Most cooks start work in an unskilled position such as kitchen helper and acquire their skills on the job. However, an increasing number of cooks are obtaining high school and post-high school vocational training in food preparation. Occasionally they are trained in apprenticeship programs offered by professional associations and trade unions, or in a 3-year apprenticeship program administered by an office of the American Culinary Federation in cooperation with local employers and junior colleges. A few are trained in programs that some large hotels and restaurants have for new employees.

Inexperienced workers usually can qualify as assistant or fry cooks after several months of on-the-job training, but acquiring all-round skills as head cook or chef in a fine restaurant often takes several years. A high school diploma is not required for most beginning jobs; it is recommended, however, for those planning careers as cooks or chefs. High school or vocational school courses in business arithmetic and business administration are helpful in becoming a cook or chef. High school students can get experience as a cook by working part time in a fast-food restaurant or other limited service operation.

Persons who have had courses in commercial food preparation will have an advantage when looking for jobs in large restaurants and hotels where hiring standards are often high. Some vocational programs in high schools offer this kind of training to students. More often, these courses, ranging from a few months to 2 years or more, and open in some cases only to high school graduates, are given by trade schools, vocational centers, junior colleges, universities, professional associations, hotel management groups, and trade unions. Training in supervisory and management skills sometimes is emphasized by private vocational schools in courses offered by professional associations, and in university programs. The Armed Forces are also a good source of training and experience in food service work.

Although curricula may vary, students usually spend most of their time learning to prepare food through actual practice in well-equipped kitchens. They learn to bake, broil, and otherwise prepare food, and to use and care for kitchen equipment. Training programs often include courses in selection and storage of food, use of leftovers, determination of portion size, menu planning, and purchasing food supplies in quantity. Students also learn hotel and restaurant sanitation and public health rules for handling food.

Many school districts in cooperation with school foodservices divisions of State departments of education provide on-the-job training and sometimes summer workshops for cafeteria workers who wish to become cooks. Some junior colleges, State departments of education, and school associations also provide such training. School cooks often are selected from employees who have participated in these training programs.

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Persons who want to become cooks or chefs should like to work with people in a team relationship and be able to work under pressure during busy periods and in close quarters. Cleanliness and a keen sense of taste and smell and the physical stamina to stand for hours at a time also are important qualifications. Most States require health certificates indicating that cooks and chefs are free from contagious diseases.

Advancement opportunities for cooks are better than for most other food service occupations. Many cooks acquire higher paying positions and new cooking skills by moving from restaurant to restaurant. Others gradually advance to chef positions or supervisory or management positions, particulary in hotels, clubs, or the larger, more elegant restaurants. Some eventually go into business as caterers or restaurant owners; others may become instructors in vocational programs in high schools, junior and community colleges, and other academic institutions.

Employment Outlook

Employment of cooks and chefs is expected to increase faster than the average for all occupations through the mid-1980's. In addition to employment growth, thousands of job openings will arise annually from the need to replace experienced workers who retire, die, or transfer to other occupations. Small restaurants, school cafetrias, and other eating places with simple food preparation will provide the greatest number of starting jobs for cooks.

The demand for cooks and chefs will increase as population grows and people spend more money on eating out. Higher personal incomes and more leisure time will allow people to go out for dinner more often and to take more vacations. Also, as an increasing number of wives work, more families are finding dining out a welcome convenience.

Earnings and Working Conditions

In 1976, hourly pay rates ranged from $3.11 to $6.01 for chefs, from $2.81 to $5.19 for cooks of various types, and from $2.02 to $4.05 for assistant cooks, according to limited data from union contracts in several large metropolitan areas.

Wages of cooks and chefs vary depending on the part of the country and the type of establishment in which they work. Wages generally are higher in the West and in large, well-known restaurants and hotels. Cooks and chefs in famous restaurants earn much more than the minimum rates and several chefs with national reputations earn more than $40,000 a year. Hours in restaurants may include late evening, holiday, and weekend work, and range from 37 1/2 to 48 hours a week. Cooks employed in public and private schools work regular school hours during the school year only, usually for 9 months.

Many kitchens are air-conditioned and have convenient work areas and modern equipment. Others, particularly in older or smaller eating places, are often not as well equipped and working conditions may be less desirable. In all kitchens, however, cooks must stand most of the time, lift heavy pots and kettles, and work near hot ovens and ranges.

The principal union organizing cooks and chefs is the Hotel and Restaurant Employees and Bartenders International Union.

Sources of Additional Information

Information about job opportunities may be obtained from local employers, locals of the Hotel and Restaurant Employees and Bartenders International Union, and local offices of the State employment service.

General information about restaurant cooks and chefs is available from:

Culinary Institute of America, P.O. Box 53, Hyde Park, N.Y. 12538.

Educational Director, National Institute for the Foodservice Industry, 120 South Riverside Plaza, Chicago, Ill. 60606.

The Educational Institute, American Hotel and Motel Association, 1407 S. Harrison Rd., Michigan State University, Stephen S. Nisbet Bldg., East Lansing, Mich. 48823.

For information on the American Culinary Federation's apprenticeship program for cooks and chefs, write to:

American Culinary Federation, Educational Institute, 1407 S. Harrison Rd., East Lansing, Mich. 48823.

DINING ROOM ATTENDANTS AND DISHWASHERS

(D.O.T. 311.878 and 381.887)

Nature of the Work

Clean and attractive table settings are as important to a restaurant's reputation as the quality of food it serves. An egg-stained fork, a soiled tablecloth, or an empty salt shaker can make a customer unhappy. Dining room attendants and dishwashers provide the quick hands and sharp eyes needed to prevent such problems.

Attendants do many jobs that otherwise waiters and waitresses would have to do. They clear and reset tables, carry dirty dishes from the dining area to the kitchen and return with trays of food, and clean up spilled food and broken dishes. By taking care of these details, attendants give waiters and waitresses more time to serve customers.

In some restaurants, attendants also help by serving water and bread and butter to customers. When business is light, they do odd jobs like refilling salt and pepper shakers and cleaning coffee urns.

Dishwashers pick up where the attendants leave off—with the dirty dishes. They operate special machines that clean silverware and dishes quickly and efficiently. Occasionally, they may have to make minor adjustments to keep machines operating properly. Dishwashers scrub large pots and pans by hand. In addition, they clean refrigerators and other kitchen equipment, sweep and mop floors, and carry out trash.

Places of Employment

About 250,000 dishwashers and 190,000 attendants were employed in 1976. Many worked only part time.

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Most attendants and dishwashers work in restaurants, bars, and hotels. Dishwashers also work in schools and hospitals.

Training, Other Qualifications, and Advancement

A high school education is not needed to qualify for jobs as dining room attendants and dishwashers, and many employers will hire applicants who do not speak English. Attendants and dishwashers must be in good physical condition and have physical stamina because they stand most of the time, lift and carry trays, and work at a fast pace during busy periods. State laws often require them to obtain health certificates to show that they are free of contagious diseases. Because of their close contact with the public, it is important that attendants have a neat appearance and the ability to get along with people.

Promotions for dining room attendants and dishwashers are limited. Attendants sometimes advance to positions as waiter or waitress, and dishwashers occasionally advance to cook's helper or short-order cook. The ability to read, write, and do simple arithmetic is required for promotion. Advancement opportunities generally are best in large restaurants.

Employment Outlook

Job openings for dining room attendants and dishwashers are expected to be plentiful in the years ahead. Most openings will result from the need to replace workers who find jobs in other occupations, retire, or die. Turnover is particularly high among part-time workers. About one-half of the attendants and dishwashers are students, most of whom work part time while attending school and then find other jobs after graduation.

Additional openings will result from employment growth. Employment of dining room attendants is expected to increase faster than the average for all occupations and employment of dishwashers is expected to grow about as fast as the average for all occupations through the mid-1980's as population growth and higher incomes create more business for restaurants.

Earnings and Working Conditions

Dining room attendants and dishwashers have relatively low earnings. Limited data from union contracts that cover restaurants and bars in several large cities indicate that hourly rates for these workers ranged from $1.46 to $3.75 in 1976. These amounts were below the average earnings of most other nonsupervisory workers in private industry, except farming.

Attendants may receive a percentage of waiters' and waitresses' tips in addition to wages. Tips often average between 10 and 20 percent of patrons' checks.

The majority of employers provide free meals at work and furnish uniforms. Paid vacations are customary, and various types of health insurance and pension plans may be offered.

Most attendants and dishwashers work less than 30 hours a week. Some are on duty only a few hours a day during either the lunch or dinner period. Others work both periods but may take a few hours off in the middle of the day. Weekend and holiday work often is required.



Attendants and dishwashers must have good health and physical stamina.

Sources of Additional Information

Information about job opportunities may be obtained from local employers, locals of the Hotel and Restaurant Employees and Bartenders International Union, and local offices of the State employment service. Names of local unions can be obtained from:

Hotel and Restaurant Employees and Bartenders International Union, 120 East 4th St., Cincinnati, Ohio 45202.

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For general information about dining room attendants and dishwashers, write to:

Educational Director, National Institute for the Food Service Industry, 120 S. Riverside Plaza, Chicago, Ill. 60606.

Culinary Institute of America, P.O. Box 53, Hyde Park, N.Y. 12538.

FOOD COUNTER WORKERS

(D.O.T. 311.878 and 319.878)

Nature of the Work

Counter workers serve customers in eating places that specialize in fast service and inexpensive food, such as hamburger and fried chicken carryouts, drugstore soda fountains, and school and public cafeterias. About 420,000 persons, most of whom worked part time, had food counter jobs in 1976.

Typical duties of counter workers include taking customers' orders, serving food and beverages, making out checks, and taking payments. At drugstore fountains and in diners, they also may cook, make sandwiches and cold drinks, and prepare sundaes and other ice cream dishes. In hamburger carryouts, where food is prepared in an assembly-line manner, counter workers may take turns waiting on customers, making french fries, toasting buns, and doing other jobs.

Counter workers in cafeterias fill plates for customers and keep the serving line supplied with desserts, salads, and other dishes. Unlike other counter workers, they usually do not take payments and make change.

Counter workers also do odd jobs, such as cleaning kitchen equipment, sweeping and mopping floors, and carrying out trash.

Training, Other Qualifications, and Advancement

In the counter jobs that require totaling bills and making change, employers prefer to hire persons who are good in arithmetic and have attended high school, although a diploma usually is not necessary. Managers of fast-food restaurants often hire young people still in high school as part-time counter workers. There usually are no specific educational requirements for counter jobs in cafeterias.

Many large companies, such as the nationwide hamburger carryout chains, operate formal management training programs. Counter workers who show leadership ability may qualify for these programs.

Because counter workers deal with the public, a pleasant personality and neat appearance are important. Good health and physical stamina also are needed because they stand most of the time and work at a fast pace during busy periods. State laws often require counter workers to obtain health certificates to show that they are free of contagious disease.

Opportunities for advancement are limited, especially in small eating places. Some counter workers move into higher paying jobs and learn new skills by transferring to a larger restaurant. Advancement can be to cashier, cook, waiter or waitress, counter or fountain supervisor, or, in the case of counter workers in cafeterias, to line supervisor or merchandiser (person in charge of stocking food).

Most counter workers learn their skills on the job by observing and working with more experienced workers. Some employers, including some fast-food restaurants, use self-study instructional booklets and audio-visual aids to train new employees.

Employment Outlook

Job openings for food counter workers are expected to be plentiful in the years ahead. Most openings will result from turnover—replacement of workers who find jobs in other occupations, retire, or die. Many counter workers are high school and college students who work part time while attending school and find jobs in other occupations after graduation. Because of the high turnover, jobs for counter workers are relatively easy to find.

Additional job openings will result from employment growth. Employment is expected to increase faster than the average for all occupations through the mid-1980's, as population growth and higher incomes create more business for eating places.

Earnings and Working Conditions

Hourly rates for food counter workers ranged from $1.67 to $3.79 in 1976, based on limited data from union contracts that covered eating places in several large cities. These amounts were well below the average earnings for most other nonsupervisory workers in private industry, except farming. However, some counter workers, such as those in drugstores and diners, receive tips which can be greater than hourly



Flexible schedules often allow students to fit their working hours around their classes.

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wages. Tips usually average between 10 and 20 percent of patrons' checks. Counter workers usually receive free meals at work, and may be furnished with uniforms.

Most counter workers work less than 30 hours a week. Some are on duty only a few hours a day for either the lunch or dinner period. Many others work both periods, but may take a few hours off in the middle of the day. Flexible schedules often allow students to fit their working hours around their classes. Weekend and holiday work often is required.

Job hazards include the possibility of falls, cuts, and burns, but injuries seldom are serious.

Sources of Additional Information

Information about job opportunities may be obtained from local employers, locals of the Hotel and Restaurant Employees and Bartenders International Union, and local offices of the State employment service. Names of local unions are available from the Hotel and Restaurant Employees and Bartenders International Union, 120 East 4th St., Cincinnati, Ohio 45202.

For general information about food counter workers, write to:

Educational Director, National Institute for the Food Service Industry, 120 S. Riverside Plaza, Chicago, Ill. 60606.

Culinary Institute of America, P.O. Box 53, Hyde Park, N.Y. 12538.

MEATCUTTERS

(D.O.T. 316.781 and .884)

Nature of the Work

Meatcutters prepare meat, fish, and poultry in supermarkets or wholesale food outlets. Their primary duty is to divide animal quarters and carcasses into steaks, roasts, chops, and other serving-sized portions. They also may prepare meat products such as sausage and corned beef. Cutters who work in retail foodstores may set up counter displays and wait on customers.

In preparing beef quarters, meatcutters divide them into primal cuts such as rounds, loins, and ribs with a band saw, and then use knives or saws to divide these large cuts into customer-sized cuts such as steaks, roasts, and chops. Meatcutters use knives or slicers or power cutters to divide boneless cuts and a band saw or cleaver to divide pieces that contain bones. Any bone chips left on the meat are scraped off with a knife or brushed off by a machine. Cutters grind trimmings into hamburger.

Places of Employment

About 215,000 persons worked as meatcutters in 1976. They had jobs in almost every city and town in the Nation. Most meatcutters worked in retail foodstores. A few worked in wholesale stores, restaurants, hotels, hospitals, and other institutions.

Training, Other Qualifications, and Advancement

Most meatcutters acquire their skills on the job. Although many are informally trained, most learn through apprenticeship programs. A few meatcutters learn their skills by attending private schools specializing in this trade.

Generally, on-the-job trainees begin by doing odd jobs, such as removing bones and fat from retail cuts. Under the guidance of skilled meatcutters, they learn about the various cuts and grades of meats and the proper use of tools and equipment. After demonstrating skill with tools, they learn to divide quarters into pri-



Meatcutters acquire their skills on the job either informally or through apprenticeship programs.

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mal cuts and to divide primal cuts into individual portions. Trainees may learn to cut and prepare fish and poultry, roll and tie roasts, prepare sausage, and cure and corn meat. Later, they may learn marketing operations such as inventory control, meat buying and grading, and recordkeeping.

Meatcutters who learn the trade through apprenticeship generally complete 2 to 3 years of supervised on-the-job training that may be supplemented by some classroom work. At the end of the training period, apprentices are given a meatcutting test which is observed by their employer. A union member also is present in union shops. Apprentices who pass the test qualify as meatcutters. Those who fail can take the test again at a later time. In many areas, apprentices may become meatcutters in less than the usual training time if they can pass the test.

Employers prefer applicants who have a high school diploma and the potential to develop into meat department managers. High school or vocational school courses in business arithmetic are helpful in weighing and pricing meats and in making change.

Manual dexterity, good depth perception, color discrimination, and good eye-hand coordination are important in cutting meat. A pleasant personality, a neat appearance, and the ability to communicate clearly also are important qualifications when cutters wait on customers. Better than average strength is needed to lift heavy pieces of meat. In some communities, a health certificate may be required for employment.

Meatcutters may progress to supervisory jobs, such as meat department managers in supermarkets. A few become meat buyers for wholesalers and supermarket chains. Some cutters become grocery store managers or open their own meat markets.

Employment Outlook

The number of meatcutters is expected to decline slightly through the mid-1980's. Nevertheless, thousands of entry jobs will be available as experienced workers retire, die, or leave the occupation for other reasons.

Employment of meatcutters in food stores will be limited by central cutting—the practice of cutting and wrapping meat for several stores at one location. Central cutting, which permits meatcutters to specialize in both a type of meat and a type of cut, increases efficiency. In addition, more central cutting is expected to be done in meatpacking plants, thus reducing the amount of meat cut—and the need for meatcutters—in food stores.

Earnings and Working Conditions

Hourly earnings of most meatcutters averaged $7.10 in 1976, according to a 1975 survey of union wage rates for grocery store employees in cities of 100,000 inhabitants or more. Meatcutters working in cities with 500,000 inhabitants or more tended to earn more than those in smaller cities. Among grocery store occupations, meatcutters have the highest wages.

Beginning apprentices usually receive between 60 and 70 percent of the experienced cutter's wage and generally receive increases every 6 to 8 months.

Cutters work in coldrooms designed to prevent meat from spoiling. They must be careful when working with sharp tools, especially those that are powered.

Most cutters are members of the Amalgamated Meat Cutters and Butcher Workmen of North America.

Sources of Additional Information

Information about work opportunities can be obtained from local employers or local offices of the State employment service. For information on training and other aspects of the trade, contact:

Amalgamated Meat Cutters and Butcher Workmen of North America, 2800 North Sheridan Rd., Chicago, Ill. 60657.

WAITERS AND WAITRESSES

(D.O.T. 311.138 through .878)

Nature of the Work

Waiters and waitresses take customers' orders, serve food and beverages, make out checks, and sometimes take payments. In diners, coffee shops, and other small restaurants they provide fast, efficient service. In other restaurants, waiters and waitresses serve food at a more leisurely pace and offer more personal service to their customers. For example, they may suggest wines and explain the preparation of items on the menu.

Waiters and waitresses may have duties other than waiting on tables. They set up and clear tables and carry dirty dishes to the kitchen. In very small restaurants they may combine waiting on tables with counter service, preparing sandwiches, or cashiering. In large restaurants and in places where meal service is formal, waiters and waitresses are relieved of most additional duties. Dining room attendants often set up tables, fill water glasses, and do other routine tasks.

Places of Employment

About 1,260,000 waiters and waitresses were employed in 1976. More than half worked part time (less than 35 hours a week). Most worked in restaurants; some worked in hotels, colleges, and factories that have restaurant facilities. Jobs are located throughout the country but are most plentiful in large cities and tourist areas. Vacation resorts offer seasonal employment and some waiters and waitresses alternate between summer and winter resorts instead of remaining in one area the entire year.

Training, Other Qualifications, and Advancement

Most employers prefer to hire applicants who have had at least 2 or 3 years of high school. A person may start as a waiter or waitress, or advance to that position after working as a dining room attendant, car hop, or soda fountain worker. Although most waiters and waitresses pick up their skills on the job, at least 3 months' experience is preferred by larger restaurants and hotels. Some public and private vocational

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More than one-half of all waiters and waitresses work part time.

schools, restaurant associations, and some large restaurant chains provide classroom training. Other employers use self-instruction programs to train new employees. In these programs, an employee learns food preparation and service skills by observing film strips and reading instructional booklets.

Because people in this occupation are in close and constant contact with the public, a neat appearance and an even disposition are important qualifications. Physical stamina also is important, as waiters and waitresses are on their feet, lifting and carrying trays of food from kitchen to table, for hours at a time. Waiters and waitresses also should be good at arithmetic and, in restaurants specializing in foreign foods where customers may not speak English, knowledge of a foreign language is helpful. State laws often require waiters and waitresses to obtain health certificates showing that they are free of contagious diseases.

Opportunities for promotion in this occupation are limited, due to the small size of most food-serving establishments. After gaining experience, however, a waiter or waitress may transfer to a larger restaurant where earnings and prospects for advancement may be better. The most successful waiters and waitresses are those who genuinely like people, are interested in offering service, and possess the ability to sell rather than just take orders. Advancement can be to cashier or supervisory jobs, such as maitre d'hotel or dining room supervisor. Some supervisory workers advance to jobs as restaurant managers.

Employment Outlook

Job openings are expected to be plentiful in the years ahead, mainly due to the need to replace the waiters and waitresses who find other jobs or who retire, die, or stop working for other reasons. Turnover is particularly high among part-time workers. About one-fourth of the waiters and waitresses are students, most of whom work part time while attending school and then find other jobs after graduation. In addition to the job openings from turnover, many will result from employment growth.

Employment of waiters and waitresses is expected to grow about as fast as the average for all occupations through the mid-1980's, as population growth and higher incomes create more business for restaurants. Higher incomes and more leisure time will permit people to eat out more often. Also, as an increasing number of wives work, more and more families may find dining out a welcome convenience.

Beginners will find their best opportunities for employment in the thousands of informal restaurants. Those who seek jobs in expensive restaurants may find keen competition for the jobs that become available.

Earnings and Working Conditions

Hourly rates for waiters and waitresses (excluding tips) ranged from $1.25 to $3.33 in 1976, according to limited data from union contracts that covered eating and drinking places in several large cities. For many waiters and waitresses, however, tips are greater than hourly wages. Tips generally average between 10 and 20 percent of guests' checks. Most waiters and waitresses receive meals at work and many are furnished with uniforms.

Some waiters and waitresses work split shifts—that is, they work for several hours during the middle of the day, take a few hours off in the afternoon, and then return to their jobs for the evening hours. They also may work on holidays and weekends. The wide range in dining hours creates a good opportunity for part-time work. Waiters and waitresses stand most of the time and often have to carry heavy trays of food. During dining hours they may have to rush to serve several tables at once. The work is relatively safe, but they must be careful to avoid slips or falls, and burns.

The principal union organizing waiters and waitresses is the Hotel and Restaurant Employees and Bartenders International Union.

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Sources of Additional Information

Information about job opportunities may be obtained from local employers, locals of the union previously mentioned, and local offices of the State employment service. General information on waiter and waitress jobs is available from:

National Institute for the Foodservice Industry, 120 South Riverside Plaza, Chicago, Ill. 60606.

The Educational Institute, American Hotel and Motel Association, 1407 S. Harrison Rd., Michigan State University, East Lansing, Mich. 48823.

Culinary Institute of America, P.O. Box 53, Hyde Park, N.Y. 12538.

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PERSONAL SERVICE OCCUPATIONS

Personal service workers perform a variety of tasks for people, such as styling or cutting hair, making airline passengers safe and comfortable, conducting tours, carrying baggage, or arranging funerals. Some of these tasks require special skills that must be learned through formal training. Others require skills that can be learned on the job. For some personal service jobs, workers must obtain a State license after completing a training program or apprenticeship.

Persons entering these occupations should be neat, tactful and able to get along well with people because success on the job depends on the impression personal service workers make on their customers. Physical stamina is necessary for those jobs that involve lifting heavy objects or standing for long periods of time.

Personal service workers may receive salaries, commissions or both. In many cases they also receive tips that add substantially to their income. Employers often furnish uniforms for jobs that require them. Some workers, like barbers and cosmetologists, must provide their own tools.

This section describes four personal service occupations: barbers, cosmetologists, funeral directors and embalmers, and bellhops and bell captains.

BARBERS

(D.O.T. 330.371)

Nature of the Work

Although most men go to a barber for just a haircut, other services such as hairstyling and coloring have become increasingly popular. Barbers trained in these areas are called "hairstylists" and work in styling salons, "unisex" salons, and some barbershops. They cut and style hair to suit each customer and may color or straighten hair and fit hair pieces. Most barbers offer hair and scalp treatments, shaves, facial massages, and shampoos.

A small but growing number of barbers cut and style women's hair. They usually work in unisex salons—shops that have male and female customers. Some States require a cosmetologist's license as well as a barber's license, however, to permanent wave or color women's hair.

As part of their responsibilities, barbers keep their scissors, combs, and other instruments sterilized and in good condition. They clean their work areas and may sweep the shop as well. Those who own or manage a shop have additional responsibilities such as ordering supplies, paying bills, keeping records, and hiring employees.



More than half of all barbers operate their own businesses.

Places of Employment

Most of the 124,000 barbers in 1976 worked in barbershops. Some worked in unisex salons, and a few worked for government agencies, hotels, or department stores. More than half of all barbers operated their own businesses.

Almost all cities and towns have barbershops, but employment is concentrated in the most populous cities and States. Hairstylists usually work in large cities where the greatest demand for their services exists.

Training, Other Qualifications, and Advancement

All States require barbers to be licensed. The qualifications necessary to get a license vary from one State to another, however. Generally a person must be a graduate of a State-approved barber school, have completed the eighth grade, pass a physical examination, and be at least 16 (in some States 18) years old.

Many States require a beginner to take an examination for an apprentice license, and serve 1 or 2 years as an apprentice before taking the examination required for a license as a registered barber. In the examinations, the applicant usually is required to pass a written test and demonstrate an ability to perform the basic services. Fees for these examinations range from $10 to $75.

Because most States do not recognize training, apprenticeship work, or licenses obtained in another State, persons who wish to become barbers should review the laws of the State in which they want to work before entering a barber school.

Barber training is offered in about 350 schools; 3 out of 4 barber schools are private. Some public high schools offer barbering in their vocational programs. Barber school programs usually last 9 to 12 months. Students buy their own tools, which cost about $200. They study the basic services—haircutting, shaving, facial massaging, and hair and scalp treatments—and, under supervision, practice on fellow students and on customers in school "clinics." Besides attending lectures on barber services and the use and care of instruments, students take courses in

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sanitation and hygiene, and learn how to recognize certain skin conditions. Instruction also is given in selling and general business practices. Advanced courses are available in some localities for barbers who wish to update their skills or specialize in hairstyling, coloring, and the sale and service of hairpieces.

Dealing with customers requires patience and a better than average disposition. Good health and stamina also are important because barbers stand a great deal and work with both hands at shoulder level—a position that can be tiring.

Beginners may get their first jobs through the barber school they attended, or through the local barber's union or employer's association.

Some experienced barbers advance by becoming managers of large shops or by opening their own shops. A few may teach at barber schools. Barbers who go into business for themselves must have the capital to buy or rent a shop and install equipment. New equipment for a one-chair shop cost from $1,500 to $3,000 in 1976. Some shopowners buy used equipment and fixtures at reduced prices, however.

Employment Outlook

The employment decline of the last decade is expected to level off by the mid-1980's as population growth and the increasing popularity of hairstyling offset the effect of the fashion for longer hair. Although little change is expected in the level of employment, several thousand job openings for barbers will occur each year because of the need to replace workers who retire, die, or transfer to other kinds of work. Replacement needs in barbering are high, compared with many other occupations.

The shift in consumer preferences from regular haircuts to more personalized and intensive services has greatly affected the occupation. Barbers who specialize in hairstyling have been much more successful than those who offer conventional services. This trend is expected to continue, and employment opportunities should be better for hairstylists than for regular barbers.

Earnings and Working Conditions

Barbers receive income from commissions or wages and tips. Most barbers who are not shopowners normally receive 60 to 70 percent of the money they take in; a few are paid straight salaries.

Weekly earnings of experienced barbers (including tips) generally ranged between $200 and $250 in 1976, according to limited information available. Hairstylists usually earned $315 to $400 a week, because the services they provide are more personalized and therefore more expensive. Some hairstylists and a few barbers who operated their own shops earned more than $400 a week. Beginning barbers usually earn about $175 to $200 a week, hairstylists $200 to $250 a week.

Earnings depend on the size and location of the shop, customers' tipping habits, competition from other barbershops, and the barber's ability to attract and hold regular customers.

Most full-time barbers work more than 40 hours a week and a workweek of over 50 hours is not uncommon. Although Saturdays and lunch hours are generally very busy, a barber may have some time off during slack periods. To assure an even workload, some barbers ask customers to make appointments. Some barbers receive 1- or 2-week paid vacations, insurance, and medical benefits.

The principal union that organizes barbers—both employees and shopowners—is the Journeymen Barbers, Hairdressers, Cosmetologists and Proprietors' International Union of America. The principal association that represents and organizes shopowners, managers, and employees is the Associated Master Barbers and Beauticians of America.

Sources of Additional Information

Lists of barber schools, by State, are available from:

National Association of Barber Schools, Inc., 338 Washington Ave., Huntington, W.Va. 25701.

National Association of Trade and Technical Schools, 2021 L St., NW., Room 440, Washington, D.C. 20036.

Every State maintains information on State licensing requirements and approved barber schools. For details, contact the State board of barber examiners or the equivalent authority at your State capital.

Additional information on this occupation is available from:

National Barber Career Center, 3839 White Plains Rd., Bronx, N.Y. 10467.

BELLHOPS AND BELL CAPTAINS

(D.O.T. 324.138 and .878)

Nature of the Work

Bellhops carry baggage for hotel and motel guests and escort them to their rooms on arrival. When showing new guests to their rooms, bellhops make sure everything is in order and may offer information about valet services, dining room hours, or other hotel services. Bellhops also run errands for guests and may relieve elevator operators or switchboard operators.

Large and medium-sized hotels employ bell captains to supervise bellhops on the staff. They plan work assignments, record the hours each bellhop is on duty, and train new employees. Bell captains take care of any unusual requests guests may make and handle any complaints regarding their department. Sometimes they help arriving or departing guests if a bellhop is unavailable. In 1976, more than 16,000 persons worked as bellhops and bell captains.

A few hotels have large service departments and employ superintendents of service to supervise bell captains and bellhops, elevator operators, doorkeepers, and washroom attendants.

Training, Other Qualifications, and Advancement

No specific educational requirements exist for bellhops, although high school graduation improves the chances for promotion to a job as desk clerk or reservation clerk. Many hotels fill bellhop jobs by promoting elevator operators.

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Because bellhops and captains have frequent contact with guests, they must be neat, tactful, and courteous.

Because bellhops have frequent contact with guests, they must be neat, tactful, and courteous. A knowledge of the local area is an asset because guests often ask about local tourist attractions, restaurants, and transportation services. Bellhops also must be able to stand for long periods, carry heavy baggage, and work independently.

