find a good many openings in high school teaching. Some will also be able to qualify as trainees in administrative and management positions in government agencies, nonprofit foundations, civic organizations and, more rarely, in private industry.

Earnings

Salaries of social scientists (historians included) employed by 4-year colleges and universities averaged $7,800 in 1962–63; instructors averaged $6,000; assistant professors, $7,200; associate professors, $8,500; and professors, $10,800. Salaries tended to be lower for those persons employed in junior colleges and teacher's colleges.

In the Federal Government, the starting salary for persons with a bachelor's degree was $5,000 in early 1965. Those with a superior academic record or with a year of graduate training were eligible for positions at an annual salary of $6,050. Most of the experienced historians in the Federal Government earned from $7,220 to $14,170 per year in early 1965.

Some historians, particularly those in college teaching, supplement their income by summer teaching or writing books or articles. A few earn additional income from lectures.

Where To Go for More Information

Additional information on employment opportunities for historians may be obtained from:

American Historical Association,
400 A St. SE., Washington, D.C. 20003.

Political Scientists

(2d ed. D.O.T. 0–36.96)
(3d ed. D.O.T. 051.088)

Nature of Work

Political science is the study of government—what it is, what it does, and how and why. Political scientists are interested in government at every level—local, county, State, regional, national, and international. Many political scientists specialize in public administration, in American Government, or in international relations. Smaller numbers specialize in such fields as public law, history of political ideas, political parties, public opinion, and area studies.

Political scientists are most frequently employed as college teachers, sometimes teaching other social sciences as well. They may combine research, consultation, or administrative duties with their teaching. Some teach in foreign universities where they prepare students for careers in public administration and assist in the development of training programs for government personnel. A good many political scientists are engaged mainly in research. They may make surveys of public opinion on political questions for private research organizations. They may make studies of proposed legislation for State or municipal legislative reference bureaus or congressional committees to determine whether the legislation is well drafted and constitutional. They may analyze the operations of government agencies or specialize in foreign affairs research, either for government or nongovernment organizations. Still others are engaged in administrative or managerial duties in all fields of work, although in such cases occupational distinctions are far from clear. For example, they may be employed as budget analysts, as personnel directors or assistants, as city planners or managers, as legislative aids to congressmen, and as staff members of congressional committees.

Where Employed

Probably between 8,000 and 9,000 people were employed as political scientists in 1965, largely in colleges and universities or in government agencies. Fewer than 10 percent worked for other types of employers such as municipal and other research bureaus, civic and taxpayers associations, and large business firms.

Political scientists are employed in nearly every college in the United States, since courses in political science or government are widely taught. Most other political scientists are located in Washington, D.C., and in other large cities, or in State capitals. A good many are employed in over-

seas jobs, mainly by the U.S. Department of State, the Agency for International Development, and the U.S. Information Agency.

Training and Other Qualifications

Graduate training is generally required for employment as a political scientist. College graduates with a master's degree in public administration can qualify for various administrative and research positions in government and in nonprofit research and civic organizations. More than 80 colleges and universities offer graduate degrees in public administration. The college programs cover a wide range of subjects—for example, international administration, city planning, municipal administration, criminal investigation, and social security administration. A majority of the schools provide field training, and many offer internships which enable the student to obtain experience in government work. A good many universities award graduate degrees in international relations, foreign service, and area studies, as well as political science in general. A master's degree in any of these fields is very helpful in obtaining a position in a Federal Government agency concerned with foreign affairs. However, for some Government jobs, such as those with the Agency for International Development, only persons with substantial experience (preferably in public administration) are hired.

Completion of all requirements for the Ph. D. degree, except the doctoral dissertation, is the usual prerequisite for appointment as a college instructor. The Ph. D. degree is generally required for advancement to the position of professor.

Some young people with only a bachelor's degree in political science qualify as trainees in public relations or research work, or in jobs such as budget analyst, personnel assistant, or investigators in government or industry. However, they must compete for these jobs with college graduates majoring in many other fields, particularly those with majors in business administration, accounting, economics, and other social science specialties. A great many students with the bachelor's degree in political science go on to study law; many others obtain graduate training in public administration, international relations, or other specialized branches of political science.

Employment Outlook

Employment of political scientists will probably increase rapidly through the mid-1970's. The largest increase will be in colleges and universities. The number of political scientists in administrative jobs in government agencies will probably rise also because of a growing recognition of the value of specialized training in developing and planning new programs. Government agencies concerned with foreign affairs will continue to employ a good many political scientists. A slow growth is anticipated in employment of political scientists in private industry.

Many political scientists will be needed to fill positions vacated because of retirements, deaths, or transfers to other fields of work. Colleges and universities will probably need 200 to 300 political scientists annually between 1965 and 1975, to fill new positions and to meet replacement needs. Government agencies will need 200 or more each year.

The number of political scientists with the doctorate is expected to rise less rapidly than demand. As a result, new Ph. D. graduates will find very good opportunities in college teaching and good chances for employment in other fields as well. Those who have completed all the requirements for the doctorate except the dissertation are also likely to find favorable opportunities in college teaching. Employment opportunities for others with the master's degree will be more limited, but openings will be available to them in Federal, State, and municipal government agencies; research bureaus; political organizations; and civic and welfare agencies. For new graduates with only the bachelor's degree, opportunities for employment in the political science field will probably continue to be very limited. However, those planning to continue their studies in law, foreign affairs, journalism, and other related fields will find their political science background very helpful. Some who meet State certification requirements will be able to enter high school teaching.

Earnings

Salaries of social science teachers, including political scientists, employed by 4-year colleges and universities, averaged $7,800 in 1962–63; in-

structors averaged $6,000; assistant professors, $7,200; associate professors, $8,500; and professors, $10,800. Salaries tended to be lower for those persons employed in junior colleges and teachers colleges. Generally, those persons holding the doctorate had the higher salaries.

In the Federal Government, the starting salary for political scientists with a bachelor's degree was $5,000 a year in early 1965. Those with a superior academic record or with a year of graduate training were eligible for positions at an annual salary of $6,050. Most of the experienced political scientists in the Federal Government earned considerably more.

Some political scientists, particularly those in college teaching, supplement their income, generally by doing summer teaching or consulting work.

Where To Go for More Information

Additional information on employment opportunities in political science and public administration may be obtained from the following organizations:

American Political Science Association,
1726 Massachusetts Ave. NW., Washington, D.C. 20036.
American Society for Public Administration,
1329 18th St. NW., Washington, D.C. 20036.

Sociologists

(2d ed. D.O.T. 0–36.31)
(3d ed. D.O.T. 054.088)

Nature of Work

Sociologists study the many groups which man forms—families, tribes, communities, and States, and a great variety of social, religious, political, business, and other organizations which have arisen out of living together. They study the behavior and interaction of these groups, trace their origin and growth, and analyze the influence of group activities on individual members. Some sociologists are primarily concerned with the characteristics of particular kinds of social groups and institutions; others are more interested in the ways in which individuals are affected by groups to which they belong. Many specialize in the study of social organization, social psychology, or rural sociology. Others specialize in intergroup relations, family problems, social effects of urban living, population studies, or analyses of public opinion. Some sociologists concentrate on research methodology or the conduct of surveys. Growing numbers are concerned with the application of sociological knowledge and methods in the areas of penology and correction, education, public relations in industry, and regional and community planning. A few specialize in medical sociology—studying the social factors which affect the fields of mental or public health, or studying the problems of hospital administration. The topics in which sociologists may specialize are too many and varied to be listed fully here.

Most sociologists are college teachers, but, as a rule, these teachers also conduct research. In addition, sociologists are employed full time in research by government agencies, research bureaus connected with universities, welfare agencies, other nonprofit organizations, and large companies.

Sociological research often involves the collection of data (often through personal interviews), preparation of case studies, testing, and the conduct of statistical surveys and laboratory experiments. Sociologists may study individuals, families, or communities in an attempt to discover the causes of social problems—such as crime, juvenile delinquency, alcoholism, poverty, and dependency; the normal pattern of family relations; or the different patterns of living in communities of varying types and sizes. They may collect and analyze data from official government sources to show the trends in population, including changes in age, sex, race, and other population characteristics; and also the extent of population movement among rural, suburban, and urban areas and among different geographic areas. Some sociologists specialize in conducting surveys, either

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those which add to basic sociological knowledge or those which may be applied in such fields as public opinion research, marketing, and advertising research. Still others are specialists in the use of mass communication facilities, including radio, television, newspapers, magazines, and circulars.

Sociologists are sometimes administrators—supervising research projects or the operation of social agencies, including family and marriage clinics. Some people with sociological training are recreation workers, social case workers, prison inmate classification officers, or probation and parole officers. Other sociologists act as consultants, advising on such diverse problems as the management of hospitals for the mentally ill, the rehabilitation of juvenile delinquents, or the development of effective advertising programs to promote public interest in particular products.

Where Employed

It is estimated roughly that between 4,000 and 5,000 persons were professionally employed as sociologists in 1965. Numerous other persons were employed in positions requiring some training in this field, including many in social, recreation, and public health work.

Approximately three-fourths of the sociologists—people in research and administrative positions, as well as teachers—are employed in colleges and universities. About one-tenth are in Federal, State, local, or international government agencies; the remainder work in private industry, in welfare or other nonprofit organizations, or are self-employed.

Since sociology is taught in most institutions of higher learning, sociologists may be found in nearly all college communities. They are most heavily concentrated, however, in large colleges and universities which offer graduate training in sociology and opportunities for employment in research. Medical sociologists are most often employed on the teaching or research staffs of medical colleges and their graduate departments of public health and preventive medicine. They also find employment on hospital staffs and in State and municipal health departments. Rural sociologists most frequently work at State universities where they are likely to have exceptional opportunities for research at the State agricultural experiment stations attached to these universities. Some specialists in rural sociology and community development are employed in foreign countries by U.S. Government agencies and private foundations.

Training, Other Qualifications, and Advancement

A master's degree with a major in sociology is usually the minimum required for employment as a sociologist. The Ph. D. degree is frequently required for employment in the better positions and virtually always for the most responsible positions.

Young people with only a bachelor's degree in sociology are not usually considered qualified for professional employment as sociologists, although they may be able to secure other jobs in this or related fields. They may get jobs as interviewers or as research assistants working under close supervision. Many are employed as case workers, counselors, recreation workers, or administrative assistants in public and private welfare agencies. As a rule, however, welfare agencies prefer persons with specific training in social work. Sociology majors with sufficient training in statistics may obtain positions as beginning statisticians. Those who meet State certification requirements may enter high school teaching.

Sociologists with master's degrees may qualify for many administrative and research positions, provided they are trained in research methods and statistics. They may perform work requiring responsibility for specific portions of a survey or for the preparation of analyses and reports under general supervision. As they gain experience, they may advance to supervisory positions in both public and private agencies. Sociologists with the master's degree may qualify for some college instructorships. Most colleges, however, appoint as instructors only people with training beyond the master's level—frequently the completion of all requirements for the Ph. D. degree except the doctoral dissertation. Outstanding graduate students can often get teaching or research assistantships which will provide both financial aid and valuable experience.

The Ph. D. degree is essential for attaining a professorship in most colleges or universities, and is commonly required for directors of major research projects, important administrative positions, or consultants.

The choice of a graduate school is very important for people planning to become sociologists. Students interested in research should select schools which emphasize training in research methods and statistics, and provide opportunities to gain practical experience in research work. Professors and chairmen of sociology departments frequently aid in the placement of graduates.

Employment Outlook

Employment opportunities for sociologists are expected to increase substantially through the mid-1970's. The majority of new positions will be in college teaching. Expanding college enrollments will account for most of these new positions; however, some will result from the growing trend to include sociology courses in the curriculums of other professions, such as medicine, law, and education. More than 200 new sociology teachers may be needed each year, on the average, to fill new positions and to replace college faculty members who leave the profession. A moderate rise in the number of sociologists in nonteaching fields is also anticipated.

Sociologists well trained in research methods and advanced statistics will have the widest choice of jobs. Employment opportunities are expected to be better than average for research workers in rural sociology, community development, population analysis, public opinion research, and in various branches of medical sociology. Employment opportunities will also increase in other applied fields, such as the study of juvenile delinquency and education. A few openings are anticipated in a new area, the sociology of law.

The number of sociologists with the doctor's degree is expected to rise less rapidly than demand, through the mid-1970's. As a result, employment opportunities for both Ph. D.'s, and those who have completed all requirements for the doctorate except the dissertation, will probably be very good during this period. Inexperienced graduates with only the master's degree—with the exception of those specifically trained in research methods—will probably continue to face considerable competition for positions as professional sociologists.

Earnings

Sociologists in teaching—where most are employed—averaged $10,000 annually in 1964. In comparison, those working for nonprofit organizations or in industry averaged $12,000 and $14,000, respectively; in the Federal Government, those with experience averaged $12,000.

In the Federal Government, the beginning salary in early 1965 for sociologists with a bachelor's degree was $5,000. Those with a superior academic record or a year of graduate training were eligible for positions at an annual salary of $6,050. Starting salaries were higher for candidates with additional graduate training.

In general, sociologists with the Ph. D. degree earn substantially higher salaries than those with the master's degree. Many sociologists supplement their regular salaries with earnings from other sources. Summer teaching and consulting work are the principal sources of income. Sociologists employed by colleges and universities are the most likely to have additional earnings.

Where To Go for More Information

Additional information about sociologists, including schools offering degrees in this field may be obtained from:

American Sociological Association,
1755 Massachusetts Ave. NW., Washington, D.C. 20036.

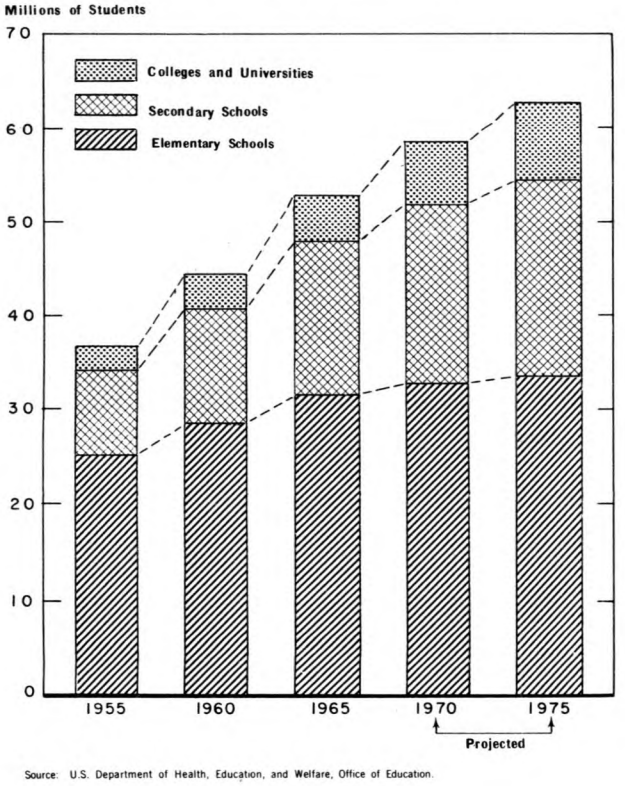
TEACHING

Of all the professions, teaching is the largest. More than 2 million men and women were full-time teachers in the United States in the 1964–65 school year and thousands of others taught part-time. Many scientists, physicians, accountants, and members of other professions teach one or more classes in colleges and universities. Similarly, large numbers of craftsmen teach part-time in vocational schools. Also, many other people instruct in adult education and recreation programs.

No other profession offers so many employment opportunities for women; close to 1½ million women are teachers, more than twice the number employed in nursing, the second largest field of professional employment for women. Women teachers far outnumber men in kindergarten and elementary schools and hold slightly less than half the teaching positions in secondary (junior and senior high) schools, but only about one-fifth of all college and university teaching positions.

CHART 19

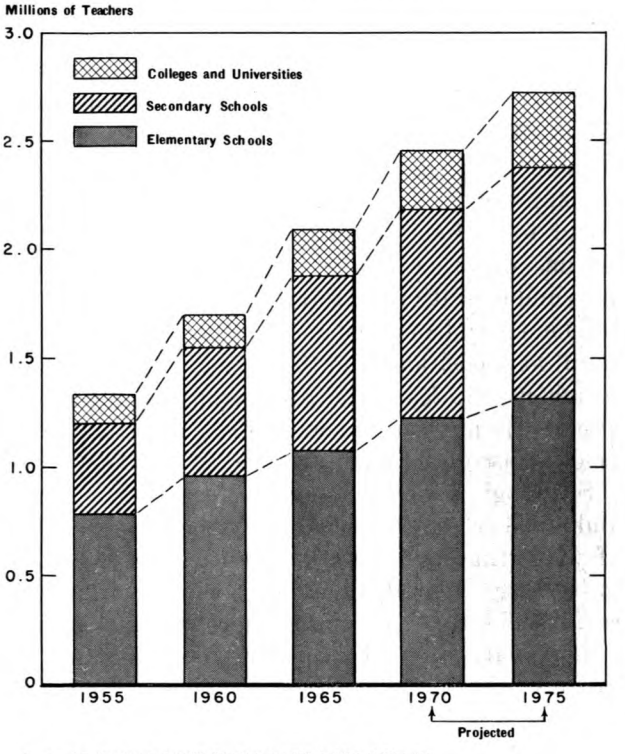
COLLEGE ENROLLMENTS WILL SHOW THE FASTEST GROWTH RATE BETWEEN 1965 AND 1975 RISING TO OVER 8 MILLION



Source: U.S. Department of Health, Education, and Welfare, Office of Education.

CHART 20

TOTAL TEACHING STAFF WILL EXPAND BY ALMOST A THIRD TO OVER 2½ MILLION DURING THE 1965-75 PERIOD



Source: U.S. Department of Health, Education, and Welfare, Office of Education.

The number of teachers needed by the Nation's schools depends chiefly, of course, on the number of students enrolled. At the beginning of the 1964–65 school year, 53 million people—more than one-fourth of the country's total population—were enrolled in the Nation's schools and colleges. The high birth rates of the past two

decades largely account for this record enrollment. For example, the high birth rates of the 1940's brought unprecedented increases in elementary school enrollments in the early 1950's. By the mid-1950's, these children were beginning to enter the high schools, and in the early 1960's the colleges were feeling the full force of this impact. Furthermore, the proportion of young people of high school and college age who are now attending school is higher than ever before. Over the 10-year period, 1965–75, continued population growth and increased high school and college attendance are expected to produce a rise in high school enrollments and an impressive rate of increase in college enrollments. The proportion of young children of elementary school age enrolled in school is not expected to change appreciably during the coming decade; nevertheless, a sizable increase in the number of children so enrolled is expected. Total enrollments in all schools and colleges combined, according to U.S. Office of Education estimates, may increase to more than 60 million by 1975.

To staff the new classrooms that must be provided for the rising numbers of students, the Nation's teaching staff will need to be almost a third, or about 650,000, larger by 1975. In addition, a much greater number of teachers—perhaps as many as 1.8 million—will be required to replace those who leave the profession. Many new teachers also will be needed in elementary and secondary schools if the existing ratios between pupils and teachers are to be reduced significantly. Moreover, additional teachers will be required to replace those who do not meet the minimum standards for certification.

The outlook for teachers at each educational level—in elementary and secondary schools, and also in colleges and universities—is discussed in the following statements.

Kindergarten and Elementary School Teachers

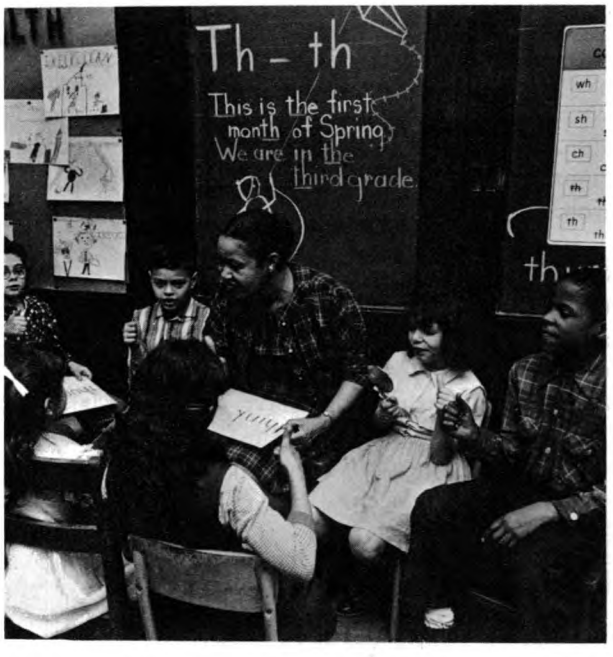
(2d ed. D.O.T. 0–30.02 and .11)

(3d ed. D.O.T. 092.228)

Nature of Work

Elementary school teaching is the largest field of professional employment for women and is also a growing field for men. In the 1964–65 school year, over 1 million kindergarten and elementary teachers were employed. In addition, over 60,000 principals and supervisors were employed in public and private elementary schools.

Kindergarten teachers conduct a program of education for young children. Most frequently, they divide the schoolday between two groups, teaching two different classes a day. Some, however, may work with one group all day. The kindergarten program provides children with experiences in play, music, artwork, stories, and poetry; it also introduces them to science, numbers, language, and social studies. After school hours, kindergarten teachers may plan the next day's work, study and prepare the children's school records, confer with parents or professional personnel concerning individual children, participate in teachers' in-service activities, and locate and become familiar with teaching resources.



Elementary school teachers usually work with one group of pupils during the entire schoolday, teaching several subjects and supervising various

activities, such as lunch and play periods. In some school systems, however, teachers in the upper elementary grades may teach several groups of children in one or two subjects. Many school systems also employ special teachers to give instruction and to assist classroom teachers in certain subjects, such as art, music, physical education, industrial arts, foreign languages, and homemaking. Teachers in schools with only a few students, largely in rural areas, may be required to teach all subjects in several grades.

Where Employed

Elementary school teachers are employed in all cities, towns, villages, and in rural areas. As a result of reorganization of school districts, many teachers are employed in consolidated schools in small towns. Only about 10,000 teach in 1-room schools. Kindergarten teachers are employed primarily in the large urban areas.

Training, Other Qualifications, and Advancement

All States require every teacher in the public schools to hold a certificate. Several States have this same requirement for teachers in parochial and other private elementary schools.

In 1964, 45 States and the District of Columbia issued regular teaching certificates only to persons with at least 4 years of approved college preparation. Some school systems have higher educational requirements than those for State certification.

In nearly all States, certificates are issued by State departments of education on the basis of transcripts of credits and recommendations from approved colleges and universities. Certificates may be issued to teachers from other States if the prescribed programs have been completed at accredited colleges or if the teachers meet the academic and personal requirements of the State to which they are applying. Under certain conditions, usually related to a shortage of qualified teachers, most States will issue emergency or temporary certificates to partially prepared teachers. However, these teachers must have their certificates renewed every year until all requirements for regular certificates have been met.

All States have certain additional requirements for public school teaching. They may, for example, require a health certificate, evidence of citizenship, or an oath of allegiance. The prospective teacher should find out about the specific requirements of the area in which he plans to work by writing to the State department of education or to the superintendent of the local school system.

Most institutions of higher education offer teacher preparation. In a 4-year teacher-preparation curriculum, prospective elementary school teachers spend about one-fourth of the time in professional courses—learning about children, the place of the school in the community, and materials and methods of instruction—including student teaching in an actual school situation; the remainder of their time is devoted to studying liberal arts subjects. Some study of the process of learning and human behavior is usually included.

After gaining experience, teachers will find opportunities for advancement through annual salary increases in the same school system; by transferring to a system with a higher salary schedule which recognizes experience gained in another school system; by appointment to a supervisory, administrative, or specialized position in the school system; or by transferring to higher levels of teaching for which their training and experience may qualify them.

Among the most important personal qualifications for elementary school teaching are an enjoyment and understanding of children. Teachers must be patient and self-disciplined, and have high standards of personal conduct. A broad knowledge and appreciation of the arts, sciences, history, and literature also are valuable. Civic, social, and recreational activities of teachers may be influenced, and are sometimes restricted, by the customs and attitudes of their community.

Employment Outlook

Young people preparing to teach in elementary schools will find a large number of teaching opportunities available—an estimated 1.2 million over the 1965–75 period. About 900,000 teachers—or 90,000 annually—will be needed to replace

those who retire, die, or leave the profession for other reasons. In addition, close to 300,000, or nearly 30,000 annually, will be needed to take care of increased enrollments, some improvement in the pupil-teacher ratio, and to replace persons not meeting certification requirements.

The slowing down in the enrollment growth in elementary schools that is expected between 1965 and 1975 may be accompanied by an increase in the number of college graduates qualified to teach. If present teacher training trends continue, the supply of newly trained teachers available for elementary teaching will increase significantly in the 1965–75 decade. In the face of an improved supply situation relative to previous decades, young people seeking their first teaching assignment are likely to find the schools placing greater emphasis on quality of applicants' training and academic accomplishment. Nevertheless, even as supply expands as the trends suggest, the demand may exceed the supply in certain geographic areas, where teaching salaries are low and better paying opportunities are available in other fields in the community. With the passage of the Economic Opportunity Act (1964), the Elementary and Secondary Education Act (1965), and the Higher Education Act (1965), which place special emphasis on aid to preschoolers, children in low-income areas, the mentally retarded, and other groups requiring special attention, it is possible that additional kindergarten and elementary teachers may be needed, adding considerable pressure to the demand for teachers. For example, the National Teacher Corps (federally recruited teachers and teacher-interns for low-income areas) is expected to enroll many teachers in the next few years.

Earnings and Working Conditions

The average salary for classroom teachers in public elementary schools, according to National Education Association (NEA) estimates, was $6,035 in 1964–65. In the three highest paying States (California, Connecticut, and New York) teachers' salaries averaged $6,875 or more, in the six States with lowest salaries (Arkansas, Mississippi, North Dakota, South Dakota, South Carolina, and West Virginia), it was $4,500 or less.

Although the time spent in the classroom is usually less than the average workingday in most other occupations, the elementary school teacher must spend additional time each day planning work, preparing instructional materials, developing tests, checking papers, making out reports, and keeping records. Conferences with parents, meetings with school supervisors, and other professional activities also frequently occur after classroom hours.

Since most schools are in session less than 12 months a year, teachers often work at other jobs or take courses for professional growth during the summer. Some school systems, however, are extending the teachers' working year to 12 months, with a 1-month vacation in the summer.

Employment in teaching is steady, and usually not affected by changes in business conditions. Tenure provisions protect teachers from arbitrary dismissal. Pension and sick leave plans are common, and a growing number of school systems grant other types of leave with pay.

Where To Go for More Information

Information on schools and certification requirements is available from the State department of education at each State capital.

Information on the National 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,
716 North Rush St., Chicago, Ill. 60611.

National Commission on Teacher Education and Professional Standards,
National Education Association,
1201 16th St. NW., Washington, D.C. 20036.

Secondary School Teachers

(2d ed. D.O.T. 0–31.01 and .10)
(3d ed. D.O.T. 091.118 through .228)

Nature of Work

Secondary school teachers—those employed in junior and senior high schools—usually specialize in a particular subject. They teach several classes every day, either in their main subject, in related subjects, or both. The most frequent combinations are English and history or other social science subjects; mathematics and general science; and chemistry and biology or general science. Teachers in some fields, such as home economics, agriculture, commercial subjects, driver education, music, art, and industrial arts, less frequently conduct classes in other subjects.

Besides giving classroom instruction, secondary school teachers develop and plan teaching materials, develop and correct tests, keep records, make out reports, consult with parents, supervise study halls, and perform other duties. Many supervise student activities, such as clubs and social affairs —sometimes after regular school hours. Maintaining good relations with parents, the community, and fellow teachers is an important aspect of their jobs.

About 790,000 teachers were employed in the Nation's public and private secondary schools in 1964–65. Slightly more than half the classroom teachers in public secondary schools were men. Men far outnumber women in supervisory and administrative positions in both public and private schools.

Where Employed

The number of grades in secondary schools depends on how the local school system is organized. Many secondary school teachers are employed in 6-year combined junior-senior high schools (grade 7–12); another large group of teachers are in separate junior high schools of either two or three grades (7–8 or 7–9); and the remainder teach in 4-year high schools (grades 9–12) and in senior high schools (grades 10–12).

Despite increasing urbanization, about half of all secondary school teachers are still employed in rural areas or in cities of less than 30,000 population.

Training, Other Qualifications, and Advancement

In every State, a certificate is required for public secondary school teaching. To qualify for this certificate, the prospective teacher must have a bachelor's degree. Nearly all States also require at least the equivalent of one-half year of education courses, including practice teaching, plus professional courses in one or more subjects commonly taught in secondary schools.

Nine States and the District of Columbia require a fifth year of study or qualification for a master's degree within a specified period following the teacher's beginning employment. Many school systems, especially in large cities, have requirements beyond those needed for State certification. Some systems require additional educational preparation, successful teaching experience, or special personal qualifications.

College students preparing for secondary school teaching usually devote about one-third of the 4-year course to their major, which may be in a single subject or a group of related subjects. About one-sixth of the time is spent in education courses—learning about children, the place of the

school in the community, and materials and methods of instruction—including student teaching in an actual school situation. The remaining time is devoted to general or liberal arts courses. Accepted teacher-preparation curriculums are offered by universities with schools of education, by colleges with strong education departments and adequate practice-teaching facilities, and by teachers' colleges.

Although certification requirements vary among the States, the person who is well prepared for secondary school teaching in one State usually has little trouble meeting requirements in another State. A well-qualified teacher can ordinarily obtain temporary certification in a State, while he prepares to meet its additional requirements.

Qualified secondary school teachers may advance to positions as supervisors, assistant principals, principals, superintendents, or other administrative officers as openings occur. At least 1 year of professional education beyond the bachelor's degree, plus several years of successful classroom teaching are required for most supervisory and administrative positions. Often a doctorate is required for appointment as superintendent. A few experienced teachers are assigned to the positions of part-or-full-time guidance counselors, teachers who instruct in the pupils' homes, or instructors of handicapped or other special groups. Usually, additional preparation, and sometimes special certificates, are required for these assignments.

Probably, the most important personal qualifications for secondary school teaching are an appreciation and understanding of adolescent children. Patience and self-discipline are desirable traits, as are high standards of personal conduct. In addition to an enthusiasm for the subjects they teach, a broad knowledge and appreciation of the arts, sciences, history, and literature also are desirable. Civic, social, and recreational activities of teachers may be influenced, and sometimes restricted, by the customs and attitudes of their community.

Employment Outlook

About 1 million new secondary school teachers will be needed over the 1965–75 period to take care of enrollment increases, to reflect some improvement in the pupil-teacher ratio, to replace teachers who retire, marry, or leave the field for other reasons, and to replace persons who do not meet certification requirements. Although some job openings for secondary school teachers will be created by rising enrollments, most of the job openings—about 70 percent of the total requirements—will come from the need to replace teachers who for various reasons may leave the field.

The recent slowing down in enrollment growth in secondary schools may be accompanied by a simultaneous increase in the number of college graduates trained for teaching. If the total number of degrees awarded increases as sharply as projected by the U.S. Office of Education, and if the proportion of graduates prepared to teach in secondary schools continues to be about the same as in the past, during the 1965–75 decade the total number of new graduates available for secondary school teaching positions will increase significantly. In addition to newly trained teachers, many reentries in the profession also will be available to fill teacher vacancies. Young people planning to teach, therefore, should expect school boards to place greater emphasis on the nature of applicants' professional training and academic performance. Even with an improvement in the supply situation, however, demand may continue to exceed the supply in some geographic areas and in some subject fields, such as physical and biological sciences and mathematics, for which the demand in private industry and government is also great. With further specialized training, many teachers trained for secondary school teaching may qualify for positions in junior colleges, where demand for teachers is expected to be especially great in the years to come. Also, considerable additional demand for teachers may be generated by Federal legislation that provides for supplementary educational centers and services and a National Teachers Corps. These extensive additions to present teaching services will be available to both public and private nonprofit school children.

Earnings and Working Conditions

The average annual salary for all classroom teachers in public secondary schools was about $6,503 in 1964–65, according to estimates by the National Education Association. In California

and New York, average salaries exceeded $8,000; the average was less than $4,500 in two States, Arkansas and Mississippi.

Junior high school teachers frequently receive somewhat lower salaries than high school teachers in the same school system. Teachers of vocational education, physical education, and other special subjects often receive higher salaries for their work than do other teachers in the same school. Under salary schedules in effect in most school systems, teachers in all subject fields get regular salary increases as they gain experience and additional education.

Teachers' salaries are usually lower in towns and small cities than in larger cities, but high educational and experience requirements are likely to prevail in large city school systems. On the average, salaries of principals in the largest cities, where administrative responsibilities are great, are much higher, than in towns and small cities. Salaries of superintendents are $25,000 or more in many large cities.

Teachers often add to their incomes by teaching in summer school, working as camp and recreational counselors, or doing other work. Some teachers supplement their incomes during the regular school year. They may teach in adult or evening classes, work part-time in business or industry, or write for publication.

Some form of retirement is provided most teachers. Nearly all school systems have some provision for sick leave, and an increasing number grant other types of leave with pay.

According to a recent survey, the average workweek of secondary school teachers is about 46 hours a week, of which 23 hours are spent in classroom instruction and the remainder in out-of-class instruction and other duties.

Where To Go for More Information

Information on schools and certification requirements is available from the State department of education at the State capital.

Information on the National 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,
716 North Rush St., Chicago, Ill. 60611.

National Commission on Teacher Education and Professional Standards,
National Education Association,
1201 16th St., NW., Washington, D.C. 20036.

College and University Teachers

(2d ed. D.O.T. 0–11.50)
(3d ed. D.O.T. 090.168 and .228)

Nature of Work

About 370,000 faculty members were employed in the Nation's 2,000 colleges and universities in the 1964–65 academic year. About 210,000 were teaching full time. Another 100,000 were teaching part time in medicine, law, business administration, and other professional fields. Other faculty members were employed in administration, full-time research, or other educational activities. Men predominated in most college teaching fields and held at least 95 percent of the positions in engineering, the physical sciences, agriculture, and law. Only about one-fifth of all college and university teachers were women; however, the majority of teachers in the fields of nursing, home economics, and library science were women.

College and university teachers instruct students in specific subjects. More than half teach courses in the social sciences, fine arts, English and journalism, the physical sciences, education and related fields, or engineering. In many 4-year institutions, the usual teaching load is from 12 to 15 hours a week. Associate professors and full professors—who also serve as advisors to graduate students and who are actively engaged in research—may spend only 6 or 8 hours a week in actual classroom work. Besides teaching

classes, college teachers spend time preparing tests and other materials for classroom use, checking and grading students' work, and keeping up to date with developments in their specialties. Many carry on research projects, write for publication, or aid in college administration. Some professors act as consultants to business, industrial, scientific, or government organizations.

Where Employed

About half of all faculty members in 4-year institutions were employed by universities in the 1962–63 school year. About a third were in liberal arts colleges. A little more than 10 percent were employed by teachers' colleges. The rest were in technological institutions.

Some States have many more colleges and universities than others, partly reflecting differences in population size. About half of all college and university teachers are employed in eight States, each with college enrollments exceeding 100,000: New York, California, Pennsylvania, Illinois, Massachusetts, Texas, Ohio, and Michigan.

Training, Other Qualifications, and Advancement

To qualify for most beginning positions, applicants must have at least the master's degree, and for many they must have completed all requirements for the doctorate except the dissertation. The doctor's degree is often required for promotion or appointment to positions above the rank of instructor. It is particularly important for teaching positions in the biological sciences, physical sciences, psychology, social sciences, philosophy, and religion; it is least likely to be a requirement in the fields of business and commerce, engineering, fine arts, health and physical education, and home economics. A number of States that maintain public junior colleges require State certification for teaching in these 2-year schools. To obtain such a certificate, a teacher must have received the master's degree and taken certain courses in education.

To enter college teaching, specialization in some subject field is necessary. In addition, undergraduate courses in the humanities, social sciences, natural sciences, and the mastery of at least one foreign language are important. Intensive instruction in the selected field of specialization is given in graduate school. During their graduate work, outstanding students may be employed as part-time teaching assistants, such work affords valuable experience. Some colleges offer other means, such as informal seminars or meetings, by which the graduate students can develop teaching competence. A good many beginning college teachers—especially those in education departments, and junior colleges—have had some experience in high school or other types of teaching.

Most 4-year colleges and universities recognize four academic ranks: Instructor, assistant professor, associate professor, and full professor. Few institutions grant tenure (full status as a member of the staff on a continuing basis) or give advancement to instructors with less than 3 years of service. Advancement to assistant and associate professorship is generally restricted to candidates with extensive graduate training or teaching experience. A doctor's degree and many years of teaching experience—from 10 to 20 years—are usually required to become a full professor. A U.S. Office of Education survey indicates that about one-quarter of the teaching faculty are professors, another quarter associate professors, 30 percent are assistant professors, and about 18 percent are instructors. Outstanding achievement, generally through research or publications, hastens advancement. Because demand is particularly strong, teachers of some subjects, such as engineering, law, mathematics, medicine, and natural sciences, are sometimes appointed at higher ranks and at higher beginning salaries than other teachers with comparable experience and education.

Employment Outlook

College teaching opportunities will be excellent for those with doctoral degrees and for those who have completed all requirements for the doctorate except the dissertation. There also will be many employment opportunities for new entrants with the master's degree, particularly in junior colleges.

A great increase in college enrollment is in prospect. The number of young people in the 18- to 21-year age group is expected to rise by almost 4 million between 1965 and 1975. At the same time, it is likely that larger proportions of young

people of college age will attend college—owing to rising family income, new Federal legislation to help needy college students, greater demand for college-trained personnel, and the increasing number and proportion of the population who finish high school. The anticipated increase in the number of community colleges and schools offering evening classes will also tend to make it possible for more young people to attend college. If the proportion of young people attending college continues to increase and facilities are available, college enrollments will increase from about 5 million at present to over 8 million by 1975, according to U.S. Office of Education projections.

Taking all these factors into account, the U.S. Office of Education estimates that the full-time college teaching staff will increase from its present size of 210,000 to 337,000 in 1975, an increase of about two-thirds. In addition to the teachers needed to take care of the enrollment growth, about 160,000 more teachers may be needed during the 1965–75 period to replace those who retire, die, or leave the profession for other reasons.

The supply of new college teachers, which consists largely of students receiving graduate degrees, is also expected to grow. The U.S. Office of Education estimates that the number of doctorates conferred through 1975 will average about 19,000 a year, and the number of master's degrees about 140,000 annually. It is difficult, however, to say how many of these will enter teaching. According to the National Education Association in 1961–62 and 1962–63, fewer than half of the new teachers were graduate students the preceding year. In 1964–65, when the demand was for over 20,000 new teachers, about 115,000 persons received graduate degrees; nevertheless, shortages of qualified teaching personnel were reported in several fields, particularly in the physical sciences, engineering, mathematics, and in some social science fields. This may be due in part to the fact that many of these new degree recipients were already employed when they received their degrees, or to the fact that better paying opportunities may have attracted them to industry, government, and nonprofit organizations where demand for these graduates is very high.

The supply and quality of college teachers may be improved in the years ahead by recent Federal legislation that makes fellowships available to qualified graduate students and junior members of the faculty who are interested in teaching in colleges and universities. Nevertheless, it is likely that the number of well-qualified persons available for teaching positions will continue to be insufficient to meet the demand in many subject fields through the mid-1970's.

Earnings and Working Conditions

According to the U.S. Office of Education, salaries of teachers in 4-year colleges and universities averaged $8,518 for 9–10 months' work in 1963–64. Average salaries of teachers tend to be lowest in teachers' colleges. The U.S. Office of Education also reported 1963–64 average salaries (9–10 months' basis) for instructors and for full professors in public and private institutions as follows:

	Average salaries			
	Instructors		*Full professors*	
	Private	*Public*	*Private*	*Public*
Universities	$6,197	$6,227	$13,426	$12,543
Liberal arts colleges	5,792	6,386	9,883	11,165
Teachers' colleges	5,195	6,249	9,533	10,156

Faculty members who teach year-round usually receive higher salaries than those employed for the academic year only. Teachers in professional schools (medicine, dentistry, etc.) and graduate schools generally receive higher salaries than teachers in other colleges.

Some faculty members supplement their regular salaries with earnings from a variety of sources. The chief source is additional teaching (often in summer sessions). Consulting work may be a major source of extra income, particularly for teachers of engineering and physical sciences; research grants are now common, especially in many large, well-known universities; fees for lecturing and royalties on publications are other possible sources of income. Opportunities for additional income usually increase as the faculty member gains recognition. For the

majority of college teachers, additional income is small.

Retirement plans differ considerably among institutions, but an increasing number are participating in the Government social security program, often as an accompaniment to plans of their own. The greatest number of institutions have set 65 years as the normal retirement age, though nearly as many stipulate 70.

Many colleges and universities provide benefits such as: Sabbatical leaves of absence—typically, 1 year's leave with half salary or a half-year's leave at full salary after 6 or 7 years of employment; other types of leave for advanced study; life, sickness, and accident insurance; reduced tuition charges or cash-tuition grants for children of faculty members; housing allowances; travel funds for attending professional meetings; and other benefits.

Where To Go for More 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 Association of University Professors, 1785 Massachusetts Ave. NW., Washington, D.C. 20036.

American Council on Education, 1785 Massachusetts Ave. NW., Washington, D.C. 20036.

National Education Association, 1201 16th St. NW., Washington, D.C. 20036.

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.*

TECHNICIAN OCCUPATIONS

Technicians are among the fastest growing occupational groups in the United States. In recent years, the needs of an expanding and increasingly technical economy have greatly intensified the demand not only for engineers and scientists, but also for the technical workers who assist them. This chapter is concerned with the technicians who work with engineers and scientists, and with draftsmen, also usually considered technicians. Information on surveyors, often classified as technicians, and on technical occupations in the health field—including medical technologists, dental laboratory technicians, medical X-ray technicians, and dental hygienists—is presented elsewhere in the *Handbook*.

Engineering and Science Technicians

(2d ed. D.O.T. 0–50.20 through .99 and 0–67.12 through .86)

(3d ed. D.O.T. .002 through .029.)

Nature of Work

The term "technician," as used here, refers to technical workers whose jobs require both knowledge and use of scientific and mathematical theory; specialized education or training in some aspect of technology or science; and who, as a rule, work directly with scientists and engineers.

However, the term "technician" has no generally accepted definition. It is used by different employers to refer to workers in a great variety of jobs, requiring a wide range of education and training. It is applied to employees doing relatively routine work, to persons performing work requiring skills within a limited sphere, and to persons doing highly technical work, among them assistants to engineers and scientists. The workers' job titles may be descriptive of their technical level (for example, junior engineer, biological aid, or engineering technician) or their work activity (for example, quality-control technician, production analyst, tool designer, materials tester, or time-study analyst). Some employers use the word "technician," preceded by adjectives, such as mechanical, electrical, electronics, or chemical, descriptive of areas of technology in which their personnel are employed.

In general, the jobs of engineering and science technicians are more limited than those of the engineer or scientist, and have a greater practical orientation. Many of these technician jobs require the ability to analyze and solve engineering and science problems and prepare formal reports on experiments, tests, or other projects. Some require considerable aptitude in mathematics; others, the ability to visualize objects and to make sketches and drawings. Design jobs often require creative ability. Many technician jobs require some familiarity with one or more of the skilled trades, although not the ability to perform as a craftsman. Still others demand extensive knowledge of industrial machinery, tools, equipment, and processes. Some jobs held by these technicians are supervisory and require both technical knowledge and the ability to supervise people.

In carrying out their assignments, engineering and science technicians frequently use complex electronic and mechanical instruments, experimental laboratory apparatus, and drafting instruments. Almost all of the technicians whose jobs are described in this statement must be able to use engineering handbooks and computing devices such as the slide rule or calculating machine.

Technicians engage in virtually every aspect of engineering and scientific work. In research, development, and design work, one of the largest areas of employment, they conduct experiments or tests; set up, calibrate, and operate instru-

ments; and make calculations. They also assist scientists and engineers in developing experimental equipment and models by making drawings and sketches and, under the engineer's direction, frequently do some design work.

Technicians also work in jobs related to production, usually following a course laid out by the engineer or scientist, but often without close supervision. They may aid in the various phases of production operations, such as working out specifications for materials and methods of manufacture, devising tests to insure quality control of products, or making time-and-motion studies (timing and analyzing the workers movements) designed to improve the efficiency of a particular operation. They may also perform liaison work between engineering and production or other departments.

Technicians often do work that might otherwise have to be done by engineers. They may serve as technical sales or field representatives of manufacturers; advise on installation and maintenance problems; or write specifications and technical manuals. (See statement on Technical Writers.)

The following sections describe a number of areas of technology in which engineering and science technicians are trained and employed.

Aeronautical Technology. Technicians specializing in this area of technology work with engineers and scientists in many phases of the design and production of aircraft, helicopters, rockets, guided missiles, and spacecraft. Many aid engineers in preparing layouts of structures, control systems, or equipment installations by collecting information, making calculations, and performing many other tasks. They work on projects involving stress analysis, aerodynamics, structural design, flight test evaluation, or weight control. For example, under the direction of an engineer, a technician might estimate weight factors, centers of gravity, and other items affecting load capacity of an airplane or missile. Other technicians working on engineering projects prepare or check drawings for technical accuracy, practicability, and economy.

Technicians sometimes help to estimate the cost of the materials and labor needed to manufacture aircraft and missiles. They may also be responsible for liaison between the engineers who do the planning and development work and the craftsmen who convert the engineers' ideas into finished products. For example, as an aircraft or missile is built, the liaison technician checks it for conformance to specifications, keeps the engineer informed as to progress, and investigates any production engineering problems that arise. He sometimes recommends minor changes in the design, the materials, or the method of fabrication.

Courtesy of the National Aeronautics and Space Administration

Electronic technicians check circuits in part of a satellite.

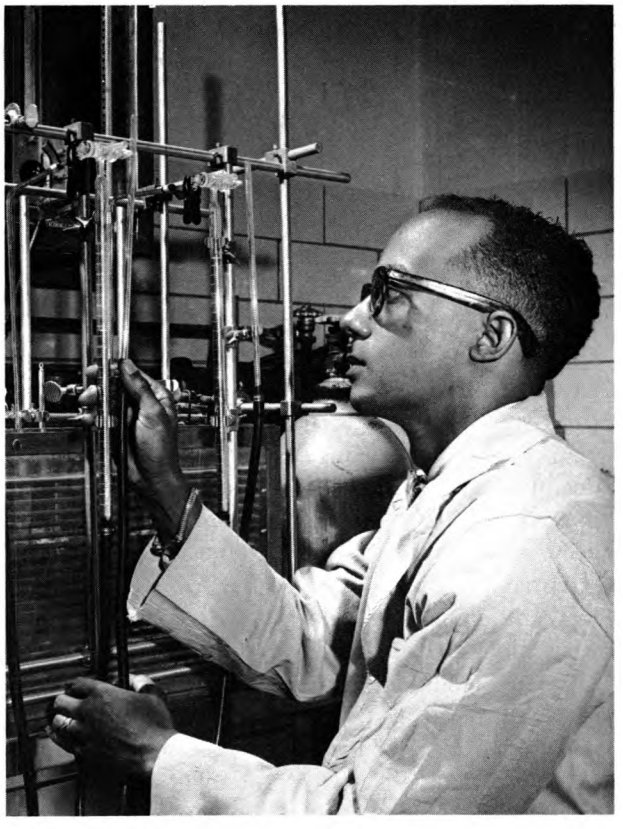
Other aeronautical technicians are employed as manufacturers' field service representatives, serving as the link between their company and the military, commercial airlines, and other customers. Technicians often prepare instruction manuals, bulletins, catalogs, and other technical materials. (See statements on Aerospace Engineers and Airplane Mechanics, and chapter on Occupations in Aircraft, Missile, and Spacecraft Manufacturing.)

Air-Conditioning, Heating, and Refrigeration Technology. Technicans in this field often become specialists in one area of work, such as refrigeration, and sometimes in a particular type of activity, such as research and development, or design of layouts for heating, cooling, or refrigeration systems.

In the manufacture of air-conditioning, heating, and refrigeration equipment, technicians work in research and engineering departments, usually as aids to engineers and scientists. They may be assigned to such jobs as devising methods for testing equipment or analyzing production methods. Technically trained personnel also assist in designing the air-conditioning, heating, or refrigeration systems for a particular office, store, or other location, and in preparing instructions for their installation. In designing the layout for an air-conditioning or heating system, they must determine the cooling or heating requirements, decide what kind of equipment is most suitable, and estimate costs. Technical sales work for equipment manufacturers is still another area of employment for these technicians. In such work, they must be able to supply contractors who design and install systems with information on such technical subjects as installation, maintenance, operating costs, and expected performance of equipment. (See also statement on Refrigeration and Air-Conditioning Mechanics.)

Chemical Technology. Technicians specializing in this area work mainly with chemists and chemical engineers in the development, production, sale, and utilization of chemical and related products and equipment. The field of chemistry is so broad that chemical technicians often become specialists in the problems of a particular industry, such as food processing, or in a particular activity, such as quality control.

Most chemical technicians work in research and development, testing, or other laboratory work. They conduct experiments and tabulate and analyze the results. In testing work, technicians make chemical tests of materials to determine whether the materials meet specifications or whether particular substances are present and, if so, in what quantities. They may, for example, analyze steel for carbon, phosphorous, and sulfur content, or water for the amount of silica, iron, and calcium present. They also perform experiments to determine the characteristics of substances such as the specific gravity and ash content of oil. Technicians employed in research or testing laboratories often assemble and use such apparatus and instruments as dilatometers (which measure the dilation or expansion of a substance), analytical balances, and centrifuges.



Laboratory technician conducts a kinetic diffusion test.

Outside the laboratory, chemical technicians are sometimes employed to supervise various operations in the production of chemical products and as technical salesman of chemicals and chemical equipment. (See also statements on Chemists and Chemical Engineers, and chapter on Occupations in the Industrial Chemical Industry.)

Civil Engineering Technology. Technicians trained in this area assist civil engineers in performing many of the tasks necessary in the planning and construction of highways, railroads, bridges, viaducts, dams, and other structures. During the planning stage, technicians may help to estimate costs, to prepare specifications for materials, or participate in surveying, drafting, detailing, or designing work. Once the actual construction work has begun, they may assist the contractor or superintendent in scheduling construction activities or inspecting the work to assure conformance to blueprints and specifications. (See also statements on Civil Engineers, Draftsmen, and Surveyors.)

Electronics Technology. This field includes radio, radar, sonar, telemetering, television, telephony, and other forms of communication; industrial and medical measuring, recording, indicating, and controlling devices; navigational equipment; missile and spacecraft guidance and control instruments; electronic computers; and many other types of equipment using vacuum tubes and semiconductor circuits. Because the field is so broad, technicians generally become specialists in one area—for example, induction or dielectric heating, servomechanisms, automation controls, or ultrasonics.

Technicians working with engineers and scientists in the field of electronics do complex technical work that is more difficult than routine operating and repair work. (For additional information on broadcast technicians, see chapter on Occupations in Radio and Television Broadcasting.)

Industrial Technology. Technicians trained in this area are sometimes called *industrial technicians* or *production technicians.* They assist industrial engineers on problems involving the efficient use of personnel, materials, and machines in the production of goods or services. Their work includes preparing layouts of machinery and equipment, planning the flow of work, and making statistical studies and analyses of production costs. The industrial technician may also conduct time-and-motion studies.

In the course of their duties, many industrial technicians acquire experience which enables them to qualify for other jobs. For example, those expert in machinery and production methods may move into the field of industrial safety. Others who specialize in job analyses may become involved in the setting of job standards and in the interviewing, testing, hiring, and training of personnel. Still others may move into production supervision. (See statements on Personnel Workers and Industrial Engineers.)

Mechanical Technology. Mechanical technology is a broad term usually used to cover a large number of specialized fields, including automotive technology, diesel technology, tool design, machine design, and production technology.

Technicians in the above areas of mechanical technology often assist engineers in design and development work by making freehand sketches and rough layouts of proposed machinery and other equipment and parts. They help in determining whether a proposed design change in a product is practical and how much the product will cost to produce. They may also be called upon to solve design problems such as those involving tolerances, stress, strain, friction, and vibration.

The planning and carrying out of test on experimental machines and equipment for performance, durability, and efficiency provide a large area of work for technicians. In the testing procedure, they record data, make computations, plot graphs, analyze results, and write reports. They sometimes make recommendations for design changes to improve performance. Their jobs often require skill in the use of instruments, test equipment and gages, such as dynamometers, as well as the ability to prepare and interpret drawings.

Some mechanical technicians are employed in manufacturing departments to help develop plans for testing and inspecting machines and equipment, or to work with engineers in eliminating production problems. Some obtain jobs as technical salesmen. (See statements on Mechanical Engineers, Automobile Mechanics, Manufacturers' Salesmen, and Diesel Mechanics.)

One of the better known specialties which may be grouped under mechanical engineering technology is that of *tool designer.* The tool designer designs tools and devices for the mass production of manufactured articles. He originates and prepares sketches of the designs for cutting tools, jigs, dies, special fixtures, and other attachments used in machine operations. He may also make detailed drawings of these tools and fixtures, or supervise others in making them. Besides developing new tools, designers frequently redesign tools to improve their efficiency.

Machine drafting with some designing is another major area of work often grouped under mechanical technology. The work of technicians who are draftsmen is described elsewhere in this chapter.

Other Areas of Technology. Many fields of work besides those described above offer opportunities for engineering and science technicians. Those in the field of *metallurgical technology*, for example, work with metallurgists and

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metallurgical engineers in processing metals, minerals, and ceramics and converting these substances into finished products. Their jobs may include testing metals and alloys to determine their physical properties, or developing new ways of treating and using metals and alloys. Technicians in the field of *mathematics* assist mathematicians, engineers, and scientists by doing computations involving the use of algebra, logarithms, trigonometric functions, and higher mathematics. Those working in the field of *biology* assist biological scientists in conducting tests and experiments to gain knowledge about living organisms and in applying this knowledge to the solution of practical problems, such as the development of new drugs and vaccines or new varieties of plants. In *agricultural technology*, technicians work with agricultural scientists in improving farm products, the quality of foods, and soil conditions. Still other fields of work for technicians include cartography (mapmaking), electrical technology (power), gas turbine technology, optical technology, and petroleum technology.

As industry becomes increasingly mechanized, new technical occupations continue to emerge. For example, *instrumentation technology* has evolved from the introduction of automatic controls and precision-measuring devices in manufacturing operations. In industrial plants and laboratories, instruments are used to record data, to control and regulate the operation of machinery, and to measure time, weight, temperature, speeds of moving parts, mixtures, volume, flow, strain, and pressure. Technicians in this field work with the engineers and scientists who develop and design these highly complex devices, as well as with those who use them for research and development work. (See also statement on Instrument Makers.)

Another new area of work for technicians, which has resulted from recognition of the need for a more scientific approach toward the reduction of industrial hazards is safety technology. In the rapidly growing atomic energy field, in particular, technicians work with scientists and engineers on problems of radiation safety, inspection, and decontamination. (See chapter on Occupations in the Atomic Energy Field.)

Where Employed

An estimated 620,000 engineering and science technicians, not including draftsmen and surveyors, were employed in mid-1964—about 12 percent were women. Nearly 475,000 of these technicians (about three-fourths of the total) were employed by private industry. The industries employing the largest numbers of engineering and science technicians were electrical equipment, machinery, chemicals, and aerospace.

In mid-1964, the Federal Government employed approximately 75,000 engineering and science technicians; chiefly as engineering aids and technicians, electronic technicians, equipment specialists, cartographic aids, meteorological technicians, and physical science technicians. Of these engineering and science technicians, the largest number worked for the Department of Defense. Most of the others were employed by the Departments of Agriculture, Commerce, and the Interior.

State government agencies employed over 40,000 engineering and science technicians in mid-1964, and local governments about 15,000. The remainder were employed by colleges and universities, mostly in university-operated research institutes, and by nonprofit organizations.