Bellhops can advance to bell captain and then to superintendent of service, but opportunities are limited. Because there is only one bell captain position in each hotel, many years may pass before an opening occurs. Opportunities for advancement to superintendent of service are even fewer.

Employment Outlook

Little or no change in employment of bellhops is expected through the mid-1980's. Most openings will result from the need to replace workers who die, retire, or leave the occupation.

Although many motels now offer services similar to those of a hotel and employ bellhops, the growing popularity of economy motels that offer only basic services is expected to limit employment growth. New workers will have better opportunities in motels and small hotels because the large luxury hotels prefer to hire experienced workers. Opportunities also will be available in resort areas where hotels and motels are open only part of the year.

See the statement on the Hotel Industry elsewhere in the *Handbook* for information on earnings and working conditions, sources of additional information, and more information on employment outlook.

COSMETOLOGISTS

(D.O.T. 332.271 and .381; 331 and 339.371)

Nature of the Work

Hair has been a center of attention since women and men first began to care about their appearance. Throughout history a great deal of effort has gone into acquiring a fashionable hairstyle or a perfectly trimmed beard. Although styles change from year to year, the cosmetologist's task remains the same—to help people look attractive.

Cosmetologists, who also are called *beauty operators*, *hairstylists*, or *beauticians*, shampoo, cut, and style hair, and advise patrons on how to care for their hair. Frequently they straighten or permanent wave a patron's hair to keep the style in shape. Cosmetologists may also lighten or darken the color of the hair to better suit the patron's skin color. Cosmetologists may give manicures, scalp and facial treatments, provide makeup analysis for women, and clean and style wigs and hairpieces.

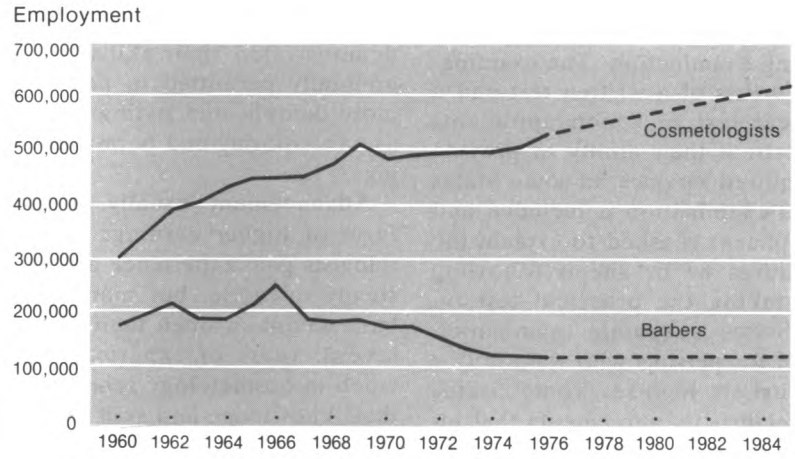
Most cosmetologists make appointments and keep records of hair color formulas and permanent waves used by their regular patrons. They also keep their work area clean and sanitize their hairdressing implements. Those who operate their own salons also have managerial duties which include hiring and supervising workers, keeping records, and ordering supplies.

Places of Employment

Most of the more than 534,000 cosmetologists employed in 1976 worked in beauty salons. Some worked in "unisex" shops, barber-styling shops, or department stores, and a few were employed by hospitals and hotels. More than one-third operated their own businesses.

All cities and towns have beauty salons, but employment is concentrated in the most populous cities and States. Those cosmetologists who set fashion trends with their hairstyles usually work in New York City, Los Angeles, and other centers of fashion and the performing arts.

Changing hairstyles have caused a drop in employment of barbers, but cosmetology has continued to grow



Source: Bureau of Labor Statistics

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Training, Other Qualifications, and Advancement

Although all States require cosmetologists to be licensed, the qualifications necessary to obtain a license vary. Generally, a person must have graduated from a State-approved cosmetology school, have completed at least the 10th grade, pass a physical examination, and be at least 16 years old. In some States completion of an apprenticeship training program can substitute for graduation from a cosmetology school, but very few cosmetologists learn their skills in this way.

Cosmetology instruction is offered in both public and private vocational schools, in either daytime or evening classes. A daytime course usually takes 9 months to 1 year to complete; an evening course takes longer. Many public school programs include the academic subjects needed for a high school diploma and last 2 to 3 years. An apprenticeship program usually lasts 1 or 2 years.

Both public and private programs include classroom study, demonstrations, and practical work. Most schools provide students with the necessary hairdressing implements, such as manicure implements, combs, scissors, razors, and hair rollers, and include their cost in the tuition fee. Sometimes students must purchase their own. A good set of implements costs over $50. Beginning students work on manikins or on each other. Once they have gained some experience, students practice on patrons in school "clinics."

After graduating from a cosmetology course, students take the State licensing examination. The examination consists of a written test and a practical test in which applicants demonstrate their ability to provide the required services. In some States an oral examination is included and the applicant is asked to explain the procedures he or she is following while taking the practical test. In some States a separate examination is given for persons who want only a manicurist's license. Some States have reciprocity agreements that allow a cosmetologist licensed in one State to work in another without reexamination.



Cosmetologists must keep up with the latest fashions.

Persons who want to become cosmetologists must have finger dexterity, a sense of form and artistry, and the physical stamina to stand for long periods of time. They should enjoy dealing with the public and be willing and able to follow patrons' instructions. Because hairstyles are constantly changing, cosmetologists must keep abreast of the latest fashions and beauty techniques. Business skills are important for those who plan to operate their own salons.

Many schools help their students find jobs. During their first months on the job, new cosmetologists are given relatively simple tasks, such as giving manicures or shampoos, or are assigned to perform the simpler hairstyling patterns. Once they have demonstrated their skills, they are gradually permitted to perform the more complicated styling tasks such as hair coloring and permanent waving.

Advancement usually is in the form of higher earnings as cosmetologists gain experience and build a steady clientele; but many manage large salons or open their own after several years of experience. Some teach in cosmetology schools or use their knowledge and skill to demonstrate cosmetics in department stores. A few work as examiners for State cosmetology boards.

Employment Outlook

Employment of cosmetologists is expected to grow about as fast as the average for all occupations through the mid-1980's as population increases and the number of working women rises. The trend to hairstyling for men also creates a demand for these workers because many men go to unisex shops or beauty salons for styling services. In addition to openings due to growth in the occupation, thousands of cosmetologists will be needed each year to replace those who die, retire, or leave the occupation.

Employment in this occupation is not strongly affected by downturns in the business cycle, and job opportunities are expected to be good for both newcomers and experienced cosmetologists. Many openings should be available for persons seeking part-time work.

Earnings and Working Conditions

Cosmetologists receive income from commissions or wages and from tips. Those who are not salon owners receive a percentage of the money they take in, usually 50 percent; a few are paid straight salaries.

Weekly earnings of experienced cosmetologists (including tips) generally ranged between $285 and $340 in 1976, according to limited information available. After 10 years of experience, they can earn more than $450 a week. Beginners usually earned $95 to $125 a week. Those cosmetologists who cut and style men's hair often earn more than those who work on women's hair because the services they provide are more expensive.

Earnings also depend on the size and location of the salon, patrons' tipping habits, competition from other beauty salons, and the individual cosmetologist's ability to attract and hold regular patrons.

Many full-time cosmetologists work more than 40 hours a week, including evenings and Saturdays when beauty salons are busiest. More than one-third of all cosmetologists

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work part time, usually during these busy hours.

A few large salons and department stores offer group life and health insurance and other benefit plans. Nearly all employers provide annual paid vacations of at least 1 week after a year's service.

The principal union which organizes cosmetologists—both employees and salon owners—is the Journeymen Barbers, Hairdressers, Cosmetologists, and Proprietor's International Union of America. The principal trade association which represents and organizes salon owners, managers, and employees is the Associated Master Barbers and Beauticians of America. Other organizations include the National Hairdressers and Cosmetologists Association, Inc.; the National Association of Cosmetology Schools, Inc., which represents school owners and teachers; and the National Beauty Culturists' League, representing black cosmetologists, teachers, managers, and salon owners.

Sources of Additional Information

A list of approved training schools and licensing requirements can be obtained from State boards of cosmetology or from:

Cosmetology Accrediting Commission, 1707 L Street, N.W., Room 440, Washington, D.C. 20036

Additional information about careers in cosmetology and State licensing requirements is available from:

National Beauty Career Center, 3839 White Plains Rd., Bronx, N.Y. 19467.

National Hairdressers and Cosmetologists Association, 3510 Olive St., St. Louis, Mo. 63103.

For general information about the occupation, contact:

Journeymen Barbers, Hairdressers, Cosmetologists, and Proprietors International Union of America, 7050 West Washington St., Indianapolis, Ind. 46241.

National Association of Cosmetology Schools, 599 South Livingston Ave., Livingston, N.J. 07039.

FUNERAL DIRECTORS AND EMBALMERS

(D.O.T. 187.168 and 338.381)

Nature of the Work

Few occupations require the tact, discretion, and compassion called for in the work of funeral directors and embalmers. The family and friends of the deceased may be under considerable emotional stress and bewildered by the many details of the occasion. The *funeral director* (D.O.T. 187.168) helps them to make the personal and business arrangements necessary for the service and burial. The *embalmer* (D.O.T. 338.381) prepares the body for viewing and burial. In many instances, one person performs both functions.

The director's duties begin when a call is received from a family requesting services. After arranging for the deceased to be removed to the funeral home, the director obtains the information needed for the death certificate, such as date and place of birth and cause of death. The director makes an appointment with the family to discuss the details of the funeral. These include time and place of service, clergy and organist, selection of casket and clothing, and provision for burial or cremation. Directors also make arrangements with the cemetery, place obituary notices in newspapers, and take care of other details as necessary. Directors must be familiar with the funeral and burial customs of various religious faiths and fraternal organizations.

Embalming is a sanitary, preservative and cosmetic measure. Embalmers, perhaps with the help of apprentices, first wash the body with germicidal soap. The embalming process itself replaces the blood with a preservative fluid. Embalmers apply cosmetics to give the body a natural appearance and, if necessary, restore disfigured features. Finally, they dress the body and place it in the casket selected by the family.

On the day of the funeral, directors provide cars for the family and pallbearers, receive and usher guests to their seats, and organize the funeral procession. After the service they may help the family file claims for social security, insurance, and other benefits. Directors may serve a family for several months following the funeral until such matters are satisfactorily completed.

Places of Employment

About 45,000 persons were licensed as funeral directors and embalmers in 1976. A substantial number of the directors were funeral home owners.

Most of the 22,000 funeral homes in 1976 had 1 to 3 directors and embalmers, including the owner. Many large homes, however, had 20 or more. Besides the embalmers employed by funeral homes, several hundred worked for morgues and hospitals.

Training, Other Qualifications, and Advancement

A license is needed to practice embalming. State licensing standards vary but generally an embalmer must be 21 years old, have a high school diploma or its equivalent, graduate from a mortuary science school, serve an apprenticeship, and pass a State board examination. One-half of the States require a year or more of college in addition to training in mortuary science.

All but six States also require funeral directors to be licensed. Qualifications are similar to those for embalmers but directors may have to take special apprenticeship training and board examinations. Most people entering the field obtain both licenses, however some States issue a single license to embalmer/funeral directors. Information on licensing requirements is available from the State office of occupational licensing.

High school students can start preparing for a career in this field by taking courses in biology, chemistry, and speech. Students may find a part-time or summer job in a funeral home. Although these jobs consist mostly of maintenance and clean-up tasks, such as washing and polishing hearses, they can be helpful in gain-

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ing familiarity with the operation of funeral homes.

In 1976, 34 schools had mortuary science programs accredited by the American Board of Funeral Service Education. About one-half were private vocational schools that offer 1-year programs emphasizing basic subjects such as anatomy and physiology as well as practical skills such as embalming techniques and restorative art. Community colleges offer 2-year programs, and a small number of colleges and universities offer 2- and 4-year programs in funeral service. These programs included liberal arts and management courses as well as mortuary science. All programs offered courses in psychology, accounting, and funeral law.

Apprentices work under the guidance of experienced embalmers and directors. An apprenticeship usually lasts 1 or 2 years and may be served before, after, or during the time one attends mortuary school, depending on State regulations.

State board examinations consist of written and oral tests and actual demonstration of skills. After passing the examination and meeting other requirements, apprentices receive a license to practice. If they want to work in another State, they may have to pass its examination, although many States have mutual agreements that make this unnecessary.

Important personal traits for funeral directors are composure, tact, and the ability to communicate easily with the public. They also should have the desire and ability to comfort people in their time of sorrow.

Advancement opportunities are best in large funeral homes where directors and embalmers may earn promotion to higher paying positions such as personnel manager or general manager. Some workers eventually acquire enough money and experience to establish their own businesses.

Employment Outlook

Little change in the employment of funeral directors and embalmers is expected through the mid-1980's. In recent years, the number of mortuary school graduates has approximately equaled the number of jobs available due to retirements, deaths, and transfers to other occupations. Many students secure a promise of employment before entering a program and, barring any significant growth in enrollments, future graduates should find job opportunities available.

Demand for funeral services will rise as the population grows and deaths increase. Most funeral homes, however, will be able to meet the demand without expanding their employment. The average funeral home conducts only one or two funerals each week and is capable of handling several more without hiring additional employees.

Earnings and Working Conditions

In 1976, funeral directors and embalmers generally earned from $200 to $300 a week. Managers generally earned between $10,000 and $16,000 a year, and many owners earned more than $20,000. Apprentices earned between $2.25 and $4.60 an hour.

In large funeral homes, employees usually have a regular work schedule. Typically they put in 8 hours a day, 5 or 6 days a week. Overtime, however, occasionally may be necessary. Some employees work shifts; for example, nights 1 week, and days the next.

Occasionally embalmers may come into contact with contagious diseases but the possibility of their becoming ill is remote, even less likely than for a doctor or nurse.

Sources of Additional Information

Information about job opportunities in this field is available from local funeral homes and from:

National Funeral Directors Association of the United States, Inc., 135 W. Wells St., Milwaukee, Wisc. 53203.

National Selected Morticians, 1616 Central St., Evanston, Ill. 60201.

For a list of accredited schools of mortuary science and information about scholarship opportunities, contact:

The American Board of Funeral Service Education, Inc., 201 Columbia St., Fairmont, W. Va. 26554.

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PRIVATE HOUSEHOLD SERVICE OCCUPATIONS

About 1.4 million workers were employed in private households in 1976. The majority were domestic workers who performed household tasks such as cooking, cleaning, or caring for children, but workers in other occupations also were employed by private households. Gardeners keep the grounds of large estates looking attractive by planting shrubs and flowers and cutting the lawn. Chauffeurs drive their employers' cars and keep the vehicles clean and in good running condition. Carpenters, painters, and other craft workers maintain and redecorate homes. Private nurses, secretaries, and curators or librarians are employed in some households.

The following statement discusses the domestic occupations most frequently found in private households, including general housekeeper, mother's helper, and companion.

PRIVATE HOUSEHOLD WORKERS

(D.O.T. 099.228, 301.887, 303.138, 304.887, 305.281, 306.878, 307.878, and 309.138 through .878)

Nature of the Work

Thousands of people employ private household workers to help care for children, clean and maintain the house and yard, cook meals, or serve the family. Some household workers specialize in one of these jobs, but the duties of most workers change from day to day. Frequently, workers who specialize live in their employer's house.

Most private household workers are employed as *general houseworkers* or *mother's helpers*. These workers clean the house and may also be responsible for meal preparation, laundry, or caring for children. When hired by the day or hour, they are called *day workers*.

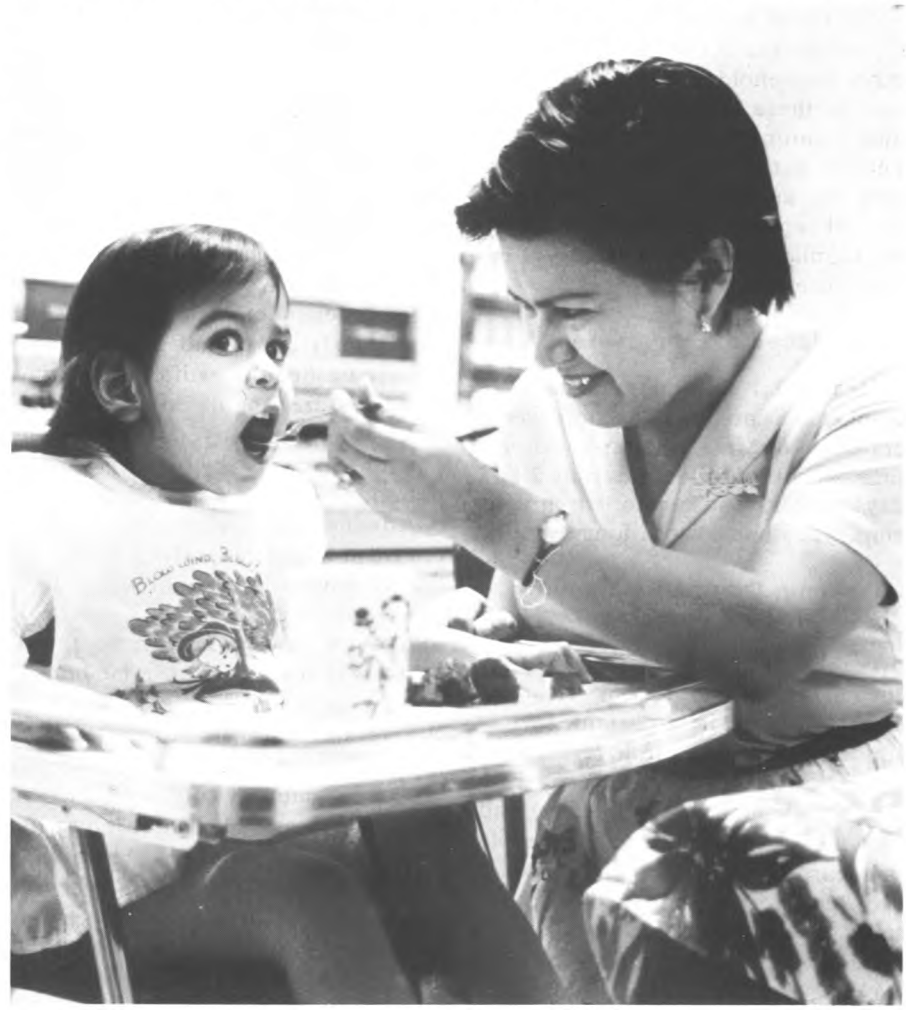
Heavy household tasks and yard maintenance are usually performed by *caretakers*. They may wash windows, paint fences and mow the lawn.

In some households, meals are prepared by *cooks*. Some cooks do everything from planning menus and buying food to serving meals and cleaning the kitchen. Others follow the instructions of a family member. Cooks may be assisted by a *cook's helper*, who is less skilled than a cook and performs simple tasks, such as peeling vegetables and cleaning the kitchen.

A few households employ *launderers* to wash, iron, and fold the laundry.

Some private household workers specialize in performing personal services for members of the family. *Lady's and gentleman's attendants* keep their employer's clothes pressed and hung, make their beds, help them dress, and run errands. *Companions* do similar work, but they also act as a friend or aide to the convalescent, elderly, or handicapped person who employs them.

Some private households employ workers whose sole job is child care.



Most private household workers are employed as general houseworkers or mothers' helpers.

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Unlike mothers' helpers, whose duties generally entail light housekeeping as well as child care, these workers have no general housekeeping responsibilities. Such workers bathe the children, prepare their meals, launder their clothes, and supervise their play. Those who care for very young children are responsible for sterilizing bottles, preparing formulas, and changing diapers. Some households employ tutors, who usually are in charge of school-age children and supervise their recreation, diet, and health, as well as their education. These workers also are responsible for disciplining the children and arranging their activities.

A household with a large staff of workers may employ a *home housekeeper* or a *butler* to supervise the staff and the operation of the household. These workers usually are responsible for hiring and firing the other household employees. In addition to these duties, butlers receive and announce guests, answer telephones, serve food and drinks, and may act as gentleman's attendants. Housekeepers order food and cleaning supplies and keep a record of expenditures.

Places of Employment

Nearly 1.1 million persons were employed as private household workers in 1976. Most are employed part time, working half-days or only 2 or 3 days a week. Those who live in their employer's house work longer hours.

Training, Other Qualifications, and Advancement

For most household jobs, experience and an ability to cook, clean, or care for a yard is important; formal education is not. Employers prefer workers who know how to operate vacuum cleaners, floor waxers, and lawn mowers, but most young people can learn these skills while helping with the house and yard work at home. Some household workers acquire skills by spending a year working as a mother's helper under the supervision of either an experienced household worker or their employer.

Home economics courses in high schools, vocational schools, and junior colleges offer training in child development and meal preparation that can be very useful to persons interested in becoming cooks or child care workers. Training programs sponsored by Federal agencies, State employment service offices, and local welfare departments also teach many of the skills needed for household work.

For a person wishing a job serving as a companion or caring for children, educational and cultural background is more important than work experience. Generally a companion's background, interests, and age should be similar to the employer's, and practical nursing experience is useful if the employer is an invalid. Being able to read well or carry on an interesting conversation is helpful. A well-rounded education and teaching skills are important for persons interested in caring for children.

Private household workers must have physical stamina because they are on their feet most of the time and sometimes must do some heavy lifting. The desire to do a job carefully and thoroughly is important. Household workers should be able both to get along well with people and to work independently. Some workers, particularly cooks and infant's nurses, need a health certificate showing that they are free of contagious diseases. Many employers arrange and pay for the necessary physical examination.

Advancement other than an increase in wages generally is not possible in private household work. Few households require live-in workers, and even fewer require so many workers that a butler or home housekeeper is needed as a supervisor. Workers can transfer to better paying and more highly skilled household jobs, such as cook or lady's or gentleman's attendant, but job openings in these occupations are limited.

However, many private household workers use their training and experience to transfer to related jobs—in child care or day care facilities, or as kitchen workers in restaurants. Some may go to work as building cleaners, employed by commerical cleaning services. Others may go to work as nursing aides in hospitals, or nursing homes, or homemaker-home health aides employed by health agencies, public welfare departments, or commerical firms.

Employment Outlook

Although the number of private household workers is expected to decline through the mid-1980's, thousands of openings will result each year from the need to replace those who die, retire, or leave the occupation. The demand for household workers has exceeded supply for some time, as more women, especially those with young children, enter the labor force. Low wages, the tedious nature of some household tasks, and the lack of advancement opportunities discourage many persons from entering the occupation, however, and some prospective employers are turning to child-care centers and commercial cleaning services for help.

Job openings for domestic workers, particularly for general housekeepers and mothers' helpers, will be plentiful through the mid-1980's. Many openings will be available for part-time work.

Earnings and Working Conditions

In 1975, full-time female private household workers averaged $2,413 a year, less than half the average for all nonsupervisory workers in private industry, except farming. Earnings data are not available for men in the occupation because men represent such a small proportion of total employment. The provisions of Federal and State minimum wage laws were extended to private household workers in May 1974.

Wages vary according to the work performed, employer's income, and the custom of the local area. Earnings are highest in large cities, especially in the North.

Most private household workers receive instructions from their employers, but are free to work on their own. Frequently, they have a key to the house or apartment. Household work is often tedious, especially for day workers who generally are given

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the less desirable tasks, such as cleaning bathrooms or defrosting the refrigerator. Long or irregular working hours can isolate workers who "live in" from their families and friends, and if they are the sole employees in the households, they are likely to be alone most of the time.

Sources of Additional Information

Facts about employment opportunities and training programs in private household work are available from local offices of State employment agencies.

Information on laws affecting household workers and guidelines for work is available from:

National Committee on Household Employment, 7705 Georgia Ave. NW., Suite 208, Washington, D.C. 20012.

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PROTECTIVE AND RELATED SERVICE OCCUPATIONS

The growth of our Nation's population and economy has put an increasing emphasis on protective services. Each city, suburban area, and national port of entry requires protective and related service workers to check crime, minimize loss of life and property, and enforce regulations that protect the health and safety of our citizens at home and on the job.

Careers in protective and related service occupations require varied combinations of education and experience. Workers such as FBI special agents and some Federal Government inspectors must have at least a bachelor's degree, while guards may have less than a high school education. Most occupations in this group, however, require a high school diploma. In many cases, a college degree is an asset for advancement to higher level positions.

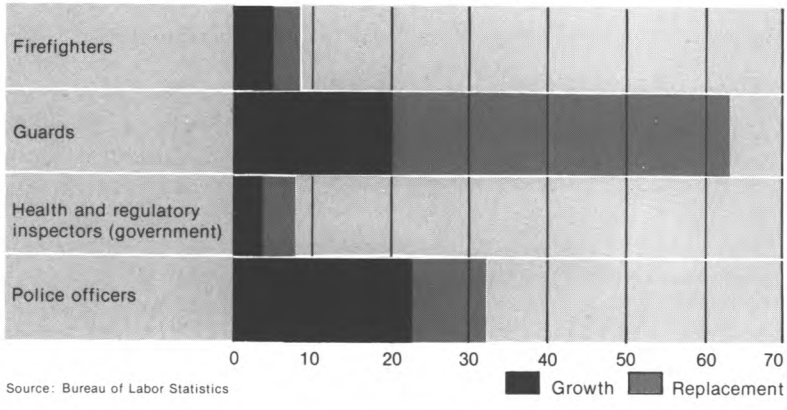
In addition to educational requirements, most workers in protective and related services must undergo formal training programs and get on-the-job experience before they are fully qualified. Training programs last from several days to a few months and emphasize specific job-related skills.

Personal qualifications such as honesty and an understanding of human nature are important. Persons seeking careers in protective and related service occupations should sincerely desire to serve the community and be able to exercise proper judgment under a variety of conditions.

This section describes the work of several occupations in protective and related services: correction officers, FBI special agents, firefighters, guards, police officers, State police officers, occupational safety and health workers, and health, regulatory, and construction inspectors.

Except for guards, most openings in the protective service occupations result from growth in employment needs

Selected protective and related service occupations
Average annual openings, 1976-85 (in thousands)



Source: Bureau of Labor Statistics

CORRECTION OFFICERS

(D.O.T. 372.868 and 375.168 and .868)

Nature of the Work

Correction officers are charged with the safekeeping of persons who have been arrested, are awaiting trial, or who have been tried and convicted of a crime and sentenced to serve time in a correctional institution. They maintain order within the institution, enforce rules and regulations, and often counsel inmates.

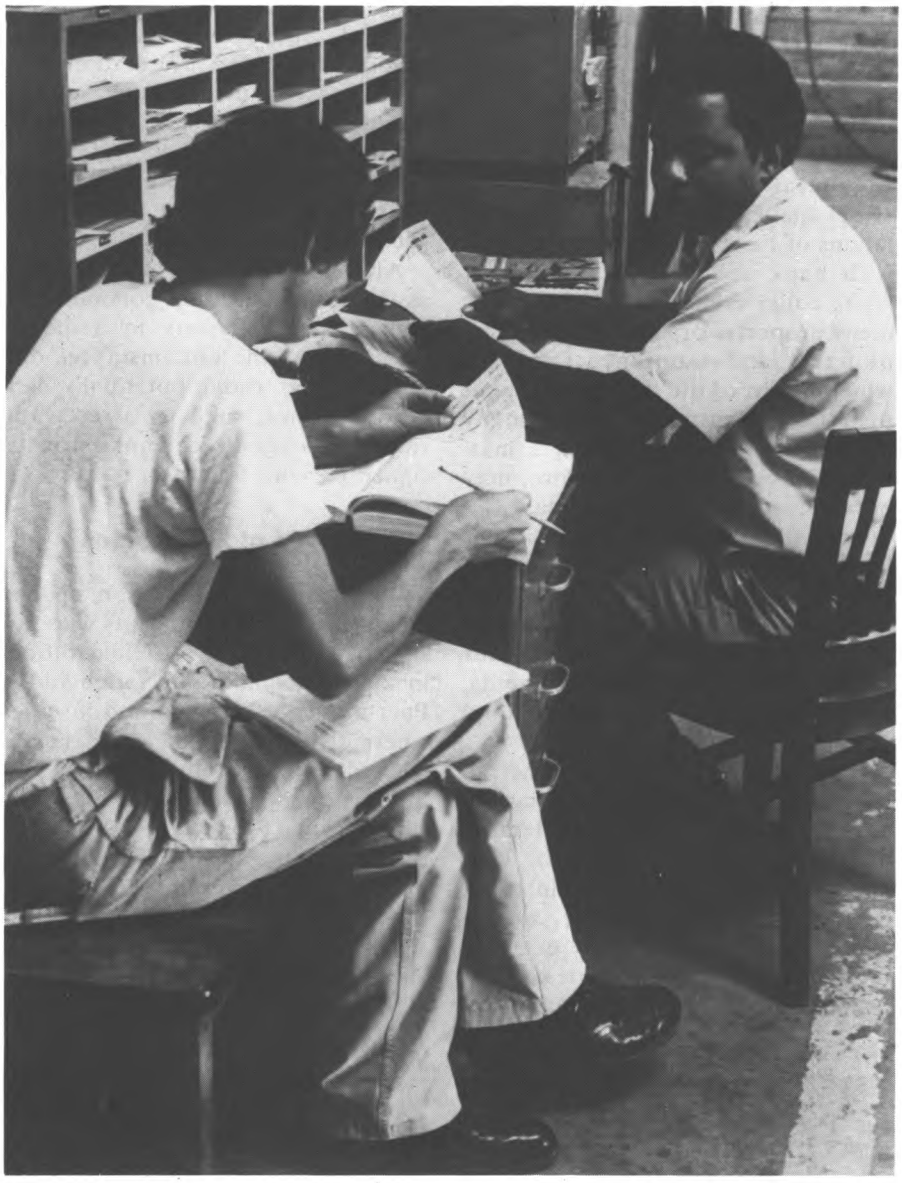
To make sure inmates are orderly and obey rules, correction officers keep a close watch on everything the immates do—working, exercising, eating, and bathing. They give and oversee work assignments for inmates, as well as instruct and help them on specific tasks. Sometimes it is necessary to search inmates for forbidden items, such as weapons or drugs, to settle disputes between inmates, and to enforce discipline. They cannot show favoritism to any inmate and must report all who violate rules. To prevent escapes, officers serve as guards on towers and at gates. They count inmates to make sure all are present during transfers and activities.