Training, Other Qualifications, and Advancement

Young men and women who wish to prepare for careers as engineering or science technicians can obtain the necessary training from a number of sources, including specialized formal training programs offered in post-secondary schools—technical institutes, junior and community colleges, area vocational technical schools, and extension divisions of colleges and universities—and technical and technical-vocational high schools. Persons can also become qualified for technician jobs by completing an on-the-job training program, through work experience and formal courses taken on a part-time basis in post-secondary or correspondence schools, or through training and experience obtained while serving on active duty in the Armed Forces. In addition, many engineering and science students who have not completed all requirements for a bachelor's degree, as well as some other persons with college education in mathematics and

science, are able to qualify for technician jobs after they obtain some additional technical training and experience. In general, post-secondary school technical training is required for high-level engineering and science technician jobs.

Engineering and science technicians usually begin work as trainees or in the more routine positions under the direct supervision of an experienced technician, scientist, or engineer. As they gain experience they are given more responsibility, often carrying out a particular assignment under only general supervision. Technicians may move into supervisory positions. Those with exceptional ability sometimes obtain additional formal training and are promoted to professional engineering positions.

For admittance to most schools offering post-secondary technician training, a high school diploma is usually required. Some schools, however, admit students without a high school diploma, if they are able to pass special examinations and otherwise demonstrate their ability to perform work above the high school level. Because all engineering and science occupations require basic training in mathematics and science, students should obtain a sound background in these subjects while in high school. Many post-secondary schools have arrangements for helping students make up deficiencies in these subjects.

Programs offered by schools specializing in post-high school technical training require 1, 2, or 3 years of full-time study. The majority are 2-year programs, leading to an associate of arts or science degree. Evening as well as day sessions are generally available. The courses offered in science, mathematics, and engineering are usually at the college level. They include instruction in laboratory techniques and the use of instruments, and emphasize the practical problems met on the job. Students are also instructed in the use of machinery and tools, but more to give them a familiarity with such equipment than to develop skills.

Because of the variety of educational institutions offering training and the differences in the kind and level of training, persons seeking a technical education should use more than ordinary care in selecting a school. Information should be secured about the fields of technology in which training is offered, accreditation, the length of time the school has been in operation, instructional facilities, faculty qualifications, acceptability of credits toward the bachelor's degree, and the type of work obtained by the school's graduates.

Briefly discussed here are some of the types of post-secondary educational institutions and other sources where young people can obtain training as technicians.

Technical Institutes. Technical institutes offer training designed to qualify the graduate for a specific job or cluster of jobs immediately upon graduation, and with a minimum of on-the-job training. In general, the student receives intensive technical training but less theoretical and general education than is provided in curriculums leading to a bachelor's degree in engineering and liberal arts colleges. Emphasis is placed on laboratory and practical work in order to familiarize students with techniques, and instruments and other equipment used in industry.

Some technical institutes offer cooperative programs under which a student spends part of his time in school and part in employment related to the occupation for which he is preparing himself. It may take more than 2 years to complete the curriculum at a school with a cooperative plan, but this type of program gives students valuable work experience, which often outweighs the disadvantages of a longer training period. In addition, students participating in cooperative programs frequently earn enough to pay for at least a part of their educational expenses, and are often able on their first jobs to obtain higher starting salaries than are those with no experience.

Some technical institutes are operated as regular or extension divisions of colleges and universities. Others are separate institutions operated by States or municipalities, privately endowed institutions, and proprietary schools.

Junior Colleges and Community Colleges. Many junior and community colleges offer the necessary training to prepare students for technician occupations. Some of these schools offer curriculums that are equivalent to those given in the freshman and sophomore years of 4-year colleges. Graduates can transfer to the junior year in a 4-year college or qualify for technician

jobs. Other schools offer 2-year terminal programs of the technical institute type.

Junior college courses in technical fields are often planned around the employment needs of the industries in their locality. The training programs for prospective technicians therefore vary and may include highly specialized preparation in addition to general courses. In some cases, the courses are designed to meet the specifications of one or two industries or even of a single plant.

Area Vocational-Technical Schools. Area vocational-technical schools are post-secondary public institutions that are established in central locations to serve students from several surrounding areas. In the early 1960's, the number of such schools increased rapidly primarily due to the stimulus provided by title VIII of the National Defense Education Act of 1958. In some States, many established public junior and community colleges have been designated as area schools and have received title VIII funds in order to extend their training capacity.

In general, the admission requirements of vocational-technical schools are less rigid than those of other schools offering post-secondary technician training. Area school curriculums are usually designed to train the types of technicians most needed in the area. In some area vocational-technical schools, training is also offered to prepare workers for skilled occupations.

Training in Industry. Some large corporations conduct training programs to meet their need for technically trained personnel. This type of training is primarily technical and rarely includes any general studies. Instruction is given both through formal classes and through training on the job. Workers for whom training is entirely on the job generally acquire less theoretical background than those who receive formal instruction.

Other employers, aware of the need for technically trained workers but without training programs, often encourage their employees to attend evening classes in local schools or to enroll in correspondence courses. Many corporations reimburse their employees for tuition after they have satisfactorily completed courses. The workers are usually expected to take courses directly related to their work assignment, and are sometimes allowed to attend classes on the employer's time.

Training for some occupations in the technician category—tool designer and electronic technician, for example—may be obtained through a formal apprenticeship. In addition to on-the-job training, supplementary education in mathematics and science is provided. Persons interested in apprentice training may obtain further information from the local office of their State employment service, their State apprenticeship agency, the U. S. Department of Labor's Bureau of Apprenticeship and Training, or directly from employers or the local labor union concerned with the occupation they wish to learn.

Other Training. Although most engineering and science technician jobs require post-high school education or the equivalent in experience, a few technical and technical-vocational high school's, principally in large cities, offer programs which qualify their graduates for some technician entry jobs. Graduates of this type of school, however, often need supplementary training before they can progress to higher level positions. In recent years, public high schools of this type in some States have been designated as area schools to serve several school districts and have received funds provided by title VIII of the National Defense Education Act of 1958 to increase their training capacity as have post-secondary area schools.

Many technical high schools have high admission requirements and offer more thorough and advanced courses in mathematics, science, drafting, and laboratory work than are usually available in academic high schools. They sometimes offer a year of schooling beyond the 12th grade. Some have evening courses. The courses may be organized as formal technical programs to prepare technicians or may cover only a few subjects related to a particular area of work.

Correspondence schools provide technician training for those who wish to learn more about their jobs or who wish to advance in the same field by increasing their theoretical and mathematical knowledge. Success in correspondence courses depends greatly on the ability of the student to study by himself.

Technician training is offered by all branches of the military. Some military trainees are given

intensive short courses; others receive extensive training of a year or more. Many of the technicians trained by the military establishments utilize their training in civilian employment especially in the field of electronics, after they leave the Armed Forces.

Employment Outlook

Employment opportunities for engineering and science technicians are expected to be very good through the mid-1970's. In recent years, technicians have been one of the fastest growing occupational groups and it is estimated that this rapid growth will continue. In general, the demand will be strongest for graduates of post-secondary school technician training programs to fill high-level engineering and science technician jobs.

Among the factors underlying the increase in demand for technicians are the anticipated expansion of industry and the increasing complexity of modern technology. As products and the methods by which they are manufactured become more complex, increasing numbers of technicians will probably be required to assist engineers in such activities as production planning, maintaining liaison between production and engineering departments, and technical sales work. Furthermore, as the employment of scientists and engineers continue to grow, increasing numbers of technicians will be needed to assist them. The trend toward automation of industrial processes and the growth of new areas of work, such as that related to atomic energy, will probably also add to the demand for technical personnel. In addition to the technicians needed to fill new positions, more than 25,000 will be needed each year to replace those who retire, die, or transfer to other occupations.

Another factor supporting the expected increase in demand for engineering and science technicians is the growth in research and development expenditures. Such expenditures have increased very rapidly in recent years and are expected to continue to rise through the mid-1970's, although somewhat more slowly than in the past. Expenditures for the defense and space programs also greatly affect the demand for technical personnel. The level of such expenditures is not expected to change substantially in the years ahead, and therefore the demand for technicians in defense-related work is not expected to change significantly. However, should there be a major change in expenditures for the defense and space programs, the employment of engineering and science technicians will be affected accordingly.

Well-qualified women technicians should continue to find favorable employment opportunities, chiefly in drafting jobs, in chemical and other laboratory work, and in computation and other work requiring application of mathematics. Over the long run, it is likely that more women will be trained and will find employment in these and other technician occupations.

Earnings

In general, a technician's earnings depend upon his education and technical specialty, as well as his ability and work experience. Other important factors which influence his earnings are the type of firm for which he works, his specific duties, and the geographic location of his job.

Annual starting salaries for graduates of post-high school technical schools averaged about $5,000 in private industry in 1964. Young persons entering engineering and science technician jobs with less formal training generally earned somewhat less.

In Federal Government agencies in early 1965, beginning engineering and science technicians were offered $4,005, $4,480 or $5,000, depending upon the type of job vacancy and the applicant's education and other qualifications. Some Federal Government agencies hire high school graduates and train them for technician jobs. Begining salaries for these jobs ranged from $3,680 to $4,005 a year, depending on the individual's high school courses and experience.

Most technicians can look forward to an increase in earnings as they move to higher positions. In 1964, annual salaries of workers in high level technician positions in private industry averaged $8,500 and approximately one-fourth of the workers had salaries above $9,200 a year, according to a Bureau of Labor Statistics survey.

Where To Go for More Information

General information on careers for engineering and science technicians may be obtained from:

American Society for Engineering Education,
Technical Institute Council, Dupont Circle Bldg.,
1346 Connecticut Ave. NW., Washington, D.C. 20036.
Engineers' Council for Professional Development,
345 East 47th St. New York, N.Y. 10017.
National Council of Technical Schools,
1507 M St. NW., Washington, D.C. 20005.

Information on training opportunities may also be obtained from the Engineers' Council for Professional Development, a nationally recognized accrediting agency for engineering technology programs; the National Council of Technical Schools; and the U. S. Department of Health, Education, and Welfare, Office of Education, Division of Higher Education and/or Division of Vocational and Technical Education, Washington, D.C., 20202.

State departments of education at each State capital also have information about approved technical institutes, junior colleges, and other educational institutions within the State offering post-high school training for specific technical occupations. Other sources include:

American Association of Junior Colleges,
1315 16th St. NW., Washington, D.C. 20036.
National Home Study Council,
1601 18th St. NW., Washington, D.C. 20009.

Draftsmen

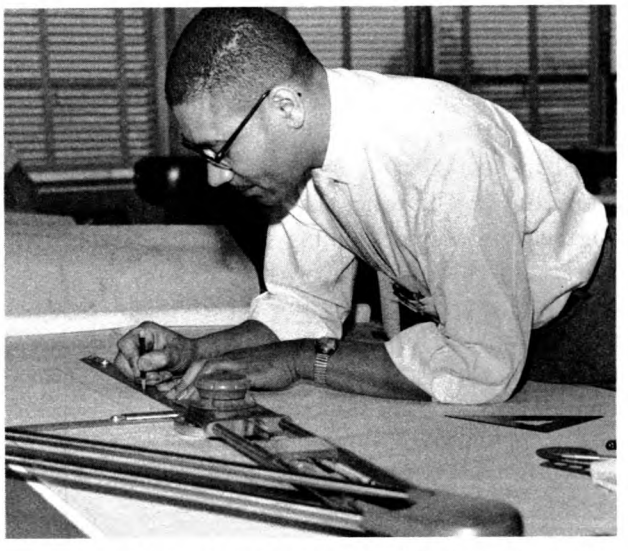
(2d ed. D.O.T. 0–48)
(3d ed. D.O.T. 001. through 019.)

Nature of Work

In making a space capsule or an electric iron, a nuclear submarine or a television set, a bridge or a typewriter, detailed plans are needed that give the exact dimensions and specifications for the entire object and each of its parts. The workers who draw these plans are draftsmen.

Draftsmen translate the ideas, rough sketches, specifications, and calculations of engineers, architects, and designers into working plans which are used by skilled craftsmen in making a product. Draftsmen may calculate the strength, reliability, and cost of materials. In their drawings and specifications, they describe exactly what materials and processes workers are to use on a particular job. To prepare their drawings, draftsmen use such instruments as compasses, dividers, protractors, and triangles, as well as machines that combine the functions of several devices. They may also use engineering handbooks and tables to assist in solving technical problems.

Draftsmen are often classified according to the type of work they do or their level of responsibility. *Senior draftsmen* use the preliminary information provided by engineers and architects to prepare design "layouts" (drawings made to scale of the object to be built). *Detailers* make drawings of each part shown on the layout, giving dimensions, material, and any other information necessary to make the detailed drawing clear and complete. *Checkers* carefully examine drawings for errors in computing or in recording dimensions and specifications. Under the supervision of draftsmen, *tracers* make minor corrections and prepare drawings for reproduction by tracing them on transparent cloth, paper, or plastic film.



Courtesy of the President's Committee on Equal Employment Opportunities

Draftsman makes drawing of product designed by engineers.

Draftsmen may also specialize in a particular field of work, such as mechanical, electrical, electronic, aeronautical, structural, and architectural drafting.

Where Employed

An estimated 260,000 draftsmen were employed in mid-1964; about 6 percent were women. The large majority of draftsmen about 9 out of 10—are employed in private industry. The manufacturing industries that employ large numbers of draftsmen are the machinery, electrical equipment, fabricated metal products, and transportation equipment industries. Nonmanufacturing industries employing large numbers of draftsmen are engineering and architectural consulting firms, construction companies, and public utilities.

About 26,000 draftsmen worked for Federal, State, and local governments in mid-1964. Of those employed by the Federal Government, the large majority work for the Departments of the Army, Navy, and Air Force. Draftsmen employed by State and local governments work chiefly for highway and public works departments. A few thousand draftsmen are employed by colleges and universities and by nonprofit organizations.

Training, Other Qualifications, and Advancement

Young persons interested in becoming draftsmen can acquire the necessary training from a number of sources, including technical institutes, junior and community colleges, extension divisions of universities, vocational and technical high schools, and correspondence schools. Other persons may qualify for draftsmen jobs through on-the-job programs combined with part-time schooling or through 3- or 4-year apprenticeship programs.

The prospective draftsman's training, whether obtained in high school or post-high school drafting programs, should include courses in mathematics and physical sciences, as well as in mechanical drawing and drafting. The study of shop practices and the learning of some shop skills are also helpful, since many higher level drafting jobs require a knowledge of manufacturing or construction methods. Many technical schools offer courses in structural design, strength of materials, and physical metallurgy.

Young people with only high school drafting training usually start out as tracers. Those with some formal post-high school technical training can often qualify as junior draftsmen. As draftsmen gain skill and experience, they may advance to higher level positions as checkers, detailers, senior draftsmen, or supervisors of other draftsmen. Some may become independent designers. Furthermore, some draftsmen who take courses in engineering and mathematics are able to transfer to engineering positions.

Qualifications for success as a draftsman include the ability to visualize objects in three dimensions and to do freehand drawing. Although artistic ability is not generally required, it may be very helpful in some specialized fields.

Employment Outlook

Employment opportunities for draftsmen are expected to be favorable through the mid-1970's. Prospects will be best for those with post-high school drafting training. Well-qualified high school graduates who have had only high school drafting, however, will also be in demand for some types of jobs.

Employment of draftsmen is expected to rise rapidly as a result of the increasingly complex design problems of modern products and processes. As the engineering and scientific occupations grow, more draftsmen will be needed as supporting personnel. On the other hand, photoreproduction of drawings and expanding use of newly developed electronic drafting equipment are eliminating some routine tasks done by draftsmen and will probably bring about a reduction in the need for tracers.

In addition to draftsmen needed to fill new positions, many will be required each year to replace those who retire, die, or move into other fields of work. The number needed to fill such vacancies, estimated to be about 10,000 in 1964, will probably rise slowly through the mid-1970's.

Earnings

In private industry, persons in beginning drafting positions earned an average of about $350 a month in early 1964, according to a Bureau

of Labor Statistics survey. As they gain experience, draftsmen may move up to higher level positions with a substantial increase in earnings. For example, the earnings of senior draftsmen averaged about $565 a month in early 1964.

In the Federal Civil Service in early 1965, the entrance salary for high school graduates without work experience who were employed in trainee-draftsman positions was about $305 a month. For those with post-high school education or with some experience in drafting, entrance salaries were higher. The majority of experienced draftsmen working for the Federal Government earned between $460 and $555 in early 1965.

Where To Go for More Information

American Institute for Design and Drafting, 18465 James Couzens, Detroit, Mich. 48235.

American Federation of Technical Engineers, 900 F St. NW., Washington, D.C. 20004.

See also section on Where To Go for More Information in the statement on Engineering and Science Technicians.

WRITING OCCUPATIONS

Newspaper Reporters

(2d ed. D.O.T. 0–06.71)
(3d ed. D.O.T. 132.268)

Nature of Work

Newspaper reporters gather information on current events and write stories on many subjects for publication in daily or weekly newspapers. In covering these events, they may interview people, review public records, attend planned news happenings, and do research. As a rule, reporters take brief notes while collecting the facts, and write their stories upon return to the office. Sometimes, to meet deadlines, they telephone their stories to "dictationists" or give the information by phone to other staff members known as "rewrite men," who write the stories for them.

Large dailies frequently assign some reporters to "beats," such as police stations or the courts, to cover news originating in these places, whereas other local news is handled by general assignment reporters. Specialized reporters, who are well-versed in a subject matter field as well as in writing, are increasingly interpreting and analyzing the news in subject fields such as medicine, politics, science, education, business, labor, and religion. Reporters on small newspapers get broad experience; they not only cover all aspects of local news, but may also take photographs, write headlines, lay out inside pages, and even write editorials. On the smallest weeklies, they may also solicit advertisements, sell subscriptions, and perform general office work.

Where Employed

An estimated 30,000 newspaper reporters were employed in the United States in 1965. The majority worked for daily newspapers; most of the others worked for weekly papers. In addition, some reporters were employed by press services and newspaper syndicates.

Reporters prepare news stories from facts they collected.

Reporters work in cities and towns of all sizes throughout the country. Of the approximately 1,800 daily and 8,900 weekly newspapers, the great majority are in medium-size towns. Large numbers of reporters, however, are in cities, since big city dailies employ many reporters, whereas a small-town paper generally employs only a few.

Training, Other Qualifications, and Advancement

Although talented writers with little or no academic training beyond high school sometimes become reporters, an increasing number of news-

papers will consider only applicants with a college education; graduate work is also becoming increasingly important. Some editors prefer those with a degree in journalism; others consider a degree in liberal arts as equally desirable.

Professional training leading to a bachelor's degree in journalism can be obtained in more than 170 colleges; about 100 of these have separate departments or schools of journalism. The typical undergraduate journalism curriculum is offered during the junior and senior years of college, and is divided about equally between cultural and professional subjects. Students preparing to become newspaper reporters take professional subjects such as reporting, copyreading, editing, feature writing, and the history of journalism. Although a number of schools award the master's degree in journalism, at present only a few offer programs leading to the doctor's degree in this field.

Young people who wish to prepare for newspaper work through a liberal arts curriculum should take English courses that include some journalism, as well as such subjects as sociology, political science, economics, history, and psychology. Reading and conversational ability in a foreign language and some familiarity with mathematics also are desirable qualifications. Those who look forward to becoming technical writers, or to reporting in a special field such as science, should concentrate on course work in their subject matter areas to the maximum extent possible. (See statement on Technical Writers.) Those without college training usually qualify by gaining experience on rural, small-town, or suburban papers.

Writing ability is fundamental to success in this field. Other personal characteristics of importance are a "nose for news," curiosity, persistence, initiative, resourcefulness, an accurate memory, and the physical stamina necessary for an active and often fast-paced life. Skill in typing is useful since reporters often type their own news stories. On small papers, a knowledge of news photography is also valuable.

Many beginners start on weekly or small daily newspapers. Some outstanding college graduates are hired directly for reporting positions by papers that prefer to train them on the job. Others, also usually college graduates, start on large city papers as copy boys, acting as messengers or office boys. They may be promoted to reporting jobs as they gain experience and as openings arise. Opportunities are increasing for college students to learn the rudiments of reporting through summer internships with newspapers. These internships—more than 1,000 in 1964—usually lead to regular employment upon graduation.

In competing for regular positions, it is helpful to have had experience as a "stringer"—one who covers the news in a particular area of the community for a newspaper and is paid on the basis of the stories printed. Experience on a high school or college newspaper may also be helpful in obtaining employment.

Beginning reporters are first assigned to such work as summarizing speeches, covering civic and club meetings, writing obituaries, interviewing visitors to the community, and covering police court proceedings and minor news events. As they gain experience, they may advance to covering more important developments, to an assigned "beat," or to specializing in a particular field of knowledge. Reporters with extensive experience may become rewrite men or copy editors. Newspapermen also progress to reporting jobs with larger papers or with press services and newspaper syndicates. Some experienced reporters advance to positions such as columnist, correspondent, or editor; to top executive positions; or become publishers; but these positions represent the top of the field and competition for them is keen. Other reporters transfer to related fields such as magazines, radio and television news, advertising, or public relations.

Employment Outlook

Well-qualified beginners with exceptional writing talent will find good employment opportunities through the mid-1970's. In early 1965, editors of large newspapers were actively seeking young reporters with exceptional talent. Other beginners, however, were facing keen competition for jobs, especially on large city dailies, and will probably continue to do so. In addition to seeking young reporters with exceptional talent, editors were also looking for reporters who were

qualified to handle news about atomic energy, military developments, labor, and other highly specialized or technical subjects.

Weekly or daily newspapers located in small towns and suburban areas will continue to offer the most opportunities for beginners entering newspaper reporting. Openings arise on these papers as young people gain experience and transfer to reporting jobs on larger newspapers or to other types of work. Moreover, the number of newspapers in suburban areas is increasing, and many of the existing ones are expanding their staffs to satisfy the need for more detailed community news. Preference in employment on small papers is likely to be given to beginning reporters who are able to help with photography and other specialized aspects of newspaper work and who are acquainted with the community.

Large city dailies will provide some openings for the inexperienced with good educational backgrounds and a flair for writing to enter as reporter trainees; some opportunities may continue to be available for young people to enter as copy boys and advance to reporting jobs.

In addition to jobs in newspaper reporting, new college graduates with journalism training may enter related fields, such as advertising, public relations, trade and technical publishing, radio, and television. The broad field of mass communication, which has grown rapidly in recent years, will continue to expand in future years. Factors pointing toward this continuing expansion include rising levels of education and income; increasing expenditures for newspaper, radio, and television advertising; and a growing number of trade and technical journals and various types of company publications. Newspapers will share in this growth. Employment of reporters is expected to increase, although not as fast as employment in some related areas. The greatest number of job openings will continue to arise from the need to replace reporters who are promoted to editorial or other positions, transfer to other fields of work, retire, or leave the profession for other reasons.

Special opportunities for women will continue in such reporting fields as society news, food, fashions, clubs, and beauty culture for the women's section of newspapers. In addition, there is a growing trend for women reporters to have the same types of job assignments as men.

Earnings and Working Conditions

Many daily newspapers have negotiated contracts with the American Newspaper Guild which set minimum wages based on experience, and provide for annual salary increases. Papers under Guild contracts often pay salaries higher than the minimum rates called for in their contracts. Particularly successful, experienced reporters on city dailies may earn over $300 a week. In early 1965, the minimum starting salaries on most daily newspapers with Guild contracts ranged between $75 and $110 a week for reporters with no previous experience. On a few small dailies, the Guild minimum starting salaries were less than $70 a week; on a few large dailies, Guild minimum rates for beginning reporters approached $120 a week. Young people starting as copy boys earn less than new reporters; minimum Guild rates for copy boys with some experience ranged from about $50 to slightly more than $85 a week.

On most dailies, minimum Guild rates for reporters with some experience (usually for those with 4 to 6 years) ranged from about $135 to $175 a week in early 1965. Contract minimums for experienced reporters on a few small dailies were less than $125 a week; on a few large dailies they were from $175 to $190 a week.

Newspaper reporters on big city papers frequently work 7 to 7½ hours a day, 5 days a week; most other reporters generally work an 8-hour day, 40-hour week. Many of those employed by morning papers start work in the afternoon and finish about midnight. City papers pay overtime rates for work performed after the regularly scheduled workday, or for more than 40 hours of work a week; they often provide various employee benefits such as paid vacations, group insurance, and pension plans.

Where To Go for More Information

Information about opportunities with daily newspapers may be obtained from:

American Newspaper Publishers Association,
750 Third Ave., New York, N.Y. 10017.

Information on opportunities in the newspaper field as well as a list of scholarships, fellowships,

assistantships, and loans available at colleges and universities, may be obtained from:

The Newspaper Fund, Inc.,
Box 300, Princeton, N.J. 08540.
Sigma Delta Chi,
35 East Wacker Dr., Chicago, Ill. 60601.

Information on union wage rates is available from:

American Newspaper Guild, Research Department,
1126 16th St. NW., Washington, D.C. 20036.

General information on journalism opportunities may be obtained from:

American Council on Education for Journalism,
Ernie Pyle Hall,
Bloomington, Ind. 47405.

Names and locations of all daily newspapers and a list of departments and schools of journalism are published in the *Editor and Publisher International Yearbook*, available in most large newspaper offices and public libraries.

Technical Writers

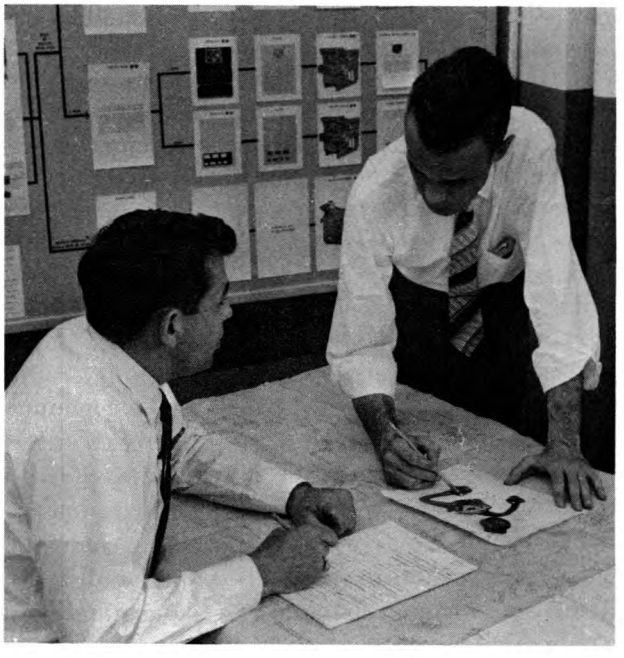
(2d ed. D.O.T. 0–06.90)
(3d ed. D.O.T. 139.288)

Nature of Work

The many technical and scientific developments of recent years have created a growing need for written descriptions of these developments. The technical writer's main function is to satisfy this need by presenting scientific and technical information in a simple, clear, and factual manner, so that it can be readily understood by readers who are not scientists or engineers. At times, technical writers may prepare complex reports for experts. Regardless of what kind of writing they do, technical writers serve to establish easy communication between scientists, engineers, and other specialists, and the users of their information.

Technical writers as defined in this statement include only those people primarily employed to interpret and write about technical or scientific subject matter. It excludes those primarily employed as scientists, engineers, or other technical specialists who also do a considerable amount of writing.

Before starting a writing assignment, technical writers research their subject. This process may involve studying reports, reading technical journals, and consulting with the engineers, scientists, and other technical personnel who have worked on the project. Then, they prepare a rough draft that may be revised several times before it is submitted for review. Technical writers usually arrange for the preparation of tables, charts, illustrations, and other artwork, and in so doing may work with technical illustrators, draftsmen, or photographers.



Technical writer obtains specification data from engineer.

The technical writer's product takes many forms, such as a publicity release on a company's scientific or technical achievement or a manufacturer's contract proposal to the Federal Government. It may be a manual that explains how to operate, assemble, disassemble, maintain, or overhaul components of a missile or other system. Technical writers also write for scientific and engineering periodicals, and for popular magazines.

Where Employed

About 30,000 technical writers and editors were employed in 1965, according to an estimate made by the Society of Technical Writers and Publishers. Most technical writers are employed in the electronics and aerospace industries. Many work for research and development firms or for the Federal Government—mainly in the Department of Defense and Agriculture, the Atomic Energy Commission, and the National Aeronautics and Space Administration. Some work in the more than 300 job shops that specialize in technical writing. Others are in business for themselves as freelance technical writers.