Correction officers examine facilities to assure the safety and security of prisoners. They check cells and other areas of the institution for unsanitary conditions, fire hazards, and evidence of infraction of rules by inmates. Periodically, they inspect locks, windowbars, grill doors, and gates for tampering.

Correction officers report orally and in writing on inmate conduct and on the quality and quantity of work done by inmates. Officers also report disturbances, violations of rules, and any unusual occurrences. They keep a record of their activities in a notebook.

Correction officers escort inmates to and from cells and other areas and admit and accompany authorized visitors within the facility. From time to time, they may censor mail, administer first aid, or assist police authorities by investigating crimes committed within the institution and by searching for escaped inmates.

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Correction officers oversee work assignments of inmates and instruct them in specific tasks.

Counseling inmates and helping them with problems also is an important part of the correction officer's job. Officers play a key role in efforts to rehabilitate inmates by helping them adjust to life in the institution, preparing them for later civilian life, and counseling them on how to avoid future criminal behavior. In some institutions, officers lead or participate in group counseling sessions. More often, however, the counseling is informal. Officers may arrange a change in a daily schedule so that an inmate has an opportunity to visit the library, help inmates get news of their families, talk over personal problems that may have led to committing a crime, or suggest where to look for a job after release from prison.

Correction sergeants directly supervise correction officers. They usually are responsible for maintaining security and directing the activities of a group of inmates during an assigned watch.

Places of Employment

There were about 90,000 correction officers in 1976. More than 9 out of 10 correction officers work for State and local governments; the remainder work for the Federal Government.

Most correction officers work in relatively large institutions located outside metropolitan areas, although a significant number work in smaller facilities located in towns.

Training, Other Qualifications, and Advancement

The Federal Government, as well as almost every State and a few localities, provides training for correction officers. Some States—Maryland and New York are two—have special training academies. Most States, however, provide informal on-the-job training.

Academy trainees generally receive 4 to 8 weeks of instruction on institutional policies, regulations and procedures, the behavior and custody of inmates, writing reports, and security. On-the-job trainees receive 2 to 6 months of similar training in an actual job setting under the guidance of an experienced officer. Experienced officers sometimes receive in-service training to keep abreast of new ideas and procedures.

Most penal systems require that correction officers be at least 21 years old and have a high school education or its equivalent, or else work experience that qualifies them. They must be in good health. Many States require candidates to meet formal standards of height, weight, vision, and hearing. Strength, good judgment, and the ability to think and act quickly are assets. Some States require candidates to have 1 or 2 years' experience in corrections or related police work. A few States require candidates to pass a written examination.

With additional education, experience, and training, qualified officers may advance to correction sergeant or other supervisory or administrative positions. Officers sometimes transfer to related areas, such as probation and parole.

Employment Outlook

Employment of correction officers is expected to increase about as fast as the average for all occupations through the mid-1980's. The likely population increase within correctional facilities is expected to create

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growth in the employment of correction officers. Many additional openings will result from job turnover and the need to replace workers who die or retire.

Earnings and Working Conditions

In 1976, salaries for correction officers varied widely by level of government. At the Federal level, the starting salary was $10,370 per year; the average salary for all Federal correction officers and correction sergeants was $12,675 per year. At the State level, starting salaries averaged $8,900 per year while maximum salaries averaged $11,400 per year. Salaries of correction sergeants range from an average minimum of $10,259 to an average maximum of $13,426 at the State level.

Correction officers usually work an 8-hour day, 40-hour week. Prison security must be provided around the clock, which means some officers work weekends, holidays, and nights. During emergencies, officers may work overtime, for which they are paid straight time, or time-and-one-half, or are given equal time off.

Officers may work either indoors with inmates or outdoors on towers or at gates. Although corrections work is not normally hazardous, there is always the threat of trouble by inmates.

Sources of Additional Information

Information about entrance requirements, training, and career opportunities for correction officers may be obtained from Federal and State civil service commissions, State departments of corrections, or nearby correctional institutions and facilities.

Additional information describing a career as a correction officer is available from:

American Correctional Association, National Offender's Services Contact Center, P.O. Box 81826, Lincoln, Neb. 68501.

FBI SPECIAL AGENTS

(D.O.T. 375.168)

Nature of the Work

Federal Bureau of Investigation (FBI) special agents investigate violations of Federal laws in connection with bank robberies, kidnappings, white-collar crime, thefts of Government property, organized crime, espionage, and sabotage. The FBI, which is part of the U.S. Department of Justice, has jurisdiction over many different Federal investigative matters. Special agents, therefore, may be assigned to any type of case, although those with specialized training usually work on cases related to their background. Agents with an accounting background, for example, may investigate white-collar crimes such as bank embezzlements, or fraudulent bankruptcies or land deals.

Because the FBI is a fact-gathering agency, its special agents function strictly as investigators, collecting evidence in cases in which the U.S. Government is or may be an interested party. In their casework, special agents conduct interviews, examine records, observe the activities of suspects, and participate in raids. Because the FBI's work is highly confidential, special agents may not disclose any of the information gathered in the course of their official duties to unauthorized persons, including members of their families. Frequently agents must testify in court about cases that they investigate.

Although they work alone on most assignments, agents communicate with their supervisors by radio or telephone as the circumstances dictate. In performing potentially dangerous duties, such as arrests and raids, two agents or more are assigned to work together.

Places of Employment

About 8,600 persons were special agents in 1976. Most agents were assigned to the FBI's 59 field offices located throughout the Nation and in Puerto Rico. They worked in cities where field office headquarters are located or in resident agencies (suboffices) established under field office supervision to provide prompt and efficient handling of investigative matters arising throughout the field office territory. Some agents are assigned to the Bureau headquarters in Washington, D.C., which supervises all FBI activities.



Special agents process a car for fingerprints.

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Training, Other Qualifications, and Advancement

To be considered for appointment as an FBI special agent, an applicant usually must be a graduate of a State-accredited law school or a college graduate with a major in accounting. The law school training must have been preceded by at least 2 years of undergraduate college work.

From time to time, as the need arises, the FBI accepts applications from persons who have a 4-year college degree with a physical science major or fluency in a foreign language, or who have 3 years of professional, executive, complex investigative, or other specialized experience.

Applicants for the position of FBI special agent must be citizens of the United States, be at least 23 years old but not have reached their 35th birthday before they begin duty and be willing to serve anywhere in the United States or Puerto Rico. They must be capable of strenuous physical exertion, and have excellent hearing and vision, normal color perception, and no physical defects that would prevent their using firearms or participating in dangerous assignments. All applicants must pass a rigid physical examination, as well as written and oral examinations testing their aptitude for meeting the public and conducting investigations. All of the tests except the physical examinations are given by the FBI at its facilities. Background and character investigations are made of all applicants. Appointments are made on a probationary basis and become permanent after 1 year of satisfactory service.

Each newly appointed special agent is given about 15 weeks of training at the FBI Academy at the U.S. Marine Corps Base in Quantico, Va. before assignment to a field office. During this period, agents receive intensive training in defensive tactics and the use of firearms. In addition, they are thoroughly schooled in Federal criminal law and procedures, FBI rules and regulations, fingerprinting, and investig a tive work. After assignment to a field office, the new agent usually works closely with an experienced agent for about 2 weeks before handling any assignments independently.

All administrative and supervisory jobs are filled from within the ranks by selecting those FBI special agents who have demonstrated the ability to assume more responsibility.

Employment Outlook

The jurisdiction of the FBI has expanded greatly over the years. Although it is impossible to forecast special agent personnel requirements, employment may be expected to increase with growing FBI responsibilities.

The FBI provides a career service and its rate of turnover is traditionally low. Nevertheless, the FBI is always interested in applications from qualified persons who would like to be considered for the position of special agent.

Earnings and Working Conditions

The entrance salary for FBI special agents was $15,524 in late 1976. Special agents are not appointed under Federal Civil Service regulations, but, like other Federal employees, they receive periodic within-grade salary raises if their work performance is satisfactory; they can advance in grade as they gain experience. Salaries of supervisory agents start at $28,725 a year.

Special agents are subject to call 24 hours a day and must be available for assignment at all times. Their duties call for some travel, for they are assigned wherever they are needed in the United States or Puerto Rico. They frequently work longer than the customary 40-hour week and, under specified conditions, receive overtime pay up to about $3,900 a year. They are granted paid vacations, sick leave, and annuities on retirement. Agents are required to retire at age 55 if they have served at least 20 years.

Sources of Additional Information

The Federal Bureau of Investigation, U.S. Department of Justice, Washington, D.C. 20535.

FIREFIGHTERS

(D.O.T. 373.118 through .884)

Nature of the Work

Every year fires destroy thousands of lives and property worth millions of dollars. Firefighters help protect the public against this danger. This statement gives information only about paid (professional) firefighters; it does not cover the many thousands of volunteer firefighters in communities across the country.

During duty hours, firefighters must be prepared to respond to a fire and handle any emergency that arises. Because firefighting is dangerous and complicated, it requires organization and teamwork. At every fire, firefighters perform specific duties assigned by a company officer such as lieutenant, captain, or other department officer: they may connect hose lines to hydrants, operate a pump, or position ladders. Because their duties may change several times while the company is in action they must be skilled in many different firefighting activities such as rescue, ventilation, and salvage. Some firefighters operate fire apparatus, emergency rescue vehicles, and fire boats. In addition, they help people to safety and administer first aid.

Most fire departments also are responsible for fire prevention activities. They provide specially trained personnel to inspect public buildings for conditions that might cause a fire. They may check building plans, the number and working condition of fire escapes and fire doors, the storage of flammable materials, and other possible hazards. In addition, firefighters educate the public about fire prevention and safety measures. They frequently speak on this subject before school assemblies and civic groups, and, in some communities, they inspect private homes for fire hazards.

Between alarms, firefighters spend much time improving their skills and doing maintenance work. They also have practice drills, clean and lubricate equipment, and stretch hoses to dry.

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Firefighting requires organization and teamwork.

Places of Employment

More than 210,000 persons worked as firefighters in 1976. Nine out of ten worked in municipal fire departments. Some very large cities have several thousand firefighters on the payroll while many small towns have fewer than 25. Some firefighters work in fire departments on Federal installations; others work in large manufacturing plants.

Training, Other Qualifications, and Advancement

Applicants for municipal firefighting jobs must pass a written test, a medical examination, and tests of strength, physical stamina, and agility, as specified by local regulations. These examinations are open to men and women who are at least 18 years of age, meet certain height and weight requirements, and have a high school education or equivalent. Those who receive the highest scores on the examinations have the best chances for appointment. Extra credit usually is given for military service. Experience gained as a volunteer firefighter or through training in the Armed Forces also may improve an applicant's chances for appointment.

As a rule, beginners in large fire departments are trained for several weeks at the city's fire school. Through classroom instruction and practice drills, the recruits study firefighting techniques, fire prevention, local building codes, and first aid; also, they learn how to use axes, chemical extinguishers, ladders, and other equipment. After completing this training, they are assigned to a fire company where they are evaluated during a probationary period.

Experienced firefighters often continue study to improve their job performance and prepare for promotional examinations. Fire departments frequently conduct training programs, and many colleges and universities offer courses such as fire engineering and fire science that are helpful to firefighters.

Among the personal qualities firefighters need are mental alertness, courage, mechanical aptitude, endurance, and a sense of public service. Initiative and good judgment are extremely important because firefighters often must make quick decisions in emergency situations. Because members of a crew eat, sleep, and work closely together under conditions of stress and danger, they should be dependable and able to get along well with others in a group. Leadership qualities are assets for officers who must establish and maintain a high degree of discipline and efficiency as well as direct the activities of the firefighters in their companies.

Opportunities for promotion are good in most fire departments. As firefighters gain experience, they may advance to a higher rank. After 3 to 5 years of service they may become eligible for promotion to the grade of lieutenant. The line of further promotion usually is to captain, then battalion chief, assistant chief, deputy chief, and finally to chief. Chances for advancement generally depend upon each candidate's position on the promotion list, as determined by the score on a written examination, his or her supervisor's rating, and seniority.

Employment Outlook

Employment of firefighters is expected to increase about as fast as the average for all occupations through the mid-1980's to meet the growing need for fire protection. Thousands of jobs will become available each year due to growth and the

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need to replace those who die, retire, or leave the occupation.

Employment should rise as new fire departments are formed and as others enlarge their fire prevention sections. Much of the expected increase will occur in smaller communities as volunteer firefighters are replaced by professionals. Additional firefighters also may be required as more cities shorten the workweek for firefighters.

The number of firefighters in a community ultimately depends upon the availability of funds from the municipal government for salaries and equipment. Fire protection is an essential service and citizens are likely to exert considerable pressure on city officials to expand fire protection coverage. However, local governments must live within their budgets. This means that in some financially troubled cities, firefighter employment probably will remain at current levels or decline while in other cities, employment is likely to increase substantially to meet the needs of an expanding population.

The number of people who qualify for firefighter jobs in large cities usually is greater than the number of job openings, even though the written examination and physical requirements eliminate many applicants. Therefore, competition among candidates in urban areas is apt to remain keen. Opportunities should be much better in smaller communities.

Earnings and Working Conditions

In 1976, average entrance salaries for beginning full-time firefighters ranged from $9,900 to $12,200 a year, depending on city size and region of the country. Average maximum salaries varied from $12,600 to $14,850 annually. Earnings for firefighters are lowest in the South and highest in the West, and generally are higher in suburban districts than in large cities. Average earnings of all firefighters are about one and one-half times as much as the average of all nonsupervisory workers in private industry, except farming.

Fire lieutenants started at an average salary of $13,700 a year in 1976 and earned an average maximum salary of $16,100. Fire captains started at an average salary of $15,450 a year and earned an average maximum of $18,300.

Practically all fire departments furnish allowances to pay for protective clothing (helmets, boots, and rubber coats) and many also provide dress uniforms.

In some cities, firefighters are on duty for 24 hours, then off for 48 hours, and receive an extra day off at intervals. In other cities, they work a day shift of 10 hours and a night shift of 14; shifts are rotated at frequent intervals. The average workweek for firefighters is 52 hours, but is only 42 hours in many large cities, particularly in the East. Some firefighters work as many as 84 hours a week. Fire lieutenants and fire captains work the same hours as the firefighters they supervise. Duty hours may include some time when firefighters are free to read, study, or pursue other personal interests. In addition to scheduled hours, firefighters often must work extra hours when they are bringing a fire under control. When overtime is worked, most fire departments give compensatory time off or extra pay.

The job of a firefighter involves risk of death or injury from sudden cave-ins of floors or toppling walls and danger from exposure to flames and smoke. Firefighters also may come in contact with poisonous, flammable, and explosive gases and chemicals. In addition, they work in all types of weather.

Firefighters generally are covered by liberal pension plans that often provide retirement at half pay at age 50 after 25 years of service or at any age if disabled in the line of duty. Firefighters also receive paid vacations. Provisions for sick leave usually are liberal. Health and surgical benefit plans are offered in many fire departments and compensation is provided for firefighters injured in the line of duty. Most fire departments provide paid holidays—ranging to 11 or more a year—or compensatory time off for working on holidays.

About 8 out of 10 firefighters are members of the International Association of Firefighters (AFL-CIO).

Sources of Additional Information

Information on obtaining a job as a firefighter is available from local civil service commission offices or fire departments.

Information about a career as a firefighter may be obtained from:

International Association of Fire Chiefs, 1725 K St. NW., Washington, D.C. 10006.

National Fire Protection Association, 470 Atlantic Ave., Boston, Mass. 02210.

Additional information on the salaries and hours of work of firefighters in various cities is published annually by the International City Management Association in its *Municipal Yearbook*, which is available in many libraries.

GUARDS

(D.O.T. 372.868)

Nature of the Work

Guards patrol and inspect property to protect it against fire, theft, vandalism, and illegal entry. The specific duties of these workers, however, vary depending on the size, type, and location of their employer.

In office buildings, banks, hospitals, and department stores, guards protect records, merchandise, money, and equipment. In department stores they often work with undercover detectives watching for theft by customers or store employees.

At ports and railroads, guards protect merchandise in shipment as well as property and equipment. They insure that nothing is stolen while being loaded or unloaded, and watch for fires, prowlers, and trouble among work crews. Sometimes they direct traffic.

Guards who work in public buildings, such as museums or art galleries, protect paintings or exhibits from fire, theft, or damage. They also answer routine questions from visitors and sometimes guide traffic.

In large factories, aircraft plants, and defense installations where valuable information must be protected, some guards check the credentials of persons and vehicles entering and

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Bank guards maintain the security of the bank by monitoring closed circuit television cameras.

leaving the premises. University, park, or recreation guards perform similar duties and also may issue parking permits and direct traffic.

At social affairs, sports events, conventions, and other public gatherings, guards maintain order, give information, and watch for persons who may cause trouble.

In a large organization, a security officer often is in charge of the guard force; in a small organization, a single worker may be responsible for security. Patrolling usually is done on foot; but if the property is large, guards may make their rounds by car or motor scooter.

As they make their rounds, guards check all doors and windows, see that no unauthorized persons remain after working hours, and insure that fire extinguishers, alarms, sprinkler systems, furnaces, and various electrical and plumbing systems are working properly. They sometimes set thermostats or turn on machines for janitorial workers.

Guards usually are uniformed and often carry a nightstick or gun. They also may carry a flashlight, whistle, two-way radio, and a watch clock—a device that indicates the time at which they reach various checkpoints. (The related occupation of correction officer also is discussed in this section on protective service occupations.)

Places of Employment

In 1976, almost 500,000 persons worked as guards. Most work in office buildings, government installations and buildings, stores, hotels, banks, schools, and manufacturing plants. Industrial security firms and guard agencies employ about 40 percent of all guards; agency guards work under contract in private business establishments of all types, as well as in some government facilities.

Although guard jobs are found throughout the country, most are located in highly industrialized areas.

Training, Other Qualifications, and Advancement

Most employers prefer guards who are high school graduates. Applicants with less than a high school education usually are tested for their reading and writing abilities and their competence in following written and oral instructions. Employers also seek people who have had experience in the military police or in State and local police departments. Most persons who enter guard jobs have prior work experience, although it is usually unrelated. Many have retired from careers in the military or other protective services, and their guard employment is a second career.

Candidates for guard jobs in the Federal Government must be veterans, have some experience as guards, and pass a written examination. For most Federal guard positions, applicants must qualify in the use of firearms. A driver's permit is required for some jobs.

Many employers give newly hired guards instruction before they start the job and also provide several weeks of on-the-job training. Guards may be taught the use of firearms, the administration of first aid, the procedure to use in handling various emergencies, and ways to spot and deal with security problems.

Applicants are expected to have good character references, no police record, good health—especially in hearing and vision—and good personal habits such as neatness and dependabiluty.They should be mentally alert, emotionally stable, and physically fit to cope with emergencies. Some employers require guards to meet height and weight specifications or to be within a certain age range.

Although guards in small companies receive periodic salary increases, advancement is likely to be limited. However, most large organizations use a military type of ranking that offers advancement in position and salary. Guard experience enables some persons to transfer to police jobs that offer higher pay and greater opportunities for advancement. Gards with some college education may advance to jobs that involve administrative duties or the prevention of espionage and sabotage.

Employment Outlook

Employment of guards is expected to grow faster than the average for all occupations through the mid-1980's. Increased concern for crime and vandalism will heighten the need for security in and around plants, stores, and recreation areas and is expected to cause rapid growth of agency guard employment. Additional guards will be needed by banks, manufacturing plants, and Federal, State, and local governments to provide better security and monitor remote cameras, alarm systems, and other electronic surveillance equipment. Many openings also will arise as guards retire, die, or leave their jobs for other reasons. Opportunities will be most plentiful for persons seeking work on night shifts.

Earnings and Working Conditions

Wages of guards working in 36 urban areas were estimated to average $3.23 an hour in 1976. Those working in the North earned more than the average while guards employed in the South and West earned somewhat less. Hourly wages of guards were estimated to average $5.04 in manufacturing; $5.29 in transportation and public utilities; $4.10 in banking, finance, insurance, and real

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estate; $4.22 in wholesale trade; $3.70 in retail trade; and $2.61 in the various service industries, including security and guard agencies. Guards who were members of unions earned more than average.

Depending on their experience, newly hired guards in the Federal Government earned between $142 and $160 a week. Top supervisory guards in the Federal Government may be paid up to $271 a week. These workers usually receive overtime pay as well as a wage differential for the second and third shifts. Guards generally have paid vacations, sick leave, and insurance and pension plans.

About two-thirds of all guards work at night; the usual shift lasts 8 hours. Some employers have three shifts where guards rotate to divide daytime, weekend, and holiday work equally. Guards usually eat on the job instead of taking a regular lunch break.

Guards often work alone, so that no one is nearby to help if an accident or injury occurs. Some large firms therefore use a reporting service that enables guards to be in constant contact with a central station outside the plant. If they fail to transmit an expected signal, the central station investigates.

Sources of Additional Information

Further information about work opportunities for guards is available from local employers and the nearest State employment service office.

POLICE OFFICERS

(D.O.T. 375.118 through .868, and 377.868)

Nature of the Work

The security of our Nation's cities and towns greatly depends on the work of local police officers whose jobs range from controlling traffic to preventing and investigating crimes. Whether on or off duty, these officers are expected to exercise their authority whenever necessary.

Police officers who work in a small community have many duties. In the course of a day's work, they may direct traffic at the scene of a fire, investigate a housebreaking, and give first aid to an accident victim. In a large police department, by contrast, officers usually are assigned to a specific type of duty. Most officers are detailed either to patrol or to traffic duty; smaller numbers are assigned to special work such as accident prevention or operation of communications systems. Others work as detectives (plainclothes officers) assigned to criminal investigation; still others, as experts in chemical and microscopic analysis, firearms identification, and handwriting and fingerprint identification. In very large cities, a few officers may work with special units such as mounted and motorcycle police, harbor patrols, helicopter patrols, canine corps, mobile rescue teams, and youth aid services.

Most new recruits begin on patrol duty. Recruits may be assigned to such varied areas as congested business districts or outlying residential areas. They may cover their beats alone or with other officers. They may ride in a police vehicle or walk on "foot" patrol. In any case, they become thoroughly familiar with conditions throughout their area and, while on patrol, remain alert for anything unusual. They note suspicious circumstances, such as open windows or lights in vacant buildings, as well as hazards to public safety such as burned-out street lights or fallen trees. Officers also watch for stolen automobiles and enforce traffic regulations. At regular intervals, they report to police headquarters through call boxes, by radio, or by walkie-talkie. They prepare reports about their activities and may be called on to testify in court when cases result in legal action.

Places of Employment

About 500,000 full-time officers worked for local police departments in 1976. Some cities have very large police forces. For example, New York has about 30,000 police officers and Chicago has nearly 13,000. Hundreds of small communities employ fewer than 25 officers each.

Training, Other Qualifications, and Advancement

Local civil service regulations govern the appointment of police officers in practically all large cities and in many small ones. Candidates must be U.S. citizens, usually at least 21



Police officers often work independently in carrying out their duties.

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years of age, and must meet certain height and weight standards. Eligibility for appointment depends on performance in competitive examinations as well as on education and experience. The physical examinations often include tests of strength and agility.

Because personal characteristics such as honesty, good judgment, and a sense of responsibility are especially important in police work, candidates are interviewed by a senior officer at police headquarters, and their character traits and background are investigated. In some police departments, candidates also may be interviewed by a psychiatrist or a pyschologist, or be given a personality test. Although police officers work independently, they must perform their duties in line with laws and departmental rules. They should enjoy working with people and serving the public.

In large police departments, where most jobs are found, applicants usually must have a high school education. A few cities require some college training and some hire law enforcement students as police interns. A few police departments accept applicants who have less than a high school education as recruits, particularly if they have worked in a field related to law enforcement.

More and more, police departments are encouraging applicants to take post-high school training in sociology and psychology. As a result, more than 1,000 junior colleges, colleges, and universities now offer programs in law enforcement or criminal justice. Other courses helpful in preparing for a police career include English, American history, civics and government, business law, and physics. Physical education and sports are especially helpful in developing the stamina and agility needed for police work.

In some large cities, young persons who have completed high school can enter police work as police cadets, or trainees, while still in their teens. As paid civilian employees of the police department, they attend classes to learn police skills and do clerical work. They may be appointed to the regular force at age 21 if they have all the necessary qualifications.

Before their first assignments, officers usually go through a period of training. In small communities, recruits learn by working for a short time with experienced officers. Training provided in large city police departments is more formal and may last several weeks or a few months. This training includes classroom instruction in constitutional law and civil rights; in State laws and local ordinances; and in accident investigation, patrol, and traffic control. Recruits learn how to use a gun, defend themselves from attack, administer first aid, and deal with emergencies.

Police officers usually become eligible for promotion after a specified length of service. In a large department, promotion may allow an officer to specialize in one type of police work such as laboratory work, traffic control, communications, or work with juveniles. Promotions to the rank of sergeant, lieutenant, and captain usually are made according to a candidate's position on a promotion list, as determined by scores on a written examination and on-the-job performance.

Many types of training help police officers improve their performance on the job and prepare for advancement. Through training given at police department academies and colleges, officers keep abreast of crowd-control techniques, civil defense, legal developments that affect their work, and advances in law enforcement equipment. Many police departments encourage officers to work toward college degrees, and some pay all or part of the tuition.

Employment Outlook

Police work is attractive to many. The job frequently is challenging and involves much responsibility. Furthermore, layoffs are rare. In periods of relatively high unemployment, the number of persons seeking police employment may be greater than the number of openings. However, the written examinations and strict physical requirements always eliminate many applicants. The outlook should be good for persons having some college training in law enforcement.

Law enforcement is complex and requires an approach tailored to the particular problems of each city. The police department of a city with a large, mobile population is likely to emphasize traffic control, preventive patrol, and cooperation with police agencies in the surrounding areas. In smaller cities, or those with well-established communities and fewer employment and recreation centers, police work may be less specialized. In either case, however, the usual way of increasing police protection is to provide more officers for duty.

The number of officers employed will depend on the amount of money made available by local governments. Because police work is essential, it is likely that funding for law enforcement will have high priority, and that the employment of city police officers will rise faster than the average for other occupations through the mid-1980's.

Earnings and Working Conditions

In 1976, entry level salaries for police officers averaged nearly $11,300 a year, although they varied widely from city to city. In some smaller communities, officers started at less than $8,400 a year, while some major cities offered over $15,000 a year to new employees. Most officers receive regular salary increases during the first few years of employment until they reach a set maximum for their rank. Maximum earnings averaged $13,900 a year in 1976, and exceeded $17,000 a year in some areas.

Promotion to a higher rank brings a higher basic salary. The average starting salary for sergeants, for example, was almost $14,500 a year in 1976; more than $18,000 a year in the largest cities. Beginning salaries for lieutenants averaged more than $16,300 a year in 1976. In general, police officers are paid about 1 1/2 times as much as nonsupervisory workers in private industry, except farming.

Police departments usually provide officers with special allowances for uniforms and furnish revolvers, night sticks, handcuffs, and other required equipment.

The scheduled workweek for police officers usually is 40 hours. Because police protection must be pro-

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vided around the clock in all but the smallest communities, some officers are on duty over weekends, on holidays, and at night. Police officers are subject to call any time their services are needed and may work overtime in emergencies. In some departments, overtime is paid at straight time or time and one-half; in others, officers may be given an equal amount of time off on another day of the week.

Police officers generally are covered by liberal pension plans, enabling many to retire at half pay by the time they reach age 55. In addition, paid vacations, sick leave, and health and life insurance plans frequently are provided.

Police officers may have to work outdoors for long periods in all kinds of weather. The injury rate is higher than in many occupations and reflects the risks officers take in pursuing speeding motorists, capturing lawbreakers, and dealing with public disorder.

Sources of Additional Information

Information about entrance requirements may be obtained from local civil service commissions or police departments.

Additional information describing careers as police officers is available from:

International Association of Chiefs of Police, 11 Firstfield Rd., Gaithersburg, Md. 20760.



State police officers usually take care of vehicle and traffic matters on the State's highways.

STATE POLICE OFFICERS

(D.O.T. 375.118, .138, .168, .228, .268, and .388)

Nature of the Work

The laws and regulations that govern the use of our Nation's roadways are designed to insure the safety of all citizens. State police officers (sometimes called State troopers) patrol our highways and enforce these laws.

State police officers issue traffic tickets to motorists who violate the law. At the scene of an accident, they direct traffic, give first aid, call for emergency equipment including ambulances, and write reports to be used in determining the cause of the accident.

In addition, State police officers provide services to motorists on the highways. For example, they radio for road service for drivers with mechanical trouble, direct tourists to their destination, or give information about lodging, restaurants, and tourist attractions.

State police officers also provide traffic assistance and control during road repairs, fires, and other emergencies, as well as during special occurrences such as parades and sports events. They sometimes check the weight of commercial vehicles, conduct driver examinations, and give information on highway safety to the public.

In addition to highway responsibilities, State police may investigate crimes, particularly in areas that do not have a local police force. They sometimes help city or county police catch lawbreakers and control civil disturbances. State highway patrols, however, normally are restricted to vehicle and traffic matters.

Some officers work with special State police units such as the mounted police, canine corps, and marine patrols. Others instruct trainees in State police schools, pilot police aircraft, or specialize in fingerprint classification or chemical and microscopic analysis of criminal evidence.

State police officers also write reports and maintain police records.

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Some officers, including division or bureau chiefs responsible for training or investigation and those who command police operations in an assigned area, have administrative duties.

Places of Employment

About 48,000 State police officers were employed in 1976.

The size of State police forces varies considerably. The largest force (in California) has over 5,000 officers; the smallest (in North Dakota) has fewer than 100. One State (Hawaii) does not maintain a police force.

Training, Other Qualifications, and Advancement

State civil service regulations govern the appointment of State police officers. All candidates must be citizens of the United States. Other entry requirements vary, but most States require that applicants have a high school education or an equivalent combination of education and experience and be at least 21 years old.

Officers must pass a competitive examination and meet physical and personal qualifications. Physical requirements include standards of height, weight, and eyesight. Tests of strength and agility often are required. Because honesty and a sense of responsibility are important in police work, an applicant's character and background are investigated.

Although State police officers work independently, they must perform their duties in line with department rules. They should want to serve the public and be willing to work outdoors in all types of weather.

In all States, recruits enter a formal training program for several months. They receive classroom instruction in State laws and jurisdictions, and they study procedures for accident investigation, patrol, and traffic control. Recruits learn to handle firearms, defend themselves from attack, handle an automobile at high speeds, and give first aid. After gaining experience, some officers take advanced training in police science, administration, law enforcement, or criminology. Classes are held at junior colleges, colleges and universities, or special police institutions such as the National Academy of the Federal Bureau of Investigation.

High school and college courses in English, government, psychology, sociology, American history, and physics help in preparing for a police career. Physical education and sports are useful for developing stamina and agility. Driver education courses and military police training also are helpful.

Police officer recruits serve a probationary period ranging from 6 months to 3 years. After a specified length of time, officers become eligible for promotion. Most States have merit promotion systems that require officers to pass a competitive examination to qualify for the next highest rank. Although the organization of police forces varies from State to State, the typical avenue of advancement is from private to corporal, to sergeant, to first sergeant, to lieutenant, and then to captain.

In some States, high school graduates may enter State police work as cadets. These paid civilian employees of the police organization attend classes to learn various aspects of police work and are assigned nonenforcement duties. Cadets who qualify may be appointed to the State police force at age 21.

Employment Outlook

State police employment is expected to grow about as fast as the average for other occupations. Although most jobs will result from this growth, some openings will be created as officers retire, die, or leave the occupation for other reasons.

Although some State police will be needed in criminal investigation and other nonhighway functions, the greatest demand will be for officers to work in highway patrol. This is the result of a growing, more mobile population. In ever-increasing numbers, Americans are using the motor vehicle as a means of transportation and a source of recreation. Motorcycles, campers, and other recreational vehicles will continue to add to the Nation's traffic flow and require additional officers to insure the safety of highway users.

Because law enforcement work is becoming more complex, specialists will be needed in crime laboratories and electronic data processing centers to develop administrative and criminal information systems. However, in many departments, these jobs will be filled by civilian employees rather than uniformed officers.

Earnings and Working Conditions

In 1976, beginning salaries for State police officers averaged about $10,400 a year. Officers generally receive regular salary increases, based on experience and performance, until a specified maximum is reached. Maximum salaries averaged $13,600 a year in 1976, but ranged to more than $15,000 a year in some States. Although starting salaries are normally higher in the West and lower in the South, State police officers on the average earn about 1 1/2 times as much as nonsupervisory workers in private industry, except farming.

Earnings increase with promotions to higher ranks. State police sergeants received average starting salaries of $12,350 a year in 1976, and average maximum salaries of close to $15,800. Lieutenants received average starting salaries of $14,200 a year and average maximum salaries of more than $18,300.

State police agencies usually provide officers with uniforms, firearms, and other necessary equipment, or give special allowances for their purchase.

In many States, the scheduled workweek for police officers is 40 hours. Although the workweek is longer in some States, the trend is toward a 40-hour week. Since police protection must be provided around the clock, some officers are on duty over weekends, on holidays, and at night. Police officers also are subject to emergency calls at any time.

State police usually are covered by liberal pension plans. Paid vacations, sick leave, medical insurance, and life insurance plans frequently are provided.

The work of State police officers is sometimes dangerous. They always run the risk of an automobile accident while pursuing speeding motor-

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ists or fleeing criminals. Officers also face the risk of injury while apprehending criminals or controlling disorders.

Sources of Additional Information

Information about specific entrance requirements may be obtained from State civil service commissions or State police headquarters, usually located in each State capital.

CONSTRUCTION INSPECTORS (GOVERNMENT)

(D.O.T. 168.168)

Nature of the Work

Federal, State, and local government construction inspectors insure that recognized standards of construction are observed in public and private construction. They inspect the construction, alteration, or repair of highways, streets, sewer and water systems, dams, bridges, buildings, and other structures to insure compliance with building codes and ordinances, zoning regulations, and contract specifications.



An inspector's job is to insure compliance with building codes and ordinances, zoning regulations, and contract specifications.

Construction inspectors visit worksites to inspect recently completed construction. On large projects, they generally are required to inspect each new stage of construction. Several members of large inspection staffs may be assigned to a single complex project.

Construction inspectors generally specialize in one particular type of construction work. Broadly categorized, these are building, electrical, mechanical, and public works.

Building inspectors inspect the structural quality of buildings. Some may specialize—for example, in structural steel or reinforced concrete buildings. Before construction, inspectors determine whether the plans for the building or other structure comply with local zoning regulations and are suited to the engineering and environmental demands of the building site. They visit the worksite before the foundation is poured to inspect the positioning and depth of the footings. They inspect the foundation after it has been completed. The size and type of structure and the rate of completion determine the number of other visits they must make. Upon completion of the project, they conduct a final comprehensive inspection.

Electrical inspectors inspect the installation of electrical systems and equipment to insure that they work properly and are in compliance with electrical codes and standards. They visit worksites to inspect new and existing wiring, lighting, sound and security systems, and generating equipment. They also may inspect the installation of the electrical wiring for heating and air-conditioning systems, kitchen appliances, and other components.

Mechanical inspectors examine plumbing systems including septic tanks, plumbing fixtures and traps, and water, sewer, and vent lines. They also inspect the installation of the mechanical components of kitchen appliances, heating and air-conditioning equipment, gasoline and butane tanks, gas piping, and gas-fired appliances. Some specialize in inspecting boilers, mechanical components, or plumbing.

Public works inspectors insure that Federal, State, and local government construction of water and sewer systems, highways, streets, bridges, and dams conforms to detailed contract specifications. They inspect excavation and fill operations, the placement of forms for concrete, concrete mixing and pouring, and asphalt paving. They also record the amount of work performed and materials used so that contract payment calculations can be made. Public works inspectors may specialize in inspection of highways, reinforced concrete, or ditches.

While inspections are primarily visual, inspectors often use tape measures, metering devices, concrete strength measurers, and other test equipment during inspections. They often keep a daily log of their work, file written reports, and, if necessary, act on their findings. For example, construction inspectors notify the construction contractor, superintendent, or supervisor when they discover a detail of a project that is not in compliance with the appropriate codes, ordinances, or contract specifications. If the deficiency is not corrected within a reasonable period of time, they have authority to issue a "stop-work" order.

Many inspectors also investigate reported incidents of "bootlegging," construction or alteration that is being carried on without proper permits. Violators of permit laws are directed to obtain permits and submit to inspection.

Places of Employment

About 22,000 persons worked as government construction inspectors in 1976. More than three-fourths worked for municipal or county building departments. Public works construction inspectors were employed primarily at the Federal and State levels.

The employment of local government construction inspectors is concentrated in cities and in suburban areas undergoing rapid growth. These governments employ large inspection staffs, including most of the inspectors who specialize in structural steel, reinforced concrete, and boiler inspection.

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About half the construction inspectors employed by the Federal Government work for the Department of Defense, primarily for the U.S. Army Corps of Engineers.

Training, Other Qualifications, and Advancement

To become a construction inspector, several years of experience as a construction contractor, supervisor, or craft worker are generally required. Federal, State, and most local governments also require an applicant to have a high school diploma. High school preparation should include courses in drafting, mathematics, and English.

Workers who want to become inspectors should have a thorough knowledge of construction materials and practices in either a general area like structural or heavy construction, or in a specialized area such as electrical or plumbing systems, reinforced concrete, or structural steel; a significant number of construction inspectors have recent experience as carpenters, electricians, plumbers, or pipefitters.

Many employers prefer inspectors to be graduates of an apprenticeship program, to have studied at least 2 years toward an engineering or architectural degree, or to have a degree from a community or junior college, with courses in construction technology, blueprint reading, technical mathematics, English, and building inspection.

Construction inspectors must be in good physical condition in order to walk and climb about construction sites. They also must have a motor vehicle operator's license. In addition, Federal, State, and many local governments usually require that construction inspectors pass a civil service examination.

Construction inspectors receive most of their training on the job. During the first couple of weeks, working with an experienced inspector, they learn about inspection techniques; codes, ordinances, and regulations; contract specifications; and recordkeeping and reporting duties. They begin by inspecting less complex types of construction such as residential buildings. The difficulty of their assignments is gradually increased until they are able to handle complex assignments. An engineering degree is frequently needed in order to advance to supervisory inspector.

Since they advise representatives of the contruction industry and the general public on matters of code interpretation, construction practices, and technical developments, construction inspectors must keep abreast of new building code developments. The Federal Government and most State and large city governments conduct formal training programs for their construction inspectors to broaden their knowledge of construction materials, practices, and inspection techniques and to acquaint them with new materials and practices. Inspectors who work for small agencies that do not conduct training programs frequently can broaden their knowledge of construction and upgrade their skills by attending State-conducted training programs or by taking college or correspondence courses.

Employment Outlook

Employment of government construction inspectors is expected to grow faster than the average for all occupations through the mid-1980's. Because of the increasing complexity of construction technology and the trend toward the establishment of minimum professional standards for inspectors by State governments, job opportunities should be best for those who have some college education or who are currently employed as carpenters, electricians, or plumbers.

In addition to growth needs, job openings for construction inspectors will occur each year to replace those who die, retire, or leave the occupation for other reasons.

The number of new positions for construction inspectors will be largely affected by the level of new housing and commercial building activity. Because construction activity is sensitive to ups and downs in the economy, the number of job openings may fluctuate from year to year.

The demand for construction inspectors also should increase as they are given more responsibility for insuring safe construction of prefabricated buildings mass-produced in factories and assembled on the construction site.

Earnings and Working Conditions

Starting salaries of construction inspectors working in cities and towns averaged about $10,500 a year in 1974, according to a survey conducted by the Public Personnel Association. Top salaries for senior inspectors averaged $13,000. Salaries for supervisory inspectors were higher in large cities. Among geographic regions, the West had the highest average salaries, cities in the South the lowest.

In the Federal Government, construction inspectors started at $9,300 or $11,500 a year in 1977, depending on the amount and nature of their earlier work experience. Experienced construction inspectors were paid salaries ranging from $14,000 to $19,500, and more experienced workers were paid salaries ranging from $17,000 to over $22,000.

Construction inspectors often spend a large portion of their time traveling between worksites. Usually, an automobile is furnished for their use or their expenses are reimbursed if they use their own. Since they spend most of their time outdoors or in partially enclosed structures, they are exposed to all types of inclement weather.

Unlike the seasonal and intermittent nature of employment in many of the occupations associated with the construction industry, inspection work tends to be steady and year round. In 1976, according to limited information, unemployment was estimated to be less than 3 percent, a figure significantly lower than that for the Nation.

Sources of Additional Information

Persons seeking additional information on a career as a State or local government construction inspector should contact their State or local employment service, or:

International Conference of Building Officials, 5360 South Workman Mill Rd., Whittier, Calif. 90601.

Persons interested in a career as a construction inspector with the Fed-

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eral Government can get information from:

Interagency Board of the U.S. Civil Service Examiners for Washington, D.C., 1900 E St. NW., Washington, D.C. 20415.

HEALTH AND REGULATORY INSPECTORS (GOVERNMENT)

(D.O.T. 168.168, and .287)

Nature of the Work

Protecting the public from health and safety hazards, prohibiting unfair trade and employment practices, and raising revenue are included in the wide range of responsibilities of government. Health and regulatory inspectors help insure observance of the laws and regulations that govern these responsibilities. For discussion of a third type of inspector, see the statement on construction inspectors (Government) elsewhere in the *Handbook*.

The duties, titles, and responsibilities of Federal, State, and local health and regulatory inspectors vary widely. Some types of inspectors work only for the Federal Government while others also are employed by State and local governments. Many other workers employed as accountants, agricultural cooperative extension service workers, and other agricultural professionals also have inspection duties.

Health Inspectors. Health inspectors work with engineers, chemists, microbiologists, and health workers to insure compliance with public health and safety regulations governing food, drugs, and various other consumer products. They also administer regulations that govern the quarantine of persons and products entering the United States from foreign countries. The major types of health inspectors are: Food and drug, meat and poultry, and agricultural quarantine inspectors. In addition, some inspectors work in a field that is closely related to food inspection—agricultural commodity grading.

Most *food and drug inspectors* specialize in one area of inspection such as food, feeds and pesticides, weights and measures, or drugs and cosmetics. Some, especially those who work for the Federal Government, may be proficient in several of these areas. Working individually or in teams under the direction of a senior or supervisory inspector, they travel throughout a geographical area to check periodically firms that produce, handle, store, and market food, drugs, and cosmetics. They look for evidence of inaccurate product labeling, decomposition, chemical or bacteriological contamination, and other factors that could result in a product becoming harmful to consumer health. They assemble evidence of violations, using portable scales, cameras, ultraviolet lights, container sampling devices, thermometers, chemical testing kits, and other types of equipment.

Product samples collected as part of their examinations are sent to laboratories for analysis. After completing their inspection, inspectors discuss their observations with the management of the plant and point out any areas where corrective measures are needed. They prepare written reports of their findings, and, when necessary, compile evidence that may be used in court if legal actions must be taken to effect compliance with the law.

Federal and State laws empower *meat and poultry inspectors* to inspect meat, poultry, and their byproducts to insure that they are wholesome and safe for public consumption. Working as part of a constant onsite team under the general supervision of a veterinarian, they inspect meat and poultry slaughtering, processing, and packaging operations. They also check to see that products are labeled correctly and that proper sanitation is maintained in slaughtering and processing operations.

Agricultural quarantine inspectors protect American agricultural products from the introduction and spread of foreign plant pests and animal diseases. To safeguard crops, forests, and gardens, they inspect ships, aircraft, railroad cars, and motor vehicles entering the United States for the presence of restricted or prohibited plant or animal materials.

Environmental health inspectors, or sanitarians, work primarily for State and local governments. These inspectors perform a variety of inspection duties to help insure that the food people eat, the water they drink, and the air they breathe meet government standards. They check the cleanliness and safety of food and beverages produced in dairies and processing plants, or served in restaurants, hospitals, and other institutions. They often examine the handling, processing, and serving of food for compliance with sanitation rules and regulations.

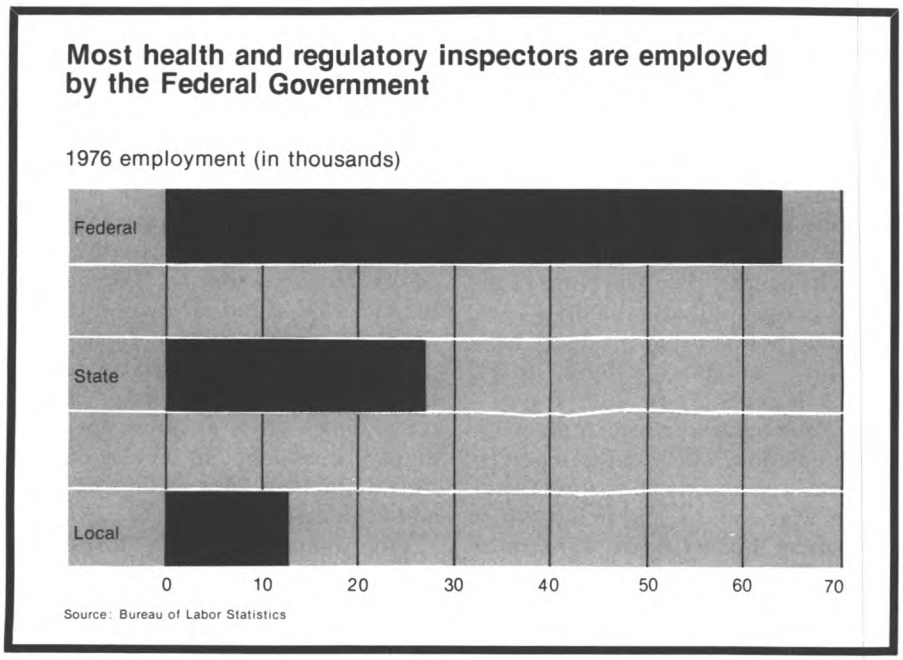
Environmental health inspectors concerned with waste control oversee the treatment and disposal of sewage, refuse, and garbage. They examine places where pollution is a danger, perform tests to detect pollutants, and collect air or water samples for analysis. They determine the nature and cause of the pollution, then initiate action to stop it.

In large local and State health or agriculture departments, environmental health inspectors may specialize in areas of work such as milk and dairy products, food sanitation, waste control, air pollution, institutional sanitation, and occupational health. In rural areas and small cities, they may be responsible for a wide range of environmental health activities.

Agricultural commodity graders apply quality standards to various commodities to insure that retailers and consumers receive good and reliable products. They generally specialize in an area such as eggs and egg products, processed or fresh fruits and vegetables, grain, or dairy products. They inspect samples of a particular product to determine its quality and grade, and issue official grading certificates. Graders also may inspect the plant and equipment to insure that adequate sanitation standards are maintained.

Regulatory Inspectors. Regulatory inspectors insure compliance with various laws and regulations that protect the public welfare. Important types of regulatory inspectors are: Immigration; customs; aviation safe-

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ty; mine; wage-hour compliance; alcohol, tobacco, and firearms; and occupational safety inspectors.

Immigration inspectors interview and examine people seeking admission, readmission, or the privileges of passing through or residing in the United States. They inspect the passports of those seeking to enter the United States to determine whether they are legally eligible to enter and to verify their citizenship, status, and identity. Immigration inspectors also prepare reports, maintain records, and process applications and petitions by aliens for privileges such as immigrating to or living temporarily in the United States.

Customs inspectors enforce the laws governing U.S. imports and exports. Stationed at airports, seaports, and border crossing points, they count, weigh, gauge, measure, and sample commercial cargoes entering and leaving the United States to determine the amount of tax that must be paid. They also inspect baggage and articles worn or carried by the passengers and crew of ships, aircraft, and motor vehicles to insure that all merchandise being brought through ports of entry is declared and the proper taxes paid.

Aviation safety officers insure that Federal Aviation Administration (FAA) regulations that govern the quality and safety of aircraft equipment and personnel are maintained. Aviation safety officers may inspect aircraft manufacturing, maintenance, or operations procedures. They usually specialize in inspecting either commercial or general aviation aircraft. They are responsible for the inspection of aircraft manufacturing and of major repairs. They also certify aircraft pilots and schools, pilot examiners, flight instructors, and instructional materials.

Mine inspectors work to insure the health and safety of miners and to promote good mining practices. To insure compliance with safety laws and regulations, mine inspectors visit mines and related facilities to obtain information on health and safety conditions.

Mine inspectors discuss their findings with the management of the mine, prepare written reports that incorporate their findings and decisions, and issue notices of findings that describe violations and hazards that must be corrected. They also investigate and prepare reports on mine accidents and direct rescue and firefighting operations when fires or explosions occur.

Wage-hour compliance officers inspect the employer's time, payroll, and personnel records to insure compliance with the provisions of various Federal laws on minimum wages, overtime, pay, employment of minors, and equal employment opportunity. They often interview employees to verify the employer's records and to check for any complaints.

Alcohol, tobacco, and firearms inspectors insure that the industries which manufacture these products comply with the provisions of revenue laws and other regulations on operating procedures, unfair competition, and trade practices. They spend most of their time inspecting distilleries, wineries, and breweries; cigar and cigarette manufacturing plants; wholesale liquor dealers and importers; firearms and explosives manufacturers, dealers, and users; and other regulated facilities. They periodically audit these establishments to determine that appropriate taxes are correctly determined and paid.

Places of Employment

About 115,000 persons worked as health and regulatory inspectors in 1976. Nearly two-thirds of all health and regulatory inspectors work for the Federal Government, although State and local governments also employ large numbers. The largest single employer of food and drug inspectors is the U.S. Food and Drug Administration, but the majority work for State governments. Meat and poultry inspectors and commodity graders who work in processing plants are employed mainly by the U.S. Department of Agriculture. Agricultural quarantine inspectors work either for the U.S. Public Health Service or the U.S. Department of Agriculture. Environmental health inspectors work primarily for State and local governments.

Regulatory inspectors work for various agencies within the Federal Government, mainly in regional and district offices throughout the United States. Aviation safety officers work for the Federal Aviation Administration; wage-hour compliance officers, for the Department of Labor; mine inspectors, the Department of the Interior; and alcohol, tobacco, and firearms inspectors, the Treasury Department. Immigration, customs, and agricultural quarantine inspectors work at U.S. airports, seaports, border crossing points, and at foreign airports and seaports. They are employed by the Justice and Treasury Departments.

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Training, Advancement, and Other Qualifications

Because inspectors perform such a wide range of duties, qualifications for employment in these positions vary greatly. The Federal Government requires a passing score on the Professional and Administrative Career Examination (PACE) for several inspector occupations, including immigration; customs; wage and hour compliance; alcohol, tobacco, and firearms; occupational safety; and consumer safety (food and drug). To take this examination, a bachelor's degree or 3 years of responsible work experience, or a combination of the two, are required. In some cases, agencies will give preference to an applicant whose course work or work experience is related to the field of employment.

Other Federal inspectors must pass an examination based on specialized knowledge, in addition to having work experience in related fields. These include commodity inspectors such as those in meat, poultry, livestock, and egg products.

Air safety inspectors must have considerable experience in aviation maintenance, and an FAA Air Frame and Power Plant certificate. In addition, various pilot certificates and considerable flight experience are required, with the type dependent on the inspection duties. Many air safety inspectors receive both their flight training and mechanical training in the Armed Forces. No written examination is required.

Applicants for mine safety inspector positions generally must have specialized work experience in mine management or supervision, or possess a skill such as electrical engineering (for mine electrical inspectors). In some cases, a general aptitude test may be required.

Some Civil Service registers, including those for agricultural quarantine inspectors and fruit and vegetable graders, rate applicants solely on their experience and education and require no written examination.

Qualifications for inspectors at the State and local level usually are similar to those for Federal employees. However, this may vary among government employers, particularly at the local level. Environmental health inspectors, called sanitarians in many States, must have a bachelor's degree in environmental health or the physical or biological sciences. In 35 States, they are licensed and their qualifications regulated by examining boards.

All inspectors are trained in the laws and inspection procedures related to their specific field through a combination of classroom and on-the-job training. In general, people who want to become health and regulatory inspectors should be able to accept responsibility and like detailed work. They should be neat and personable and able to express themselves well orally and in writing.

All Federal Government inspectors are promoted on a Civil Service "career ladder." This means that, assuming satisfactory work performance, workers will advance automatically, usually at 1-year intervals, to a specified maximum level. Above this level (usually supervisory positions), advancement is competitive, based on needs of the agency and individual merit.

Employment Outlook

Employment of health and regulatory inspectors as a group is expected to increase faster than the average for all occupations through the mid-1980's. The growth in employment of health inspectors is expected to be more rapid than that of regulatory inspectors. In addition to job opportunities stemming from growth, many inspectors will be needed each year to replace those who die, retire, or transfer to other occupations.

Increased food consumption caused by population growth and greater public concern over potential health hazards should create additional jobs for food and drug, meat and poultry, and other commodity inspectors and graders. Public concern for improved quality and safety of consumer products also should result in new legislation in these areas, requiring additional inspectors to insure compliance.

Aviation industry growth, increased international travel, and increases in the volume of U.S. imports and exports should continue to create new openings for aviation safety officers, quarantine and immigration inspectors, and customs inspectors. Increasing coal mining activity and concern over mine safety should create additional mine inspector jobs. Continued public pressure for equal employment rights should cause a growing need for wage-hour compliance officers.

Earnings and Working Conditions

With the exception of mine inspectors and aviation safety officers, the Federal Government paid health and regulatory inspectors and graders starting salaries of $9,303 or $11,523 a year in 1977, depending on the type of position and the qualifications of the applicant. Aviation safety officers and mining inspectors usually received starting salaries of $14,097.

Salaries of experienced meat and poultry inspectors, egg product inspectors, agricultural quarantine inspectors, alcohol, tobacco, and firearms inspectors, and customs and immigration inspectors were over $14,000 a year in 1977. Experienced food and drug inspectors (consumer safety officers), mine inspectors, and wage-hour compliance officers usually received salaries of about $20,000 from the Federal Government in 1977. Experienced aviation safety officers averaged over $24,000 a year.

Nonsupervisory environmental health inspectors working for selected U.S. cities and counties received average starting salaries about $11,000 in 1976; those working for State governments started at about $1,000 less. Experienced environmental health inspectors working for State governments earned between $11,500 and $15,200, but those in top supervisory and administrative positions had salaries between $15,500 and $20,500 in 1976.

Most health and regulatory inspectors live an active life, meeting many people and working in a variety of environments. Many travel frequently and are usually furnished with an automobile or reimbursed for travel expenses.

At times inspectors must work under unfavorable working conditions. For example, meat and poultry, and alcohol, tobacco, and firearms in-

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Public concern for improved quality and safety of consumer products will require additional inspectors to insure compliance.

spectors frequently come in contact with strong, unpleasant odors; mine inspectors often spend a great deal of time in mines where they are exposed to the same hazards as miners. Many inspectors work long and often irregular hours.

Sources of Additional Information

For facts about inspector careers in the Federal Government, contact:

Interagency Board of U.S. Civil Service Examiners for Washington, D.C., 1900 E St. NW., Washington, D.C. 20415.

More detailed information on qualifications for Federal jobs is available from local Civil Service Commission offices or from individual Federal agencies.

Information about career opportunities as inspectors in State and local governments is available from State civil service commissions, usually located in each State capital, or from local government offices.

OCCUPATIONAL SAFETY AND HEALTH WORKERS

(D.O.T. 010.081; 012.081 and .188; 079.188; 168.168, .268, and .284; 379.387; 821.387; and 909.128)

Nature of the Work

People in the occupational safety and health field have the challenging job of insuring a safe and healthful environment for workers and safe products for consumers. Safety and health workers in a number of different occupations strive to control occupational accidents and diseases, property losses, and injuries from unsafe products. This statement discusses occupations in private industry; for a discussion of related occupations in government, see the statement on health and regulatory inspectors elsewhere in the *Handbook*.

The largest group of safety workers is *safety engineers*. Although all of them are concerned with preventing accidents, their specific tasks depend on where they work. For example, the safety engineer working in a large manufacturing plant (D.O.T. 012.081) may develop a comprehensive safety program covering several thousand employees. This usually entails detailed analysis of each job in the plant to identify potential hazards so that preventive measures can be taken. When accidents do occur, safety engineers in manufacturing plants investigate to determine the cause. If poor design, improper maintenance, or mechanical failure is involved, they use their technical skills to correct the situation and prevent its recurrence. When human error is

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Safety engineer inspecting plant machinery for potential hazards.

the cause of an accident, safety engineers may establish training courses for plantworkers and supervisors or reemphasize existing ones.

Safety engineers who work for trucking companies (D.O.T. 909.128) study schedules, routes, loads, and speeds to determine their influence on trucking accidents. They also inspect heavy rigs, such as trucks and trailers, to suggest ways of safer operation. In the mining industry, safety engineers (D.O.T. 010.081) may inspect underground or open-pit areas to insure compliance with State and Federal laws, design protective equipment and safety devices for mine machinery, or lead rescue activities during emergencies.

Many safety engineers are directly concerned with the safety of their company's product. They work closely with design engineers to develop models that meet all safety standards, and they monitor the manufacturing process to insure the safety of the finished product.

Safeguarding life and property against loss from fire, explosion, and related hazards is the job of the *fire protection engineer* (D.O.T. 012.188). Those who specialize in research investigate problems such as fires in high-rise buildings or the manufacture, handling, and storage of flammable materials. Fire protection engineers in the field use these research findings to identify hazards and devise ways to correct them. For example, new findings concerning flashpoints (the temperatures at which different materials will ignite) are valuable to the engineer designing storage facilities in a chemical plant.

Like safety engineers, fire protection engineers may have different job duties depending on where they work. One who works for a fire equipment manufacturing company may design new fire protection devices, while engineers in consulting firms work with architects and others to insure that fire safety is built into new structures. In contrast, fire protection engineers working for insurance rating bureaus (organizations that calculate basic costs of insurance coverage in particular areas) inspect private, commercial, and industrial properties to evaluate the adequacy of fire protection for the entire area. Many fire protection engineers have special expertise in one area or more of fire protection, such as sprinkler or fire detection systems.

Losses in the workplace cannot be reduced without measures to eliminate hazards to workers' health. Designing and maintaining a healthful work environment is the job of the *industrial hygienist* (D.O.T. 079.188). These health professionals are concerned with how noise, dust, vapors, and other hazards common to the industrial setting affect workers' health. After a problem is detected, perhaps by analyzing employee medical records, the industrial hygienist at the jobsite may take air samples, monitor noise levels, or measure radioactivity levels in the areas under investigation.

Other industrial hygienists work in private laboratories or in those maintained by large insurance companies or industrial firms. Laboratory hygienists analyze air samples, do research on the reliability of health equipment such as respirators, or investigate the effects of exposure to chemicals or radiation. Some hygienists specialize in problems of air and water pollution. For example, these

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health professionals may work with government officials, environmental groups, labor organizations, and plant management to develop a system to screen harmful substances before they enter and pollute a river.

Loss control and *occupational health consultants* (D.O.T. 168.168) in property-liability insurance companies perform many services for their clients. These range from correcting a single hazard in a small business to devising a program to eliminate or reduce all losses arising out of a large firm's operation. When dealing with a new account, the consultant makes a thorough inspection of the plant and then confers with management to formulate a program that meets the company's needs. The consultant may, for example, help set up plant health programs and medical services, assist plant personnel to insure that a new facility meets all safety requirements, or train plant safety people. Safety and health consultants also help their company's underwriters determine whether a risk is acceptable and the amount of premium to charge.