Technical writers are located mainly in the Northeastern States, Texas, and California. They are concentrated in the Washington, D.C., Los Angeles, Houston, Fort Worth–Dallas, Chicago, New York, Boston, and Philadelphia metropolitan areas.

Training, Other Qualifications, and Advancement

The bachelor's degree is the desirable minimum entrance requirement for work in this field, although talented and experienced writers having less academic training can qualify. Employers do not agree on the most appropriate kind of college training needed by technical writers, but graduates usually must have a combination of courses in writing and scientific and technical subjects. Some employers prefer applicants with degrees in engineering or science who have had courses in writing. Others seek graduates with majors in English or journalism who have taken some courses in scientific and technical subjects. Regardless of the college training they prefer, all employers place great emphasis on writing skills.

Few schools offer formal undergraduate programs leading to a bachelor's degree in technical writing or technical journalism. However, about 170 colleges and universities provide professional education leading to a bachelor's degree in journalism; and most of these offer at least one course in technical writing or technical journalism as part of the regular curriculum. Liberal arts colleges and some engineering schools offer English and other courses that sharpen writing skills. Many colleges and universities conduct short-term summer workshops and seminars for technical writers.

Young people who plan to become technical writers should, while still in high school, supplement the required science and mathematics courses with as many elective courses in grammar and composition as possible. They also can gain helpful experience by working as editors or writers for their school papers.

In addition to the ability to write well, technical writers must have the ability to think logically. They should have a great interest in scientific and technological developments and be able to work and communicate well with others.

Beginners often assist experienced technical writers by doing library research, by editing, and by preparing drafts of portions of reports. Experienced writers in organizations with large technical writing staffs may become technical editors or progress to supervisory and administrative positions. After gaining experience and contacts, a few may open their own job shops.

It is also possible to advance by becoming a specialist in a particular scientific or technical subject. These writers sometimes prepare syndicated newspaper columns, or articles for popular magazines.

Employment Outlook

Well-qualified and experienced technical writers are expected to find excellent employment opportunities through the mid-1970's. Beginners who have outstanding writing talent will have many opportunities; those with minimum qualifications will find stiff competition for jobs. The greatest demand probably will be for technical writers with backgrounds in electronics and communications, particularly in research and development, to work in the aerospace and related industries.

The employment of technical writers will increase moderately in the 1965–75 decade because of the need to put the increasing volume of scientific and technical information into language that can be understood by management, for decision making, and by technicians for operating, and maintaining complicated industrial equipment. Also, since many products will continue to

be assembled from components manufactured by different companies, technical writers will be in demand to describe, in simple terms, the interrelationships of these components. The growth in this occupation will be accelerated also by the need for simplified operating and maintenance instructions for new consumer products.

The demand for technical writers will continue to be related to research and development expenditures. These expenditures are expected to increase because of the expanding space program, and the increasing emphasis on medical and other research. In the years ahead, a continuing demand is expected for technical writers to interpret the new language of science that will accompany accelerating scientific and technological advances.

Technical writers with training in journalism will also find opportunities in other fields that employ writers, such as advertising, public relations, trade publishing, radio, and television.

Earnings and Working Conditions

In 1965, inexperienced technical writers with bachelor's degrees were hired in private industry at starting salaries ranging from $5,000 to $7,000 a year; those with moderate experience earned from $7,000 to $10,000 a year; highly experienced writers earned from $11,000 to $13,000, and, with supervisory duties, up to $17,000. Differences in the earnings of experienced writers depended not only on their prior experience, but also on factors such as the type, size, and location of their employing firms. Earnings of freelance technical writers vary greatly and are related to the writer's reputation in the field.

In the Federal Government in early 1965, inexperienced technical writers with a bachelor's degree and credit for about five science courses could start at either $5,000 or $6,050 a year, depending on their college records. Those with a year's experience could begin at $6,050 or $7,220; with 2 years' experience, at $7,220 or $8,650. With 3 years' experience, they could start at $8,650 or $10,250, depending on the caliber of the experience.

Technical writers usually work the standard 40-hour week. They may work under considerable pressure, frequently working overtime when a deadline has to be met on a publication or report. Technical writers usually receive the same holidays, vacations, and other benefits as other workers in their organization.

Where To Go for More Information

Additional information on this occupation, including a list of schools offering accepted courses of study and specific training programs in accredited colleges and universities, may be obtained from:

Executive Secretary,
Society of Technical Writers and Publishers, Inc.,
P.O. Box 3706, Beechwold Station, Columbus, Ohio 43214.

OTHER PROFESSIONAL AND RELATED OCCUPATIONS

Architects

(2d ed. D.O.T. 0–03.10)
(3d ed D.O.T. 001.081)

Nature of Work

Architects plan buildings and other structures and supervise their construction. Their goal is to design structures which are safe, useful, and pleasing in appearance.

When an architect receives a commission for a building, he meets with the client to discuss the purpose, requirements, and cost limitations of the structure as well as the client's preferences as to style and plan. Subsequently, the architect must make hundreds of decisions, taking into account not only the requirements of the building, but also local and State building codes, zoning laws, fire regulations, and other ordinances. For example, in planning a school, the architect must decide, among other things, the amount of corridor and staircase space required to enable students to move easily from one class to another; the type and arrangement of storage space; and the location, size, and interior arrangements of the classrooms, laboratories, lunchroom, gymnasium, and administrative offices.

The architect makes preliminary drawings of the structure and submits them to the client for his approval. Alterations suggested by the client may be incorporated in the final design, which includes floor plans as well as details of the interior and exterior of the building. The final design is then translated into working drawings, which show the exact dimensions of every part of the structure and the location of the plumbing, heating, electrical, air-conditioning, and other equipment. Consulting engineers usually prepare detailed drawings of the structural, plumbing, heating, and electrical work. Engineers' drawing are coordinated with the architect's working drawings, and specifications are prepared listing the construction materials to be used, the equipment, and, in some cases, the furnishings.

The architect then assists his client in selecting a building contractor and in drawing up the contract between client and contractor, and acts as the client's advisor and representative in dealings with the contractor. As construction proceeds, the architect makes periodic inspections to make certain that the design is not altered and that the materials specified in the contract are used. The architect's work is not completed until the project is finished, all required tests are made, and guarantees are received from the contractor.

Architects study model of urban redevelopment project.

Most self-employed architects plan and design a wide variety of structures, ranging from homes to churches, hospitals, office buildings, and airports. Some specialize in one particular type of structure. When working on large-scale projects or for large architectural firms, architects frequently specialize in one phase of the work, such as design, drafting, specification writing, or construction supervision.

Where Employed

An estimated 30,000 registered (licensed) architects were employed in the United States in 1964. In addition, several thousand people were working in positions requiring a knowledge of architecture. Less than 3 percent of all architects are women.

Approximately two-fifths of all architects are self-employed, either practicing individually or as partners. Most of the others work for architectural firms. Some architects work for engineers, builders, real estate firms, and for other businesses with large construction programs. Others are employed by government agencies, often in fields such as city and community planning and urban redevelopment. A few are full-time teachers in schools of architecture.

Architects are employed in all parts of the country. However, they are concentrated in those States with large metropolitan areas. Six States employ nearly half of the total—California, New York, Illinois, Texas, Pennsylvania, and Ohio.

Training, Other Qualifications, and Advancement

A license for the practice of architecture is required by law in all States and the District of Columbia, mainly to insure that architectural work which may affect life, health, or property is done by qualified architects. Requirements for admission to the licensing examination are set by the individual States. These generally include graduation from an accredited professional school followed by 3 years of practical experience in an architect's office. As a substitute for formal training, most States accept longer periods of practical experience (usually 10 to 12 years) for admission to the licensing examination.

In 1964, professional training in architecture was offered by 75 colleges and universities in the United States, 53 of which were accredited by the National Architectural Accrediting Board. The great majority of these schools offered a 5-year curriculum leading to the bachelor of architecture degree. Many architectural schools also offer graduate education leading to the master's degree, and a few schools offer the Ph. D. degree. Although graduate training is not essential for the practice of architecture, it is often desirable for research and teaching positions.

Most schools of architecture admit qualified high school graduates who meet the entrance requirements of the liberal arts college with which the school of architecture is associated. Some schools require 1 or 2 years of college education before admitting the student to a 3- or 4-year architectural training program. In general, architectural schools prefer that students' preparation include mathematics, science, social studies, language, and art.

A typical curriculum in an architectural school includes not only architectural courses but also other subjects—usually English, mathematics, physics, chemistry, sociology, economics, and a foreign language. Some examples of technical and professional courses in the curriculum are: Architectural design, structural theory, working drawings, specification writing, graphic presentation, freehand drawing, the history of architecture, professional ethics, and business practices.

Among the personal qualifications needed by persons planning a career in architecture are a capacity to master technical problems, a gift for artistic creation, and a flair for business and for human relations. Although ability in freehand drawing is helpful, it is not a requirement for a successful career in architecture. To determine their interests and potentialities, young people should, if possible, spend some time in an architect's office before entering architectural school. Students are also encouraged to work for architects or for building contractors during summer vacations to gain some knowledge of practical problems.

The new graduate usually begins as a junior draftsman in an architectural firm where he makes drawings and models of building projects or drafts details in the working drawings. As he gains experience, he is given more complex work.

After several years, he may progress to chief or senior draftsman, with responsibility for all the major details of a set of working drawings and for the supervision of other draftsmen. Other architects become designers or construction supervisors, or branch off into the field of specification writing. An employee who is particularly valued by his firm may be designated an associate and may receive, in addition to his salary, a share of the profits. Usually, however, the architect's goal is to establish his own practice.

Employment Outlook

The outlook is for continued rapid growth of the profession through the mid-1970's. Employment opportunities are expected to be favorable both for experienced architects and for new architecture graduates.

A major factor contributing to the favorable outlook is the expected growth in the volume of nonresidential construction—the major area of work for architects. Residential construction, a growing area of work for architects, should also increase. Moreover, the increasing size and complexity of modern nonresidential buildings, as well as homeowners' growing awareness of the value of architects' services, are likely to bring about a greater demand for architectural planning. Urban redevelopment and city and community planning projects, other growing areas of employment for architects, are also expected to increase considerably in the years ahead. (See statement on Urban Planners.) Expanding college enrollments will create a need for additional architects to teach architectural courses.

Besides those needed to fill new positions due to growth, additional numbers of architects will be required each year to replace those who transfer to other fields of work, retire, or die. The number needed to fill such vacancies, estimated to be about 700 in 1964, will probably rise slowly in the future.

Along with the anticipated rise in demand for architects, an increase is expected in the number of architectural graduates. If graduations in this field follow the trend expected in all college graduations, the number of architectural degrees awarded each year during the late 1960's and early 1970's should be considerably greater than the 2,100 degrees awarded in 1964. However, many architectural graduates utilize their training in fields such as sales and administration and do not enter the profession. Thus, those who choose to enter the field should have favorable employment opportunities through the mid-1970's.

The outlook for women architects, although less favorable than for men, is nonetheless expected to be good. Women who are good draftsmen will probably be able to obtain employment readily. However, very few women are able to establish themselves in private practice.

Earnings and Working Conditions

Starting salaries for architectural school graduates were generally between $90 and $120 a week in 1964, according to available information. Draftsmen with 3 or more years' experience earned between $125 and $150 a week; job captains, specification writers, and other senior employees usually earned from $150 to $200 a week. Senior employees often receive yearly bonuses in addition to their salaries.

After architects have become well established in private practice, they generally earn much more than high-paid salaried employees of architectural firms. The range in their incomes is very wide, however. Some architects with many years of experience and good reputations earn well over $25,000 a year, while many who have not become well known have very low incomes. Young architects starting their own practices may go through a period when their expenses are greater than their income.

Most architects work in well-lighted, well-equipped offices and spend long hours at the drawing board. However, their routine is often varied by interviewing clients or contractors or discussing the design, construction procedures, or building materials of a project with other architects or engineers. Architects specializing in construction supervision may do most of their work out of doors at a construction site.

Where To Go for More Information

The American Institute of Architects,
1735 New York Ave. NW., Washington, D.C. 20006.

778-316 O—65——17

College Placement Officers

(3d ed. D.O.T. 166.268)

Nature of Work

Without employment counseling during their college years and proper placement upon graduation, college students might experience a series of job dissatisfactions throughout much of their working lives. The basic responsibility of the college placement officer is to help both students and alumni evaluate their talents and abilities in order to make realistic career decisions. In carrying out this responsibility, he not only counsels those planning a career, but assists employers in appraising qualifications of the college graduates who are seeking jobs.

To counsel students adequately, the college placement officer assembles and maintains a library concerning careers for graduates, and part-time and summer jobs for nongraduates. Such material usually includes data on the nature and availability of employment, job descriptions, company employment brochures, and various other types of recruitment literature.

Through student interviews, the college placement officer collects and analyzes information regarding the student's precollege history and education, his work experience, interests, and abilities. He also may administer vocational and psychological tests in his attempt to match a student's qualifications and desires with job requirements. In addition, before arranging meetings with prospective employers, the placement officer may advise the applicant on how to conduct himself at the interviews.

In dealing with employers, the college placement officer arranges for "company recruiters" to visit the campus to discuss their organization's personnel needs and to meet qualified applicants. From the "recruiters," he learns of specific job openings, then schedules employment interviews, and provides the recruiter with information about interested students. Other employer-related activities of the placement officer may include making additional employer contacts so that more opportunities for employment will be available to applicants. He may also suggest improvements in employer recruitment literature; and, by keeping in touch with employment trends, inform the college faculty of any change in job requirements that might warrant an adjustment in the institution's curriculum.

Placement officers may specialize in such areas as law, teaching, part-time and summer work, or other specific group placements. However, the extent of specialization usually depends upon the size and type of the college, as well as the size of the placement staff.

Where Employed

Placement services are offered in nearly all colleges and universities. Large colleges may employ several placement officers working under a director of placement activities; in many institutions, however, a combination of placement functions is performed by one officer and his clerical staff. In some colleges, especially the smaller ones, the functions of placement officers may be performed on a part-time basis by members of the faculty or administrative staff. Universities frequently have placement offices for each major branch or college. In some universities, there is a central office which coordinates the work of all placement officers; in others, each office works as a separate unit.

An estimated 2,000 placement officers were employed in 1964, most of them on a full-time basis. Of this total number, about one-third were women.

College placement officers are located in all parts of the country, although there are greater concentrations of these workers in the metropolitan areas where many colleges and universities are situated.

Training, Other Qualifications, and Advancement

A bachelor's degree is generally considered to be the minimum requirement for entry into the field. Important undergraduate courses for the prospective placement officer include counseling, psychology, sociology, education, and personnel administration or related business subjects. At present, however, no specific educational specialty exists for college placement officers.

In 1963, more than 100 colleges and universities offered programs leading to a graduate degree in college student personnel work. These programs included such placement oriented subjects as Occupational Information and Analysis, Problems of Placement, Occupational Trends, and Principles of Career Planning.

College placement officers often are chosen from among the junior professional members of an institution's administrative staff or faculty. In some instances, an alumnus who has displayed a strong interest in his school, and exhibits ability in dealing effectively with people, will be employed as an assistant in the placement office and may advance to more responsible positions as he gains experience.

Many people go into college placement after working in other areas. Experience in private employment agencies, a broad background of business or industrial experience, previous placement training, teaching experience, or knowledge of personnel and guidance techniques, are all useful backgrounds for persons interested in college placement work.

A person who would like to enter the college placement field should have a genuine interest in people, as well as the ability to gain the confidence of students and employers. Also of importance, is the ability to develop a keen insight into the employment problems of both groups, and to gain the respect of both by maintaining honest and confidential communications.

Advancement for college placement officers is usually by promotion to placement director, director of student personnel services, or to some other higher level administrative position; however, the extent of such opportunity usually depends upon the type of college or university and the number of people on the placement staff.

Employment Outlook

The number of job opportunities in the college placement field is expected to rise rapidly through the mid-1970's. In general, employment prospects will be best for new or recent college graduates seeking beginning positions, often at their own alma maters. Among the factors expected to contribute to the favorable outlook for college placement officers are the increasing number of college graduates and the expansion in the number of college students from lower income families who will seek part-time jobs during their college years. Demand for college placement officers will be increased also as a result of the trend among colleges and universities to place more emphasis on the student personnel service aspect of higher education. This emphasis has already resulted in increased placement activity for graduate students and alumni, and for nongraduates seeking summer and part-time employment. Junior colleges—the fastest growing segment of higher education—also will have an increased need for placement personnel.

Generally, the extent of placement services will continue to be related to the priority assigned to placement services in college planning. Although an institution may be in favor of the expansion of placement services, the necessary financial support may not be made available because of competing needs for funds. In recent years, however, budget allocations for placement activities have increased and this trend is expected to continue, thus leading to a growing demand for college placement officers in most parts of the country.

In addition, regional college placement associations, through their coordinating organization, the College Placement Council, are expanding their programs with the objective of improving operations in the less organized placement offices of member colleges, they are trying, also, to establish placement services where none presently exist.

Some openings also will occur each year as placement officers transfer to other positions, retire, or leave the field for other reasons.

Earnings and Working Conditions

In 1963, earnings of placement office directors ranged from less than $4,000 to a high of $18,000, with the average (median) salary about $8,700, according to a National Education Association survey of 920 public and private colleges and universities. The same survey indicated that large and medium-size public universities and State colleges paid the highest average salaries—approximately $10,000 in 1963. Large private universities paid an average salary of $9,250; the lowest placement director salaries were reported

by small public universities and large private colleges, the average salaries being approximately $7,500. Earnings of placement officers and assistants averaged about two-thirds of the amount paid placement directors.

College placement officers usually work a standard 35- to 40-hour week; however, irregular hours and overtime may be necessary during the "recruiting season." Most placement personnel are employed on a 12-month basis, are paid for holidays and vacations, and receive the same benefits as other professional personnel employed by colleges and universities.

Where To Go for More Information

The College Placement Council, Inc.,
35 East Elizabeth Ave., Bethlehem, Pa. 18018.

Home Economists

(2d ed. D.O.T. 0–12.10 through .36)
(3d ed. D.O.T. 096.128)

Nature of Work

Improving products, services, and practices that affect the comfort and well-being of the family is the primary aim of home economists. These professional workers must have a broad knowledge of the field or be specialists in a particular area such as food, clothing and textiles, housing, home equipment, child care, household management, or family economics.

Teachers make up the largest single group of home economists. They give high school courses in food, nutrition, clothing, textiles, child care, family relations, homefurnishings and equipment, household economics, and home management. The nature of much of the work done by home economics teachers is similar to that described in the statement on Secondary School Teachers, elsewhere in this *Handbook*. In addition, they may help students and their parents with homemaking problems, sponsor chapters of Future Homemakers of America, and conduct many related activities. Teachers in adult education programs help homemakers to increase their understanding of family relations, and to improve their homemaking methods and skills. College teachers not only prepare students for professional careers in home economics, but help prepare young people for homemaking. College teachers may combine teaching with research and often specialize in one particular area of home economics.

Home economists employed by private business firms and trade associations help to promote the development, use, and care of specific home products. They may do research and test products; prepare advertisements and booklets with instructional materials; plan, prepare, and present programs for radio and television; serve as consultants; give lectures and demonstrations before the public; and conduct classes for workers, salesmen, and appliance servicemen. They may also study

Utility company home economist helps a homemaker.

consumer needs and help manufacturers translate these needs into useful products.

Home economists who work for food manufacturers do an important part of their work in test kitchens—developing new recipes, improving present products, or helping to create new products. They may also publicize the nutritional value of specific foods. Home-service workers employed by utility companies often give advice on kitchen planning and laundry problems, in addition to describing the operation and benefits of products and services. Home economists employed by manufacturers of kitchen and laundry equipment may work with engineers on product development and also devise plans for product uses. Those engaged in communications work for magazines, newspapers, radio and television stations, advertising and public relations agencies, trade associations, and other organizations usually plan, write and edit articles and advertisements and supervise the preparation of photographs designed to tell homemakers about home products and services. Their work may include product testing and analysis, work in research laboratories or test kitchens, and the study of consumer buying habits. Still other home economists in business organizations hold positions with dress-pattern companies, department stores, interior design studios, and other firms involved in designing, manufacturing, and selling products for the home. A small number of home economists are employed in such businesses as financial institutions, giving customers advice on spending, saving, and budgeting. Others work as consultants for moving companies and chain food stores.

Home economists are engaged in research work in laboratories and offices of the Federal Government, State agricultural experiment stations, colleges, universities, and private organizations. The largest single group works for the U. S. Department of Agriculture conducting research on food and nutrition, textiles and clothing, housing, household equipment, and household economics. Some make surveys of farm families and their buying and spending habits and then develop budget guides. Others perform laboratory tests to determine the effect of different methods of cooking on nutritive value, flavor, tenderness, or volume of a food. A few in other Federal agencies are engaged in research on space travel; working on such problems as meeting food needs in outer space.

Home economists employed in the Cooperative Extension Services of the State land-grant colleges conduct adult education programs for women (both rural and urban) and 4-H Club programs for girls. Through these programs, extension workers help families to use home economics research findings in such areas as home management, consumer education, family relations, and nutrition.

Home economists employed on social-welfare programs by State, county, city, and private welfare agencies may act as advisers and consultants in the development of budget standards and improvements in homemaking. They may work as homemaking counselors and consultants, helping handicapped homemakers and their families adjust to physical limitations by changing the arrangements in the home and revising methods of work. Other home economists in welfare agencies supervise or train workers engaged in homemaker services which provide temporary or part-time help to households disrupted by illness.

Where Employed

Altogether, about 90,000 persons were employed in home economics occupations in 1965. However, this figure includes an estimated 28,000 dietitians and approximately 5,000 extension workers whose work is discussed in separate statements on Dietitians and Agricultural Extension Workers elsewhere in the *Handbook*. Nearly 50,000 home economists were teachers. Approximately 34,000 were primarily secondary school teachers, and about 12,000 were primarily adult education instructors; however, a good many of these teachers taught both secondary school and adult education classes. In addition, there were about 2,000 college and university teachers. The remainder taught in elementary schools or were child development and family relations specialists teaching in kindergartens, nursery schools, recreation centers, and other institutions. About 5,000 home economists were in private business firms and associations. Several hundred were primarily research workers, and a smaller group partici-

pated in social welfare programs as advisers, consultants, and training supervisors. A few were self-employed.

Although home economics is generally considered a woman's field, a growing number of men are employed in home economics positions. Most men specialize in foods and institution management, though some are in the family relations and child development field, in applied arts, and in other areas.

Training, Other Qualifications, and Advancement

Approximately 450 colleges and universities offer training leading to a bachelor's degree in home economics, which qualifies graduates for most entry positions in the field. A master's or doctor's degree is required for college teaching, for certain research and supervisory positions, for work as an extension specialist or supervisor and for some jobs in the nutrition field.

The undergraduate curriculum in home economics provides students with a strong background in science and liberal arts and also includes courses in each of the areas of home economics. Students majoring in home economics may specialize in various subject-matter areas. Advanced courses in chemistry and nutrition are important for those wishing to specialize in foods and nutrition; science and statistics for research work; and journalism for advertising, public relations work, and all other work in the communications field. In order to teach home economics in a high school, it is necessary to complete the professional education courses and other requirements for a teacher's certificate in the State in which one wishes to teach.

A few scholarships especially designated for undergraduates in the field are available, as well as scholarships, fellowships, and assistantships for graduate study. Although colleges and universities offer most of these financial grants, some are provided by government agencies, research foundations, businesses, and the American Home Economics Association.

Home economists must be able to work with people of various living standards and backgrounds and should have a capacity for leadership, with ability to inspire cooperation. Good grooming, poise, and an interest in people are also essential, particularly when dealing with the public.

Employment Outlook

Home economists are expected to have very good employment opportunities through the mid-1970's. In 1965, graduates with the bachelor's degree were being sought to fill entry positions, mainly as teachers in secondary schools. In most States, not enough home economics graduates were entering and remaining in home economics occupations to satisfy the demand for these workers in teaching and other fields. Some young women who study home economics do not enter employment in the field but become full-time homemakers. Others work professionally for only a short time before marriage but often return to part-time or full-time employment after their children are in school.

The demand for home economists to fill teaching positions in secondary schools and in colleges and universities will be the principal factor in the growth in employment in this field. Increased national focus on the needs of low-income families may also increase demand for home economists to work in welfare and extension service positions. In addition, the need for more home economists in research is expected to increase with the continued interest in using scientific methods for improving various home products and services. Employers in many business establishments are also likely to become increasingly aware of the contributions that can be made by professionally trained home economists and will probably hire more of them to promote home products and to act as consultants to customers. Replacement needs will undoubtedly continue to be high in this field. There will be many opportunities for part-time teachers in adult education programs as more women utilize such programs to improve their homemaking skills for personal reasons and to obtain positions requiring such training.

Earnings and Working Conditions

Home economics teachers in public schools generally receive the same salaries as other teachers, as most school districts have a single-salary schedule, graduated by education and experience. In

school districts with 100,000 pupils or more, the average (median) salary of beginning teachers with a bachelor's degree was $5,000 for the school year 1964–65, according to a National Education Association survey; in districts with 50,000 to 99,999 enrollment, starting salaries averaged $4,780 and in districts with 25,000 to 49,999 enrollment, $4,800.

The average (median) salary of home economics instructors engaged in college and university teaching was $6,114 a year in 1963–64. In the cooperative extension service, salaries of county extension home economists averaged about $7,521 per year and those of State specialists, $9,289 in early 1964.

In the Federal Government, the entrance salary for inexperienced workers with a bachelor's degree in home economics was $6,050 in early 1965. For those with additional education and experience, salaries ranged from $7,220 to $14,170 a year, depending upon the type of position and level of responsibility.

Many home economists work a regular 40-hour week or less. Those in teaching and extension work, however, frequently work longer hours as they are expected to be available for evening lectures, demonstrations, and other work falling outside the regularly scheduled hours. Most home economists receive fringe benefits such as paid vacation, sick leave, retirement pay, and insurance benefits.

Where To Go for More Information

A list of schools granting degrees in home economics is available from the Home Economics Unit, Bureau of Adult and Vocational Education, Office of Education, U.S. Department of Health, Education, and Welfare, Washington, D.C. 20202.

Additional information about home economists and graduate scholarships may be obtained from:

American Home Economics Association,
1600 20th St. NW., Washington, D.C. 20009.

Landscape Architects

(2d ed. D.O.T. 0–03.20)
(3d ed. D.O.T. 019.081)

Nature of Work

Everyone enjoys walking through an attractively designed park or taking a drive along a scenic road. Landscape architects plan, design, and supervise the arrangement of such outdoor areas for people to use and enjoy. The attractiveness of parks, housing projects, campuses, and country clubs reflects the skill of these architects in designing landscapes that are useful and pleasing. Their knowledge of site planning allows landscape architects to serve many types of clients, from a real estate firm embarking on a new suburban development or a school board constructing a new high school, to a city preparing to build an airport.

Landscape architects may plan the entire arrangement of a site and supervise the grading, construction, and planting required to carry out the plan. Whether they perform all or only part of these services on a particular project, however, depends on the client's wishes and the available funds.

To plan a site, the landscape architects first study the nature and purpose of the client's project and the various types of structures needed. Next, they study the site itself, observing and mapping such features as the slope of the land and the position of existing buildings and trees. They also consider the parts of the site that will be sunny or shaded at different times of day, the structure of the soil, existing utilities, and many other factors. Then, after consultation with the architect and engineer working on the project, they draw up preliminary plans for the development of the site. After the client approves the preliminary plans, working drawings are made which show all existing and proposed features, such as buildings, roads, walks, terraces, grading, and drainage structures in planted areas. Landscape architects outline in detail the methods of constructing such features as walks and terraces and draw up lists of materials to be used. Landscape contractors are then invited to submit bids for the work.

Landscape architects develop planting plans for a site.

Firms of landscape architects usually handle a wide variety of assignments. Some, however, specialize in such projects as parks and playgrounds, campuses, hotels and resorts, shopping centers, roads, or public housing.

Where Employed

An estimated 4,000 landscape architects were employed in 1965. The majority were in business for themselves or worked for other landscape architects in private firms. About a third of all landscape architects were employed by government agencies concerned with public housing, city planning, urban renewal, or parks and recreational areas. Some were on the staffs of architectural or engineering firms; others were employed by landscape contractors or nurseries, and a few taught in colleges and universities.