Places of Employment

An estimated 28,000 persons were engaged in occupational safety and health work in 1976. About one-quarter of these carried the professional designations, Certified Safety Professional; Certified Industrial Hygienist; or Member, Society of Fire Protection Engineers. Many others who are not certified performed professional level work, while a relatively small number were employed in the occupational safety and health field as technicians and inspectors. Property and liability insurance companies employ many occupational safety and health workers to provide engineering, consulting, and inspection services to their clients. Others worked for a variety of industrial, manufacturing, and commercial concerns.

These workers are needed wherever large numbers of people are concentrated and industrial development occurs. Insurance consultants generally have their headquarters in a region's major city and travel to and from the sites they visit.

Training, Other Qualifications, and Advancement

Entry level safety and health professionals generally need at least a bachelor's degree in engineering or science. A more specialized degree, such as one in safety management, industrial safety, or fire protection engineering, often is helpful in getting a good job. Many employers prefer applicants with a graduate degree in areas such as industrial hygiene, safety engineering, or occupational safety and health engineering, or those with prior industrial work experience. Some employers will hire graduates of 2-year college curriculums as technicians, particularly if they have work experience related to the job.

Continuing education is necessary to stay abreast of changing technologies, new ideas, and emerging trends. Many insurance companies offer training seminars and correspondence courses for their staffs. The Occupational Safety and Health Administration (OSHA) conducts courses for safety and health workers on topics such as occupational injury investigation and radiological health hazards. The recognized marks of achievement in the field are the designations Certified Safety Professional; Certified Industrial Hygienist; and Member, Society of Fire Protection Engineers. Certification is conferred by the Board of Certified Safety Professionals, the American Board of Industrial Hygiene, or the Society of Fire Protection Engineers after the candidate completes the required experience and passes an examination.

In addition to possessing technical competence, safety and health workers must be able to communicate well and motivate others. They should be able to adapt quickly to different situations, being equally at ease with a representative of a local union, a supervisor in the welding shop, or a corporate executive. Because physical activity is basic to the job, good physical condition is necessary.

In the insurance industry, safety and health workers can be promoted to department manager in a small branch office, move up to larger branch offices, and finally take an executive position in the home office. In industrial firms, they can advance to plant safety and health manager or corporate manager over several plants. Although extensive experience is required, technicians can advance to professional safety and health positions.

Employment Outlook

Employment of safety and health workers is expected to increase faster than the average for all occupations through the mid-1980's as growing concern for occupational safety and health and consumer safety continues to generate programs and jobs. Many openings will arise also to replace workers who die, retire, or leave their jobs for other reasons.

Much of the employment growth is expected to occur in industrial and manufacturing firms. Many firms now without a safety and health program are expected to establish one, and others will upgrade and expand existing programs in response to government requirements, union interest, and rising insurance costs. The number of safety and health workers in casualty insurance companies also will increase as more small employers request the services of their insurer's engineering or loss control department. Prospects should be best for graduates of occupational safety or health curriculums.

Earnings and Working Conditions

Salaries of safety and health workers vary widely according to education, experience, and specialty. In manufacturing firms, persons with a bachelor's degree generally started at between $12,000 and $15,000 a year in 1976, according to the limited data available. Those with a graduate degree usually received higher starting salaries, and technicians somewhat lower ones. Safety and health workers with several years' experience averaged $18,000 to $22,000, and corporate managers well over $25,000 a year.

The amount of travel required depends upon job specialty and geographic location. For example, the plant safety engineer may travel only to seminars and conferences, while

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the insurance consultant may spend about half the time traveling between worksites. Usually, a car is furnished or workers are reimbursed for the expenses of using their own vehicles.

Sources of Additional Information

For general information about safety careers, write to:

American Society of Safety Engineers, 850 Busse Highway, Park Ridge, Ill. 60068.

Also available from the Society is a booklet that lists colleges and universities offering degree programs in the occupational safety and health field.

Information concerning a career in industrial hygiene is available from:

American Industrial Hygiene Association, 66 S. Miller Rd., Akron, Ohio 44313.

Career information concerning fire protection engineering may be obtained from:

Society of Fire Protection Engineers, 60 Batterymarch St., Boston, Mass. 02110.

Career information on insurance loss control consulting is available from the home offices of many property-liability insurance companies.

The National Institute for Occupational Safety and Health of the U.S. Public Health Service provides general information on requirements for various careers in the occupational safety and health field, as well as lists of college and universities that award degrees in the various occupational safety and health disciplines. This information is available from:

Division of Training and Manpower Development, National Institute for Occupational Safety and Health, Robert A. Taft Laboratories, 4676 Columbia Parkway, Cincinnati, Ohio 45226.

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OTHER SERVICE OCCUPATIONS

MAIL CARRIERS

(D.O.T. 233.138 and 233.388)

Nature of the Work

Most mail carriers travel planned routes delivering and collecting mail. Carriers start work at the post office early in the morning, where they spend a few hours arranging their mail for delivery and taking care of other details.

A carrier may cover the route on foot, by vehicle, or a combination of both. On foot, they tote a heavy load of mail in a satchel or push it in a cart. In outlying suburban or rural areas a car or small truck is used to deliver mail. Residential carriers cover their routes only once a day, but carriers assigned to a business district may make two trips a day. Deliveries are made house-to-house, to roadside mailboxes, and to large buildings, such as apartments, which have all the mailboxes on the first floor.

Besides making deliveries, carriers collect postage-due and c.o.d. fees and obtain signed receipts for registered, certified, and sometimes for insured mail. If a customer is not home the carrier leaves a notice that tells where special mail is being held.

After completing their routes, carriers return to the post office with mail gathered from street collection boxes and homes. They turn in the accountable mail receipts and money collected during the day and may separate letters and parcels so that they can be canceled easily, and they turn in the receipts and money collected.

Many carriers have more specialized duties. Some deliver only parcel post while others collect mail from street boxes and office mail chutes. In contrast, rural carriers provide a wide variety of postal services. In addition to delivering and picking up mail, they sell stamps and money orders and accept parcels and letters to be registered or insured.

All carriers answer customers' questions about postal regulations and service and provide change-of-address cards and other postal forms when requested.

Training, Other Qualifications, and Advancement

Mail carriers must be at least 18 and qualify on a four-part written examination. The first part tests clerical accuracy by asking the applicant to compare pairs of add7esses and indicate which are identical. The second part tests ability to memorize mail distribution systems. The third measures reading ability, including vocabulary, and the fourth tests ability to do simple arithmetic.

If the carrier job involves driving, applicants must have a driver's license, a good driving record, and pass a road test. Before appointment, mail carriers must pass a physical examination and may be asked to show that they can lift and handle mail sacks weighing up to 70 pounds.

Applicants for mail carrier jobs should apply at the post office where they wish to work because each post officeeeps a separate list of those who have passed the examination. Applicants' names are listed in order of their scores. Five extra points are added to the score of an honorably discharged veteran, and 10 extra points to the score of a veteran wounded in combat or disabled. When a vacancy occurs, the appointing officer chooses one of the top three applicants; the rest of the names remain on the list to be considered for future openings.

Mail carriers are classified as casual, part-time flexible, part-time regular, or full time. Casual workers are hired to help deliver mail during peak mailing periods during the year. Part-time flexible employees do not have a regular work schedule but replace absent workers and help with extra work as the need arises. Part-time regulars have a set work schedule—for example, 4 hours a day.

New carriers are trained on the job. They may begin as part-time flexible city carriers and become regular or full-time carriers in order of seniority as vacancies occur. Advancement possibilities are limited, but carriers can look forward to obtaining preferred routes or higher level jobs such as carrier technician as their seniority increases. A relatively small number of carriers become supervisors.

Employment Outlook

Employment of mail carriers—who numbered 250,000 in 1976—is expected to change very little through the mid-1980's. Although the number of homes and business establishments is expected to increase along with growth in population and business activity, anticipated cutbacks in the frequency of mail delivery should limit the need for additional carriers. Most job openings will result from the need to replace experienced carriers who retire, die, or transfer to other occupations. Openings will be concentrated in metropolitan areas.

Earnings and Working Conditions

Part-time flexible carriers began at $6.18 an hour in 1976, with periodic increases up to $7.46 an hour after 8 years of satisfactory service. Hourly wages of part-time regular workers were $5.97 an hour, with periodic increases up to $7.21 an hour after 8 years of service. Full-time carriers were paid on an annual basis, beginning at $12,422 and increasing to a maximum of $15,007 after 8 years. Rural carriers are paid time-and-one-half for each hour they work over 40 hours a week or for each route mile over 42 miles. They also receive an allowance of 18 cents a mile for the use of their automobiles. Substitute rural carriers receive the same pay as the regular carriers whose routes they are covering. Rural carriers work either a 5- or 6-day week.

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Carriers can work at their own pace as long as they cover their routes on time.

A full-time city carrier works an 8-hour day 5 days a week. City carriers who work more than 8 hours a day or 40 hours a week also are paid 1 1/2 times their regular rate of pay for the extra hours. City carriers also receive 10 percent additional pay for work between 6 p.m. and 6 a.m.

Most carriers begin work early in the morning, in some cases as early as 4 a.m. if they have routes in the business district. Carriers spend most of their time outdoors in all kinds of weather delivering mail. Even those who drive often must walk when making deliveries, and must lift heavy sacks of parcel post when loading their vehicles.

The job, however, has its advantages. Carriers who begin work early in the morning are through by early afternoon. They are also free to work at their own pace as long as they cover their routes within a certain period of time. Moreover, full-time postal employees have more job security than workers in most other industries.

(For information on fringe benefits, see the statement on Postal Service occupations elsewhere in the *Handbook*.)

Sources of Additional Information

Local post offices and State employment service offices can supply details about entrance examinations and employment opportunities for mail carriers.

TELEPHONE OPERATORS

Nature of the Work

Although millions of telephone numbers are dialed directly each day, there are times when making a call requires the assistance of a telephone operator. Often an operator is needed because a caller wants to reverse long-distance charges, locate a telephone number in another city, or know the cost of a call. Operators also may be needed to contact the police or fire department in an emergency or arrange a conference call for business executives.

Providing these service are two groups of telephone operators. The operators who work in telephone company central offices probably are the most familiar. But many business and large organizations receive so many calls that they also employ operators to run their private branch exchange (PBX) switchboards. Sometimes operators place calls by inserting and removing plugs that make switchboard connections and by listening and speaking into their headsets. However, many switchboards, especially those in telephone company central offices, are now operated by pushbuttons or dials.

Telephone company operators may be assigned either to handle long-distance calls or to give directory assistance. Long-distance opera-

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During peak calling periods, the pace at the switchboard may be very hectic.

tors obtain the information needed to complete the call, make the necessary connections, and record the details for billing. *Directory assistance operators* (D.O.T. 235.862) look up and provide telephone numbers. Service assistants train and help new operators to complete difficult calls.

PBX operators (D.O.T. 235.862) run switchboards for business offices and other establishments. They connect interoffice or house calls, answer and relay outside calls, assist company employees in making outgoing calls, supply information to callers, and record charges. In many small establishments, PBX operators work at switchboards that serve only a limited number of telephones. These operators may do other office work such as typing or sorting mail and many also act as receptionists or information clerks. (The work of receptionists is described elsewhere in the *Handbook*.)

Places of Employment

About 340,000 telephone operators were employed in 1976. More than one-half worked as PBX operators in manufacturing plants, hospitals, department stores, or businesses. The remainder worked in telephone companies. About one-fourth of all operators work only part time.

Both telephone company and PBX operators are concentrated in heavily populated areas. Nearly one-fifth work in the New York, Chicago, and Los Angeles metropolitan areas.

Training, Other Qualifications, and Advancement

Persons planning to become telephone operators should like to serve the public, be pleasant and courteous, and not mind sitting at a switchboard for long periods. A clear and pleasing voice and good hearing also are important. Many telephone companies and business firms require applicants, including operators, to pass physical examinations. High school courses in speech, office practices, and business math provide a helpful background for persons interested in this occupation.

New operators are taught on the job how to use the equipment and keep records of calls. Once they have learned the procedure, they put through practice calls. Instruction and practice usually last from 1 to 3 weeks. Operators then are assigned to regular operator jobs and receive further instruction from supervisors.

PBX operators who handle routine calls may have a somewhat shorter training period than telephone company operators. In large businesses, an instructor from the local telephone company may train new employees.

Experienced telephone company operators may be promoted to supervisory jobs or transfer to clerical occupations such as secretary or bookkeeper. They also may have the opportunity to advance to jobs as telephone craft workers such as telephone installers and repairers. PBX operators in large firms may advance to more responsible clerical positons; however, in many small business, opportunities for advancement usually are very limited.

Employment Outlook

Employment of telephone and PBX operators as a group is expected to decline slightly through the mid-1980's. Nevertheless, thousands of full-time and part-time workers will be hired each year to replace experienced operators who die, retire, or stop working for other reasons. Many other openings will result from the need to replace operators who advance to other occupations.

Employment of telephone company operators is expected to decline more than employment of PBX operators. As more telephone companies start charging customers for directory assistance and information calls, more people will dial numbers directly and use telephone directories to locate unknown numbers, thus reducing the need for operators. Also, technological improvements will limit the employment of operators. For example, more telephone companies are installing electronic switching systems in their central offices, thus reducing the need for manual switching of calls. In addition, traffic service position systems are being added, which automatically feed data about each telephone connection, such as the length and cost of the call, into a computer that processes the billing statements. Formerly this information was tabulated by an operator and then transferred to the statement.

Even though more small businesses will require PBX services, employment growth of PBX operators will be limited as many large businesses

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convert to Central Exchange (CENTREX). With CENTREX, incoming and outgoing calls can be dialed directly without an operator's assistance.

Earnings and Working Conditions

Telephone company operators in training averaged $3.75 an hour in late 1975; experienced operators $4.90; service assistants $5.92; and supervisors or chief operators, $8.63. Contracts between unions and telephone companies generally provide for periodic pay increases and extra pay for work on evenings, Sundays, and holidays.

Most telephone company and PBX operators work between 35 and 40 hours a week. Often, their scheduled hours are the same as those of other office clerical workers. In telephone companies, however, and in hotels, hospitals, and other places where telephone service is needed on a 24-hour basis, operators work on shifts and on holidays and weekends. Some operators work split shifts—that is, they are on duty during the peak calling periods in the late morning and early evening, and have time off between these two periods.

Operators usually work in well-lighted and pleasant surroundings. The job of a telephone operator does not require any physical exertion; however, during the peak calling periods in the late morning and late afternoon, the pace at the switchboard may be very hectic. Often operators are unable to leave their seats during these periods.

Insurance, pension programs, holidays, vacations, and other fringe benefits are much the same as those for other types of clerical employees. For specific information about fringe benefits for telephone company operators, see the statement on the telephone industry elsewhere in the *Handbook*.

Many operators employed by telephone companies are members of the Communications Workers of America, the International Brotherhood of Electrical Workers, and the Telecommunications International Union.

Sources of Additional Information

For more details about employment opportunities, contact the telephone company in your community or local offices of the unions that represent telephone workers. For general information on telephone operator jobs, write to:

Telecommunications International Union, P.O. Box 5462, Hamden, Conn. 06518.

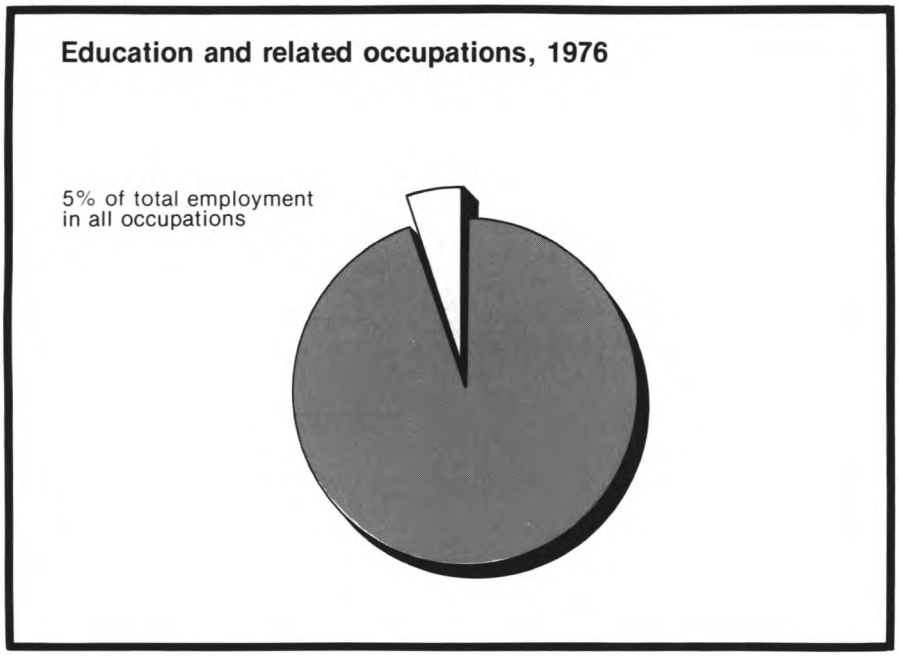
United States Independent Telephone Association, 1801 K St. NW., Suite 1201, Washington, D.C. 20006.

International Brotherhood of Electrical Workers, 1200 15th St. NW., Washington, D.C. 20005.

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EDUCATION AND RELATED OCCUPATIONS

The importance of an education has grown considerably since the birth of our Nation. Once primarily an agrarian economy, we have evolved into a highly sophisticated, technical, and urban society. Machinery and products never envisioned before are constantly being invented, calling for new jobs and skills to produce and use them. As a result, more educated workers are needed to fill a variety of positions at all levels of society.



In addition, as our economy has prospered, it has allowed people more time for personal development and leisure. No longer required to labor from early morning until dusk, workers have sought new avenues for personal enrichment. Adult education and craft courses, for example, draw increasingly larger numbers of interested students.

Teachers, teacher aides, and librarians play vital roles in the education of people of all ages. In large urban classrooms or rural county libraries, teachers and librarians are the people we turn to for information. These occupations are discussed in the following sections.

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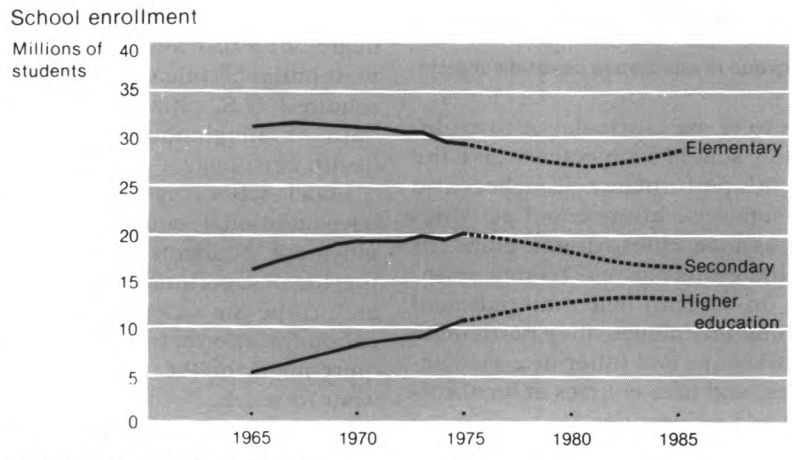
TEACHING OCCUPATIONS

Most people would agree that education is a life-long process. At every age we learn from our friends, family, and associates. We also teach others along the way, often unwittingly. But perhaps our most influential educational experiences occur during the years of formal education. During those years, students explore themselves and learn about many subjects. They make career decisions and train for productive work. Most significantly, they learn to think for themselves.

Today, more than 3 million teachers are involved at all levels of this educational process. Teachers work with people of all ages in a variety of different subjects. Some teach youngsters in their first years away from home, while others work primarily with adults who are taking courses to expand or change their job potential, or as a source of recreation. Some teachers are members of other professions who instruct part time.

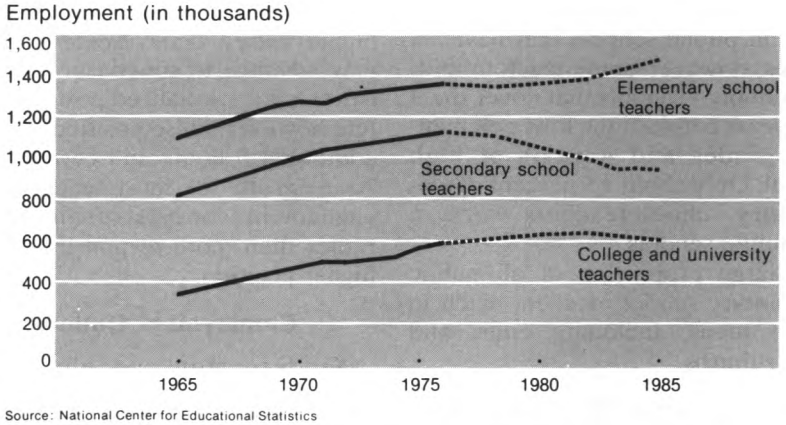
Detailed information on teaching occupations and the outlook for teachers through the mid-1980's is presented in the following statements.

Changing enrollment levels will be the primary factors affecting employment of teachers through 1985



Source: National Center for Educational Statistics

Employment of teachers generally will follow enrollment trends, rising or falling according to the number of students through 1985



Source: National Center for Educational Statistics

KINDERGARTEN AND ELEMENTARY SCHOOL TEACHERS

(D.O.T. 092.228)

Nature of the Work

Kindergarten and elementary school teachers play a vital role in the development of children. What is learned or not learned in these early years can, to a large measure, shape students views of themselves, the world and the process of education.

Kindergarten and elementary school teachers must introduce children to the basic concepts of mathematics, language, science, and social studies to provide a sound foundation for more advanced study in the higher grades. They also try to instill in the students good study and work habits and an appreciation for learning while closely watching and evaluating each child's performance and potential.

Elementary school teachers often devise creative means to present a specific subject matter. They may use films, slides, computers, or develop instructional games. They also ar-

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Most elementary school teachers instruct a single group of children in several subjects.

range class trips, speakers, and class projects. All of this work involves much time and effort, often after the regular school day is finished.

Teachers also are concerned with the social development and health of their students. They study each child's interactions with his or her classmates and discuss any problems with the parents. Teachers may, for example, meet with the parents of a child who habitually resists authority to discover the causes of these actions and work out a solution. Teachers also report any possible health problems to parents and school health officials. The teacher's primary concern is to insure that each child receives as much personalized help as required.

Most elementary school teachers instruct a single group of children in several subjects. In some schools, two teachers or more "team teach" and are jointly responsible for a group of students or for a particular subject. An increasing number of elementary school teachers specialize in one or two subjects and teach these subjects to several classes. Some teach special subjects such as music, art, or physical education, while others teach basic subjects such as English, mathematics, or social studies.

Teachers participate in many activities outside the classroom. They generally must attend regularly scheduled faculty meetings and may serve on faculty committees, such as those to revise curricula, or to evaluate the school's objectives and the student's performance. Teachers also may supervise after-school activities such as glee clubs, drama clubs, or arts and crafts classes. To stay up-to-date on educational materials and teaching techniques, they participate in workshops and other inservice activities, and take courses at local colleges and universities.

A growing number of elementary school teachers have aides to do secretarial work and help supervise lunch and playground activities. As a result, teachers can be free from routine duties to give more individual attention to students.

Places of Employment

About 1.4 million people worked as elementary school teachers in 1976. Most elementary teachers work in public schools that have six grades; however, some teach in middle schools—schools that cover the 3 or 4 years between the lower elementary grades and 4 years of high school. Only about 13 percent of elementary school teachers work in nonpublic schools.

A large proportion of all public elementary school teachers teach in urban areas, including cities and their suburbs.

Training, Other Qualifications, and Advancement

All 50 States and the District of Columbia require public elementary school teachers to be certified by the department of education in the State in which they work. Some States also require teachers in private and parochial schools to be certified.

To qualify for certification, a teacher must have a bachelor's degree from an institution with an approved teacher education program. Besides a bachelor's degree, which provides the necessary liberal arts background, States require that prospective teachers have student-teaching and other education courses.

In 1976, 14 States required teachers to get supplementary postgraduate education—usually a master's degree or a fifth year of study—after their initial certification. Some States required U.S. citizenship; some an oath of allegiance; and several a health certificate.

Local school systems sometimes have additional requirements for employment. Students should write to the local superintendent of schools and to the State department of education for information on specific requirements in the area where they want to teach.

In addition to meeting educational and certification requirements, teachers should be creative, dependable, and patient. Most important, they should want to be directly involved in the educational and emotional development of children. Competence in handling classroom situations also is important.

As a teacher gains experience, he or she may advance within a school system or transfer to another which recognizes experience and has a higher salary scale. Some teachers may advance to supervisory, administrative, or specialized positions. Often, however, these positions require additional training and certification. As a result, for most teachers, advancement consists of higher pay rather than more responsibility or a higher position.

Employment Outlook

Kindergarten and elementary school teachers are expected to face competition for jobs of their choice through the mid-1980's. If patterns of entry and reentry to the profession continue in line with past trends, the

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number of persons qualified to teach in elementary schools will exceed the number of openings.

The basic sources of teacher supply are recent college graduates qualified to teach at the elementary level and teachers seeking reentry to the profession. Reentrants, although more experienced, will face increasing competition from new graduates, who command lower salaries and have more recent training.

Pupil enrollment is the basic factor underlying the need for teachers. Because of fewer births in the 1960's, elementary enrollments have been on the decline since 1967, when they peaked at nearly 32 million. The National Center for Education Statistics projects that by 1982 the downward enrollment trend will halt at a level of 28 million, and enrollments again will advance to about 29 million by 1985.

Teachers will be needed to fill new positions created by larger enrollments; to replace those who are not now certified; to meet the expected pressure for an improved pupil-teacher ratio; and to fill positions vacated by teachers who retire, die, or leave the profession for other reasons.

However, a decline in the projected number of children born over the next decade could lessen the demand for teachers. While the trend has not been clearly established, since 1970 women have continued to have fewer children, and according to a recent survey, they expect to continue having smaller families than were common 10 years ago.

Several factors could alter the outlook for teachers. Increased emphasis on early childhood education, on special programs for disadvantaged children, and on individual instruction may result in larger enrollments, smaller student-teacher ratios, and consequently an increased need for teachers. Possible budget restraints for educational services, on the other hand, might limit expansion.

Earnings and Working Conditions

According to the National Education Association, public elementary school teachers averaged $11,870 a year in 1976. Average earnings in 1976 were more than one and one-third times as much as the average earnings for all nonsupervisory workers in private industry, except farming. Generally, States in the Northeast and in the West paid the highest salaries.

Collective bargaining agreements cover an increasingly large number of teachers. In 1976, 31 States had enacted laws that required collective bargaining in the teacher contract negotiation process. Most public school systems that enroll 1,000 students or more bargain with teacher organizations over wages, hours, and the terms and conditions of employment.

Public school systems enrolling 6,000 or more pupils paid teachers with a bachelor's degree average starting salaries of $8,233 a year in 1974-75. Those with a master's degree earned a starting average of $9,159 a year.

Public elementary school teachers worked an average of about 36-1/2 hours a week in 1976. Additional time spent preparing lessons, grading papers, making reports, attending meetings, and supervising extracurricular activities increased the total number of hours to about 46.

In addition to their regular teaching assignments, some elementary school teachers teach summer sessions, take courses, or work at other jobs, such as camp counselors. Most elementary school teachers work a traditional two-semester, 9-month school year. Some, however, work in year-round schools where they work an 8-week session, are off 1 week, and have a longer midwinter break. This type of schedule may make finding additional employment outside of the school system difficult.

Teachers spend much of their time walking, kneeling, or even sitting on the floor. For example, kindergarten teachers may join their students on the floor to finger paint, cut out pictures, or do other crafts.

Employment in teaching is steady, and business conditions usually do not affect the market for teachers. In 1976, 38 States and the District of Columbia had tenure laws that insured the jobs of teachers who had successfully taught for a certain number of years.

Sources of Additional Information

Information on schools and certification requirements is available from local school systems and State departments of education.

Information on the Teacher Corps, internships, graduate fellowships, and other information on teaching may be obtained from:

U.S. Department of Health, Education, and Welfare, Office of Education, Washington, D.C. 20202.

Other sources of general information are:

American Federation of Teachers, 1012 14th St. NW., Washington, D.C. 20005.

National Education Association, 1201 16th St. NW., Washington, D.C. 20036.

SECONDARY SCHOOL TEACHERS

(D.O.T. 091.228)

Nature of the Work

The high school years are the years of transition from childhood to young adulthood. They are the years when students delve more deeply into subject matter introduced in elementary school and learn more about themselves and the world. It is also a time of preparation for their future lives as citizens and jobholders. Secondary school teachers have a direct role in this process.

The primary function of the secondary school teacher is to instruct students in a specific subject such as English, mathematics, social studies, or science. Within a teacher's specialized subject area, he or she may teach a variety of courses. A social studies teacher, for example may instruct two 9th grade classes in American History, two 12th grade classes in Contemporary American Problems, and another class in World Geography. For each class, the teacher develops lesson plans, prepares and gives examinations, and arranges other activities, such as a class project to devise an urban redevelopment plan for the city.

Teachers also must design their classroom presentations to meet the

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Teachers must strive to create an atmosphere for learning.

individual needs and abilities of their students. They may arrange tutoring for students, or give advanced assignments for highly motivated pupils. Recognizing the needs of each student can be difficult because most teachers conduct five separate classes a day.

Teachers use a variety of instructional materials including films, slides, and computer terminals. They also may arrange for speakers or trips to supplement their classroom lectures such as a visit to the planetarium after a discussion on the earth's rotation.

Some teachers train students for specific jobs after graduation such as welding, automechanics, or distributive education. These teachers instruct with the actual tools of the trade whether they be adding machines or an 8-cylinder car engine.

Secondary school teachers also supervise study halls and homerooms, and attend meetings with parents and school personnel. Often they work with student groups outside of class to help solve specific problems. Teachers also participate in workshops and college classes to keep up-to-date on their subject specialty and on current trends in education.

In recent years, teachers have been able to spend more time teaching due to the increased availability of teacher aides who perform secretarial work, grade papers, and do other routine tasks.

Places of Employment

In 1976, more than 1 million teachers taught in secondary schools. More than 90 percent of them taught in public schools. Although they work in all parts of the country, teachers are concentrated in cities and in suburban areas.

According to a recent survey, slightly more than one-half of all public secondary teachers teach in senior high schools; about one-third teach at the junior high level. About one-tenth teach in junior-senior high schools, and a very small number are elementary-secondary combination teachers.

Training, Other Qualifications, and Advancement

All 50 States and the District of Columbia require public secondary school teachers to be certified. Many States also require certification of secondary teachers in private and parochial schools.

The minimum educational requirement for certification is a bachelor's degree. In 1976, the District of Columbia was the only jurisdiction requiring a master's degree for initial certification as a senior high school teacher. Fourteen States, however, have specified that a secondary school teacher must get additional education, usually a fifth year of study or a master's degree, within a certain period after beginning employment. As a result, more and more secondary school teachers are obtaining advanced degrees.

The educational requirements for secondary school teachers vary by State and by school system. Approved colleges and universities in every State offer programs that include the education courses and the student-teaching that States require. They also offer the academic courses that are necessary to qualify teachers in the various subject specialties taught at the secondary level.

States and local jurisdictions often have general teacher requirements, such as the recommendation of the college, a certificate of health, and U.S. citizenship. Prospective teachers may get complete information on such educational and general requirements from each State department of education and from the superintendent of schools in each community.

Aside from educational requirements, a secondary school teacher must want to work with young people, have an interest in a special subject, and have the ability to motivate students and to relate knowledge to them.

Education and experience provide the primary basis for advancement, usually in the form of higher salaries rather than a different job. Advancement to supervisory and administrative positions usually requires at least 1 year of professional education beyond the bachelor's degree and several years of successful classroom teaching. Only a small proportion of secondary school teachers, however, advance to administrative positions.

Some experienced teachers with specific preparation may work as special school service personnel, such as school psychologists, reading specialists, or guidance counselors. Often these jobs require special certification as well as special education.

Employment Outlook

The supply of secondary school teachers through the mid-1980's will greatly exceed anticipated require-

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ments if past trends of entry into the profession continue. As a result, prospective teachers are likely to face keen competition for jobs.

The prime sources of teacher supply are recent college graduates qualified to teach secondary school and teachers seeking to reenter the profession. Although reentrants have experience in their favor, many schools may prefer to hire new graduates who command lower salaries and whose training is more recent.

Pupil enrollment is the basic factor underlying the demand for teachers. The National Center for Education Statistics projects that enrollment in secondary schools will decline and, in turn, reduce the demand for teachers. As a result, over the 1976-85 period, nearly all teaching positions will stem from the need to replace teachers who die, retire, or leave the profession for other reasons. Thus, an increasing proportion of prospective teachers will have to consider alternatives to secondary school teaching.

Although the overall outlook for secondary teachers indicates a highly competitive market, employment conditions may be more favorable in certain fields. According to a recent survey, the supply of teachers of vocational subjects was not adequate to meet the demand. Mathematics, natural sciences, and physical sciences should not experience as large an oversupply as some other subjects.

Earnings and Working Conditions

According to the National Education Association, public secondary school teachers averaged $12,395 per year in 1976. This is 1 1/2 times the average for nonsupervisory workers in private industry, except farming. Generally, salaries were higher in the Northeast and in the West than they were in the Southeast and in the Middle States.

In school systems with enrollments of 6,000 or more, beginning teachers with a bachelor's degree earned average salaries of $8,233 in the school year 1974-75. New teachers with a master's degree started at $9,159 a year. Beginning teachers could expect regular salary increases as they gained experience and additional education.

A recent survey of public school teachers indicated that the average required school week for those in secondary schools was 37 hours. However, when all teaching duties, including meetings, lesson preparation, and other necessary tasks are taken into consideration, the total number of hours spent working each week was slightly more than 48.

In some schools, teachers receive supplementary pay for certain school-related activities such as coaching in sports and working with students in extracurricular activities, such as music, dramatics, or school publications. Some public school teachers also work in their school systems during the summer. Others hold summer jobs outside the school system.

While many teachers work the traditional 9-month school year with a 3-month summer vacation, some districts have converted to a year-round schedule. Teachers on this type of schedule may work 8 weeks, be on vacation for 1 week, and have a 5-week midwinter break. Laws in 38 States and the District of Columbia ensure the employment of those who have achieved tenure status. Laws requiring collective bargaining of wages, hours, and the terms and conditions of employment cover increasing numbers of teachers.

Sources of Additional Information

Information on schools and certification requirements is available from local school systems and State departments of education.

Information on the Teacher Corps, internships, graduate fellowships, and other information on teaching may be obtained from:

U.S. Department of Health, Education, and Welfare, Office of Education, Washington, D.C. 20202.

Other sources of general information are:

American Federation of Teachers, 1012 14th St. NW., Washington, D.C. 20005.

National Education Association, 1201 16th St. NW., Washington, D.C. 20036.

COLLEGE AND UNIVERSITY TEACHERS

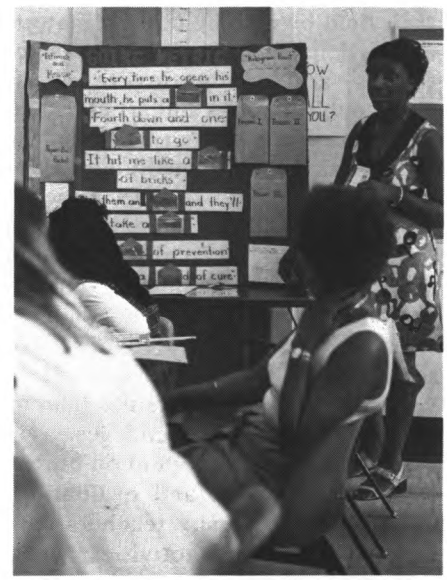
(D.O.T. 090.168 and .228)

Nature of the Work

Each year thousands of Americans enter college. Some view college as a personal enrichment experience. Others seek higher education to obtain a lucrative and interesting job. Many persons attend college for a variety of reasons. To meet these diversified demands, colleges and universities hire well-educated teachers to provide instruction in various subjects.

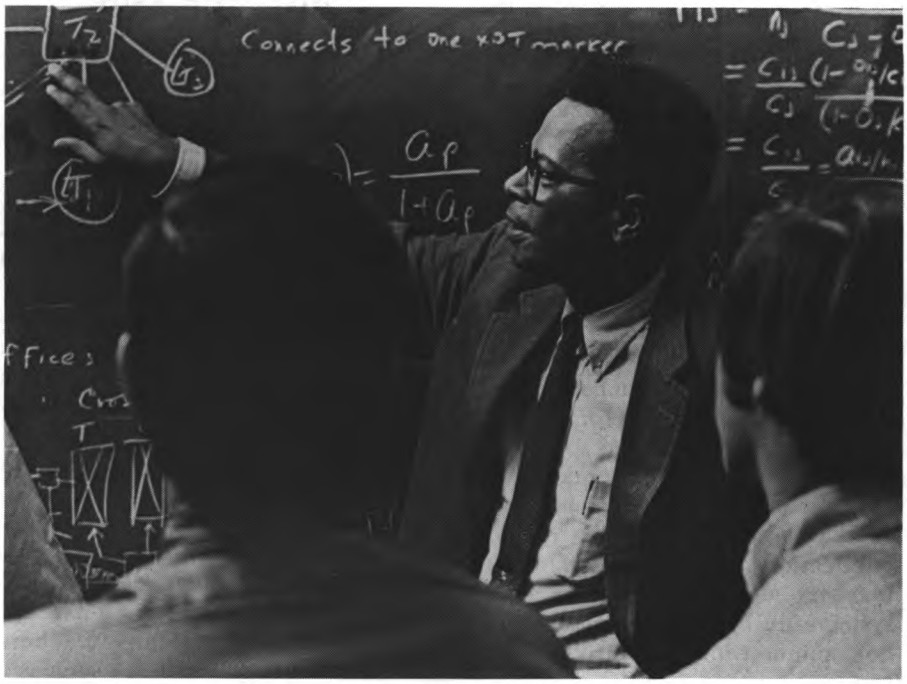
The primary function of the college or university teacher is to present an in-depth analysis of a particular subject matter. Many teachers conduct a variety of courses such as a basic, freshman English composition course and an advanced poetry class for students majoring in English. Many instruct undergraduates only, while some instruct both undergraduates and graduate students. Still fewer instruct only graduate students. Usually, the more experienced and educated teachers conduct the higher level classes.

College and university teachers use various presentations in their classes, depending on the subject, interest, and level of their students.



Professor instructing teacher education class.

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Many college teachers, in addition to teaching, participate in professional activities and conduct research.

Some conduct large lecture classes for basic courses while others lead advanced seminars with only a few students. Still others work primarily in laboratories for subjects such as biology, engineering, or chemistry. Some teachers have the aid of teaching assistants who usually are studying for advanced degrees. Closed-circuit television, tape recorders, and other machines frequently are used.

To be effective, college teachers must keep up with developments in their field by reading current material, participating in professional activities, and conducting research. Some publish books and articles. The importance of research and publication varies from one institutional level to another. For example, a recent survey indicated that more than one-third of the Ph. D. faculty in doctorate level science and engineering departments spent more than half of their time in research activities. Research usually is stressed more at 4-year colleges and universities than at junior and community colleges.

In addition to time spent on preparation, instruction, and evaluation, college and university teachers participate in faculty activities; work with student organizations and act as student advisors; work with the college administration; and in other ways serve the institution and the community. Those who are department heads have supervisory and administrative duties.

Places of Employment

In 1976, about 593,000 teachers worked in more than 3,000 colleges and universities. About 70 percent of them taught in public institutions. An estimated 441,000 were full-time senior staff; about 145,000 were part-time senior staff; and 7,000 were full-time junior instructors. In addition, there were thousands of part-time assistant instructors, teaching fellows, teaching assistants, or laboratory assistants who aided these teachers while studying for their advanced degrees.

Of full-time faculty, about one-third teach in universities; about two-fifths work in 4-year colleges; and about one-fifth teach in 2-year colleges. About two-thirds of the faculty in universities and 4-year colleges teach in public institutions; more than nine-tenths of the faculty in 2-year institutions work in public junior and community colleges.

Training, Other Qualifications, and Advancement

Most college and university faculty are classified in four academic ranks: instructors, assistant professors, associate professors, and full professors. About 75 percent of all faculty are assistant, associate, or full professors, with the three ranks equally distributed. Twenty percent are instructors.

Most inexperienced persons are hired as instructors and must have at least a master's degree. To advance to higher ranks, instructors need additional training plus experience. Assistant professors usually need a year of graduate study beyond the master's degree and at least a year or two of experience as an instructor. Appointments as associate professors frequently demand the doctoral degree and an additional 3 years or more of college teaching experience. For a full professorship, the doctorate, extensive teaching experience, and published articles and books usually are essential.

In addition to advanced study and college-level teaching experience, outstanding academic, administrative, and professional contributions influence advancement. Research, publication, and work experience in a subject area may hasten advancement.

Employment Outlook

College and university teaching candidates are expected to face keen competition through the mid-1980's. Although demand for these teachers is expected to increase, the number of master's and Ph. D. degree recipients is expected to greatly exceed all openings resulting from growth and separations from the profession. The number of Ph. D. recipients alone, in fact, is likely to exceed the expected number of openings. Therefore, an increasing proportion of prospective college teachers, especially those with only master's degrees, will have to seek nonacademic jobs. Government and private industry should provide some positions, but some persons holding graduate degrees may find it necessary to enter occupations that have not traditionally required advanced study.

Those seeking a teaching position will find the best opportunities at public colleges and universities.

The basic factor underlying the demand for teachers is college enrollment. During the 1960's and ear-

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ly 1970's, teacher employment expanded due to growth in both the number of college-age persons and the proportion of 18- to 21-year-olds enrolled in college. Enrollments are expected to increase through the mid-1980's and then decline somewhat, but to a level higher than at present. As a result, the total number of teachers needed over the period is expected to rise.

The type and level of the institution and the extent to which it wishes to upgrade its faculty also will influence the demand for teachers. Although enrollments in the 1970's are expected to stabilize in 4-year colleges and universities, many institutions, including junior and community colleges, may want to hire additional Ph. D.'s to upgrade their faculties. This, coupled with an increasingly large supply of Ph. D.'s, will make it especially difficult for master's degree holders to find teaching positions in 4-year institutions.

Earnings and Working Conditions

Earnings varied widely according to faculty rank and type of institution. In general, teachers in public institutions (in both 2-year and 4-year schools) averaged higher salaries than teachers in private schools in 1975-76. Salaries ranged from an average minimum of $7,272 for instructors in private 2-year institutions, to an average maximum of $25,387 for professors at 4-year public institutions.

In 1975-76, about one-third of all institutions paid according to salary schedules by rank. On the average, more public than private institutions had these schedules. In institutions without schedules, a college senate often determined salaries according to a general set of criteria.

Since about 2 out of 3 college teachers have 9- to 10-month contracts, many have additional summer earnings from research, writing for publication, or other employment. Royalties and fees for speaking engagements may provide additional earnings. Some teachers also undertake additional teaching or research projects or work as consultants.

College and university teachers also may enjoy certain benefits, including tuition waivers for dependents, housing allowances, travel allowances, and paid leaves of absence. Colleges typically grant a semester's leave after 6 or 7 years of employment.

About 85 percent of all college and university teachers work in institutions that have tenure systems. Of the full-time teachers employed in these institutions, over one-half are tenured. Under a tenure system, a teacher usually receives 1-year contracts during a probationary period ranging from 3 to 7 years; some universities award 2- or 3-year contracts. After the probationary period, institutions consider teachers for tenure (the assurance of continuing employment with freedom from dismissal without cause).

Most teachers work in institutions run on a semester basis; others work in schools that are on trimesters with shorter breaks between each school session.

College teachers usually have flexible teaching schedules. According to a recent survey, the undergraduate faculty in 4-year colleges and universities normally teach 12 hours a week and seldom more than 14 or 15 hours. Graduate faculty have a teaching load of about 10 hours a week. In addition to time spent in the classroom, college and university teachers devote much time to preparation and other duties. Overall, full-time faculty spend about 55 hours a week on school-related activities. For faculty in junior and community colleges, the normal teaching load is slightly heavier, but the total number of hours on the job are fewer.

Sources of Additional Information

Information on college teaching as a career is available from:

U.S. Department of Health, Education, and Welfare, Office of Education, Washington, D.C. 20202.

American Council on Education, 1 Dupont Circle NW., Washington, D.C. 20036.

American Federation of Teachers, 1012 14th St. NW., Washington, D.C. 20065.

Professional societies in the various subject fields will generally provide information on teaching requirements and employment opportunities in their particular fields. Names and addresses of societies are given in the statements on specific professions elsewhere in the *Handbook*.

TEACHER AIDES

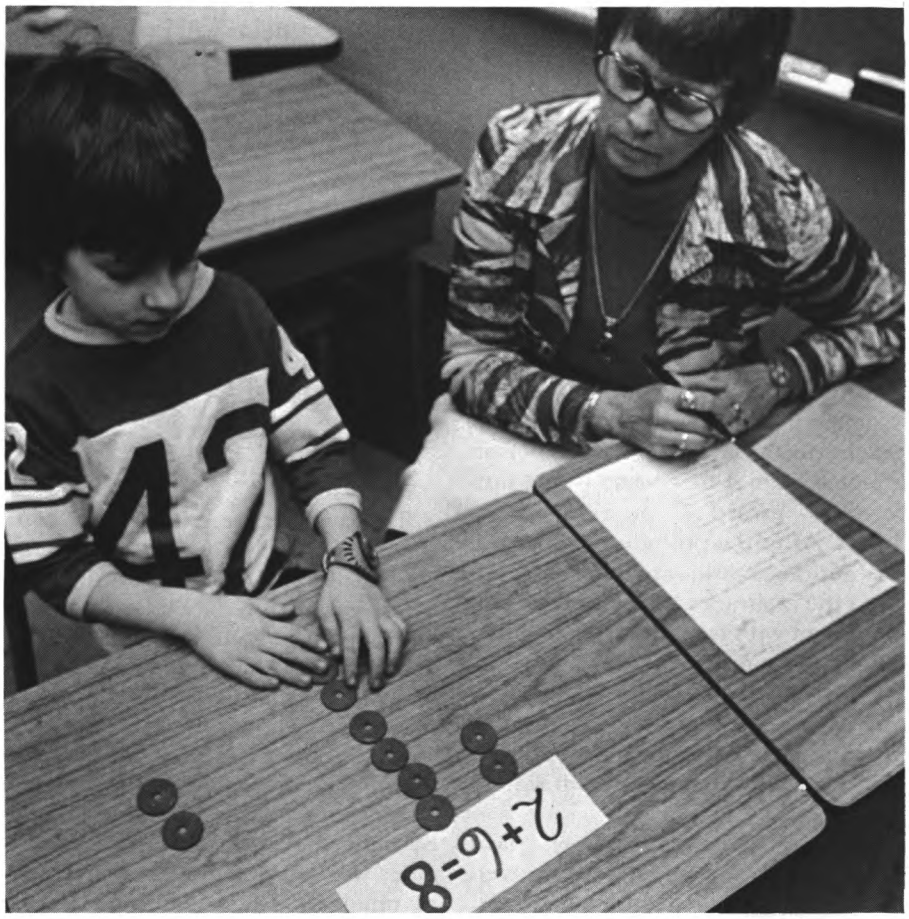
Nature of the Work

Teacher aides free teachers of routine tasks that persons without extensive training in teaching can handle. They support teachers directly in work involved with teaching students and, indirectly, in nonteaching activities. Aides may work in the classroom under the teacher's supervision or have duties assigned outside the learning environment.

Aides' responsibilities vary greatly by school district. In some areas, aides work directly in the instruction of children. Under the supervision and guidance of the teacher, they help students individually or in small groups. An aide might listen to one student read, for example, or help another find information needed for a report, or watch as a third practices or demonstrates a skill. Sometimes the teacher has an aide take charge of a special project for a group of students, such as preparing equipment for a science demonstration.

In other areas, teacher aides primarily handle many of the routine tasks that otherwise would be left to the teacher. They may grade tests and papers, check homework, and keep health and attendance records. Also, secretarial duties such as typing, filing, and duplicating materials for the teacher's use may be part of the aide's job. Sometimes the duties of teacher aides include stocking supplies, preparing materials for use by students, and operating audiovisual equipment. They also may supervise students during lunch and recreation periods and school bus loading and help keep the classroom in order.

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Some aides work directly in the instruction of children.

Places of Employment

In 1976, about 320,000 persons worked as teacher aides. While aides work in both elementary and secondary schools, they are concentrated in the early grades. Large city schools or schools in metropolitan areas surrounding large cities employ a large proportion of aides. Schools with large enrollments are more likely than small schools to employ teacher aides, and they more often hire them on a full-time, regular basis.

Training, Other Qualifications, and Advancement

Training requirements for teacher aides vary widely. Some schools hire beginning aides with a high school diploma; some do not require even a high school education. Other employers may want aides to have some college training or a bachelor's degree. Areas that delegate a significant amount of classroom responsibility to aides usually require more training than those districts which primarily assign aides to clerical or monitor jobs.

Teacher aides may receive their training for classroom work in a preservice program or on the job. A growing number of junior and community colleges offer teacher aide programs. Upon completion of one of these programs, the student is awarded an associate degree and is prepared to work directly in the classroom. In 1976, there were about 270 such programs.

In training programs, teacher aides learn how to help the classroom teacher work with students. Aides are taught to operate audiovisual equipment, administer first aid, and handle recordkeeping activities. They also learn to make charts and other instructional materials and practice techniques for making bulletin boards and working with other art media. In addition, teacher aides are made familiar with the organization and operation of a school, and they learn about the methods used to teach handwriting, reading, math, science, and other school subjects.

Personal traits are among the most important qualifying factors for the teacher aide's job. Aides should be able to work with children and to handle classroom situations with fairness and patience. Preference may be given in hiring to those with previous experience working with children. Aides also must demonstrate initiative and a willingness to follow the classroom teacher's directions. They must have basic speech and writing skills and be able to communicate effectively with students and teachers. Clerical skills may be necessary also.

Some schools have certain regulations regarding the hiring of teacher aides. Applicants may be required to have a family income below a certain level or to be parents of children in the school district. Sometimes persons living in the school community are given preference in hiring. In addition, health regulations may require that teacher aides pass a physical examination. Eight States (Alabama, Delaware, Georgia, New Mexico, New York, Ohio, Vermont, and Wisconsin) have established criteria for teacher aide employment that require aides to have permits or certificates. Thirty-eight States have issued general guidelines for hiring aides. In other areas, the city or county board of education may set standards for employment of aides. The local superintendent of schools and the State department of education can provide information on specific requirements for employment in a particular area.

Advancement for teacher aides, usually in the form of higher earnings or increased responsibility, comes primarily with experience. Some school districts provide release time so that aides may take courses. In this

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way, aides eventually can earn bachelor's degrees and become certified teachers.

Employment Outlook

Employment of teacher aides is expected to rise much faster than the average for all occupations through the mid-1980's. If past trends continue, the proportion of teacher aides in relation to teachers being hired is expected to increase. Actual job prospects, however, will vary by district. Budget constraints may adversely affect demand for these workers in some areas, while other districts, unable to afford additional more highly paid teachers, may hire aides to lessen teachers' clerical duties. In addition, more aides will be needed to fill openings as workers die, retire, or transfer to other occupations.

Earnings and Working Conditions

According to the limited information available, salaries of teacher aides ranged from $2 to over $5 an hour in 1975. Earnings varied by region and also by the work experience and academic qualifications of the aide. Most aides, usually those covered by collective bargaining agreements, have health and welfare benefits similar to those of the teachers in their schools.

Teacher aides may work full time or part time. They may work inside or outdoors and may spend much of their time standing, walking, or kneeling.

Sources of Additional Information

Information on junior college 1- and 2-year programs for teacher aides is available from:

The American Association of Junior Colleges, One Dupont Circle NW., Washington, D.C. 20036.

Additional information on the occupation may be obtained from:

National Education Association, 1201 16th St. NW., Washington, D.C. 20036.

American Federation of Teachers, 1012 14th St. NW., Washington, D.C. 20005.

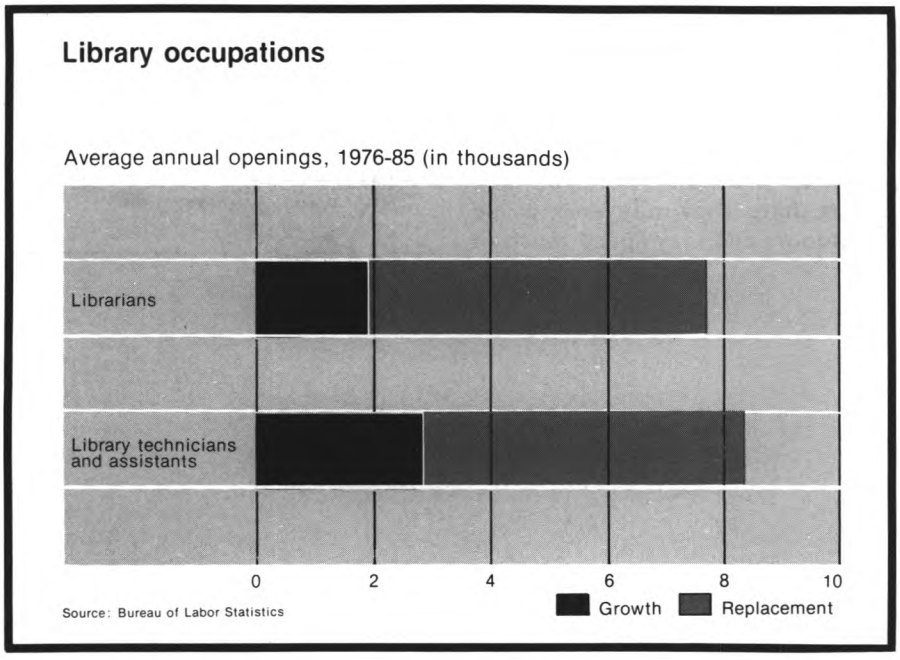
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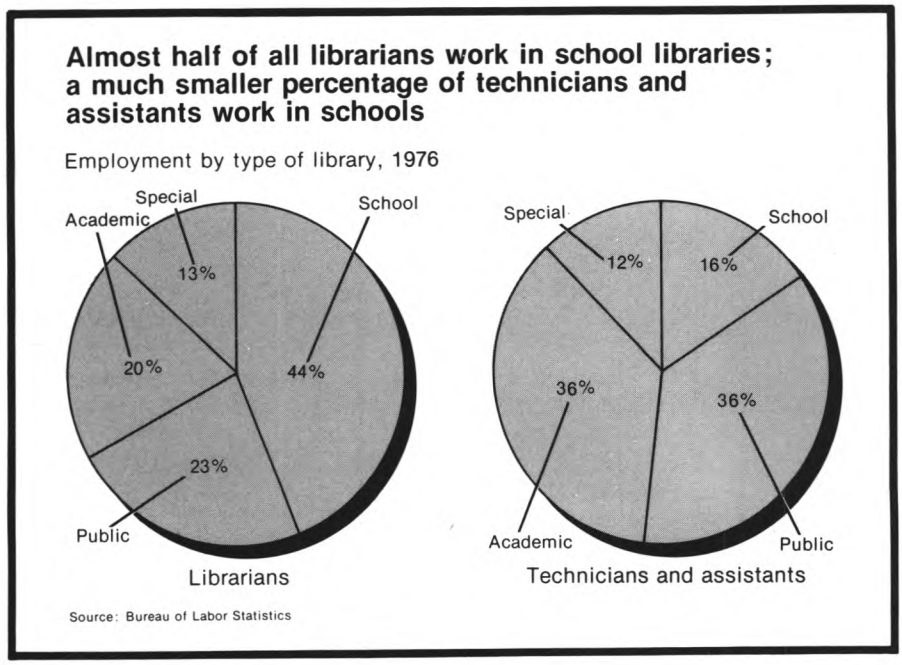
LIBRARY OCCUPATIONS

Before the written language was developed, people passed on information through the spoken word. Each generation told the next what they had learned about the world, the family, and the skills needed for survival. Often, however, details could be lost or changed substantially through the ages.

As the years passed, people learned to express their ideas in drawings and then in a written manner. Alphabets came into existence. People no longer relied on their memories for information—they could seek out what they needed to know in scrolls or books. Today, we can research what occurred centuries ago, or read of the accomplishments of modern scientists simply by giving to one source—the library.

Libraries are storehouses of information containing the history of the universe. But they also can be confusing places containing many large rooms filled with stacks of books. Librarians and library technicians and assistants help us find the information we want. They provide us with access to books, periodicals, and other printed materials, as well as less conventional forms of information such as microfilms, slides, and computer tapes. The following statements describe their work in more detail.





LIBRARIANS

(D.O.T. 100.118 through .388)

Nature of the Work

Librarians make information available to people. They serve as a link between the public and the millions of sources of information by selecting and organizing materials, making them accessible, and assisting in their use.

Library work is divided into two areas: user services and technical services. Librarians in user services—for example, reference and children's librarians—work directly with the public helping them find the information they need. Librarians in technical services—such as acquisition librarians—are primarily concerned with preparing materials for use and do not frequently deal with the public. They order, classify, and catalog all types of materials.

The size of the library usually determines the scope of a librarian's

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job. In small libraries, the job may include both user and technical services. The librarian may select and organize materials, publicize services, do research, and give reference help to groups and individuals. In large libraries, librarians usually specialize in either user or technical services and specialize further in certain subject areas, such as science, business, the arts, or medicine. A librarian in technical services who specializes in engineering, for example, may review books or write summaries of articles on new engineering developments.

Regardless of the nature of their work, librarians generally are classified according to the type of library in which they work: public libraries, school media centers, college and university libraries, and special libraries.

Public librarians serve all kinds of people—children, students, research workers, teachers, and others. Increasingly, public librarians provide special materials and services to culturally and educationally deprived persons, and to persons who, because of physical handicaps, cannot use conventional print.

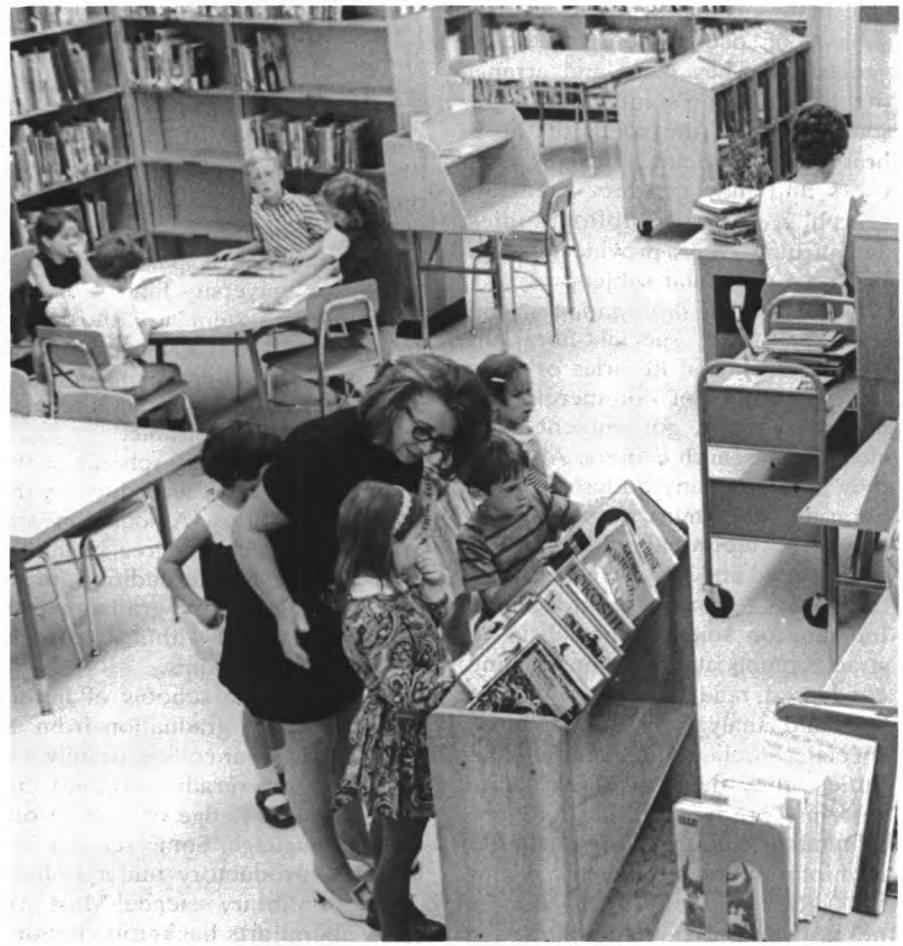
The professional staff of a large public library system may include the chief librarian, an assistant chief, and several division heads who plan and coordinate the work of the entire library system. The system also may include librarians who supervise branch libraries and specialists in certain areas of library work. The duties of some of these specialists are described briefly in the following paragraphs.