Landscape architects are found in every State and in many small towns as well as big cities. The largest numbers are in the most highly populated States. New York and California, with large populations and high per capita incomes, have more landscape architects than other States.

Training, Other Qualifications, and Advancement

A bachelor's degree from a college or university which offers professional training in landscape architecture is usually the minimum requirement for entering the profession. Such training is offered in at least 24 colleges and universities, of which 17 have been accredited by the American Society of Landscape Architects. The curriculum for the bachelor's degree requires 4 to 5 years of study, depending on the institution. A few universities also offer master's degrees in landscape architecture.

Entrance requirements for the landscape architecture course are usually the same as those for admission to the liberal arts college of the same university. Some schools also require completion of a high school course in mechanical or geometrical drawing, and most schools advise high school students to take courses in art and more mathematics than the minimum required for college entrance.

Courses in design, including architecture and drawing as well as landscape design, constitute over half of the typical curriculum in landscape architecture. Other major fields of study are civil engineering and horticulture. In addition, courses in English, science, the social sciences, and mathematics are usually required. A bachelor's degree in landscape architecture provides a good background for graduate work in city planning.

Young people who plan to become landscape architects should be interested in both art and nature, for the profession demands a talent for design and an understanding of plant life, as well as technical ability. Successful practice as an independent landscape architect also requires a good business sense and the ability to deal with people.

Working for landscape architects or landscape contractors during summer vacations will help the student to discover what phases of landscape architecture interest him most and may enable him to get a better than average job and salary upon graduation.

New graduates usually begin as junior draftsmen, tracing drawings and doing other simple drafting work. As their skill increases, they progress to more responsible work. After 2 or 3 years, they can usually advance to positions as senior draftsmen, qualified to carry a design through all its stages from preliminary sketches to finished working drawings. Experienced draftsmen often handle other aspects of land-

scape architects' work also, such as preparing specifications and detailing methods of construction. Employees who demonstrate ability for all phases of work may become associates of the firm; landscape architects who progress this far often open their own offices.

A license is required for the independent practice of landscape architecture in six States—California, New York, Michigan, Georgia, Oregon, and Louisiana. Candidates for the licensing examination are required to have 6 to 8 years' experience, or a degree from an accredited school of landscape architecture plus 2 to 4 years' experience.

Employment Outlook

Employment opportunities for graduates with professional training in landscape architecture are expected to be reasonably good through the mid-1970's. During this period and over the longer run, the profession will probably continue to expand, as a result of the continued growth of metropolitan areas with their needs for parks and recreational areas, the growing population's requirements for outdoor recreational facilities, the continued increase in public construction (including public housing), and the rising interest in city and regional planning. Additional opportunities for landscape architects may arise if developers of new residential and commercial areas continue to offer planned recreational facilities and landscaping to compete with existing areas.

In some parts of the country, the expected increase in homeownership, coupled with rising per capita incomes and living standards, will also spur the demand for landscape architects. These factors are likely to have much less effect in some other areas (especially the northern and eastern parts of the country) where homeowners generally choose the services of landscape gardeners and nurserymen instead of landscape architects.

Women can enter training for landscape architecture. They represent about 10 to 15 percent of all landscape architects (but only about 1 percent of the Nation's registered architects). Well-trained and competent women landscape architects can look forward to interesting and worthwhile careers in the profession, chiefly as specialists in garden and planting design.

Earnings and Working Conditions

In 1964, starting salaries in private industry for new graduates in landscape architecture ranged from about $90 to $130 a week, according to the limited information available. The relatively higher salaries generally were paid to graduates who had gained experience in summer jobs in landscape architecture firms. Experienced persons employed by private firms typically earned from $7,000 to $8,000 a year, though it was not unusual for especially well-qualified people to receive annual salaries of $10,000 or more.

Landscape architects in independent practice often earn more than salaried employees with considerable experience, but their earnings vary widely and may fluctuate from year to year. In recent years, earnings for this segment of the profession have tended to range from $6,000 to $15,000 a year, with some people of exceptional ability and established reputation making $25,000 or more a year.

In the Federal Civil Service in mid-1965, newly graduated landscape architects were paid annual entrance salaries of either $5,990 or $7,050, depending on their qualifications. The salary schedule also provides for periodic increases above this amount. A large majority of experienced landscape architects in the Federal Government earn $8,945 a year or more; a few earn $15,000 or more.

Salaried employees in both the government and in landscape architectural firms usually work regular hours. Self-employed persons often work long hours, especially in the planting season. Salaried employees in private firms may also work overtime in the seasonal rush periods.

Where To Go for More Information

Additional information on the profession and a list of colleges and universities offering accredited courses of study in landscape architecture may be obtained from:

American Society of Landscape Architects, Inc., 2000 K St. NW., Washington, D.C. 20006.

Lawyers

(2d ed. D.O.T. 0–22.10 through .40)
(3d ed. D.O.T. 110.108 and .118 and 119.168)

Nature of Work

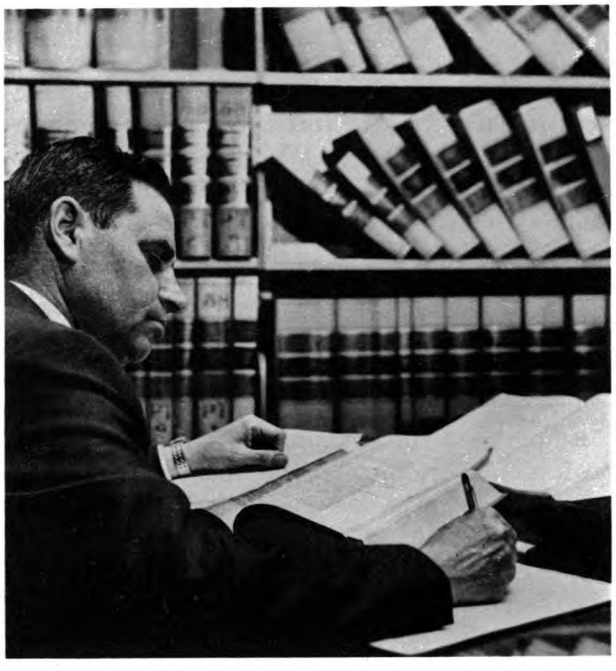
Most people, at some time in their lives, need legal advice and help. For this they turn to lawyers, who advise them of their legal rights and obligations and, when necessary, represent them in courts of law. In addition, lawyers (also called *attorneys*) negotiate settlements out of court and represent clients before quasi-judicial and administrative agencies of the government. They may act as trustees, guardians, or executors. Government attorneys play a large part in developing and administering Federal and State laws and programs; they prepare drafts of proposed legislation, establish law enforcement procedures, and argue cases.

A majority of lawyers are engaged in general practice, handling all kinds of legal work for clients. However, a significant number practice in a particular branch of the law—for example, corporation, criminal, labor, patent, real estate, tax, or international law. Some attorneys devote themselves entirely to trying cases in the courts. Others never appear in court but spend all their time in such activities as drawing up wills, trusts, contracts, mortgages, and other legal documents, conducting out-of-court negotiations, and doing the investigative and other legal work necessary to prepare for trials. Still others are primarily engaged in teaching, research, writing, or administrative activities.

Many people with legal training are not employed as lawyers but are in other occupations where they can use their knowledge of law. They may, for example, be insurance adjusters, tax collectors, probation officers, credit investigators, or claims examiners. A legal background is also a valuable asset to people seeking or holding public office.

Where Employed

An estimated 250,000 lawyers were employed in 1965, with the great majority working full time. Of the total number, approximately 3 out of 4 were in private practice. More than half of the private practitioners were in practice by themselves, about 35 percent were in partnerships, and the remainder—less than 10 percent—worked for other lawyers or law firms.



Lawyer researches legal precedents for client's case.

The greatest number of salaried attorneys are employed by government agencies. In 1963, the Federal Government employed approximately 15,000 attorneys, chiefly in the Department of Justice, the Department of Defense, and the Veterans Administration. About 6,500 attorneys were employed by State governments, and 7,700 held positions with city or county governments.

The second largest number of salaried lawyers are employed by private companies, including large manufacturing firms, banks, insurance companies, real estate firms, and public utilities. Most of the remainder teach in law schools. Some lawyers in salaried legal positions also have an independent practice; others do legal work on a part-time basis while primarily employed in another occupation.

Although lawyers practice in all parts of the country, most of them are in cities and in the States with the greatest population. In 1963, for

example, about 30 percent of all lawyers were distributed among New York City, Chicago, Washington, D.C., Los Angeles, Boston, Detroit, Philadelphia, and Cleveland.

Training, Other Qualifications, and Advancement

Before a person can practice law in the court of any State he must be admitted to the bar of that State. In all States, applicants for bar admission must pass a written examination; however, a few States waive this requirement for graduates of their own in-State law schools. Other usual requirements are U.S. citizenship and good moral character. If a lawyer has been admitted to the bar in one State, he can usually be admitted to practice in another State without taking an examination, provided he meets the State's standards of good moral character and has a specified amount of legal experience. The right to practice before Federal courts and agencies is controlled by special rules of each court or agency.

To qualify for the bar examinations in the majority of States, an applicant must have completed a minimum of 3 years of college work and, in addition, must be a graduate of a law school approved by the American Bar Association or the proper State authorities. Some States will accept study in a law office instead of, or in combination with, study in a law school—though this method of training is now rare. A few States will accept study of the law wholly in a law office; only one State will accept study of the law by correspondence. A number of States require registration and approval by the State Board of Examiners before students enter law school or during the early years of legal study. In a few States, candidates must complete a period of clerkship in a law office before they are admitted to the bar.

As a rule, it takes 7 years of full-time study after high school to complete the required college and law school work. The most usual preparation for becoming a lawyer is 4 years of college study followed by 3 years in law school. However, many law schools admit students after 3 years of college work. A few schools, particularly if they have a 4-year, full-time curriculum, may accept students after 2 years of college work. On the other hand, an increasing number of law schools are requiring applicants to have a college degree. Law schools seldom specify the college subjects which must be included in students' prelegal education. However, courses in English, history, economics, and other social sciences, logic, and public speaking are all important for prospective lawyers. In general, their college background should be broad enough to give them an understanding of society and its institutions. Students interested in a particular aspect of the law may find it helpful to take related courses; for example, engineering and science courses would be useful to the prospective patent attorney, and accounting would be useful to the future tax lawyer.

Of the 162 law schools in existence in 1964, 135 were approved by the American Bar Association and the others—chiefly night schools—were approved by State authorities only. A substantial number of full-time law schools have night divisions designed to meet the needs of part-time students; some law schools have only night classes. Four years of part-time study is usually required to complete the night-school curriculum. In 1964, about one-quarter of all law students in ABA-approved schools were enrolled in evening classes.

The first 2 years of law school are generally devoted to fundamental courses such as contracts, criminal law, and property. In the third year, students may elect courses in specialized fields such as tax, labor, or corporation law. Practical experience is often obtained by participating in legal aid activities sponsored by the school, in the school's practice court where the students conduct trials under the supervision of experienced lawyers, and by writing on legal issues for the school's law journal. Upon graduation, the degree of bachelor of laws (LL.B.) is awarded by most schools, although a few confer the degree of juris doctor (J.D.). Advanced study is often desirable for those planning to specialize in one branch of the law or to engage in research and law-school teaching.

Most beginning lawyers start in salaried positions, although some go into independent practice immediately after passing the bar examination. Young salaried attorneys usually act as assistants (law clerks) to experienced lawyers

or judges. Initially, their work is limited to research such as checking points of law; they rarely see a client or argue a case in court. After several years of progressively responsible salaried employment, during which time they can obtain experience and funds and become better known, many lawyers go into practice for themselves. Some lawyers, after years of practice, become judges.

Employment Outlook

Graduates from widely recognized law schools and those who rank high in their classes will have very good employment prospects through the mid-1970's. They are expected to have good opportunities for obtaining salaried positions with well-known law firms, on the legal staffs of corporations and government agencies, and as law clerks to judges. Graduates of the less well-known schools and those who graduate with lower scholastic ratings may experience some difficulty in finding salaried positions as lawyers. However, numerous opportunities will be available for law school graduates to enter a variety of other types of salaried positions requiring a knowledge of law. Law graduates will also be in demand as commissioned officers in the Armed Forces for legal assignments. Young attorneys who open their own law offices after being admitted to the bar will, as in most other independent professions, generally face a period of low earnings while they build up their practice.

Prospects for establishing a new practice will probably continue to be best in small towns and expanding suburban areas. In such communities, competition with other lawyers is likely to be less than in big cities; also, office rent and other business costs may be somewhat lower, and young lawyers may find it easier to become known to potential clients. On the other hand, opportunities for salaried employment will be limited largely to big cities where the chief employers of legal talent—government agencies, law firms, and big corporations—are concentrated. For able and well-qualified lawyers, good opportunities to advance will be available in both salaried employment and private practice.

Although the majority of employment opportunities for new lawyers will arise from the need to replace those who retire, die, or otherwise leave the field, the total number of lawyers is expected to grow over the long run. However, continuing a recent trend, the number of lawyers in independent practice may remain stable or decline somewhat. Most of the growth will result from the continuing expansion of business activity and population. In addition, the increased use of legal services by low- and middle-income groups will add to the long-term growth in demand for lawyers. For example, expansion of legal services for low-income groups may come about through the Community Action Programs authorized under the Economic Opportunity Act of 1964. The growing complexity of business and government activities is expected to create a steadily expanding demand for lawyers who have extensive experience in fields such as corporation, patent, administrative, labor, and international law.

Opportunities for women lawyers, who comprised less than 3 percent of the profession in 1963, will probably continue to be limited for some time to come. More than half of all women lawyers are employed in salaried positions, a few are in practice for themselves. Many women trained in the law hold positions not as attorneys but in occupations requiring a knowledge of law.

Earnings and Working Conditions

The average salary of lawyers employed in beginning positions with manufacturing and other business firms was nearly $7,200 a year in early 1964, while those with some experience earned average salaries of $8,500. Average (median) starting salaries of lawyers employed by cities and counties were about $7,500 in early 1964, according to the limited data available. In the Federal Government, the annual starting salary for attorneys who had passed the bar was either $6,050 or $7,220 in early 1965, depending upon personal qualifications.

Beginning lawyers working for small law offices or 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 find it necessary to work part time in another occupation.

Lawyers' earnings generally rise with increased experience. Those employed on a salaried basis receive increases as they demonstrate their ability to assume greater responsibilities. In early 1964, the average annual salary of attorneys in private industry who were in charge of legal staffs was over $24,000. Incomes of lawyers in private practice usually grow as their practices develop. Private practitioners who are partners in law firms generally have greater average incomes than those who practice alone.

Lawyers often work long hours and 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 are able to determine their own hours and workload, many stay in practice until well past the usual retirement age.

Where To Go for More Information

The specific requirements for admission to the bar in a particular State may be obtained from the clerk of the Supreme Court or the secretary of the Board of Bar Examiners at the State capital. Information on law schools and on law as a career is available from:

The American Bar Association,
1155 East 60th St., Chicago, Ill. 60637.

Librarians

(2d ed. D.O.T. 0–23.)
(3d ed. D.O.T. 100.118 through .388)

Nature of Work

Recording and making information widely available is the job of the librarians. Librarians select and organize collections of books, pamphlets, manuscripts, periodicals, clippings, and reports, and assist readers in their use. In many libraries, they also make available phonograph records, maps, slides, pictures, tapes, films, and filmstrips. In addition to classifying and cataloging books and other loan items, they publicize library services, study the reading interests of people served by the library, and provide a research and a reference service to various groups of people. Librarians may also review and abstract published materials, and prepare bibliographies.

In a small library, a librarian performs a great variety of tasks. In a large library, each librarian may perform only a single function such as cataloging, publicizing library services, or providing reference service, or he may specialize in a subject area such as science, business, the arts, or medicine.

Librarians may be classified by the type of library in which they are employed: Public library, school library, college or university library, or special library. In each of these types, there are two principal kinds of library work—reader services and technical services. Those who perform reader services—for example, reference librarians and children's librarians—work directly with the public. Librarians who perform technical services, including those who process books, such as catalogers or acquisition librarians often deal less directly with the public.

Public librarians serve all kinds of readers—children, students, teachers, research workers, and

Librarian charges out book to reader.

others. 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. Such a system may also include librarians who supervise branch libraries, and other librarians who are specialists in certain areas. The duties of some of these specialists are briefly described as follows: *Acquisition librarians* purchase books and other library materials recommended by staff members, keep a well-balanced library in quantity and quality, make sure that the library receives what it orders, and maintain close contact with book jobbers and publishers. *Catalogers* classify books under various subjects and otherwise describe them so they may be identified through card catalogs. *Reference librarians* aid readers in their search for information—answering specific questions or suggesting sources of information. This work requires a thorough understanding of bibliographic material and a general knowledge of library materials in various subject fields. *Children's librarians* plan and direct special programs for young people. Their duties include instructing children in the use and content of the library, giving talks on books, and maintaining contact with schools and community organizations. Often they conduct a regular story hour at the library and sometimes on radio or television. *Adult services librarians* may select materials for and advise mature readers. They are often asked to suggest reading materials, and to cooperate in, or plan and conduct, educational programs on such topics as community development, public affiairs, creative arts, problems of the aging, or home and family life. *Young adult services librarians* may select books and other materials for young people of junior high school and high school age and guide them in the use of these materials. They may arrange book or film discussion groups, concerts of recorded popular and classical music, and other programs related to the interests of young adults. They may also help to coordinate the services of the school libraries and the local public library. *Bookmobile librarians* take library materials to people who live in areas where other public library services are nonexistent or inadequate.

School librarians work with pupils as well as with teachers and school supervisors concerned with planning the curriculum. They prepare lists of printed and audiovisual materials on certain subjects; meet with faculty members to select materials for school programs and select, order, and organize library materials. They instruct students in the use of the library and visit classrooms to familiarize students with library materials relating to the subjects being taught. Many school librarians are employed by school district central offices as supervisors to plan and coordinate library services for the entire school system, as catalogers, and as librarians to administer professional libraries for teachers. Very large high schools may employ several professional librarians, each responsible for a special aspect of the library program or for special subject materials.

College and university librarians work with students, faculty members, and research workers, in general reference work or in a particular field of interest, such as law, medicine, economics, or music. In addition, they may teach one or more classes in the use of the library. Some specialize in acquisition and cataloging. A few librarians, who are employed in university research projects, operate documentation centers, sometimes using computers and other modern devices to record and retrieve specialized information.

Special librarians work in libraries maintained by commercial and industrial firms, such as pharmaceutical companies, banks, and advertising agencies; professional and trade associations; government agencies; and other types of organizations. These librarians plan, acquire, organize, and catalog collections designed to provide intensive coverage of information resources about subjects of special interest to the organization. The special librarian utilizes his extensive knowledge of the subject matter, as well as of library science, in building up library resources, advising and assisting library users, abstracting, and routing available materials. Literature searching and the preparation of summaries, translations, bibliographies, and special reports are among the major duties of special librarians.

Science information specialists, like special librarians, work in technical libraries maintained by commercial and industrial firms. How-

ever, they must possess a more extensive technical and scientific background than special librarians. They not only perform many of the duties of special librarians, but they also develop coding and programing techniques for using electronic and electromechanical information storage devices and abstract complicated information into short, readable form, and interpret and analyze data for a highly specialized clientele.

Where Employed

In 1965, about 72,000 people were employed as full-time professional librarians. School librarians and public librarians each accounted for about one-third of this professional group. Librarians in colleges and universities and those employed in special libraries (including libraries in government agencies), each accounted for about one-sixth of the total employment of full-time professional librarians. An additional 15,000 to 20,000 partly trained and part-time people were also working as librarians. A small number of librarians were employed as teachers and administrators in schools of library science.

About 80 percent of all librarians are women. Men are more frequently employed than women in executive and administrative positions in large library systems and in special libraries concerned with science and technology.

Most librarians work in cities and towns. Those attached to bookmobile units serve widely scattered population groups mostly in suburban or rural areas. Rural, suburban, and town public libraries are being organized increasingly into county and multicounty systems, with centralized reference and technical services. The headquarters for these library organizations are frequently in the largest town or the governmental seat of the region or county served.

Training, Other Qualifications, and Advancement

To qualify as a professional librarian, one must ordinarily have completed a course of study in a graduate library school. This usually means at least 5 years of college—4 to meet requirements for a bachelor's degree and a fifth year or more of specialized study in library science, after which the master's degree is conferred. A growing proportion of the persons in administrative and other high-level library positions have such training. 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 school library system. For those who are interested in the special libraries field, a doctorate in a scientific subject field would also be highly desirable.

In 1964, there were 33 library schools in the United States which were accredited by the American Library Association. Many other colleges offer courses within their 4-year undergraduate programs as well as at the graduate level which prepare students for some types of library work.

Entrance requirements to graduate schools of library science commonly include (1) graduation from an accredited 4-year college or university, (2) a good undergraduate record, and (3) a reading knowledge of at least one foreign language. Some schools also require introductory undergraduate courses in library science. Most library schools emphasize the importance of a liberal arts undergraduate program with a major selected from one of the following: Social sciences, physical and biological sciences, the arts, or comparative literature. Some schools require entrance examinations.

Special librarians and science information specialists must have extensive knowledge of the subject with which their work will deal, as well as training in library science. In libraries devoted to scientific information, librarians must know well one or more foreign languages. They must also be well informed about new equipment, methods, and techniques used in storing and recalling technical information.

Many students attend library schools under cooperative work-study programs, combining their academic program with practical work experience in a library. To aid the student in arranging his work-study schedule, many schools have adopted the policy of offering all courses every semester. 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. Numerous loans, assistantships, and financial aids are also available.

School librarians must be certified in most States as having met the requirements for both librarians and teachers. Certification of public librarians is required in 23 States and is optional in 13 others. Other requirements, based on different combinations of education and experience, are sometimes established by local, county, or State authorities. In the Federal Government, completion of a 4-year college course, including at least 24 credit hours of library science or the equivalent in experience, is required for beginning positions; candidates with a year of graduate work in library science are eligible for appointment to a higher grade.

In addition to an appropriate educational background, a person interested in becoming a librarian should have above-average intelligence, an interest in people, an attraction to books, intellectural curiosity, an ability to express himself clearly, a desire to search for and use recorded materials, and an ability to work harmoniously with others.

Experienced librarians may advance to administrative positions or to specialized work. Promotion to these higher positions may be limited, however, to those who have completed graduate training in a library school, or to those who have had specialized training and experience.

Employment Outlook

The employment outlook for trained librarians is expected to be excellent through the mid-1970's. A nationwide shortage of trained librarians now exists and is expected to continue despite the anticipated rise in the number of library school graduates. Thus, it appears that qualified librarians will have employment opportunities in most parts of the country and in all types of libraries. The greatest shortage areas, in the order named, will probably be in school libraries (especially on the elementary school level), special libraries, children's libraries, college and university libraries (especially in research, subject specialties, and some languages).

As long as there is a shortage of fully trained librarians, persons who have only a bachelor's degree with a major in library science, as well as some college graduates who have had little or no library training, will continue to find employment opportunities in libraries. Many part-time positions will also be available for persons trained in library work. Retired librarians should be able to find employment in short-term positions as consultants, as substitutes for librarians during vacation periods, or in other types of library work. Jobs for library assistants will also be available for college students or other persons interested in gaining library experience.

Over the long run, the demand for full professional librarians to meet the requirements of a growing and increasingly well-educated population will be intensified by the vast and continuing expansion in the volume and variety of materials which must be processed for reader use. Also, because of the ever-increasing demands upon high-level executives in business and industry, management will tend to rely more heavily on the services of special librarians and science information specialists to keep abreast of new developments. The increase of Federal aid through the Library Services and Construction Act (1964), the Elementary and Secondary Education Act (1965), and the Higher Education Act (1965), may further increase the demand for librarians. Improved standards for school and college libraries and the expanding student population will also necessitate the employment of a growing number of fully trained librarians. Furthermore, as new methods of storing and retrieving information by means of computer equipment are developed, demand for science information specialists will be very great. Especially well-qualified librarians will probably continue to find some opportunities for employment in the Armed Forces and U.S. Information Agency overseas. Several thousand librarians will also be needed each year to fill positions vacated by young women who leave their jobs to care for their families, and to replace librarians who transfer to other types of work, retire, or leave the field for other reasons.

Earnings and Working Conditions

The annual average starting salary of new library school graduates was about $5,900 in 1963. Specialists with extensive experience earned up to $15,000 or more. The degree of responsibility and technical skill required, as well as geographical location, size, and type of library are im-

portant factors which determine librarians' salaries.

Public libraries serving large cities and urban-centered county library systems paid new library school graduates between $5,800 and $6,000 in 1964. Department heads in these libraries earned $7,000 to $9,000 or more a year, while a number of chief librarians earned $10,000 and over annually. The heads of the libraries in the large cities have annual salaries of $16,000 and up.

In the Federal Government, the annual entrance salary for librarians with a bachelor's degree was $5,000 in early 1965; for those with a master's degree, it was $6,050. Many in supervisory and administrative positions earned annual salaries ranging from about $12,075 to $16,460, and a few earned more.

In 1964, annual starting salaries of special librarians with a master's degree in library science generally ranged from $5,800 to $6,000 for those with a general liberal arts background and from $6,000 to $6,300 for those with a physical science background. Experienced special librarians and information specialists with a Ph. D. degree in a subject field earned between $12,000 and $15,000 a year.

The 1964 estimated annual salaries of head librarians in universities averaged more than $13,000 in public institutions and over $11,000 in private institutions, while head librarians employed in public and private liberal arts colleges, averaged over $9,000 and $7,000, respectively. Some head librarians in large universities earned over $20,000. Earnings in junior colleges were somewhat lower than those in liberal arts colleges. Elementary and secondary school librarians usually are paid on the same salary scale as teachers, increases in salary being granted as experience and further graduate education are acquired.

The typical workweek for librarians is 5 days, amounting to from 35 to 40 hours. The work schedule of public and college librarians may include some Saturday, Sunday, 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.

Where To Go for More Information

Additional information, particularly on accredited schools, certification requirements, and scholarships or loans may be obtained from:

American Library Association,
50 East Huron St., Chicago, Ill. 60611.

Information on requirements and placement of special librarians may be obtained from:

Special Libraries Association,
31 East 10th St., New York, N.Y. 10003.

Additional information on employment opportunities for librarians and about library development may be obtained from:

Library Services Branch, Office of Education, U.S. Department of Health, Education, and Welfare, Washington, D.C. 20202.

Individual State library agencies can furnish information on scholarships available through their offices, on requirements for certification, as well as general information about career prospects in their regions. State boards of education can furnish information on certification requirements and job opportunities for school librarians.

Photographers

(2d ed. D.O.T. 0–56.01 through .31)
(3d ed. D.O.T. 143.062, .282 and .382)

Nature of Work

Photography is an artistic and technical occupation involving much more than taking clear pictures of people or views. Some photographers produce pictures which are so beautifully composed, otherwise artistic, and striking that they are recognized as works of fine art. Skillful portrait photographers take pictures which are not only natural looking and attractive, but express the personality of the individual. Photo-

graphing sports and other news events also calls for special photographic skills, as do other branches of photographic work.

In taking pictures, photographers use a variety of cameras—miniature (35 min.), still, motion picture, and others. The cameras may be equipped with telescopic, wide-angle, or other special lenses and with different types of light filters, to enable the photographer to get the particular effects desired in each picture. Photographers also utilize many kinds of film and must know which to use for each type of picture, lighting condition, camera, and filter. When taking pictures indoors or after dark, they use lighting equipment—flash bulbs for some pictures, flood and other special lights and reflectors for others. In addition, photographers must understand and be able to carry through the chemical and other processing by which pictures are developed, enlarged, and printed. In small shops and photographic departments, the photographer often has to do all this technical work. This may be required also in large studios, but, as a rule, such studios employ photographic technicians to do the needed technical work. The techniques involved in taking motion pictures differ greatly from those used in still photography and, therefore, most photographers restrict themselves to one field or the other.