Acquisition librarians purchase books and other materials to maintain a well-balanced library that meets the needs and interests of the public. *Catalogers* classify these materials by subject and otherwise describe them to help users find what they are looking for. *Reference librarians* answer specific questions and suggest sources of information.

Some librarians work with specific groups of readers. *Children's librarians* serve the special needs of young people by finding books they will enjoy and showing them how to use the library. They may plan and conduct special programs such as story hours or film programs. Their work in serving children often includes working with school and community organizations. *Adult services librarians* suggest materials suited to the needs and interests of adults. They may cooperate in planning and conducting education programs, such as community development, public affairs, creative arts, problems of the aging, and home and family. *Young adult services librarians* help junior and senior high school students select and use books and other materials. They may organize programs of interest to young adults, such as book or film discussions or concerts of recorded music. They also may coordinate the library's work with school programs. *Extension or outreach librarians working in bookmobiles* offer library services to people not adequately served by a public library such as those in inner city neighborhoods, migrant camps, rural communities, and institutions, including hospitals and homes for the aged.

School librarians instruct students in the use of the school library and help them choose from the media center's collection of print and nonprint materials items that are related to their interests and to classroom subjects. Working with teachers and supervisors, school librarians familiarize students with the library's resources. They prepare lists of materials on certain subjects and help select materials for school programs. They also select, order, and organize the library's materials. Increasingly, the school library is viewed as part of the entire instructional system rather than a resource that students use 1 or 2 hours a week. As a result, the scope of the duties of many school librarians' has widened. In some schools, librarians work with teachers to develop units of study or independent study programs, and also may participate in team teaching.

Very large high schools may employ several school librarians, each responsible for a particular function



School librarian showing students how to use the library.

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of the library program or for a special subject area. *Media specialists*, for example, develop audio-visual programs to be included in or to supplement the curriculum. They also may develop materials and work with teachers on curriculum.

College and university librarians serve students, faculty members, and research workers in institutions of higher education. They may provide general reference service or may work in a particular subject field, such as law, medicine, economics, or music. Those working on university research projects operate documentation centers that use computers to record, store, and retrieve specialized information. College and university librarians may teach classes in the use of the library.

Special librarians work in libraries maintained by government agencies and by commercial and industrial firms, such as pharmaceutical companies, banks, advertising agencies, and research laboratories. They provide materials and services covering subjects of special interest to the organization. They build and arrange the organization's information resources to suit the needs of the library users. Special librarians assist users and may conduct literature searches, compile bibliographies, and in other ways provide information on a particular subject.

Others called *information science specialists*, like special librarians, work in technical libraries or information centers of commercial and industrial firms, government agencies, and research centers. Although they perform many duties of special librarians, they must possess a more extensive technical and scientific background and a knowledge of new techniques for handling information. Information science specialists abstract complicated information into condensed, readable form, and interpret and analyze data for a highly specialized clientele. Among other duties, they develop classification systems, prepare coding and programming techniques for computerized information storage and retrieval systems, design information networks, and develop microfilm technology.

Information on library technicians and assistants is found in a separate statement in the *Handbook*.

Places of Employment

An estimated 128,000 professional librarians were employed in 1976. School librarians accounted for more than two-fifths of the total, and public libraries and colleges and universities each employed about one-fifth. The remainder worked in special libraries, including those in government agencies, or in institutions such as correctional facilities and hospitals. A small number served as consultants, as State and Federal Government administrators, and as faculty in schools of library science. In late 1975, the Federal Government employed about 3,300 professional librarians.

Most librarians work in cities and towns. Those attached to bookmobile units serve widely scattered population groups.

Training, Other Qualifications, and Advancement

A professional librarian ordinarily must complete a 1-year master's degree program in library science. A Ph. D. degree is an advantage to those who plan a teaching career in library schools or who aspire to a top administrative post, particularly in a college or university library or in a large library system. For those who are interested in the special libraries field, a master's degree or doctorate in the subject of the library's specialization is highly desirable.

In 1976, 58 library schools in the United States were accredited by the American Library Association and offered a master's degree in library science (M.L.S.). In addition, many other colleges offer graduate programs or courses within 4-year undergraduate programs.

Most graduate schools of library science require graduation from an accredited 4-year college or university, a good undergraduate record, and a reading knowledge of at least one foreign language. Some schools also require introductory undergraduate courses in library science. Most prefer a liberal arts background with a major in an area such as the social sciences, the arts, or literature. Some schools require entrance examinations.

Library science students usually specialize in the area in which they plan to work. An aspiring information science specialist, for example, takes courses on data processing fundamentals and computer languages in addition to the required library science courses. A student wishing to become a media specialist concentrates on courses in the use and development of audio-visual materials. Special librarians and information science specialists must have extensive knowledge of their subject matter as well as training in library science. They usually earn a bachelor's or higher degree in chemistry, for example, plus a master's or Ph. D. in library or information science.

Most States require that public school librarians be certified and trained both as teachers and librarians. They also may require that media specialists, for example, have specialized in media within the M.L.S. program. Some States require certification of public librarians employed in areas such as municipal, county, or regional library systems. The specific education and experience necessary for certification vary according to State and the school district. The local superintendent of schools and the State department of education can provide information about specific requirements in an area.

In the Federal Government, beginning positions require completion of a 4-year college course and a master's degree in library science, or demonstration of the equivalent in experience and education by a passing grade on an examination.

Many students attend library schools under cooperative work-study programs that combine the academic program with practical work experience in a library. Scholarships for training in library science are available under certain State and Federal programs and from library schools, as well as from a number of the large libraries and library associations. Loans, assistantships, and financial aid also are available.

Experienced librarians may advance to administrative positions or to specialized work. Promotion to

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these positions, however, is limited primarily to those who have completed graduate training in a library school, or to those who have specialized training.

Employment Outlook

The employment outlook for librarians is expected to be somewhat competitive through the mid-1980's. Although employment in the field is expected to grow over the period, the supply of persons qualified for librarianship is likely to expand as an increasing number of new graduates and labor force reentrants seek jobs as librarians.

Employment prospects are expected to be best in public libraries. The growth of a better educated population coupled with greater emphasis on adult and community education programs will require additional librarians. The educationally disadvantaged, the handicapped, and various minority groups also will need qualified librarians to provide special services. Also, the expanding use of computers to store and retrieve information will contribute to the increased demand for information specialists and library automation specialists in all types of libraries.

The demand for school librarians on the other hand, will not increase significantly. Enrollments in higher education, however, are expected to rise until the mid-1980's, resulting in a greater number of librarians in post-high school institutions.

In addition to openings from growth, replacements will be needed each year for librarians who retire, die, transfer to other types of work, or leave the labor force.

Employment opportunities will vary not only by type of library but also by the librarian's educational qualifications and area of specialization. Although the overall employment outlook is competitive, persons who are willing to work in libraries located away from the large East or West Coast cities will have better opportunities. New graduates having more recent training may have an employment advantage over reentrants, delayed entrants, or those who transfer into the profession. This is especially true for those wanting positions as information specialists where knowledge of the latest computer technologies is important. New graduates usually command lower beginning salaries, compared to more experienced workers, and this also may be an employment advantage.

Earnings and Working Conditions

Salaries of librarians vary by type of library, the individual's qualifications, and the size and geographical location of the library.

Starting salaries of graduates of library school master's degree programs accredited by the American Library Association average $10,594 a year in 1975, ranging from $9,692 in public libraries to $10,900 in school libraries. Average salaries for librarians in college and university libraries ranged from $11,400 a year for those with less than 5 years of experience to over $20,000 for directors of libraries. In general, librarians earned about 1 1/2 times as much as the average for all nonsupervisory workers in private industry, except farming.

In the Federal Government, the entrance salary for librarians with a master's degree in library science was $14,097 a year in 1977. The average salary for all librarians in the Federal Government was about $20,000.

The typical workweek for librarians is 5 days, ranging from 35 to 40 hours. The work schedule of public and college librarians may include some weekend and evening work. School librarians generally have the same workday schedule as classroom teachers. A 40-hour week during normal business hours is common for government and other special librarians.

The usual paid vacation after a year's service is 3 to 4 weeks. Vacations may be longer in school libraries, and somewhat shorter in those operated by business and industry. Many librarians are covered by sick leave; life, health, and accident insurance; and pension plans.

Sources of Additional Information

Additional information, particularly on accredited programs and scholarships or loans, may be obtained from:

American Library Association, 50 East Huron St., Chicago, Ill. 60611.

For information on requirements for special librarians, write to:

Special Libraries Association, 235 Park Ave., South, New York, N.Y. 10003.

Information on Federal assistance for graduate school library training under the Higher Education Act of 1965 is available from:

Office of Libraries and Learning Resources, Office of Education, U.S. Department of Health, Education, and Welfare, Washington, D.C. 20202.

Those interested in a career in Federal libraries should write to:

Secretariat, Federal Library Committee, Room 310, Library of Congress, Washington, D.C. 20540.

Material on information science specialists may be obtained from:

American Society for Information Science, 1140 Connecticut Ave. NW., Washington, D.C. 20036.

Individual State library agencies can furnish information on scholarships available through their offices, on requirements for certification, and general information about career prospects in their regions. State boards of education can furnish information on certification requirements and job opportunities for school librarians.

LIBRARY TECHNICIANS AND ASSISTANTS

(D.O.T. 249.368)

Nature of the Work

Each year thousands of additional pieces of information become available to libraries. With each scientific advance, for example, many reports and evaluations are written. Professionals in various fields continually conduct research, whether on improved methods to grow house plants or on American foreign policy. The

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sheer volume of these materials, coupled with an increasing number of library services, has created a need for library technicians and assistants to support librarians in providing information.

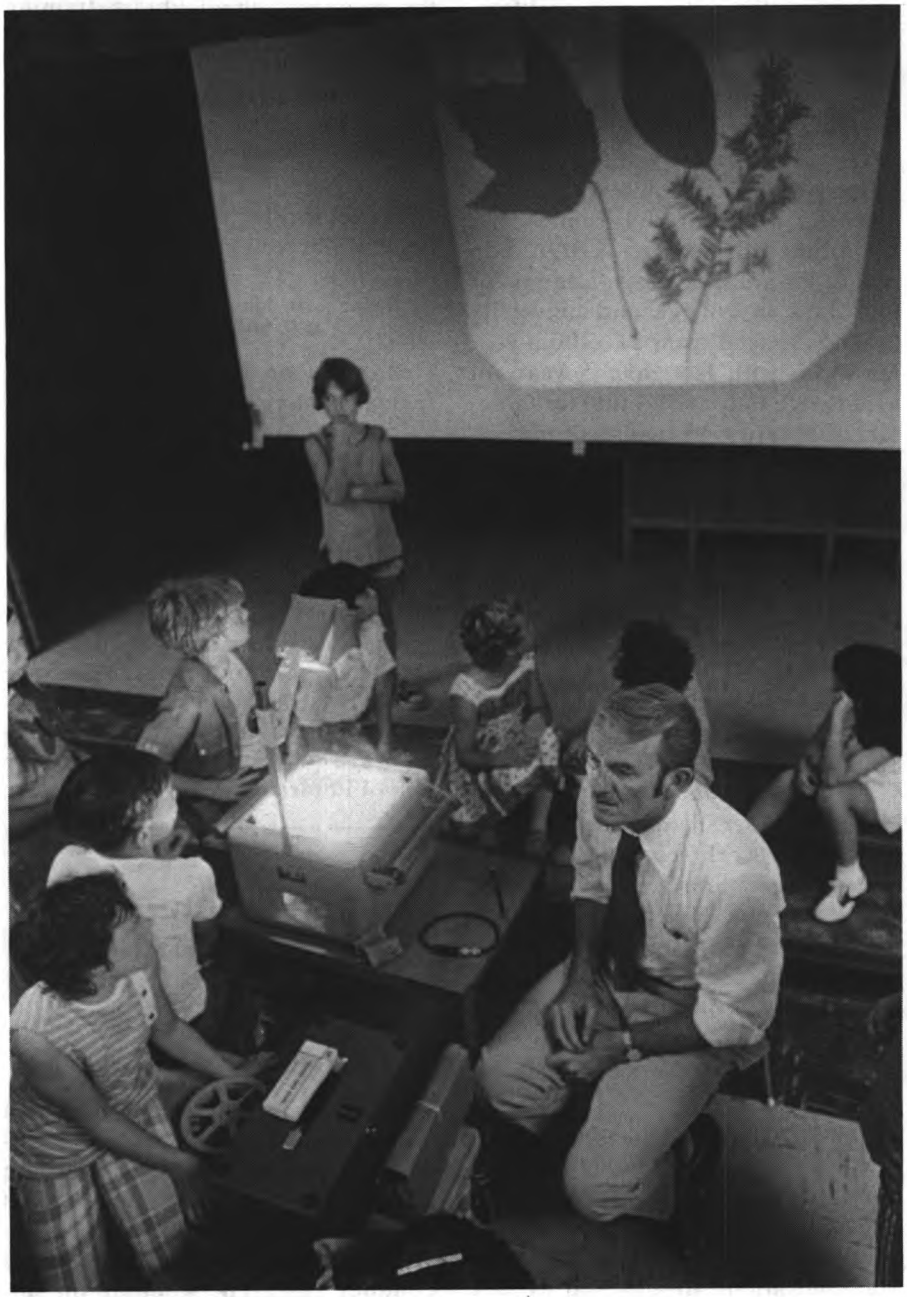
Library technicians and assistants work either in technical services or user services. Technicians, however, usually need more training than library assistants, sometimes called library clerks or pages, because their duties are more complicated and less clerical in nature.

In technical services, assistants and technicians prepare the library's materials and equipment for readers' use. Assistants may keep current files of special materials, such as newspaper clippings and pictures. They also may perform many of the routine tasks involved in purchasing and processing library materials, and sorting and shelving books.

Technicians often operate and maintain audiovisual and data processing equipment, such as projectors, tape recorders, and readers that magnify and project information on a screen. They also may catalog materials and make claims for items that are missing. Technicians sometimes work on special projects. A technician with artistic ability, for example, may design posters and displays for a school safety campaign.

In user services, library assistants and technicians furnish information on library services and answer questions that involve simple factfinding in standard reference sources. They also assist readers in the use of catalogs and indexes to locate books and other materials and may check out, reserve, and receive materials.

Technicians also may help librarians present programs to the community, school, or persons interested in a specific subject area. The technician may run a projector and pass out materials in a program on lawn care, for example.



Library technicians and assistants may operate and maintain audiovisual equipment.

Places of Employment

An estimated 143,000 people worked as library technicians and assistants in 1976. Most worked in large school and public libraries. Smaller numbers worked in college and university libraries and in medical, law, scientific, technical, and other special libraries.

In late 1975, the Federal Government employed about 3,600 library technicians. These people worked chiefly in the Department of Defense and the Library of Congress, although some worked in small Federal libraries throughout the country.

Training, Other Qualifications, and Advancement

Library technicians and assistants may receive training either on the job or in a formal post-high school program. Some libraries require only a high school education for library clerks, who, after a few years of training on the job, may advance to technicians. Other libraries hire only technicians who have formal technical training.

In 1976, 120 institutions, mostly 2-year colleges, offered library technical assistant training. Junior and community college programs generally lead to an associate of arts degree in library technology and in-

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clude 1 year of liberal arts courses and a year of library-related study. Students study the purposes and organization of libraries, and the procedures and processes involved in their operation. They learn to order and process, catalog, and circulate library materials. Some receive training in data processing as it applies to libraries. Many learn to use and maintain audiovisual materials and equipment.

Some programs teach skills for a particular type of library or a specific skill such as audiovisual technology. Therefore, a prospective student should select a program with a knowledge of the curriculum, instructional facilities, faculty qualifications, and the kinds of jobs that graduates have found. Also, applicants should be aware that, while programs may lead to an associate degree, credits earned in a library technology program apply toward a professional degree in library science.

A high school diploma or its equivalent is the standard requirment for both academic and on-the-job training programs. Many programs also require typing.

Library technicians and assistants should enjoy working with books, numbers, and people. At times their jobs may be very repetitive, when calculating circulation statistics, for example. At other times, however, they may work on various special projects such as setting up displays. Physically, the job may require much standing, stooping, bending, and reaching.

Employment Outlook

The number of library technicians and assistants is expected to grow faster than the average for all occupations through the mid-1980's. The expansion of library services and the growth in population and school and college enrollments will be the main factors affecting demand for library assistants and technicians. In addition, technicians and assistants will increasingly perform some of the routine tasks formerly done by librarians.

In addition to openings created by growth, many library technicians and assistants will be needed annually to replace those who die, retire, or transfer to other fields.

Earnings and Working Conditions

Salaries for library technicians and assistants vary widely depending on the size of the library or library system in which they work as well as the geographical location and size of the community. However, in general, they averaged about the same as all nonsupervisory workers in private industry, except farming.

Salaries of library technicians in the Federal Government, averaged $11,000 in 1976.

Library technicians and assistants in government and special libraries usually work a regular 40-hour week, but those in public libraries and college and university libraries may have schedules that include weekend and evening hours. In schools, library technicians and assistants work during regular school hours.

Most libraries provide fringe benefits such as group insurance and retirement pay. Additional benefits offered by private businesses often include educational assistance programs. Library technicians employed by the Federal Government receive the same benefits as other Federal workers.

Sources of Additional Information

For information on institutions offering programs for the training of library technicians, write:

Council on Library Technical-Assistants, School Management Institute, 750 Brooksedge Blvd., Westerville, Ohio 43081.

American Library Association, Office of Library Personnel Resources, 50 East Huron St., Chicago, Ill. 60611.

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SALES OCCUPATIONS

Sales work offers career opportunities for people who have completed high school as well as for college graduates, for those who want to travel and those who do not, and for salaried workers as well as for men and women who wish to run their own businesses.

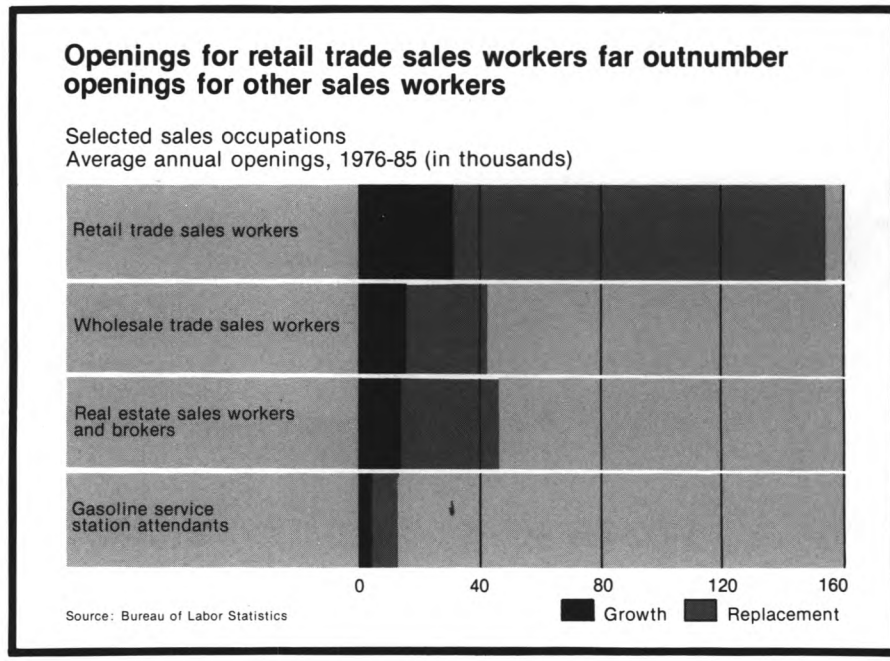
Workers in these jobs may sell for manufacturers, service firms, wholesalers, or retailers. In 1976, almost 5.5 million people, or about 7 percent of all workers, were in sales occupations; more than 25 percent worked part time. The sales occupations discussed in this section include sales workers in retail trade, wholesale trade, and manufacturing; insurance agents and brokers; real estate agents and brokers; and securities sales workers. Other statements in this section cover automotive sales workers, automobile parts counter workers, automobile service advisors, gasoline service attendants, models, and route drivers.

Training, Other Qualifications, and Advancement

Training requirements for sales work are as varied as the work itself. Sales workers who sell standardized merchandise such as magazines, candy, cigarettes, and cosmetics usually are trained on the job by experienced sales clerks; in some large stores, they may attend brief training courses. The sales worker who sells complex products or services, such as electronic equipment or liability insurance, needs a substantial amount of education and training. For some positions, sales workers must be college graduates with majors in a field such as engineering. Others get the necessary technical knowledge from university or manufacturers' courses. Still others learn through years of on-the-job experience, often supplemented by home study. Thus, a real estate agent may take university extension courses; a department store beauty counselor may participate in an industry-sponsored training program; or a jewelry sales worker may learn through years of observation and study on the job.

Even in the most routine kinds of selling, a high school diploma is an





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asset to a beginner. Courses in business, as well as specialized courses in distributive education (marketing and merchandising), are particularly good preparation. Many high schools have distributive education programs that allow students to work part time in local businesses while attending classes in retailing.

Sales workers must understand the needs and viewpoints of their customers and be poised and at ease with strangers. Other important attributes for selling are energy, self-confidence, imagination, self-discipline, and the ability to communicate. Arithmetic skills are an asset. In almost all sales work except retail trade, sales workers need initiative to locate prospective customers and to plan work schedules.

Employment Outlook

Employment in sales occupations is expected to rise about as fast as the average for all occupations through the mid-1980's. In addition to jobs resulting from growth, thousands of openings will occur each year as workers die, retire, or leave the occupation for other reasons. As the accompanying chart indicates, the greatest number of openings are expected in retail trade sales positions. Many openings are also expected for wholesale trade sales workers and real estate agents. In addition, many part-time jobs will be available in suburban shopping centers which have retail stores open several nights a week.

Further information about employment prospects for sales workers is given in statements that follow.

AUTOMOBILE PARTS COUNTER WORKERS

(D.O.T. 289.358)

Nature of the Work

Automobile parts counter workers sell replacement parts and accessories for cars, vans, trucks, and other motor vehicles. Those who work in wholesale parts stores sell parts that can be used on many makes and models of vehicles. Their customers include independent repair shops, service stations, self-employed mechanics, and "do-it-yourselfers." Counter workers employed in dealerships usually sell only parts that are made for the makes of vehicles sold by the dealers they work for and spend most of their time supplying parts to the mechanics who work in the dealers' repair shops.

Because of the wide variety of cars and trucks on the road and the growing complexity of automobiles, parts stores must stock thousands of parts ranging from carburetors to rear view mirrors. Parts counter workers must be able to quickly identify and locate any of these parts for their customers, even when customers provide only a general description of the items they want. In order to determine what their customers need, counter workers must have a good knowledge of parts catalogs. In addition, to locate the parts quickly they must be familiar with the layout of the stockroom. If a customer needs a part that is not stocked, counter workers may suggest that they use knowledge of parts catalogs. In addition, to locate the parts quickly they must be familiar with the layout of the stockroom. If a customer needs a part that is not stocked, counter workers may suggest that they use one that is interchangeable, place a special order for the part with the manufacturer, or refer the customer to another dealer or store.

Once they have obtained the parts the customers want, counter workers use price lists to determine the costs of the parts. They then fill out sales receipts and collect from their customers. When necessary they package items sold.

In addition to selling, counter workers keep parts catalogs and price lists up to date, replenish stock, and unpack incoming shipments. They also take care of the paperwork involved in selling, such as recording sales, taking inventories, and ordering parts from manufacturers. In large firms, stock and receiving clerks do some of this work.

When counter workers do not have in stock the specific part a customer wants, they may use measuring devices, such as micrometers or calipers, to see if a part that is in stock would fit the customer's needs. Sometimes customers are not sure what is wrong with their car or which parts need to be replaced. On these



In large firms, computers are used to maintain inventory, order parts, and keep price lists up to date.

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occasions, counter workers may use coil condenser testers, spark plug testers, and other equipment to identify defective parts. In some firms, particularly small wholesale stores, counter workers repair parts. For example, instead of replacing brakes they may repair them using equipment such as brake riveting machines and brake drum lathes.

Places of Employment

About 75,000 persons worked as automobile parts counter workers in 1976. Automobile dealers and parts wholesalers employed most of them. Dealers typically employed one to four counter workers; many wholesalers employed more than four. Other employers include truck dealers, retail automobile parts stores, and warehouse distributors of automotive parts. Trucking companies and buslines employ counter workers to maintain their stockrooms and dispense parts to mechanics who repair their fleets; however, these workers usually do not sell parts to customers.

Because dealerships and automobile parts stores are located throughout the country, parts counter workers are employed in almost every town and city. Those who work for warehouse distributors, trucking companies, and buslines are employed mainly in large cities.

Training, Other Qualifications and Advancement

Most parts counter workers learn the trade on the job. Beginners usually start as parts deliverers or trainees. In some large firms, beginners work as stock or receiving clerks. (See statements on stock clerks and receiving clerks elsewhere in the *Handbook*.) By filling out order forms and restocking shelves, trainees gradually familiarize themselves with the different types of parts, the use of catalogs and price lists, and the layout of the stockroom. Although trainees may wait on customers after a few months' experience, it generally takes about 2 years for a counter worker to become capable of handling every aspect of the job.

Automobile parts counter workers should have a good knowledge of how motor vehicles work and the functions of vehicle parts. The ability to work with numbers also is important. Employers generally prefer high school graduates for entry jobs. Courses in automobile mechanics, commercial arithmetic, merchandising, selling, and bookkeeping are helpful to young persons interested in becoming parts counter workers. Practical experience from working in a gasoline service station or automobile repair shop, or working on cars as a hobby also is helpful.

Since they deal with the public in many cases, persons considering careers as automobile parts counter workers should be neat, friendly, and tactful. A good memory and the ability to write legibly and concentrate on details also are important.

Counter workers with supervisory and business management ability may become parts department managers or store managers. Others who are especially good at dealing with people may become outside sales representatives for parts wholesalers and distributor These people sell parts to automobile repair shops, service stations, trucking companies, and other businesses that buy parts and accessories in large quantities. Some counter workers open their own automobile parts stores.

Employment Outlook

Employment of automobile parts counter workers is expected to increase faster than the average for all occupations. The number of vehicles in use will increase as population grows and incomes rise, allowing people to own more than one vehicle. Changes in styling and engineering of new cars and trucks will create more demand for new accessories and replacement parts. Also, as cars become more expensive, people may attempt to keep their cars longer, and create additional demand for replacement parts.

Besides jobs from employment growth, many openings are expected to be created annually because of the need to replace experienced workers who retire, die, or transfer to other occupations. The number of openings due to growth is not expected to fluctuate significantly from year to year because the demand for automobile parts, unlike some products, is not very sensitive to changing economic conditions.

Earnings and Working Conditions

Automobile parts counter workers are paid a weekly or monthly salary, or an hourly wage rate. In addition, they may receive commissions on sales. Counter workers employed by automobile dealers in 36 large cities had estimated average earnings of $5.08 an hour in 1976, slightly higher than the average for all nonsupervisory workers in private industry, except farming.

Parts counter workers typically work 40 to 48 hours a week. Because many customers find it convenient to shop on weekends, many counter workers work half a day on Saturday.

Stockrooms usually are clean and well lighted. The work is not physically strenuous, but counter workers spend much time standing or walking. They have to work rapidly, and often must wait on customers and answer telephone calls at the same time.

Many parts counter workers are members of the following unions: the International Association of Machinists and Aerospace Workers; the Sheet Metal Workers' International Association; and the International Brotherhood of Teamsters, Chauffeurs, Warehousemen and Helpers of America (Ind.).

Sources of Additional Information

Details about employment opportunities may be obtained from local automobile dealers and parts wholesalers, locals of the unions previously mentioned, or the local office of the State employment service.

For general information about the occupation, write to:

Automotive Service Industry Association, 230 N. Michigan Ave., Chicago, Ill. 60601.

National Automotive Parts Association, 10400 West Higgins Rd., Rosemont, Ill. 60018.

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AUTOMOBILE SALES WORKERS

(D.O.T. 280.358)

Nature of the Work

Automobile sales workers are important links between dealers and car buyers. Most specialize in selling either new or used cars. Others, particularly those employed in small dealerships, sell both.

Automobile sales workers spend much of their time waiting on customers in the showroom or used-car lot. When a customer enters the showroom, they try to find out what kind of car the customer wants by asking questions and encouraging the customer to talk about cars on display. For example, they may ask if the customer is interested primarily in economy, or in a high-performance automobile. Sales workers emphasize the points that please their customers in an effort to stimulate their willingness to buy. To demonstrate features, such as performance, ride, and handling, that a customer is looking for, sales workers invite their customers to test-drive the cars. Most people want to bargain over the price of cars or the allowance they get for their trade-ins, and some dealers expect their sales workers to negotiate, especially if they are overstocked that month. A sales worker generally knows what price the dealer will accept, but no sale is final until the manager approves the terms the sales worker has offered.

The final step of overcoming the customers' hesitancy to buy and getting the order (closing the sale) is difficult in any sales work. Closing is especially difficult in automobile sales because cars are the most expensive purchase many people can make. Since closing the sale frequently is difficult for beginners, experienced sales workers or sales managers often lend assistance.