Many professional photographers specialize in particular areas such as portrait work, commercial photography, or industrial photography. Portrait photographers work in their own studios, though they also go to people's homes and other places to take pictures. Commercial photographers generally take pictures for use in advertising real estate, furniture, food, apparel, and other items, but they may also do other kinds of photographic work. Industrial photographers work for a single firm or company, mainly taking pictures that are used in company publications and for advertising company products or services. They may take motion pictures of workers on the job and of equipment and machinery operating at high speed to simplify work methods or to improve the production process. Other photographic specialties include press photography (photo journalism that combines a "nose for news" with photographic ability); aerial photography; educational photography (preparing slides, film strips, and movies for use in the classroom); and science and engineering photography (the development of photographic techniques for use in space photography and related fields). Some photographers write for trade and technical publications, teach photography in schools and colleges, act as representatives of photographic equipment manufacturers, manage photofinishing establishments, sell photographic equipment and supplies, produce documentary films, or do freelance work.

Skillful portrait photographer captures his subject's personality.

Where Employed

About 52,000 photographers were employed in 1964. About half of them worked in portrait or commercial studios—many in business for themselves, the rest as salaried employees. In addition, sizable numbers were employed in industry; some worked for Federal, State, and local government agencies; and others operated camera stores or worked on the staffs of newspapers and magazines. Still others worked as freelance photographers, taking pictures of many kinds and selling them to advertisers, magazines, and other customers.

Photographers work in all parts of the country, in small towns as well as large cities. They are concentrated, however, mainly in States which are heavily populated—California, New York, Pennsylvania, Ohio, and Illinois—and which also

have great numbers of businesses and industrial establishments.

Training, Other Qualifications, and Advancement

After graduating from high school, young people may prepare for work as professional photographers through 2 or 3 years of on-the-job training in a portrait or commercial studio. A trainee generally starts by working in the darkroom, where he learns how to develop and print film and to do other related work such as making enlargements. Later, he may set up lights and cameras or otherwise assist an experienced photographer in taking pictures. Photographic training can also be obtained in many colleges and universities, trade schools, and technical institutes, or by taking correspondence school courses. Several colleges and universities offer 4-year curriculums leading to a bachelor's degree with a major in photography. These curriculums include liberal arts courses as well as courses in professional photography. A few institutions have 2-year curriculums leading to a certificate or an associate degree in photography. Training in design, at art schools or institutes, is also useful, although these schools usually do not provide the technical training for camera work. (See statement on Commercial Artists.)

The kind and amount of training obtained greatly influence the kind of photographic work for which a young person can qualify. Amateur photographic experience may be helpful to the young person considering entry jobs in this field.

Considerable formal post-high school training, plus some photographic experience, is usually needed to enter the fields of industrial, news, or scientific photography. Photographic work in scientific and engineering research generally requires an engineering background as well as skill in photography.

The prospective photographer should have manual dexterity and some artistic ability. In addition, a pleasant personality, the ability to put people at ease, and a good business sense are needed by photographers who expect to go into business for themselves. Imagination and originality are particularly important for those aspiring to careers in commercial photography or freelance work. For press photography, a knowledge of news values and the ability to act quickly are important.

Beginning photographers often work in established studios until they accumulate the capital and experience needed to start their own businesses, although some open their own portrait or commercial studios immediately after completing their training.

Employment Outlook

Employment opportunities are expected to be favorable through the mid-1970's for talented and well-trained photographers, particularly those having good technical backgrounds. People with less ability and training are likely to encounter keen competition and limited chances of advancement. The greatest number of job openings will stem from the need to replace those photographers who transfer to other fields of work, retire, or die.

The portrait and commercial fields of photography were crowded in 1964 and this situation is likely to persist. These fields may be entered easily, since a photographer can go into business for himself without a large financial investment. Moreover, the available supply of portrait and commercial photographers is continually enlarged by people who are employed in other occupations but who take pictures in their spare time. On the other hand, a strong demand existed for industrial photographers and other specialists with a thorough knowledge of photography as well as some training in a technical or scientific field. In coming years, the employment of industrial photographers is expected to rise at a more rapid pace than that of either portrait or commercial photographers.

Over the long run, a small increase in employment of photographers is expected, as the economy grows and becomes more complex. Major factors contributing to this growth are the increasing use of photographers in research and development in industry and government and the more widespread production of film strips and motion pictures for use by business, industry, civic organizations, and government. Population expansion and the growth of the suburbs will also create some opportunities for photographers to open portrait studios in new shopping centers.

Earnings and Working Conditions

Beginning photographers generally earned from $80 to $100 a week in 1964, according to limited information from various private sources. Many photographers with established reputations earned much more. For newspaper photographers without previous experience and employed on daily newspapers having contracts with the American Newspaper Guild, minimum salaries were usually between $60 and $98 weekly. Minimum rates for photographers with some experience (usually 4 to 6 years) ranged from $100 to about $180 a week on most dailies organized by the Guild. Photographers with an engineering background who work with engineers and scientists usually receive beginning salaries of from $7,000 to $8,500 a year. The entrance salary for inexperienced photographers in the Federal Civil Service was $4,005 a year in mid-1965; for those with at least 1 year of routine photographic experience, it was $4,480 a year. In addition, the salary schedule provides for periodic increases above this amount. Most experienced photographers in the Federal Government earn $5,000 or more a year; only a few earn over $10,000 annually. Self-employed photographers generally earn more than salaried workers, but their earnings are greatly affected by business conditions, their workweek, and many other factors.

Photographers with salaried jobs usually work the standard 5-day, 40-hour week and receive benefits such as paid holidays, vacations, and sick leave. Photographers in business for themselves frequently work longer hours, especially during their busy seasons. Working conditions are generally pleasant. Freelance, press, and commercial photographers may be required to travel frequently.

Where To Go for More Information

Information about photography as a career, as well as a list of schools of photography, is available from:

Professional Photographers of America, Inc.,
152 West Wisconsin Ave., Milwaukee, Wis. 53203.

Programers

(2d ed. D.O.T. 0-69.981)
(3d ed. D.O.T. 020.188)

Nature of Work

An electronic computer, even though sometimes called a "*mechanical brain*," can only follow step-by-step instructions that tell it exactly what to do. The programer prepares these instructions.

A computer not only makes mathematical calculations at fantastic speeds, but stores many thousands of facts in its "memory" and later uses them to carry out its work. Because computers are able to work with masses of figures and facts at tremendous speed, they are used for a great deal of "data processing" which would otherwise require the time of many employees. They handle such varied assignments as keeping inventories, controlling production machinery in factories, making long-range weather forecasts, doing legal research, and analyzing air traffic patterns. Some are tasks that could never be attempted on the same scale without a computer because of the excessive amount of time required. Still others, such as controlling the flight of a missile by instantaneously correcting deviations from the planned course, are tasks that would be impossible to accomplish without the speed of a computer.

Every "problem" processed in a computer must first be carefully analyzed so that exact and logical steps for its solution can be worked out. In some cases, the preliminary work is done by an experienced programer; in others, it may be done by a specialist known as a systems analyst.

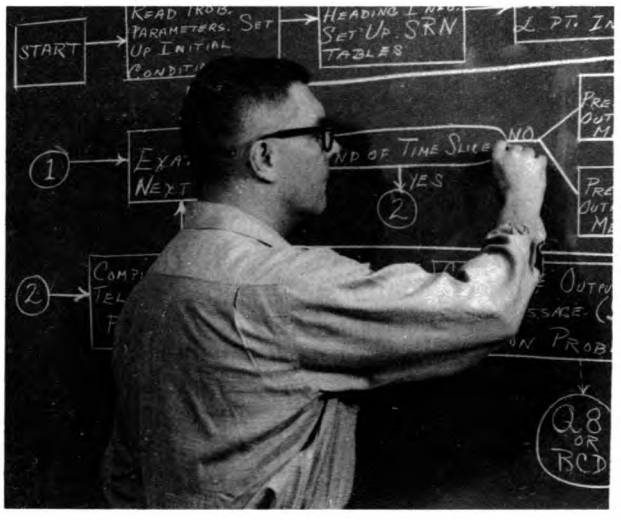
Once this preliminary work has been completed, the "program," or detailed instructions for processing the data can be prepared by the programer. Exactly how he goes about this depends not only on the type of equipment to be used, but on the nature of the problem. The mathematical calculations involved in billing a firm's customers, for example, are very different from those required in most kinds of scientific and technical work. The programing techniques are also different. Still other techniques are required in writing program-

ing "aids" which reduce the amount of detail associated with programing. Because of these differences, many programers specialize in certain kinds of work.

In business offices, where computers are frequently used to bill customers, make up payrolls, and keep track of inventories, the programer often starts his work by determining just which facts must be used to prepare documents such as customers' bills or employees' paychecks, and by ascertaining the exact form in which these facts are entered on company records. He then makes a flow chart, or diagram, showing the order in which the computer must perform each operation, and for each operation he prepares detailed instructions. These instructions, when they are relayed to the computer's memory, tell the machine exactly what use is to be made of each piece of information, in order to produce each employee's paycheck or other business document. The programer is also responsible for preparing an instruction sheet for the console operator to follow when the program is run on the computer. (The work of the console operator is descibed in the chapter on Clerical and Related Occupations.)

The final step in programing is "debugging"—that is, checking on whether the instructions have been correctly written and will produce the desired information. A program is usually debugged in two steps. First, the programer takes a sample of the data to be processed and reviews step by step just what will happen as the computer follows the series of instructions which make up the program. Then, after he has revised the instructions to take care of any difficulties that have appeared, he completes the test by having a trial run made in the computer. The console operator sometimes helps with this part of the debugging process.

A comparatively simple program can be made ready for a computer within a very few days. A program which deals with a complex problem or is designed to produce many different kinds of information may require a year or more of preparation—sometimes by a large number of programers. On involved problems, several programers at different levels of responsibility often work as a team, under the supervision of a senior programer.



Programer prepares a flow chart.

Where Employed

Based on the limited information available, it is estimated that at least 80,000 programers were employed in early 1965. Probably some were workers who spent only a part of their time in programing—engineers, scientists, economists, accountants, and other professional workers whose programing duties required specialized training in other fields or else were incidental to other major job responsibilities.

Programers are employed chiefly by large business organizations and government agencies. A great many work for insurance companies and banks, public utilities, wholesale and retail establishments, and manufacturing firms of almost every kind. A considerable number are government employees doing work related either to scientific and technical problems, or to the processing of the vast amount of paperwork which must be handled in many government offices. In addition, a growing number of programers are employed in service centers which furnish computer and programing services to business firms and other organizations on a fee basis.

Training, Other Qualifications, and Advancement

The special abilities most sought after by employers when they hire programers are similar for all types of positions, but requirements with respect to education and experience may be very

different, depending mainly on the nature of the problems with which the programer will be dealing. Some programers are college graduates with degrees in engineering, for example, whereas others have had years of experience in such work as accounting or inventory control.

In selecting programers, employers look for people with an aptitude for logical thinking and the exacting kind of analysis which is part of the job. The work also calls for patience, persistence, and the ability to work with extreme accuracy. Ingenuity and imagination are particularly important in some jobs where programers have to work out new ways of arriving at solutions to problems.

In organizations which use their computers for scientific and engineering work, most programers are college graduates, usually with degrees in engineering, the physical sciences, or mathematics. Graduate degrees may be required for some positions; for almost all positions, an applicant who has no college training is at a severe disadvantage.

Employers who use computers to process business records generally place somewhat less emphasis on technical college training. Many regard previous experience in related work—in machine tabulation, for example, or in payroll work or accounting—equally important and fill many of their programer positions by promoting qualified employees with such experience. When employers find it necessary to hire outsiders, however, they usually give preference to applicants with education beyond high school. College courses in the general field of electronic data processing, or in accounting, business administration, engineering, or mathematics provide especially good preparation.

Entrance requirements for jobs in the Federal Government are much the same as those in private industry. For practically all entry programer positions in the Government, persons hired must have a college degree, preferably with training in mathematics, or else the equivalent of such preparation in previous work experience.

Young people interested in programing jobs can acquire some of the necessary skills at a steadily increasing number of technical schools, colleges, and universities. The instruction available ranges from introductory home study and extension courses to advanced work in computer technology at the graduate level. Courses in computer programing are also open to high school students in many parts of the country. High school and post-high school instruction do not entirely eliminate the need for on-the-job training, however. Since technological changes are continually taking place in this field and each type of computer has its own special programing requirements, some additional training is often necessary even in the case of experienced programers who change from one job to another.

Most beginners in this occupation start by attending training classes for a few weeks and then, as they work on minor programing assignments, continue with further specialized training. A year or more of experience is usually necessary before a programer can handle all aspects of his job without close supervision. Once he becomes skilled, his prospects for further advancement are good. Experienced and capable programers are in strong demand. In organizations employing several programers, promotion may be to a senior programing job with supervisory responsibilities. Advancement may also be to a position as systems analyst. A few programers eventually move up to management positions with their firms.

Employment Outlook

Many thousands of new jobs for programers will become available each year during the 1965–75 decade. Employment is expected to increase very rapidly, as technological changes render computers increasingly useful to business and government, and as the number of computer installations also rises rapidly. The increase in employment is expected to be particularly sharp in firms which use computers to process business records or to control manufacturing processes. Women as well as men will find excellent opportunities for employment in this field.

The rise in employment could well be accompanied by changes in the nature of the work done by programers. Largely because of advances in programing techniques and equipment—innovations such as "automatic programing," the use of programs and parts of programs stored in libraries for future use, and other changes—much

is being done to eliminate the routine work associated with writing a program. As a consequence, professionally trained personnel qualified to handle both the programing and the systems analysis, in the areas of their specialties, are likely to be increasingly in demand for work on scientific and engineering problems. College-trained mathematicians will also find many opportunities developing the compilers and operating systems which enable computers to handle some of the time-consuming work which has hitherto been part of the programer's job. And for still other positions in this field, many of them in large business offices where the analysis is done by accountants and other subject matter experts, there is some evidence that 2 years of intensive training at the post-high school level may provide a sufficient background for beginners.

Most of the openings for programers in the years just ahead will be new jobs that arise as the number of computer installations continues to increase and computers are put to new uses. Some openings will also occur as programers advance to more responsible positions, or as they leave their jobs to enter other types of employment. Because this is still a small occupation which includes many comparatively young workers, few positions are likely to become vacant because of retirement or death.

Earnings and Working Conditions

In early 1964, salaries ranged from an average of about $5,500 a year for beginners to between $8,500 and $9,500 for experienced programers, according to a private survey which covered more than 1,000 business firms in all parts of the country. Programers with supervisory duties averaged up to $10,000 a year; and salaries for systems analysts were still higher. The survey indicated substantial differences in the salaries of the lowest and highest paid individuals in the same kinds of positions, however, with some earning up to three times as much as others in the same group. These differences were probably due partly to the kind of data processed and the kind of computer used, and partly to the industry involved and its location. In the manufacturing companies surveyed, the salaries paid programers were generally somewhat higher than in other kinds of businesses. The salaries of programers engaged in scientific and engineering work also tend to be somewhat higher-than-average, according to another private survey conducted in 1963. This latter survey also reported that salary levels varied according to the programer's educational background, with progressively higher starting salaries paid beginners with bachelor's, master's, and doctor's degrees.

Federal Government salaries for programers are comparable with those in private industry. The great majority earn between $6,000 and $12,000 a year. The minimum entrance salary for beginners was $5,000 a year in early 1965, and the top salaries of experienced programers responsible for complex programing or supervisory and administrative work ranged up to $15,000 or more a year.

The standard workweek for programers is usually the same—35 to 40 hours—as the workweek for other professional and office workers. Unlike many computer console and auxiliary equipment operators who work on a 2- or 3-shift basis, programers usually work only during the day. Occasionally evening or weekend work may be necessary—for example, when it proves particularly difficult to "debug" a program.

Work places are usually modern offices, well-lighted and air conditioned. Employers recognize the desirability of providing the best possible work surroundings, because programers working under such conditions can concentrate more readily on the very exacting kind of analysis which is an essential part of their job.

Where To Go for More Information

Additional information about the occupation of programer may be obtained from:

Data Processing Management Association,
524 Busse Highway, Park Ridge, Ill. 60068.

A list of reading materials on career opportunities in programing may be obtained from:

Association for Computing Machinery,
211 East 43d St., New York, N.Y. 10017.

School counselors may obtain a copy of the pamphlet *Careers in Electronic Data Processing*,

which has been prepared by the National Science Teachers Association and provides information on the occupation of programer, from:

Project on Information Processing, Box 201,
Montclair State College, Upper Montclair, N.J.
07087.

Psychologists

(2d ed. D.O.T. 0–36.21 through .26)

(3d ed. D.O.T. 045.088 and .108)

Nature of Work

The problems of severe emotional stress and abnormal behavior, the causes of low morale, or the effective performance of an astronaut in a space capsule, are among the concerns of psychologists seeking to understand people and to explain their actions. Psychologists study the behavior of individuals and groups and often help individuals achieve satisfactory personal adjustments. Their work includes varied activities such as teaching in colleges and universities; counseling individuals; planning and conducting training programs for workers; performing basic and applied research; advising on psychological methods and theories; and administering psychology programs in hospitals, clinics, research laboratories, and other places.

Psychologists obtain information about the capacities, traits, and behavior of people in several ways. They may interview individuals, develop tests and rating scales, study personal histories, and conduct controlled experiments. In addition, psychologists often conduct surveys, either orally or by circulating questionnaires.

Psychologists usually specialize in one of the many interrelated branches of the profession. Clinical psychologists are the largest group of specialists. Generally, they work in mental hospitals or clinics and are concerned mainly with problems of maladjusted or disturbed people. They interview patients, give diagnostic tests, and provide individual and group psychotherapy. Other specialties in psychology include experimental psychology (the study of basic learning and motivation); developmental psychology (the study of special age groups such as young children, teenagers, and the aged); personality and social psychology (the study of the social forces that affect individuals and groups); comparative psychology (sometimes called animal psychology); physiological psychology (the relationship of behavior to physiological processes); counseling psychology (helping people achieve satisfactory personal, social, educational, or occupational adjustments); educational psychology (the study of educational processes); industrial psychology (developing techniques for selecting and training workers and improving worker motivation and morale); and engineering psychology (the study of man-machine and other complex system relationships).

Courtesy of the National Institutes of Health

Psychologist uses "Psychomet" to measure an individual's reaction speed.

Where Employed

Psychologists teach in and work in college classrooms, hospitals, research laboratories, or business offices. Most psychologists are employed in large cities and in university towns, but some are on the staffs of institutions located in rural areas. Altogether, about 27,000 psychologists were employed in 1965.

Colleges and universities employ the largest number of psychologists—more than one-third

of the total. Government agencies—Federal, State, and local—employ the second largest group. Within the Federal Government, the agencies which have the most psychologists are the Veterans Administration, the Department of Defense, and the Public Health Service of the Department of Health, Education, and Welfare.

Many psychologists also work for elementary and secondary schools, for private industry, and for nonprofit foundations and clinics. A small number are in independent practice, and some serve as commissioned officers in the Armed Forces and the Public Health Service. In addition to positions with the title "psychologist," many personnel and administrative jobs are filled by persons trained in psychology.

Training, Other Qualifications, and Advancement

Generally, the master's degree with a major in psychology is the minimum educational requirement for professional employment in the field. Psychologists with this degree can qualify for positions where they administer and interpret psychological tests, collect and analyze statistical data, aid research experiments, and perform routine administrative duties. In addition, they may teach in colleges, help counsel students or handicapped persons, or—if they have had previous teaching experience—act as school psychologists or counselors. (See statements on School Counselors and Rehabilitation Counselors.) Because of the current shortage of psychologists, applicants who have only a bachelor's degree with a major in psychology may be employed for certain jobs in work related to psychology, or in other fields where training in psychology is helpful, as in administration.

The Ph. D. degree is needed for many entrance positions and is becoming increasingly important for advancement. Psychologists with doctorates are eligible for the more responsible research, clinical, and counseling positions, as well as for the higher level positions in colleges and universities, and in Federal and State programs.

At least 1 year of full-time graduate study is needed to earn the master's degree, and most students take longer. For the Ph. D. degree, a total of 4 or 5 years of graduate work is usually required. In clinical or counseling psychology, the requirements for the Ph. D. degree generally include 1 year of internship or supervised experience.

The American Board of Examiners in Professional Psychology offers diplomas in the specialties of clinical, counseling, and industrial psychology to those with outstanding educational records and experience who can pass the required examinations.

Some universities require an undergraduate major in psychology for admission to graduate work in that field. Others prefer students with a broader educational preparation, including not only some basic psychology courses but also courses in the biological, physical and social sciences, statistics, and mathematics.

Many graduate students receive financial help from universities and other sources in the form of fellowships, scholarships, or part-time employment. Several Federal agencies provide funds to graduate students, generally through the educational institution giving the training. The Veterans Administration offers a large number of predoctoral traineeships, during which time the students receive payments and gain supervised experience in VA hospitals and clinics. The Public Health Service of the U.S. Department of Health, Education, and Welfare supports doctoral study in psychology by providing funds for predoctoral and postdoctoral traineeships and research fellowships. The National Science Foundation and the U.S. Office of Education offer large programs of financial aid, including fellowships, grants, and loans. The National Institute of Mental Health also provides funds for advanced training in psychology. Part of these funds may be used to provide stipends to students for graduate and post-graduate training.

Psychologists desiring to enter independent practice must meet certification or licensing requirements in an increasing number of States. In early 1964, the following 25 States had such requirements: Alabama, Arkansas, California, Colorado, Connecticut, Delaware, Florida, Georgia, Idaho, Illinois, Kentucky, Louisiana, Maine, Maryland, Michigan, Minnesota, Nevada, New Hampshire, New Mexico, New York, Oregon, Tennessee, Utah, Virginia, and Washington.

Employment Outlook

Employment opportunities for psychologists with doctor's degrees will probaby continue to be excellent through the mid-1970's. Psychologists with master's degrees are likely to be in considerable demand but their opportunities for full professional employment will be less favorable than for those with the Ph. D. degree. In early 1964, the American Psychological Association estimated that there were many more vacancies than there were qualified psychologists to fill them. A shortage of clinical psychologists existed in State mental hospitals and mental hygiene clinics; psychologists were being sought to fill vacancies in both elementary and secondary schools; and a number of openings in research, clinical, and counseling positions were reported by several agencies of the Federal Government. Continued rapid expansion of this profession is expected, particularly in view of the passage in 1963 of the Mental Retardation Facilities and Community Mental Health Centers Construction Act.

A large increase is anticipated in the number of psychologists employed by State agencies. Currently understaffed mental hospitals and mental hygiene clinics will need many clinical, counseling, social, and physiological psychologists. Prisons, training schools, and other State institutions are expected to use psychologists more extensively in the future.

Increasing awareness of the need for testing and counseling children, plus growing school enrollments, are expected to increase the employment of psychologists in both elementary and secondary schools. In colleges and universities, more psychologists will be needed for student personnel work, as well as for teaching. (See statement on College and University Teachers.) The trend toward greater use of psychological techniques by private industry is likely to continue, thereby creating new openings for experimental, industrial, personnel, and human engineering specialists.

Many openings for psychologists with Ph. D. degrees who are specialists in clinical, counseling, experimental, human engineering, physiological, social, and personnel psychology are expected in the Veterans Administration, the Department of Defense, and in State and local areas.

Some vacancies will occur each year owing to retirements and deaths. However, such openings will be relatively few during the 1960's because psychologists as a group are young. The transfer of psychologists to work of a purely administrative nature may also create some job vacancies. Most opportunities, however, will result from the rapid expansion that is anticipated for the profession.

Earnings and Working Conditions

In 1964, beginning salaries for psychologists with master's degrees were generally between $5,500 and $7,000 a year, according to the limited data available. Those with the doctorate earned between $7,500 and $9,000 a year. In the Federal Government, psychologists with limited experience but who had completed all requirements for the doctoral degree could start at $8,650 in early 1965.

Most psychologists can look forward to a growth in earnings as they gain experience. The National Science Foundation's 1964 National Register of Scientific and Technical Personnel indicates that the average (median) salary of psychologists with 5 to 9 years of experience was $9,400 a year and that of psychologists with 20 years or more of experience about $12,000. In comparison, average salaries for psychologists with only 1 year or less of experience were about $7,500 in 1964.

Self-employed psychologists generally have higher incomes than salaried employees. For example, the median annual salary of self-employed psychologists was $17,000 about 20 percent higher than the salary of those employed in industry and more than 40 percent greater than the salary of those in the Federal Government.

Where To Go for More Information

General information on career opportunities, certification or licensing requirements, and also a list of universities with approved doctoral programs in clinical and counseling psychology may be secured from:

American Psychological Association,
1200 17th St. NW., Washington, D.C. 20036.

Information on traineeships and fellowships may be secured from colleges and universities

with graduate psychology departments and from the following Government agencies:

Chief Medical Director, Department of Medicine and Surgery.
Veterans Administration, Washington, D.C. 20420.
Training Branch, National Institutes of Mental Health,
National Institutes of Health, Bethesda, Md. 20014.

Recreation Workers

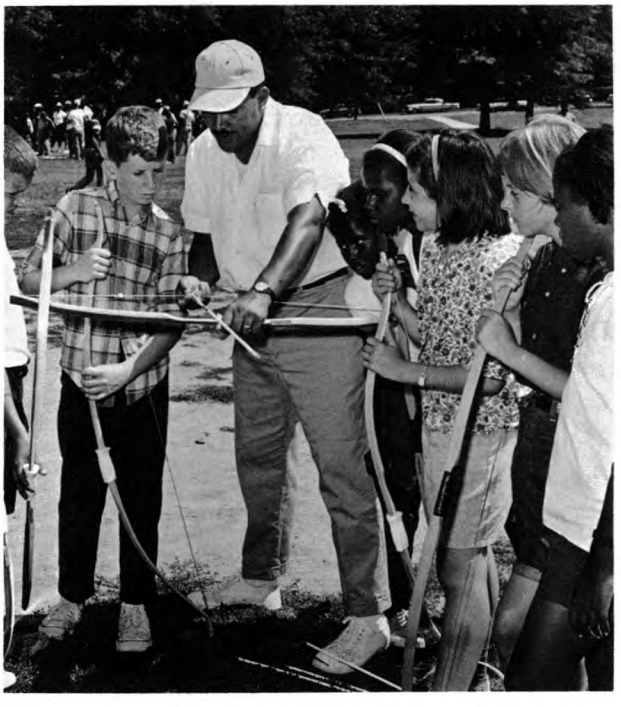
(3d ed. D.O.T. 195.288)

Nature of Work

Once leisure time was viewed as the companion of idleness, silently stealing the time needed to produce the necessities of life. In recent years, however, new machines and technology have raised the standard of living of most people and have provided for leisure hours unheard of a short time ago. How people spend their nonworking hours is now a major concern. Recreation workers help people to enjoy and constructively use their leisure time by organizing individual and group activities and by administering physical, social, and cultural programs for all age groups at camps, playgrounds, community centers, and hospitals. They also operate recreational facilities and study the recreation needs of individuals and communities.

Recreation workers employed by local government and voluntary agencies direct activities at neighborhood playgrounds and indoor recreation centers. They provide instruction in the arts and crafts and in special activities such as tennis and basketball. They may supervise recreational activities at correctional institutions and work closely with social workers in organizing programs of recreation for the young and the aged at community centers and social welfare agencies.

Many other personnel work in the specialized fields of industrial, hospital, or school recreation. Industrial recreation specialists plan the recreation programs of company employees and organize bowling leagues, softball teams, and similar activities. Sometimes they plan fund drives and company social functions. Hospital recreation specialists plan recreation programs for the ill and the handicapped in hospitals and convalescent homes. In addition, recreation therapists, who often work under the direction of a physician, help persons suffering from mental problems and physical disabilities. School recreation workers organize the leisure-time activities of school-age children during schooldays, weekends, and vacation periods.



Some volunteers and part-time recreation workers assist full-time workers throughout the year, but most nonprofessional recreation workers are employed during the summer months. These part-time workers are largely college students and teachers. They work primarily as recreation leaders and camp counselors, organizing and leading games and other activities at camps and playgrounds.

Where Employed

About 35,000 recreation workers were employed full time in early 1965; the majority worked for local governments and voluntary agencies. Most

of the remainder were employed by religious organizations and by the Federal Government in national parks, the Armed Forces, correctional institutions, and the Veterans Administration. Some recreational workers were employed by industry and a few were teachers in colleges and universities. In addition to the full-time personnel, more than 100,000 recreation workers were employed for part-time and summer work in parks, camps, and other outdoor settings.

Recreation workers are employed in all parts of the country; however, one-half of these workers are employed in California, Massachusetts, New Jersey, New York, Ohio, Pennsylvania, and Texas. More than one-third of all recreation workers are women.

Training, Other Qualifications, and Advancement

Most employers consider a bachelor's degree with a major in recreation or physical education a desirable background for work in the recreation field, although fewer than half of the recreation workers currently employed have this educational background. Persons interested in becoming recreation workers should take a broad range of courses in college, including philosophy, the humanities, natural sciences, and the arts. Specialized courses stressing the history, philosophy, and scope of recreation; the techniques of community organization; health and safety procedures; and outdoor recreation are particularly helpful. Advanced courses in recreation or public administration leading to the master's degree are desirable for persons interested in higher level administrative positions; students interested in the field of industrial recreation may find it desirable to take some courses in business administration. It is important for those interested in working as hospital recreation specialists to take courses in psychology, health education, and sociology.

Good health, emotional maturity, and a warm personality are essential qualities for recreation workers. To increase their leadership skills and their understanding of people, interested students should try to obtain related work experience in high school and college. They may do volunteer, part-time, and summer work in recreation departments, camps, youth-serving organizations, institutions, and community centers.

The majority of college graduates entering the recreation field begin as either recreation leaders or specialists, although some larger cities and organizations have trainee programs lasting 1 year. Recreation leaders work directly with groups and individuals, organizing or teaching such diversified activities as athletics, dancing, storytelling groups, and social recreation in indoor and outdoor centers. They may also supervise the work of nonprofessional workers and assist in the administration of recreation programs.

Recreation specialists are responsible for the organization and development of one activity, such as swimming and archery, or of several closely related activities. Like recreation leaders, they sometimes oversee the work of nonprofessional workers.

After a few years' experience, recreation leaders and specialists may become recreation directors; those with graduate training, however, may start at this level. Directors are responsible for the operation of the facilities, staff supervision, and the programs at a particular recreation center, as well as the preparation of budgets and the analysis of recreation programs.

Opportunities for advancement to administrative positions are often limited for persons without graduate training. However, it is sometimes possible for persons to advance through a combination of education and experience. Administrative jobs require varying years of experience in full-time recreation work, depending upon the size of the community or organization. For example, the minimum recommended experience to become a community recreation supervisor ranges from 1 to 5 years, depending upon the size of the community.

Employment Outlook

Employment opportunities for well qualified workers were excellent in early 1965. Shortages existed in all parts of the country for trained recreation workers, particularly in local govern-

ments, hospitals, and youth-serving organizations.

Opportunities for recreation workers are expected to increase rapidly at least through the mid-1970's. Thousands of recreation workers will be needed annually to allow for growth and to replace personnel who leave the field because of retirements, deaths, and transfers to other occupations. In recent years, the number of persons graduating from college with a major in the field of recreation has fallen far short of the demand, and this pattern is expected to continue. Thus, many new recreation workers will come from the related academic fields of physical education and health education; persons having less than full professional training also will find employment opportunities. As a result of the great demand for recreation workers, qualified volunteer personnel will be needed for part-time employment, particularly in social welfare agencies and at the local government level.

Increases in leisure time and rising levels of per capita income should foster growth in almost all recreational fields during the next 10 years. In recent years, more money has been spent per person on many types of sports and recreation equipment; similarly, a greater number of persons have been camping, playing baseball and tennis, and participating in many other competitive and noncompetitive sports. As family income levels continue to grow, more expenditures will be made for travel to parks and resorts for hiking, fishing, and other recreational pursuits. Improvements in the national highway system will make many State parks and national forests more accessible to vacationing families. Also, population growth will create a demand for more recreation workers to maintain existing recreation programs and to aid the mentally and physically handicapped. Longer life and earlier retirements will increase the number of clubs and organizations for retired persons, and thus increase the annual need for recreation workers.

Other reasons for the anticipated longrun expansion in the number of recreation workers include a growing interest and participation in recreation activities by the general population; the rise in industrial recreation activities as more companies promote recreation programs for their employees; increased attention to physical fitness by government, educators, and others; and the initiation of programs to insure the preservation of outdoor recreation areas. The need for physical fitness was recognized on the national level in 1961, when the President's Council on Physical Fitness was established. In 1964, the Congress passed the Wilderness Act and the Land and Water Conservation Fund Act to preserve permanently certain segments of the National Parks as wilderness areas and to help meet future outdoor recreation demands.

Earnings and Working Conditions

Beginning recreation leaders earned between $5,000 and $5,500 annually in 1964, according to the National Recreation Association. In the same year, the salaries of recreation supervisors ranged from $5,000 to $10,000, depending upon the size of the community in which they were employed and upon their qualifications. In 1962 the salaries of recreation executives ranged from $6,500 in some small communities to about $15,000 in many large cities. There were some regional variations in salary levels—higher salaries generally were paid in the West than in other areas of the country.

In early 1965, the annual starting salary for most inexperienced recreation workers in the Federal Government was $5,000; those with a superior academic record or with specialized training were eligible for positions at an annual salary of $6,050. About one-third of the recreation workers in the Federal Government earned $7,220 or more; a few in top positions earned between $10,250 and $14,170.

The average workweek for recreation workers is 40 hours, although some work upwards of 50 hours. A person entering the recreation field should expect some nightwork and irregular hours, for many recreation personnel work while other persons are enjoying their leisure time. Most public and private recreation agencies provide from 2 to 4 weeks' vacation and other fringe benefits, such as sick leave and hospital insurance.

Where To Go for More Information

Information about recreation as a career and about employment opportunities in the field may be obtained from:

National Recreation Association,
8 West Eighth St., New York, N.Y. 10011.

American Recreation Society,
1404 New York Ave. NW., Washington, D.C. 20005.

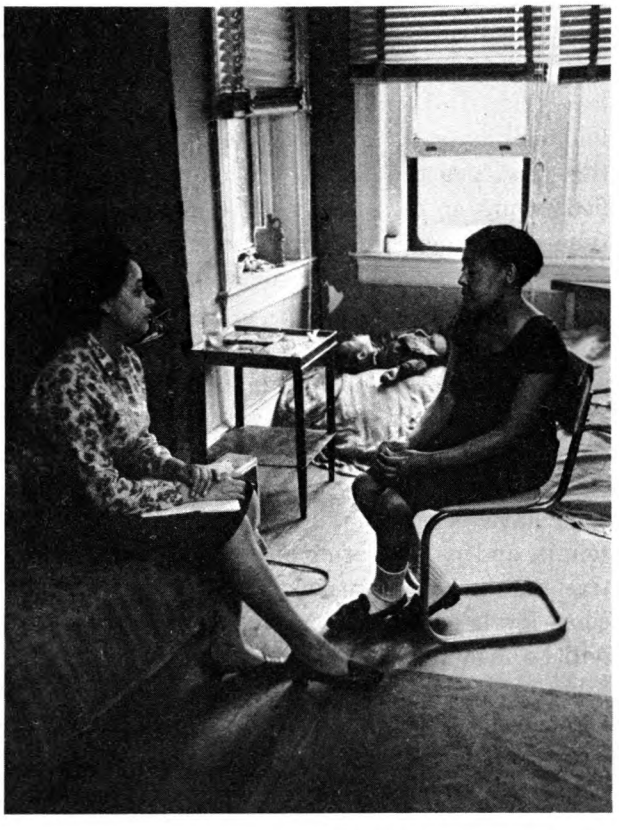
Information about employment opportunities in Veterans Administration hospitals may be obtained directly from the hospitals or the Department of Medicine and Surgery, Veterans Administration, Washington, D.C., 20421.

Social Workers

(2d ed. D.O.T. 0–27.06 through .50)
(3d ed. D.O.T. 195.108, .11T, .168, .208, and .228)

Nature of Work

In a complex urban society, where constant change is the rule, serious social problems often occur. Social workers are concerned with such problems as poverty; unemployment; broken homes; family maladjustment; physical, mental, and emotional handicaps; antisocial behavior; racial tensions; limited recreation opportunities; and inadequate housing. A variety of public and voluntary agencies have social work programs designed to meet specific needs in specific ways; for example, public assistance programs; family and child welfare services; social services for the crippled, disabled, aging and ill; and programs for the prevention of juvenile delinquency. In tackling social problems, many social work agencies emphasize service to people as individuals or in family units; some place primary emphasis on working with larger groups; and still others are concerned mainly with the community's social welfare. These approaches are reflected in the three basic methods of social work practice: casework, group work, and community organization. Although social workers in all agencies may use any of these basic methods at times, they tend to specialize in the approach customary in their own agency.



Courtesy of the U.S. Bureau of Family Services

Public assistance social case worker visits welfare recipients.

Caseworkers, who deal directly with individuals or families, may help to arrange for financial assistance, homemaker services, vocational guidance, foster family or institutional care, or health services. In addition, through interviews with their clients, caseworkers try to modify feelings, attitudes, and behavior detrimental to normal adjustment and development. Group workers, who may work for settlements and community centers, youth-serving organizations, correctional institutions, or day centers for children or the elderly, help people to benefit from group activities, to learn to understand themselves and others better, and to work with others to achieve a common goal. They may plan and conduct leisure-time programs and informal educational activities for children and adolescents, for people in hospitals and homes for the aged, and for

many other kinds of groups. Community organization workers help plan and develop health, welfare, and recreation services for a neighborhood or larger area. They often coordinate existing social services and assist in fund raising for community social welfare activities.

The majority of social workers provide social services directly to individuals, families, or groups. However, a substantial number (many of them men) perform executive, administrative, or supervisory duties. Still others are college teachers, research workers, or consultants. The wide range of services provided by social workers is suggested by the descriptions of the principal areas of social work which follow:

Family service workers. Family service workers are employed by State and local governments and by voluntary agencies. Their duties include determining their clients' needs and providing counseling and social services that strengthen family life and that help clients to become self-sufficient, improve their social functioning, and make constructive use of financial assistance and other needed social services for themselves and their families.

Child welfare workers in government and voluntary agencies deal with the problems of children. They may find foster homes or institute legal action for the protection of neglected or mistreated children, arrange for homemaker service during the illness of a mother, arrange for adoptions or placements in specialized institutions, counsel youthful delinquents, or advise parents on their children's problems.

School social workers or "visiting teachers" employed by school systems also help troubled children, including those who are excessively shy, aggressive, or withdrawn; failing in school subjects for no apparent reason; hungry or ill; or truants. Workers consult with parents, teachers, principals, doctors, truant officers, and other interested people. They frequently refer a child to other social work agencies in the community for help.

Medical social workers employed by hospitals, clinics, health agencies, rehabilitation centers, and public welfare agencies work directly with patients and their families, helping them to meet problems accompanying illness, recovery, and rehabilitation. Usually these workers function as part of a medical team composed of doctors, nurses, and therapists.

Psychiatric social workers attend patients in mental hospitals or clinics. In clinical teams, composed of psychiatrists, psychologists, and other professional personnel, these workers help patients and their families to understand the nature of the illness, enlist the patients' aid in using the various kinds of help available, and guide the patients in their social adjustment to their homes and communities. In some organizations, medical and psychiatric social workers are grouped as "clinical social workers." Psychiatric social workers also participate in community mental health programs concerned with the prevention of mental illness and with the readjustment of mental patients to normal home and community living.

Social workers in rehabilitation services assist emotionally or physically disabled persons in adjusting to the demands of everyday living. As part of a rehabilitation team, which usually includes physical or occupational therapists, these social workers serve as a link with the community while patients are in the hospital and later help them adjust to home and community life. (Rehabilitation counselors, a related occupational group, are discussed in a separate statement.)

Probation and parole officers and other correctional workers, who are employed primarily by Federal, State, county, and city governments, assist probationers, parolees, and juvenile offenders in their readjustment to society. They make investigations and submit reports to the courts concerning the activities of their clients. They also counsel their clients, may help them find jobs, and direct them to other services in the community when possible. In addition, they frequently arrange for child placements or adoptions, provide marriage counseling, and collect court-ordered payments for support of families and children.

Where Employed

About 125,000 social workers were employed in 1965. Of this total, approximately 60 percent were employed in State, county, and city government agencies; about 3 percent were in Federal Government organizations; and the remainder

were in voluntary or private agencies. In addition, a small number of experienced social workers from the United States were serving in other parts of the world as consultants, teachers, or technicians engaged in setting up agencies, schools, or assistance programs. They were employed by the Federal Government, the United Nations or one of its affiliated groups, national professional associations, or voluntary agencies.

Training, Other Qualifications, and Advancement

Educational requirements are virtually the same for all types of professional social work. Full professional status requires 2 years of graduate study in an accredited school of social work. (All such schools are graduate schools.) Upon successful completion of the 2-year program, students are awarded a master's degree. However, only about one-fifth of the social workers meet this requirement. People with 2 years of paid employment in social work and 2 years of membership in the National Association of Social Workers (open only to graduates of accredited schools of social work) are eligible for certification as members of the Academy of Certified Social Workers (ACSW).

In 1964, there were 66 graduate schools of social work accredited by the Council on Social Work Education. For admission to these schools, a student must have a bachelor's degree representing a broad knowledge of the liberal arts, including courses in economics, history, political science, psychology, sociology, and social anthropology. Courses in biology, statistics, journalism, and public speaking are also helpful.

Many scholarships and fellowships are available for graduate education. More than three-fourths of the full-time students in graduate schools receive some scholarship aid granted either by the schools or by employing agencies. Some social welfare agencies, both voluntary and public, offer plans whereby workers can take "educational leave" to obtain graduate education; they may pay expenses or a salary, or both.

Although persons with only a bachelor's degree, usually in the social sciences, are employed by many social welfare agencies, opportunities for advancement for those without graduate education are limited. In voluntary family and children's agencies, graduation from a school of social work is required for employment in positions above beginning levels. In both public and voluntary agencies, employment in certain specialized areas, such as medical and psychiatric social work programs, is generally limited to graduates of schools of social work. For teaching positions, a master's degree in social work is required, and a doctorate is preferred. In research work, training in social science research methods is required, in addition to a graduate degree and experience in social work. Most entrance jobs in State public assistance and public child welfare agencies require a bachelor's degree as a minimum educational requirement. In all States, beginners must pass a written examination in social work for employment in a government agency.

Personal qualities essential for social workers include emotional maturity, objectivity, a basic interest in people and their social problems, and ability to promote good working relationships and to encourage social adjustment in others. Students should try to obtain as much related experience as possible during high school and college to determine whether they have the interest and capacity for professional social work. They may do volunteer, part-time, or summer work in such places as camps, settlement houses, community centers, or social welfare agencies. Some social welfare agencies, both voluntary and public, hire college students and, in some cases, high school students for nonclerical jobs in which the students assist social workers in case and group work.

Employment Outlook

Employment opportunities for trained social workers were excellent in 1965. Shortages existed in all areas of social work and in most parts of the country. In both public and voluntary agencies, the need for trained social workers was acute.

Over the 1965–75 period, as many as 15,000 new social workers will be needed annually to allow for growth in the profession, and to replace persons who retire, die, or leave the field for

other reasons. The current and anticipated supply of persons from professional schools of social work is expected to fall considerably short of meeting this demand. A continuing shortage of well-trained personnel would provide opportunities for part-time employment of qualified persons, particularly in voluntary agencies engaged in family casework and group work. Moreover, some persons with less than full professional training or with training in fields related to social work will likely be employed in order to bridge the gap between the demand for and the supply of fully trained social workers.

Over the long run, social workers will continue to be in great demand. The changing occupational structure of the economy has created severe problems for many unskilled workers and others whose jobs have been replaced by machines. At the same time, the conflict between the aspirations of many members of minority groups and the discrimination they face in housing, education, and employment has led to considerable social unrest. Higher birth rates and the lengthening of the lifespan of the old and the disabled through advances promoting better health have increased the proportions of the very young and the very old. Family life has been affected by various social changes. All of these factors will contribute to the need for more social workers to maintain existing programs and to inaugurate new programs for the elderly, for children, for the handicapped, and for delinquents, and to plan new social welfare programs at the community level.

Earnings and Working Conditions

In mid-1964, the average (median) starting salary paid social case workers by various State agencies was approximately $4,700, according to a survey of selected occupations by the Public Personnel Association. In some States, however, annual salaries were considerably above this level. Case work supervisors had average annual salaries ranging from about $5,800 for those with little experience to $7,200 for those with considerable experience. The average starting salary of psychiatric social workers was about $5,800, while beginning salaries of probation and parole officers averaged about $5,400.

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Salaries of social workers in a cross-section of cities and urban counties were, on the average, above those paid by State agencies. For example, according to the mid-1964 survey cited above the average (median) starting salary of social case workers in selected urban areas was about $5,300. Salaries of case work supervisors averaged $7,000 for those with little experience to about $8,500 for those with little experience to about $8,500 for those with considerable experience. Beginning psychiatric social workers had average salaries of over $6,500, while starting salaries of probation and parole officers averaged over $5,700.

In the Federal Government in early 1965, graduates of accredited schools of social work received starting salaries of $7,220 a year.

In general, graduates of schools of social work received the highest average salaries. Salaries were usually lower for persons employed in direct-service positions, such as casework or group work, than for persons working in supervisory or executive positions, although salaries paid to persons in direct-service positions in some States and localities exceeded those paid to supervisors in other locations.

The predominant scheduled workweek for social workers in 1964 was generally 40 hours; however, as many as one-third regularly worked 37½ hours or less a week. In some social work agencies, the nature of the work requires evening and/or weekend work, for which social workers usually receive compensatory time off. Virtually all social work agencies provide fringe benefits such as paid vacations and sick leave and retirement plans.

Where To Go for More Information

Information on admission requirements and scholarships in accredited graduate schools of social work and colleges offering preprofessional courses in social work, as well as on social work as a career, may be obtained from the National Commission for Social Work Careers, jointly sponsored by the Council on Social Work Education and The National Association of Social Workers. Write to:

National Commission for Social Work Careers,
345 East 46th St., New York, N.Y. 10017.

Surveyors

(2d ed. D.O.T. 0–64.)
(3d ed. D.O.T. 018.168 through .687)

Nature of Work

Surveyors play an important part in the construction of highways, airfields, bridges, dams, and other structures. They provide information on measurements and physical characteristics of the construction site. They also locate land boundaries, assist in setting land valuations, and collect information for maps, charts, and plats.

The primary task of the surveyor is to determine the precise measurements and locations of elevations, points, lines, and contours on or near the earth's surface, and the distances between points. As a rule, the surveyor is directly responsible for the survey and its accuracy. He plans the fieldwork, selects survey reference points, and determines the precise location of natural and manmade features of the survey region. He records information disclosed by the survey; makes mathematical calculations based on such information; verifies the accuracy of survey data; and prepares sketches, maps, and reports.

In making his detailed measurements, the surveyor is assisted by workers in a field party which he directs. A typical field party is made up of from three to six members in addition to the surveyor (sometimes called the party chief). Included in the typical field party are *instrumentmen*, who set up, adjust, and operate a number of surveying instruments, including the theodolite, transit, level, altimeter, and electronic measuring devices at the points designated by the surveyor; *chainmen*, who measure distances between points, using a metal tape or surveyor's chain; and *rodmen*, who use a level rod, stadia board, or range pole to assist in measuring elevations, distances, and directions between selected points.

Surveyors often specialize in one particular type of survey. Those doing *highway surveys* are concerned with establishing the points, grades, and lines needed for highway locations. Those carrying out *land surveys* locate boundaries of a particular tract of land, prepare maps, record plats of the land, and prepare legal descriptions of it for deeds, leases, and other documents. Surveyors engaged in *geodetic surveys* measure immense areas of land, sea, or space, taking into account the earth's curvature and its geophysical characteristics. Surveyors doing *topographic surveys* determine the elevations, depressions, and contours of an area, and indicate the location of distinguishing surface features such as farms, buildings, forests, roads, and rivers. Those who work on *photogrammetric surveys* apply mathematical techniques to photographs taken from airplanes or ground stations to make topographic maps, and to measure the natural and manmade features of an area. Surveyors also specialize in other types of surveys, such as *gravity*, *magnetic*, *hydrographic*, *mine*, *oil-well directional*, *pipeline*, *construction* or *railroad*.

Courtesy of the U.S. Bureau of Reclamation

Surveyors use a plane table and transit.

Where Employed

An estimated 45,000 surveyors were employed in early 1965; less than 5 percent were women. They were located in all parts of the country—in small towns as well as in large cities.

About one-half of all surveyors work for Federal, State, and local government agencies. Among the Federal Government agencies utilizing these workers are the U.S. Geological Survey and the Bureau of Land Management of the

Department of the Interior, U.S. Coast and Geodetic Survey (within the Environmental Science Services Administration) and Bureau of Public Roads of the Department of Commerce, Corps of Engineers of the Department of the Army, and Forest Service of the Department of Agriculture. Surveyors in State and local government agencies are employed mainly by highway departments and by urban planning and redevelopment agencies.

A large number of surveyors work for construction companies and for engineering and architectural consulting firms. A sizable number either work for or head surveying firms which conduct surveys on a fee or contract basis. Other significant numbers work for the crude petroleum and natural gas industries and for utilities.

Training, Other Qualifications, and Advancement

The most common method of preparing for work as a surveyor is through a combination of post-secondary school courses in surveying and extensive on-the-job training in survey techniques and in the use of survey instruments. Courses in surveying are offered in extension divisions of many post-secondary schools and in correspondence schools. Some junior colleges, technical institutes, and vocational schools offer 1, 2, and 3-year programs in surveying. The entrance requirement for most surveying programs is high school graduation, preferably including courses in algebra, geometry, trigonometry, calculus, drafting, and mechanical drawing.

For a professional career in the more specialized and technical surveying areas such as geodesy, topography, or photogrammetry, it is usually necessary to obtain a bachelor's degree in engineering or the physical sciences.

High school graduates without formal training in surveying may also enter the field, usually starting as rodmen. After several years of on-the-job experience and some formal courses in surveying, young persons may advance successively through the positions of chainman and instrumentman to that of party chief or surveyor.

With some post-secondary school courses in surveying, beginners may start as instrumentmen. In many instances, promotion to higher level positions is made on the basis of a written examination, as well as on experience.

About 40 States require licensure or registration of land surveyors responsible for locating and describing land boundaries. In some of these States, applicants for licenses are expected to know other types of surveying in addition to land surveying. Requirements for licensing vary among the States, but in general include a combination of 4 to 8 years' experience and passing an examination in surveying. If an applicant has taken post-secondary school courses related to surveying, most States will reduce the length of experience needed for licensing. In mid-1964, approximately 16,000 land surveyors were registered. In addition, almost 15,000 engineers were registered to do land surveying, primarily as part of their civil engineering duties; however, these workers are considered engineers rather than surveyors.

In addition to the necessary training and experience, qualifications for success as a surveyor include a strong liking for outdoor work. Sound health is also essential for most types of work. Because most surveyors must supervise and direct the work of others, leadership qualities and the ability to get along with others are important.

Employment Outlook

Employment opportunities for surveyors are expected to be favorable through the mid-1970's. It is anticipated that employment in the field will continue to grow rapidly. In addition to new positions created by growth, over 1,000 openings may result each year from the need to replace those who transfer to other occupations, retire, or die. Prospects will be best for people with post-secondary school training in surveying.

Among the factors expected to contribute to the favorable employment outlook is the rapid growth of urban areas and the enactment of new or revised city zoning laws which will require additional surveyors to locate boundary lines, and to lay out streets, shopping centers, schools, and recreation areas. Construction and improvement of the Nation's roads and highways will require many new surveyors. Surveying personnel will be needed in the preparation of maps and charts, primarily for Federal and State Government agencies. Furthermore, surveyors with college degrees in geodesy will be needed to help track

missiles and spacecraft, and to assist in other space activities.

Although new devices which reduce the time spent on surveys involving large stretches of land will continue to be introduced, they are not likely to affect employment opportunities significantly. These devices will make it possible to carry out certain types of surveys—such as those of rugged mountain areas, swamps, and deserts—much more accurately and economically than in the past. However, the introduction of new instruments may make it necessary for many surveyors to obtain additional training.

Employment opportunities for women surveyors will continue to be limited, primarily because much of the surveyor's work is strenuous. A few openings will be available for women with college degrees to make survey related computations, analyze data, and prepare reports in offices.

Earnings and Working Conditions

In the Federal Government service, surveyors employed as field party chiefs received a starting salary of about $415 a month in early 1965. New college graduates with bachelor's degrees qualifying for Federal Government positions as geodesists began at approximately $500 or $590 depending on their college records. Graduates with bachelor's degrees qualifying for positions in topography and photogrammetry started at about $415 or $505 a month. In private industry, according to the fragmentary data available, beginning salaries for surveyors were generally comparable to those offered by the Federal Government.

Surveyors usually work an 8-hour day and 5-day week. However, they sometimes work longer hours during the summer months, when weather conditions are most suitable for surveying activities.

The work of surveyors is active and sometimes strenuous. They may stand for long periods, and may walk long distances or climb mountains with heavy packs of instruments and equipment. Because most of their work is done out of doors, surveyors may be exposed to all types of weather conditions. Some duties, such as planning surveys, making photogrammetric measurements, preparing reports and computations, and drawing maps, are usually performed in an office.

Where To Go for More Information

General information on careers in surveying may be obtained from:

American Congress on Surveying and Mapping,
Woodward Building, Washington, D.C. 20005.

Information on the specialty of photogrammetry may be obtained from:

American Society of Photogrammetry
6269 Leesburg Pike, Falls Church, Va. 22040.

Further information on positions in the Federal Government is given in the chapter on Occupations in Government.

Urban Planners

(2d ed. D.O.T. 0-39.)
(3d ed. D.O.T. 199.168)

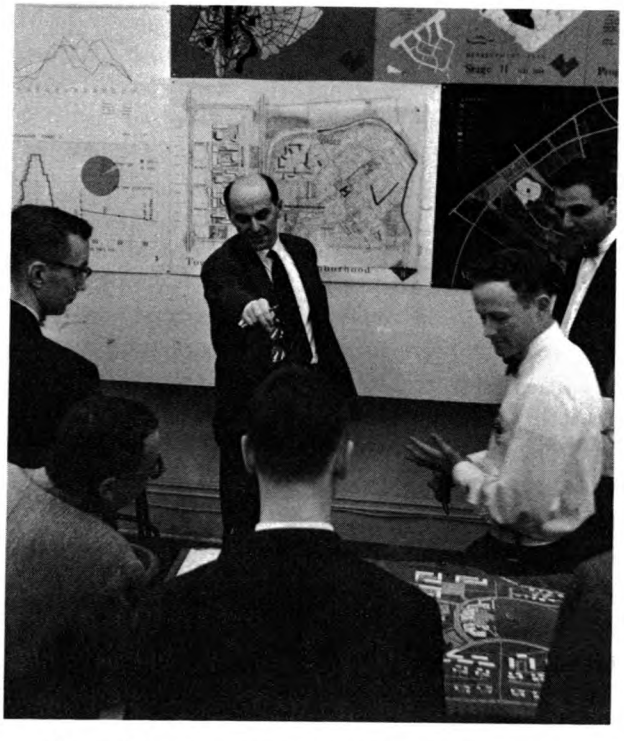
Nature of Work

City dwellers today face a growing number of typically urban problems such as deteriorating business and residential areas, traffic congestion, inadequate parks and recreation facilities, shortages of suitable space for industrial development, air pollution, and greater distances between home and work. Professional urban planners try to remedy these problems by developing comprehensive plans and programs for the overall growth and improvement of urban communities.

A community's policies and goals for development are determined by its elected governing body. The urban planner analyzes alternatives and proposes methods for achieving an efficient and attractive community within the framework of these goals. Urban planners visualize future conditions in light of the trends in population growth and social and economic change; they also estimate the community's long-range needs for land, housing, community facilities, transportation, recreation, business, and industry.

Before they can produce plans for long-range community development, however, urban planners must make detailed studies, including the preparation of maps and charts, which show the current use of land for residential, business, and community purposes; the arrangement of streets, highways, water and sewer lines; and the location of such community facilities as schools, libraries, and playgrounds. These studies also provide information on the types of industry in the community, population densities and characteristics, social features, income levels, employment and economic trends, and other related information.