Once the sale is made, the car must be registered with the State department of motor vehicles and license plates must be obtained. Sales workers fill out the forms necessary for these items, and if customers desire, arrange for financing and insurance as well. Finally, sales workers set up a delivery date for the cars and answer any additional questions the customers may have.



The success of automobile sales workers often depends on their ability to gain the respect and trust of their customers.

Successful sales workers always seek to develop customer loyalty and in this manner build repeat business. Therefore, following delivery, they often contact customers to thank them for their business and to ask if they are satisfied with the car. From time to time, they also may send literature on new models to customers in order to build repeat business.

Successful sales workers cannot simply wait for prospects to walk into the showroom. Instead, they must develop and follow leads on prospective customers. For example, they obtain names of prospects from automobile registration records and from dealer sales, service, and finance records. They also can get leads from gas station operators, parking lot attendants, and others whose work brings them into frequent contact with car owners. After obtaining their leads, sales workers may contact prospects by phone or mail.

Places of Employment

About 130,000 persons worked as automobile sales workers in 1976. New-car dealers employed about four-fifths of the total, and used-car dealers employed the rest. Dealerships vary greatly in size and employment. Many small used-car dealerships employ only one sales worker, while some new car dealerships employ more than 50 sales workers and sell over a thousand cars a year.

Automobile sales workers are employed throughout the country. Most, however, work in heavily populated areas.

Training, Other Qualifications, and Advancement

Most beginners are trained on the job by sales managers and experienced sales workers, with the amount of training depending on the dealer. In large dealerships, beginners may receive several days of classroom training to learn how to obtain leads on prospective customers, to make sales presentations, and to close sales. In addition, automobile manufacturers often furnish training manuals and other educational material for sales workers to study on their own. In almost every dealership, sales workers receive continuing guidance and training from their managers, both on the job and at periodic sales meetings. They also may attend the training programs automobile manufacturers offer when

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they develop new sales campaigns that they want their dealers to follow.

A high school diploma usually is the minimum educational requirement for beginners. Courses in English or public speaking, in particular, can help build confidence in one's ability to talk to customers. Also, courses in commerical arithmetic, merchandising, selling, business law, and psychology can provide a good background for this type of work. Previous sales experience or other work requiring contact with the public is not required, but it is helpful. Many persons in automobile sales, for example, previously were in furniture, appliance, or door-to-door sales.

Since automobiles are a major purchase, dealers prefer sales workers who exhibit the maturity which can inspire customer confidence. As a result, many employers prefer applicants who are at least in their mid- or late twenties, with 21 as the minimum age for beginners. But age requirements may be waived for a mature applicant.

The success of automobile sales workers is often dependent on their ability to gain the respect and trust of their customers. Therefore, they must be tactful, well-groomed, and able to express themselves well. Initiative and aggressiveness also are important since the number of cars sold usually depends on the number of prospective customers contacted. Because automobile sales workers occasionally work for days without making a sale, they need self-confidence and determination to get through these slow periods.

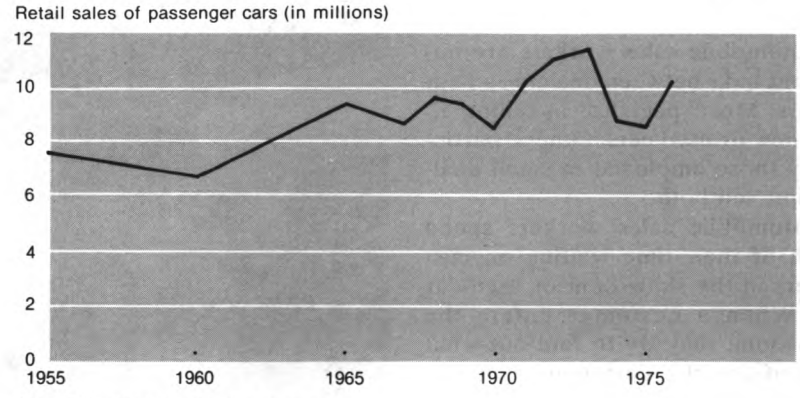
Successful employees who have managerial ability may advance to assistant sales manager, sales manager, or general manager. Many successful employees prefer to remain sales workers however, for they enjoy the freedom of changing dealerships or working in different parts of the country. Some managers and general managers open their own dealership or become partners in dealerships.

Employment Outlook

Employment of automobile sales workers is expected to grow faster than the average for all occupations through the mid-1980's as the demand for automobiles increases. In addition to jobs resulting from employment growth, thousands of openings will occur as sales workers retire, die, or transfer to other occupations.

Over the long run, rising population and personal incomes will lead to increased car sales, and employment of sales workers will grow. But, because sales are affected by changing economic conditions and consumer preferences, employment will fluctuate from year to year. Opportunities for beginners, therefore, will be plentiful in some years and scarce in others.

Auto sales fluctuate from year to year, causing job opportunities for automobile salesworkers to be abundant in some years and scarce in others



Source: Motor Vehicle Manufacturers Association

Earnings and Working Conditions

Most sales workers are paid a commission, that is, a percentage either of the price of every car they sell or the profit the dealer makes on each sale. They may earn another commission when customers finance or insure their cars through the dealer. Because car sales vary from month to month, sales workers' commissions also vary. Many dealers pay their commissioned sales workers a modest weekly or monthly salary so that they will have a steady income. Others give their sales workers advances against future commissions. A few dealers pay a straight salary. Because it takes some time for beginners to learn to sell cars, dealers often guarantee them a modest salary for the first few weeks or months.

Sales workers employed by new-car dealers had estimated average weekly earnings of about $300 in 1976. Earnings varied, depending on individual ability and experience, geographic location, and dealership size. For example, sales workers who worked for dealers that sold between 100 and 149 new vehicles annually averaged about $220 a week, while those employed by dealers that sold 1,000 cars or more averaged about $340.

Many dealerships, especially the larger ones, also provide bonus and other special incentive programs for their sales workers. For example, a sales worker may receive a bonus for selling more cars than expected.

Earnings can change considerably from year to year due to changes in the demand for cars. In lean years, workers with poor sales records may be laid off, or may quit to find better paying jobs in other fields. Many, however, return to selling when the demand for cars improves.

Sales workers receive many fringe benefits. Dealers often furnish their sales staffs with demonstrator cars free of charge, or sell or lease demonstrators at a discount. Sales work-

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ers also receive discounts on cars they buy for personal use.

Because most customers find shopping after work convenient, sales workers frequently work evenings. In some areas, they may work Sunday and take a day off during the week. Many dealers assign sales workers "floortime"—hours they spend in the showroom greeting customers. For example, a sales worker may be in the showroom from 9 a.m. to 3 p.m. 1 week, from 3 p.m. to 9 p.m. the next week, and all day on Saturdays. When not assigned to the showroom, they may spend a few hours each day delivering cars to customers and looking for new customers.

Sources of Additional Information

Details on employment opportunities may be obtained from local automobile dealers or the local office of the State employment service. For general information about the work, write to:

National Automobile Dealers Association, 2000 K St. NW., Washington, D.C. 20006.

AUTOMOBILE SERVICE ADVISORS

(D.O.T. 620.281)

Nature of the Work

Service advisors are the link between customers and mechanics in many automobile dealerships and in some large independent garages. When customers bring their cars into the service department, service advisors (sometimes called service salesworkers or service writers) find out what needs to be done and arrange for mechanics to do the work.

For routine maintenance, service advisors merely make out a repair order listing the work that the customer wants done. The order includes the customer's name and address, and make and year of the car. If a factory warranty covers the repairs, the advisor also records the engine and body numbers, mileage, and date of purchase.

There are many times, however, when customers complain of problems that could have a variety of causes. In such cases, service advisors attempt to find out as much as possible about the problem. For example, if a customer says the car is hard to start, the advisor would ask if this happens when the engine is cold or after it warms up. Or, if the complaint is a strange noise, the advisor may look the car over, or test drive the car. The advisor then writes a brief description of the symptoms of the problem, as well as any conclusion about the probable cause, on the repair order to help the mechanic locate the trouble's source.

After writing the repair order, service advisors tell the customer what repairs are needed, their approximate cost, and how long the work will take. Since this cannot always be done until mechanics have inspected the cars, service advisors may phone the customers later to give them this information and to ask permission to do the work. Sometime customers are reluctant to authorize expensive repairs even if they are necessary so service advisors may assure them that the work will improve performance and safety, and prevent more serious trouble.

Service advisors give repair orders to the shop dispatcher who figures the cost of the parts and labor needed for each order and assigns work to mechanics. In some shops however, advisors compute repair costs. Service advisors also are responsible for answering any questions the mechanics may have about a repair order. When the work is finished, service advisors may test drive cars to be sure all problems have been corrected.

When the customer returns for the car, the service advisor answers any questions about the repairs and settles complaints about their cost or quality. If the customers want to return the car to the shop or want the cost of the repairs adjusted, the advisor usually must get permission from the service manager. In some dealerships, the most experienced service advisors substitute for service managers when they are absent.



Service advisor prepares repair order.

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In addition to advising customers on their service needs, service advisors occasinally assist customers in selecting accessories for their cars. For example, a customer who wants to add an air-conditioner may check with a service advisor to be sure that the one selected will not cause the car's engine to overheat.

Places of Employment

More than 20,000 persons worked as automobile service advisors in 1976. Most worked for large automobile dealers because dealerships with less than 20 employees usually do not employ service advisors. Some worked for large independent automobile repair shops.

Training, Other Qualifications, and Advancement

Service advisors learn on the job under the guidance of experienced service advisors and the service manager. In many service departments, trainees begin by helping the shop dispatcher. They learn how to route work to the shop mechanics, to compute repair costs, and to estimate the time required for different repairs. Beginners usually can gain enough knowledge and experience in 1 to 2 years to handle almost every type of repair, but learning to estimate the cost of automobile body repairs may take a longer time, as body damage is often very difficult to see and identify. In addition to on-the-job training, some advisors attend formal training programs conducted by automobile manufacturers.

When hiring persons for jobs as service advisor trainees, employers prefer high school graduates who are 21 years of age and who have experience in automobile repair or related activities, such as assignment to the motor pool in the Armed Forces. Often employers fill these jobs by promoting persons who have worked as mechanic trainees or parts counter worker trainees within their own organization. Some firms prefer to hire mechanics who are experienced in all aspects of automobile repair.

Many autombile dealers consider service advisors their most important employees, because they can promote dealership loyalty and thus build repeat business by winning customer confidence.

Therefore, employers look for applicants who are neat, courteous, even-tempered, attentive listeners, and good conversationalists. High school and vocational school courses in automobile mechanics, commercial arithmetic, sales, public speaking, and English are helpful.

Service advisors with supervisory ability may advance to shop supervisors or to service managers. Some open their own automobile repair shops.

Employment Outlook

Employment in this small occupation is expected to increase about as fast as the average for all occupations through the mid-1980's. Not only will there be more automobiles on the road, but also future technology and design will make cars more complex. As a result, more service advisors will be needed. In addition to the job openings resulting from employment growth, hundreds of openings will arise each year due to the need to replace experienced service advisors who retire, die, or leave the occupation for other reasons. The number of openings is expected to be fairly stable from year to year, because the demand for automobile repairs is not very sensitive to changing economic conditions.

Job openings for service advisors will be concentrated in large automobile dealerships, most of which are located in heavily populated areas. In small towns, many dealers do not have enough repair business to hire service advisors so shop supervisors do the work instead.

Earnings and Working Conditions

Service advisors employed by automobile dealers in 36 large cities had estimated average earnings of $6.45 an hour in late 1976, more than one-third higher than the average for all nonsupervisory workers in private industry, except farming.

Many service advisors are paid a salary plus a commission, that is, a percentage of the cost of repairs or accessories that their customers paid for. Others are paid a straight commission.

Most service advisors work 40 to 48 hours a week. They are busiest in the early morning when most customers bring their cars in for repairs, and in late afternoon when they return to pick them up. During these peak hours, advisors may have to rush to wait on customers. In addition, they occasionally have to deal with angry customers who question or are not satisfied with the repairs made on their cars.

Service advisors spend most of their time standing or walking around the lot and garage in all kinds of weather. But the work is not physically strenuous.

Unions that organize service advisors include the International Association of Machinists and Aerospace Workers; the Sheet Metal Workers' International Association; and the International Brotherhood of Teamsters, Chauffers, Warehousemen and Helpers of America (Ind.).

Sources of Additional Information

Details on employment opportunities may be obtained from local automobile dealers or repair shops; locals of the unions previously mentioned; or the local office of the State employment service.

For general information about the work of automobile service advisors, write to:

Automotive Service Industry Association, 230 N. Michigan Ave., Chicago, Ill. 60601.

Automotive Service Councils, Inc., 188 Industrial Dr. Suite 112, Elmhurst Ill. 60126

GASOLINE SERVICE STATION ATTENDANTS

(D.O.T. 915.867)

Nature of the Work

At least once a week, most of the 137 million motor vehicles on the road are driven into gasoline service stations for fuel and service. Most need only a few gallons of gas and a clean windshield, but service station attendants check for other things as well to help owners keep their cars in good condition.

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Attendant checking the oil level in the crankcase.

Unless a driver is in a hurry, attendants usually check the oil level in the crankcase and the water levels in the battery and radiator. If the customer asks, they also will check the air pressure in the tires and examine fan belts, hoses, and other parts for signs of excessive wear that could cause problems for the driver.

Besides offering these basic services, many stations also do repair work and stock replacement parts for often-needed items such as batteries, headlights, and windshield wiper blades. Attendants sell and install these parts, and in some cases, may do minor repair work, such as changing oil, rotating tires, and fixing flats. Most of these tasks can be done using screwdrivers, pliers, wrenches, and other simple handtools. Some attendants, called mechanic-attendants, perform more difficult repairs and use more complex equipment including motor analyzers and wheel alignment machines.

When customers pay for their purchases or repair work, attendants collect payments and make change or prepare charge slips.

Attendants also may keep the service areas, building, and restrooms clean and neat. In some stations, they help the station manager take inventory of automobile parts in stock, set up displays, and keep business records.

If a service station provides emergency road service, attendants may drive a tow truck to the site of the breakdown to "boost" the battery, change a flat tire, or perform other minor repairs. If they cannot fix the car on the spot, they tow it back to the station.

Places of Employment

About 420,000 people worked as gasoline service station attendants in 1976. About one-third of these were part-time employees. In addition to attendants, more than 200,000 gasoline service station managers and owners did similar work.

Service station attendants work in every section of the country, and in every size community, from rural areas to the largest cities.

Training, Other Qualifications, and Advancement

Applicants for jobs as gasoline service station attendants should have a driver's license, a general understanding of how an automobile works, and some sales ability. They should be friendly, able to speak well, and present a generally neat appearance. They also need self-confidence. Applicants should know simple arithmetic so they can make change quickly and accurately and help keep business records. They also should be familiar with local roads, highways, and points of interest in order to give directions to customers and to locate cars whose owners have called for road service.

Although completion of high school is not generally a requirement for getting an entry job, it is an advantage because it indicates to many employers that the person has at least some of the traits of a good worker, such as the ability to stay with a job until the work is completed. A high school education usually is required for service station management training programs conducted by oil companies.

Service station attendants receive most of their training on the job, although there are some formal training programs. Trainees do relatively simple work at first, such as cleaning the station, pumping gas, and cleaning windshields. Gradually, they progress to more advanced work such as performing preventive maintenance, installing accessories on cars, and helping to keep the station records. It usually takes from several months to a year for a beginner to become familiar with and able to perform all the the jobs around a service station.

Formal training programs for gasoline service station work are offered in many high schools around the country. In this curriculum, students in their last 2 years of high school take business education courses and work part time in gasoline service stations, where they receive instruction in all phases of service station work.

Some attendants are enrolled in formal training programs for service station managers, which are conducted by most major oil companies. These programs usually last from 2 to 8 weeks and emphasize subjects such as simple automobile maintenance, marketing, and business management.

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Several avenues of advancement are open to service station attendants. Additional training qualifies attendants to become automobile mechanics; those having business management capabilities may advance to station manager. Many experienced station managers and automobile mechanics go into business for themselves by leasing a station from an oil company or buying their own station. Oil companies hire some service station managers as sales representatives or district managers.

Employment Outlook

Employment of gasoline service station attendants should continue to grow over the next few years. But whether this trend will continue through the mid-1980's is difficult to judge. Increased sales of cars that offer better gas mileage could eventually reduce total gasoline consumption, which might severely limit growth in this occupation over the long run. Self-service gas stations also may limit growth. However, in this relatively large occupation, thousands of job openings are expected each year to replace workers who retire or die. Turnover also is high, so thousands more openings will arise each year as attendants transfer to other occupations.

Earnings and Working Conditions

Earnings of gasoline service station attendants vary considerably. Hourly earnings for many attendants ranged from $2.30 to $4 in 1976, according to the limited information available. In addition, many attendants are paid a commission based on the value of the products they sell. Attendants employed in large metropolitan areas generally had higher earnings than those in small towns.

Full-time attendants work 40 hours a week or more. Because gas stations usually are open at least 12 hours a day, 6 days a week, work schedules may include evenings, weekends, and holidays.

Attendants work outdoors in all kinds of weather. They do considerable lifting and stooping and spend much time on their feet. Possible injuries include cuts from sharp tools and burns from hot engines.

For many attendants, however, the opportunity to deal with people, to work on cars, and possibly to manage their own service stations someday more than offsets these disadvantages. Also, the opportunity to get part-time employment makes the job attractive to many people. Some college students have been able to work their way through school as service station attendants and many who hold other jobs add to their income by working part time as attendants.

Sources of Additional Information

For more details about work opportunities, contact local gasoline service stations or the local office of the State employment service.

INSURANCE AGENTS AND BROKERS

(D.O.T. 250.258)

Nature of the Work

Insurance agents and brokers sell policies that protect individuals and businesses against future losses and financial pressures. They may help plan financial protection to meet the special needs of a customer's family; advise about insurance protection for an automobile, home, business, or other property; or help a policyholder obtain settlement of an insurance claim.

Agents and brokers usually sell one or more of the three basic types of insurance: life, property-liability (casualty), and health. Life insurance agents, sometimes called life underwriters, offer policies that pay survivors when a policyholder dies. Depending on the policyholder's individual circumstances, a life policy can be designed to provide retirement income, funds for the education of children, or other benefits. Casualty insurance agents sell policies that protect individual policyholders from financial losses as a result of automobile accidents, fire or theft, or other losses. They also sell industrial or commercial lines, such as workers' compensation, product liability, or medical malpractice insurance. Health insurance policies offer protection against the costs of hospital and medical care or loss of income due to illness or injury, and many life and casualty agents offer health insurance in addition to other lines. Many agents also offer securities, such as mutual fund shares or variable annuities.

An insurance agent may be either an insurance company employee or an independent business person authorized to represent one insurance company or more. Brokers are not



Insurance agents plan insurance programs that are tailored to prospects' needs.

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under exclusive contract with any single company; instead, they place policies directly with the company that best meets a client's needs. Otherwise, agents and brokers do much the same kind of work.

They spend most of their time discussing insurance needs with prospective and existing customers. Some time must be spent in office work to prepare reports, maintain records, plan insurance programs that are tailored to prospects' needs, and draw up lists of prospective customers. Specialists in group policies may help an employer's accountants set up a system of payroll deductions for employees covered by the policy.

Places of Employment

About 465,000 agents and brokers sold insurance full time in 1976. In addition, thousands of others worked part time. About half of the agents and brokers specialized in life insurance; the rest, in some type of property/liability insurance. A growing number of agents (called multi-line agents) offer both life and property-liability policies to their customers.

Agents and brokers are employed in cities and towns throughout the country, but most work near large population centers.

Training, Other Qualifications, and Advancement

Although many employers prefer college graduates for jobs selling insurance, most will hire high school graduates with potential or proven sales ability. College training may help the agent grasp the fundamentals and procedures of insurance selling more quickly. Courses in accounting, economics, finance, business law, and insurance subjects are helpful.

All agents and most brokers must obtain a license in the State where they plan to sell insurance. In most States, licenses are issued only to applicants who pass written examinations covering insurance fundamentals and the State insurance laws. Agents who plan to sell mutual fund shares and other securities also must be licensed by the State. New agents usually receive training at the agencies where they will work and frequently also at the insurance company's home office. Beginners sometimes attend company-sponsored classes to prepare for examinations. Others study on their own and accompany experienced sales workers when they call on prospective clients.

Agents and brokers can broaden their knowledge of the insurance business by taking courses at colleges and universities and attending institutes, conferences, and seminars sponsored by insurance organizations. The Life Underwriter Training Council (LUTC) awards a diploma in life insurance marketing to agents who successfully complete the Council's 2-year life program. There is also a course in health insurance. As agents or brokers gain experience and knowledge, they can qualify for the Chartered Life Underwriter (CLU) designation by passing a series of examinations given by the American College of Bryn Mawr, Pa. In much the same way, a property-liability agent can qualify for the Chartered Property Casualty Underwriter (CPCU) designation by passing a series of examinations given by the American Institute for Property and Liability Underwriters. The CLU and CPCU designations are recognized marks of achievement in their respective fields.

Agents and brokers should be enthusiastic, self-confident, and able to communicate effectively. Because agents usually work without supervision, they need initiative to locate new prospects. For this reason, many employers seek people who have been successful in other jobs.

Insurance agents who show unusual sales ability and leadership may become a sales manager in a local office or assume a managerial job in a home office. A few agents may advance to top positions as agency superintendents or company vice-presidents. Many who have built up a good clientele prefer to remain in saleswork. Some, particularly in the property-liability field, eventually establish their own independent agencies or brokerage firms.

Employment Outlook

Employment of insurance agents and brokers is expected to grow about as fast as the average for all occupations through the mid-1980's as the volume of insurance sales continues to expand. Many additional jobs will open as agents and brokers die, retire, or leave their jobs to seek other work. Due to the highly competitive nature of insurance selling, many beginners leave the field because they are unable to establish a sufficiently large clientele. Therefore, opportunities should be quite favorable for ambitious people who enjoy saleswork.

Future demand for agents and brokers depends on the volume of insurance sales. Volume should increase rapidly over the next decade as a larger proportion of the population enters the period of peak earnings and family responsibilities. Life insurance sales should grow as more families select policies designed to provide educational funds for their children and retirement income. Rising incomes also may stimulate the sales of equity products such as mutual funds, variable annuities, and other investments. Sales of property-liability insurance should rise as more consumer purchases are insured and as complex types of commercial coverage, such as product liability and workers'compensation, are expanded.

However, employment of agents and brokers will not keep pace with the rising level of insurance sales because more policies will be sold to groups and by mail. In addition, each agent should be able to handle more business as computers take over some of the time-consuming clerical tasks. The trend toward multi-line agents also will cause employment to rise more slowly than the volume of insurance sales.

Earnings and Working Conditions

Beginners in this occupation often are guaranteed a moderate salary while they are learning the business and building a clientele. In many large companies, new agents receive about $800 a month during this training period, which can last up to 6 months or longer. Thereafter, most agents are paid on a commission basis. The size of the commission depends on the type and amount of in-

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surance sold, and whether the transaction is a new policy or a renewal. After a few years, an agent's commissions on new policies and renewals may range from $12,000 to $20,000 annually. There is virtually no limit on what an agent can earn, however. Thousands of established agents and brokers earn more than $30,000 a year, and many highly successful ones earn more than $100,000 a year.

Agents and brokers generally pay their own automobile and traveling expenses. In addition, those who own and operate independent businesses must pay office rent, clerical salaries, and other operating expenses out of their earnings.

Although insurance agents usually are free to arrange their own hours of work, they often schedule appointments during evenings and weekends for the convenience of clients. Some agents work more than the customary 40 hours a week. (See the statement on the Insurance Industry for more information about work in life and property-liability companies.)

Sources of Additional Information

General occupational information about insurance agents and brokers is available from the home office of many life and property-liability insurance companies. Information on State licensing requirements may be obtained from the department of insurance at any State capital.

Information about a career as a life insurance agent also is available from:

American Council of Life Insurance, 1850 K St., NW., Washington, DC, 20006.

The National Association of Life Underwriters, 1922 F St., NW., Washington, D.C. 20006.

For career information on property/liability agents, contact:

Insurance Information Institute, 110 William St., New York, N.Y. 10038.

National Association of Insurance Agents, Inc., 85 John St., New York, N.Y. 10038.

American Mutual Insurance Alliance, 20 N. Wacker Dr., Chicago, Ill. 60606.

The National Association of Independent Insurers, Public Relations Department, 2600 River Rd., Des Plaines, Ill. 60018.

MANUFACTURERS' SALES WORKERS

(D.O.T. 260. through 298.458)

Nature of the Work

Practically all manufacturers—whether they make computers or can openers—employ sales workers. Manufacturers' sales workers sell mainly to other businesses—factories, railroads, banks, wholesalers, and retailers. They also sell to hospitals, schools, libraries, and other institutions.

Most manufacturers' sales workers sell nontechnical products. They must be well informed about their firms' products and also about the special requirements of their customers. When sales workers visit firms in their territory, they use an approach adapted to the particular line of merchandise. A sales worker who handles crackers or cookies, for example, emphasizes the wholesomeness, attractive packaging, and variety of these products. Sometimes sales workers promote their products by displays in hotels and conferences with wholesalers and other customers.

Sales workers who deal in highly technical products, such as electronic equipment, often are called sales engineers or industrial sales workers. In addition to having a thorough knowledge of their firms' products, they must be able to help prospective buyers with technical problems. For example, they may try to determine the proper materials and equipment for a firm's manufacturing process. They then present this information to company officials and try to negotiate a sale, which may take many months. Often, sales engineers work with the research-and-development departments of their own companies to devise ways to adapt products to a customer's specialized needs. Sales workers who handle technical products sometimes train their customers' employees in the operation and maintenance of new equipment, and make frequent return visits to be certain that it is giving the desired service.

Although manufacturers' sales workers spend most of their time visiting prospective customers, they also do paperwork, including reports on sales prospects or customers' credit ratings. In addition, they must plan their work schedules, draw up



Manufacturer's sales worker takes order for camera equipment from department store photo supplies buyer.

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lists of prospects, make appointments, handle some correspondence, and study literature relating to their products.

Places of Employment

Over 360,000 people were manufacturers' sales workers in 1976. About 15,000 were sales engineers. Some work out of their company's home office, often located at a manufacturing plant. The majority, however, work out of branch offices, usually in big cities near prospective customers.

More sales workers are employed by companies that produce food products than by any other industry. Large numbers also work in the printing and publishing, chemical, fabricated metal products, and electrical and other machinery industries. Most sales engineers work for companies that produce heavy machinery, transportation equipment, fabricated metal products, and professional and scientific instruments.

Training, Other Qualifications, and Advancement

Although a college degree is increasingly desirable, the type and level of education a sales worker needs depend largely on the product and its market.

Manufacturers of nontechnical products often hire college graduates who have a degree in liberal arts or business administration. Some positions, however, require specialized training. Drug sales workers, also known as pharmaceutical detailers, usually need training at a college of pharmacy. Manufacturers of electrical equipment, heavy machinery, and some types of chemicals prefer to hire people who have studied engineering or chemistry. (Information on chemists, engineers, and others with the technical training suitable for work as manufacturers' sales workers is given elsewhere in the *Handbook*.)

Beginning sales workers may take specialized training before they start on the job. Some companies, especially those that manufacture complex technical products, have formal training programs that last 2 years or longer. In some of these programs, trainees rotate among jobs in several departments of the plant and office to learn all phases of production, installation, and distribution of the product. Other trainees take formal class instruction at the plant, followed by on-the-job training in a branch office under the supervision a field sales manager.

A pleasant personality and appearance, and the ability to meet and get along well with many types of people are important. Because sales workers may have to walk or stand for long periods or carry product samples, some physical stamina is necessary. As in most selling jobs, arithmetic skills are an asset.

Sales representatives who have good sales records and leadership ability may advance to sales supervisors, branch managers, or district managers. Those with managerial ability eventually may advance to sales manager or other executive positions; many top executive jobs in industry are filled by people who started as sales workers.

Because of frequent contact with business people in other firms, sales workers often are able to transfer to other jobs. Some go into business for themselves as independent representatives. Other experienced sales workers find opportunities in advertising and marketing research.

Employment Outlook

Employment in this field is expected to grow about as fast as the average for all occupations. Growth will occur because of the rising demand for technical products and the resulting need for trained sales workers. In addition, industrial firms, chain stores, and institutions that purchase large quantities of goods at one time frequently buy directly from the manufacturer. The need for sales workers will increase as manufacturers emphasize sales activities to compete for the growing number of these valuable accounts.

Earnings and Working Conditions

According to the limited information available, salaries for inexperienced sales workers ranged from $6,000 to over $24,000 a year in 1976, exclusive of commissions and bonuses. The highest starting salaries generally were paid by manufacturers of electrical equipment, food products, and rubber goods. The average experienced sales worker earned between $17,000 and $30,000 in 1976, depending upon the firm and its product. The highest paid sales workers sometimes earned upwards of $40,000 and $50,000.

Some manufacturing concerns pay experienced sales workers a straight commission, based on their dollar amount of sales (as in the case of independent representatives); others pay a fixed salary. The majority, however, use a combination of salary and commission, salary and bonus, or salary, commission, and bonus. Commissions vary according to the sales workers' efforts and ability, the commission rate, the location of their sales territory, and the type of product sold. Bonus payments may depend on individual performance, on performance of all sales workers in the group or district, or on the company's sales. Some firms pay annual bonuses; others offer bonuses as incentive payments on a quarterly or monthly basis.

Some manufacturers' sales workers have large territories and do considerable traveling. Others usually work in the neighborhood of their "home base." When on business trips, sales workers are reimbursed for expenses such as transportation and hotels. Some companies provide a car or pay a mileage allowance to sales workers who use their own cars.

Manufacturers' sales workers call at the time most convenient to customers and may have to travel at night or on weekends. Frequently, they spend evenings writing reports. However, some plan their schedules for time off when they want it. Most sales workers who are not paid a straight commission receive 2 to 4 weeks' paid vacation, depending on their length of service. They usually share in company benefits, including life insurance, pensions, and hospital, surgical, and medical benefits.

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