After they have analyzed and evaluated the facts, urban planners may then design the layout of recommended facilities and land use, and supervise the preparation of illustrative materials. They also prepare plans to show how their proposed programs can best be carried out and what the cost is likely to be. Much of their time is spent conferring with officials of public agencies who do specialized planning, and with private land developers and civic leaders. They also may prepare materials for community relations programs, speak at civic meetings, and appear before legislative councils and committees to explain and defend their recommendations or proposals.



Urban planner describes community development plans.

In small planning organizations with only one or two professional workers, the planners must be able to handle several kinds of work. In large organizations, which may have several dozen planners, each may specialize in an area such as physical design, survey and research, or community relations work. Some specialize in new town planning or the rehabilitation of city slum areas and the reconstruction of rundown business districts.

Where Employed

More than 5,000 people were employed as professional urban planners in 1965, according to an estimate made by the American Institute of Planners. The great majority of urban planners are employed by government agencies, mainly city, county, and metropolitan regional planning organizations; some are employed by various State governments and by the Federal Government. About one-fourth of the planners do consulting work either independently in addition to their full-time job; or as an employee or partner in a private consulting firm providing services for private developers or for government agencies. Other urban planners work for large land developers or private research organizations; a few teach in colleges or universities.

In 1964, a large number of cities, some metropolitan areas, and most States employed professional planners. Cities with a population of 500,000 or more generally had large planning staffs—the median (average) number of planners employed in these cities was about 20. A few planners were employed abroad in connection with programs of aid to developing countries.

Training, Other Qualifications, and Advancement

Employers consider a master's degree in planning the most desirable educational background for professional work in this field. In Federal agencies, and in a growing number of other government agencies, 2 years of graduate work in city planning, or the equivalent, is required for most entrance level positions. However, young people with bachelor's degrees in city planning, architecture, landscape architecture, engineering,

or public administration and some other social science fields can qualify for the beginning professional level.

In 1964, about 40 colleges or universities awarded the master's degree in planning. The typical program requires that students must have successfully completed courses either at the undergraduate or graduate level in subjects such as architecture, landscape architecture, engineering, economics, statistics, sociology, public administration, or the theory and methodology of city and regional planning. Nearly all schools require students to spend considerable time in workshop, laboratory, or studio courses, learning to analyze and solve practical problems in urban planning. Most schools require candidates for the master's degree to take 2 years of graduate work and to prepare a thesis, or to take a final comprehensive examination. Nearly half of the schools require some practical experience or internship. This latter requirement is usually fulfilled by regular paid employment during summer months in a planning office approved by the school's faculty. A few schools which stress physical design grant a master's degree on completion of 1 year of graduate work to students who have the bachelor's degree in architecture or engineering.

Planners must have the ability to think in terms of spatial relationships and to visualize the effects of their plans and designs. They must also be able to get along well with people and appreciate a wide variety of attitudes and viewpoints. On occasion, they face the discouragement of seeing carefully designed plans fall through because of conflicting interests or apathy. In addition, they must be able to write and speak persuasively. It is also important that they continue their professional studies in order to broaden their knowledge and keep abreast of new developments.

Beginners in urban planning offices are likely to spend some time drafting, operating a calculating machine, or making field surveys and compiling statistics required to make projections for future plans. As they become more experienced, workers may be assigned to outline proposed studies, write reports, design the physical layout of a large development, make statistical analyses and projections, or perform other duties which require a high degree of independent judgment. When they become senior planners and planning directors, urban planners are likely to spend much time in meetings with officials in other organizations, addressing civic groups and supervising other professionals. Advancement often occurs through a move to a larger city, where the problems are more complex and the responsibilities for planning are greater.

Candidates for the position of urban planner in Federal, State, and local government agencies frequently must pass civil service examinations to become eligible for appointment. These examinations are often advertised nationally and usually do not impose residence restrictions.

Employment Outlook

Employment opportunities for graduates with professional training in city and regional planning are expected to continue to be very good through the mid-1970's. Shortages of qualified planners have been reported in recent years, even though the number of graduates has been rising. In 1964, the American Society of Planning Officials estimated that there were about 400 vacancies in planning agencies because of the shortage of well-qualified planners. Although most of these vacancies stemmed from the need to fill new planning positions, some also resulted because planners transferred to other fields of work, retired, or left the field for other reasons.

The demand for city planners is expected to continue to rise over the long run. More communities will probably turn to professional planners for help in determining the most effective way to meet the rising requirements for physical facilities that result from urbanization and the growth in population. As urban communities continue to spill into neighboring areas or merge with other urban areas, open spaces for recreation disappear, smog and traffic congestion get worse, and the need for more and better planned facilities becomes more acute. Also, the development of city plans is a requirement for local Federal financial assistance. At the present time, the Federal Government is giving financial aid to some 2,500 communities and 125 metropolitan areas under the Urban Planning Assistance Pro-

gram, and to more than 750 cities for urban renewal. Other Federal programs, such as the highway and open-space land programs, have similar planning requirements as a condition of Federal support. The important role of planners in the large-scale development of land and physical facilities for both public and private use has also been recognized by other governmental and private organizations.

Earnings and Working Conditions

Starting salaries of inexperienced planners without a graduate degree in planning were a little above $6,000 a year in local government agencies in 1964, according to a study by the American Society of Planning Officials. Entrance salaries for qualified beginners with a master's degree in planning ranged between $7,000 and $8,000 a year. Average salaries of planning directors ranged from about $9,500 in small cities to over $21,000 in cities with a population of 1 million or more. Consultants are generally paid on a fee basis. Their earnings are often high and vary greatly according to their reputation and previous work experience.

The usual entrance salary in the Federal Government was $7,220 a year in early 1965. In rare cases, individuals with less than 2 years of graduate work or its equivalent were hired as interns at salaries of $5,000 or $6,050 a year.

Since most planners work for government agencies, they usually have sick leave and vacation privileges, 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 because of the need to attend meetings with citizen's groups.

Where To Go for More Information

Information on schools which offer degrees in planning, and on employment opportunities and earnings may be obtained from:

American Institute of Planners,
917 15th St. NW., Washington, D.C. 20005.
American Society of Planning Officials,
1313 East 60th St., Chicago, Ill. 60637.

Specific information about how to obtain a Federal Government position may be obtained from the U.S. Civil Service Commission, Washington, D.C. 20415.

Clerical and Related Occupations

Almost 11 million people were employed in clerical or some closely related kind of work in 1965. A great many of these workers are occupied with the vast amount of recordkeeping and paperwork required in present-day offices. Others handle communications through mail, telephone, telegraph, and messenger services; attend to the shipping and receiving of merchandise; ring up sales on the cash registers of stores and restaurants; or do related work.

Clerical workers represent a wide variety of skills and experience. Included, for example, are title searchers and examiners in real estate firms, and confidential secretaries in business offices, as well as workers in occupations which can be entered with little specialized training or experience —messengers, file clerks, and others. For women, clerical occupations are a particularly large field of employment. More than half of all girls who go to work after completing high school find jobs in clerical and related occupations; and 7 out of 10 clerical workers are women.

By far the largest single group of clerical workers—1 out of 5—are secretaries or stenographers. Bookkeepers and accounting clerks, who represent a little more than one-tenth of the total, make up the next largest group. Chart 21 shows employment in these and in other major clerical occupations discussed in this chapter or elsewhere in the *Handbook*.

Training, Other Qualifications, and Advancement

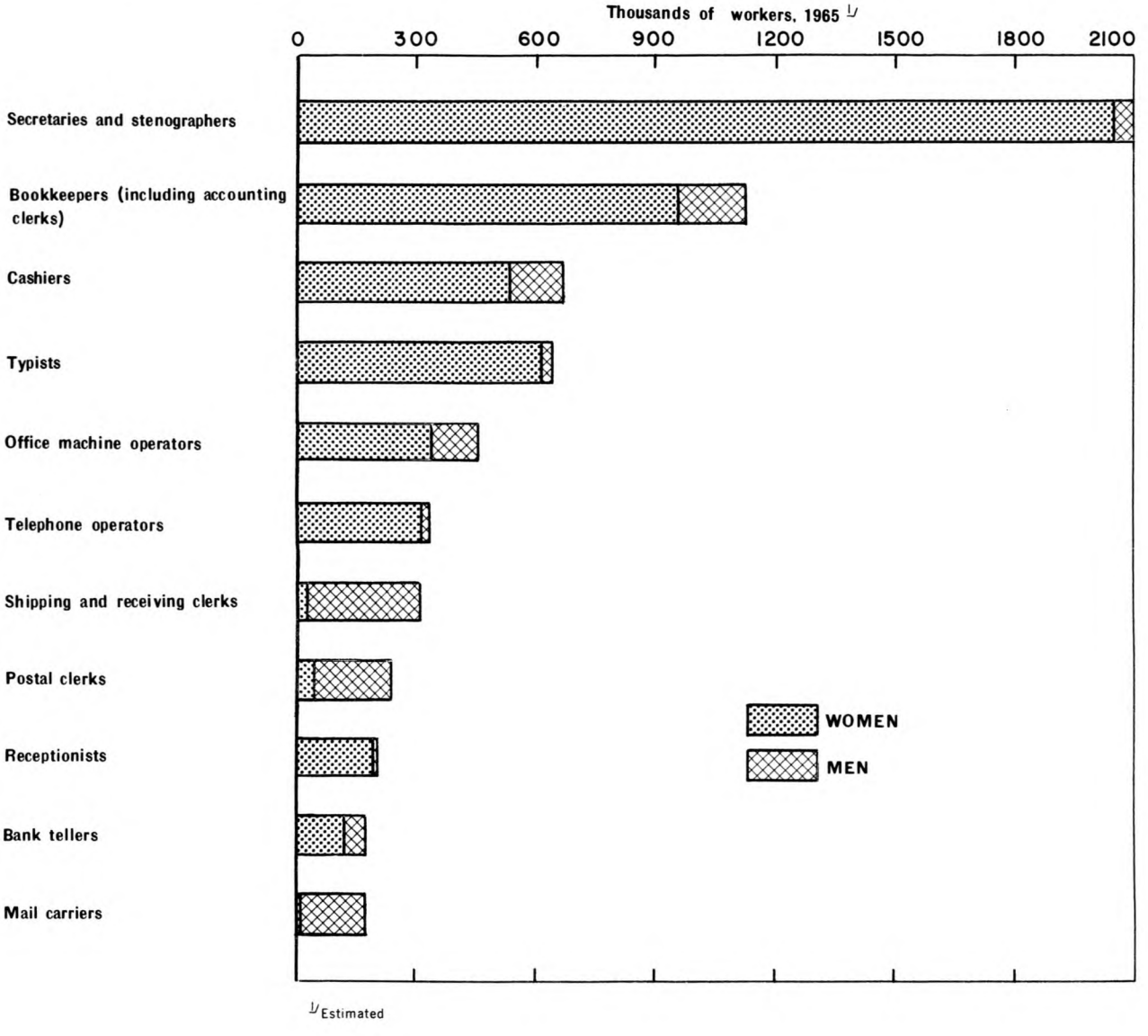
For all but the most routine clerical positions, the minimum educational requirement is usually graduation from high school. High school graduates who have had instruction in business subjects are regarded by most employers as particularly well qualified. Some companies cooperate with local high schools and business schools in office education programs which provide opportunities for students to work part time, under trained supervision, while still attending school. This experience is useful to beginners seeking office jobs after graduation. Reading comprehension, a knowledge of spelling and grammar, and ability in arithmetic are important for many types of clerical work. Some employers test applicants for clerical aptitude, to ascertain their qualifications for work in this field.

Practically all beginning clerical workers receive some on-the-job training. They learn, for example, how their employer keeps the firm's records, and what kinds of business forms are used. They may also learn to operate adding and duplicating machines and other equipment which they will occasionally use. Or, if they are to be employed as operators of tabulating machines or other specialized equipment, their employers may arrange for them to attend a school where they will receive the necessary training.

Clerical workers in modern offices use various equipment to speed their work.

CHART 21

THE MAJORITY OF CLERICAL WORKERS ARE EMPLOYED IN THESE OCCUPATIONS . . . .



Many types of clerical work offer good prospects for advancement. Some of the better paid positions—insurance claim adjuster and private secretary, for example—require a general knowledge of company policies and procedures, and are very often filled by promotion from within. In other instances, promotion may be to more difficult and higher paid assignments in a related type of work, as in the case of a keypunch operator who is selected and trained to operate a tabulating machine. In large business offices, promotion may eventually lead to supervisory or managerial positions.

Experience within an organization is often an important consideration in selecting employees for promotion. Emphasis is also placed on the

individual's training, ability, and personal qualifications. For workers without a good educational background, opportunities for advancement are likely to be limited. Many people in clerical occupations are high school graduates with some additional education in colleges or private business schools. Some are college graduates, who start as office workers with the idea of gaining experience which will later qualify them for professional or administrative positions.

Employment Outlook

Employment in clerical occupations is expected to rise very rapidly during the 1965–75 decade. As employment rises to meet the needs of an expanding economy, it is anticipated that more than 300,000 new positions in clerical and related occupations will be added each year. And an even greater number of clerical workers will be needed each year to replace those who retire or leave their job for other reasons. Employee turnover is especially high among clerical workers because many young women do this kind of work for only a few years and then leave their jobs to remain at home and care for their families.

During the 1965–75 decade, employment opportunities will be particularly numerous for workers who handle paperwork in the offices of private and public organizations—for secretaries and stenographers, typists, and bookkeeping and accounting clerks, for example. These workers will be needed particularly in banks and insurance companies, both of which are expected to continue to expand rapidly; in manufacturing establishments and in wholesale and retail trade; and in government offices, educational institutions, and professional service organizations.

The number of clerical and related jobs is expected to increase mainly because the volume of paperwork will undoubtedly expand as business organizations grow in size and complexity. On the other hand more and more mechanical equipment will undoubtedly be used to speed the process of keeping business records, particularly in large cities, and in some of these offices, the number of clerical employees may be reduced. For the economy as a whole, however, the new positions created by growth are expected to far outnumber the clerical jobs eliminated by mechanization. Furthermore, many types of clerical workers are in jobs unlikely to be materially affected by mechanization—for example, secretaries, receptionists, people responsible for collecting bills and handling complaints, and others whose duties bring them into contact with the public and require them to exercise initiative and judgment.

Since electronic computers, bookkeeping and calculating machines, and other mechanical devices are used in offices mainly to process routine and repetitive work, their use can be expected to bring about reductions in the number of clerks employed to prepare payrolls, keep track of inventories, bill customers, sort checks in banks, and do other routine work. But, as work of this kind is transferred from clerks to machines, a limited number of new positions for various kinds of machine operators will be created. This shift in type of clerical personnel will probably occur chiefly in large business firms and in the metropolitan areas where such firms tend to be concentrated.

Earnings and Working Conditions

The average salaries of women office workers in metropolitan areas surveyed by the Bureau of Labor Statistics in 1963–64 ranged from $58 a week for file clerks doing the most routine kind of work to about $107 for skilled tabulating machine operators. Within each of the 17 office occupations covered by this survey, the differences in the salaries paid some individuals were considerable; for example, a few routine file clerks earned less than $40 a week while a few others whose work was complex earned $100 or more.

Men were generally paid higher salaries than women employed in the same localities. The average for office boys was $2.50 a week more than for office girls, for example, and men employed as accounting clerks averaged nearly $20 a week more than women in the same kinds of jobs. To some extent, these differences in the salary levels of men and women in comparable jobs were due to differences in the industries where they were employed; relatively large numbers of the men were employed in manufacturing industries, where the general level of wages tends to be somewhat higher

than in retail trade and other nonmanufacturing industries. Minor differences in the duties and responsibilities assigned to men and women in comparable jobs may also affect the level of pay.

Office employees worked a 40-hour week in most of the cities included in the survey. In some, especially in the northeastern part of the country, the scheduled workweek was 37½ or 35 hours.

Office workers in large cities generally receive pay for 5 or more holidays a year and for 1 or 2 weeks of annual vacation after a year of service with their firms. Longer vacations, granted on the basis of additional years of service, may range up to 4 weeks or more with pay. Life insurance, hospitalization, surgical and medical insurance, and sick benefits are also generally available, as are retirement pension plans supplementing benefits paid under the Federal social security program.

Where To Go for More Information

Many State employment service offices can provide counselors with occupational guides giving local information about earnings, hours, and employment opportunities in clerical occupations.

Information about several clerical occupations which are of special interest to girls is contained in the following publication:

Clerical Occupations for Women, Today and Tomorrow (Women's Bureau Bulletin 289, 1964). Superintendent of Documents, Washington, D.C. 20402. Price 35 cents.

Teachers may obtain information concerning training for office occupations from:

Division of Vocational and Technical Education,
Bureau of Educational Assistance Programs,
U.S. Office of Education, Washington, D.C. 20202.

A directory of private business schools located in 300 cities throughout the country may be obtained from:

United Business Schools Association,
1518 K St. NW., Washington, D.C. 20005.

Information on wages and related benefits for office workers in 80 metropolitan areas is given in the following publication:

Wages and Related Benefits, Part I: 80 *Metropolitan Areas, 1963–64* (BLS Bulletin 1385–82). December 1964. Superintendent of Documents, Washington, D.C. 20402. Price $1.

Information on wages and related benefit earnings in 212 metropolitan areas is summarized for the northeastern, southern, north central, and western regions, and for the United States as a whole, in the following publication:

Wages and Related Benefits, Part II: *Metroplitan Areas, United States and Regional Summaries, 1963–64* (BLS Bulletin 1385–82, June 1965). Superintendent of Documents, Washington, D.C. 20402. Price 70 cents.

Stenographers and Secretaries

(2d ed. D.O.T. 1–37.12, .14 and .18; 1–33)
(3d ed. D.O.T. 201.268 and .368 and 202.368 and .388)

Nature of Work

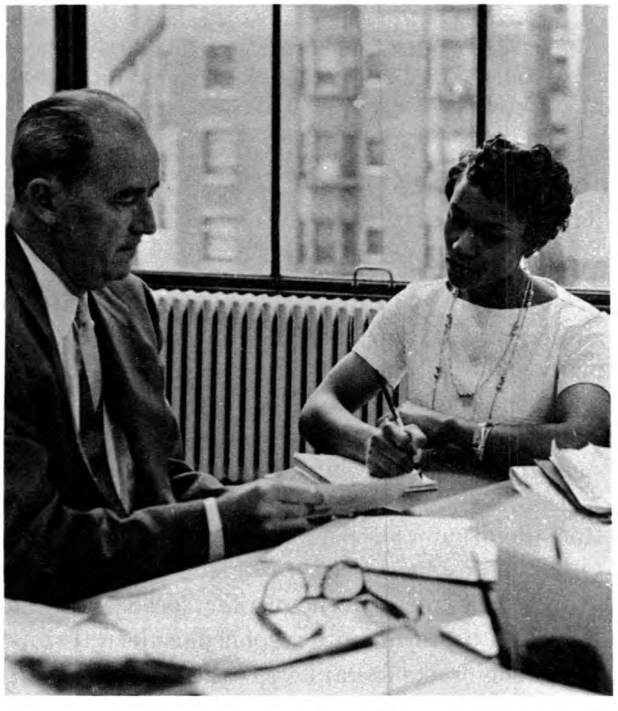
About 2 million persons were employed in 1965 in occupations requiring stenographic skills. More than 95 percent were women. Practically all stenographers and secretaries record dictation and transcribe it on the typewriter. Usually they have additional duties related to the nature of their employer's business; and sometimes they have special job titles which reflect skill levels or job specialties.

Stenographers (D.O.T. 202.388) take dictation from one or more persons and then transcribe their notes on a typewriter. Most stenographers record their notes in shorthand; some use machines which print symbols as different keys are pressed. In addition to taking and transcribing dictation, many stenographers also do other typing, answer telephones, operate various types of office machines, and perform other clerical duties. Some stenographers, including most beginners, are classified as *general stenographers;* they take fairly routine dictation and perform routine office tasks. Other, more experienced *senior stenographers* have a higher degree of stenographic speed and accuracy, and perform more responsible clerical work. Some senior stenographers, called *technical stenographers*, take dictation in medical, legal, or scientific terms, others take dictation in a

foreign language, and still others work as *public stenographers.*

Some stenographers specialize in shorthand reporting. Included in this group are *court reporters*, who record proceedings in law courts. Other *reporting stenographers* record proceedings at business and professional conventions and other meetings; report statements made by officials at press conferences and testimony given before Government legislative committees; and do other kinds of verbatim reporting. Reporting stenographers take their notes by machine or, less frequently, in written shorthand, and then either transcribe them on the typewriter or dictate them onto sound-producing records which are later transcribed by typists. Stenographers who do this kind of work must be exceptionally rapid and accurate—sometimes taking notes in technical language from many speakers and for extended periods of time.

Secretaries (D.O.T. 201.368), in addition to their stenographic work, relieve their employers of numerous routine duties and often handle a variety of business details on their own initiative. Duties vary, depending on the nature of the employer's business activities and also on the secretary's own experience and capabilities. Secretaries often handle such tasks as scheduling appointments for their employers, arranging for airline tickets and hotel reservations, taking care of some kinds of correspondence, and handling private or confidential records. Sometimes they also supervise other clerical personnel. Some secretaries, like stenographers, specialize in legal, medical, or other technical work. Others, who are *social secretaries* (D.O.T. 201.268), make arrangements for social functions, and attend to other personal and social matters for their employers.



Courtesy of the President's Committee on Equal Employment Opportunities

Where Employed

Stenographers and secretaries are employed by public and private organizations of practically every size and type. A few—chiefly public stenographers and some reporting stenographers—are self-employed.

Particularly large numbers of stenographers and secretaries work for manufacturing firms, government agencies, schools and colleges, insurance companies, banks, and hospitals. Many, including technical stenographers and secretaries, are employed in the offices of physicians, attorneys, and other professional people. Stenographic and secretarial jobs for men tend to be concentrated in educational and other professional services, and in manufacturing and public administration. More than half of the 10,000 stenographers in the United States who specialize in shorthand reporting are men.

Training, Other Qualifications, and Advancement

Adequate performance as a stenographer or secretary requires a good basic education as well as technical training. Graduation from high school is essential for practically all positions. Graduates whose high school courses have included shorthand, typing, and possibly other business subjects meet the requirements of many employers. Other employers prefer a background of academic high school subjects, supplemented by technical training taken after graduation.

Daytime and evening courses that prepare students for stenographic and secretarial work are offered by hundreds of public schools, private business schools, and colleges throughout the

country. In connection with high school courses in business subjects, some public schools conduct cooperative work-study programs which enable students to acquire practical work experience under trained supervision. Bachelor's degrees in the field of secretarial studies are conferred by the schools of business and commerce in many universities; a few confer the master's degree.

Some courses which train for stenographic work are limited to shorthand and typing, and can be completed in a few months. In other courses, which are usually of longer duration, students may also be taught additional office skills and receive instruction in general business practices and office conduct. Some courses provide intensive training to prepare students for stenographic reporting, or for legal, technical, or medical-dental secretarial work.

The time needed for students to learn shorthand, and the speed they may develop, both depend somewhat on the shorthand system used. There are many different systems—alphabet and symbol systems, as well as machine shorthand—and some are faster than others. Employers seldom have strong preferences about the system a stenographer uses, but they usually regard the rate of speed as an important factor. To qualify for positions in the Federal Government—and for employment in many private firms—stenographers must be able to take dictation at a rate of at least 80 words a minute and type 40 or more words a minute. Speed requirements in some positions may be less than this, however, but in others—particularly in shorthand reporting—much greater. Many shorthand reporting jobs require speeds of 200 or more words a minute. For beginning reporting stenographers in the Federal Government, the minimum is 120 words a minute.

Good hearing and a working knowledge of spelling, punctuation, grammar, and vocabulary are essential in stenographic and secretarial positions. Employers seek workers who are poised, alert, and have attractive personalities. Discretion, good judgment, and initiative are also important, particularly for the more responsible secretarial positions.

Capable and well-trained stenographers and secretaries have excellent opportunities for advancement. Many stenographers advance to better paying positions as secretaries; others, who acquire the necesary speed through experience or additional training, may become reporting stenographers. Both stenographers and secretaries may eventually be promoted to jobs such as administrative assistant, office supervisor, executive secretary, or some other responsible position requiring specialized knowledge of the employer's industry or business.

Employment Outlook

Employment opportunities for workers with stenographic skills is expected to be excellent during the rest of the 1960's and early 1970's. A very rapid increase in employment is anticipated. The use of dictating machines and the development of other types of office equipment will undoubtedly continue, but technological changes of this kind are not expected to affect greatly the growth of employment in these occupations.

Openings for stenographers and secretaries may total more than 200,000 annually during the next 10 years. Many thousands of workers will be hired to fill new jobs, but an even greater number will be needed to replace stenographers and secretaries who retire or stop working for other reasons. Turnover among stenographic workers is high because many young women stenographers and secretaries are employed for only a few years and then leave to care for their families. Some openings will also occur as stenographers and secretaries leave their jobs to enter other types of employment.

Earnings and Working Conditions

In 1963–64, the average weekly salaries of women in stenographic and secretarial positions, in metropolitan areas surveyed by the BLS, were as follows:

General stenographers	$79. 50
Senior and technical stenographers	91. 50
Secretaries	99. 50

The salaries paid to individuals included in the survey varied considerably, partly because of differences in the location and the industry where they were employed, but also because of differences in experience. About two-thirds of all women employed as general stenographers earned between

$60 and $90 a week, for example—but a few earned less than $40 and others more than $120.

The earnings of reporting stenographers are generally considerably higher than those of stenographic workers in business offices. According to the limited information available, some reporting stenographers earned between $95 and $100 a week in 1965, but many others earned more than $150 or $200 a week.

The usual entrance salary in the Federal Government in early 1965 was about $77 a week ($4,005 a year) for stenographers and secretaries, and about $96 ($5,000 a year) for reporting stenographers; shorthand reporters—capable of reporting at a minimum of 160 words a minute—started at about $106 a week, $5,505 a year). Entrance salaries for all these workers were somewhat higher for experienced persons and for those with more than the minimum requirements in training and speed. (See introductory section of this chapter for more information on Working Conditions.)

Where To Go for More Information

Additional information on careers in secretarial work may be obtained from:

United Business Schools Association,
1518 K St. NW., Washington, D.C. 20005.

Information regarding shorthand reporting may be obtained from:

National Shorthand Reporters Association,
25 West Main St., Madison, Wis. 53703.

See introductory section of this chapter for additional sources of information.

Typists

(2d ed. D.O.T. 1–37.30 through .59)
(3d ed. D.O.T. 203.138 through .588; 208.588; and 209.388 through .588)

Nature of Work

Typists operate the one machine found in practically every business office—the typewriter. Their main job assignment is to produce typed copies of printed and handwritten materials; in this respect, their work differs from that of many others office employees, who also do some typing but whose principal job assignment is altogether different.

Practically all typewriters, including the electric machines being used in an increasing number of offices, have the same type keyboard and are operated in much the same way. Some typing jobs are considerably more difficult than others, however. Beginners, sometimes called *junior typists*, often address envelopes, type headings on form letters, copy directly from handwritten or typed drafts, and do other routine work. Experienced, or *senior typists*, generally perform work requiring a particularly high degree of accuracy or independent judgment; they may work from rough drafts which are difficult to decipher and which contain technical material, or they may plan and type complicated statistical tables, combine and rearrange materials from several different sources, or prepare master copies of material to be reproduced by photographic processes. A few specially trained typists operate teletypewriters, proportional spacing typewriters, and other special kinds of machines.

Many typists, because they use special equipment or have jobs involving special duties, also have special job titles. Thousands who combine typing with filing, sorting mail, answering the phone, and other general office work are called *clerk-typists* (D.O.T. 209.588). Other, much smaller, groups of typists include *transcribing machine operators* (D.O.T. 208.588), who type letters and other documents as they listen to dictation recorded on tape or on sound-producing records; *data typists* (D.O.T. 213.588) and *tape perforator operators* (D.O.T. 203.588), who use specially equipped electric typewriters to transfer coded instructions to magnetic or paper tapes for use in electronic computers. Still other typists with special duties and job titles 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) in banks.

A typist's work must be accurate and neat.

Where Employed

Almost 650,000 workers were employed as typists in early 1965; 95 percent were women. In addition, hundreds of thousands of workers in other kinds of clerical occupations also use typing skills in connection with their main job assignments.

Typists are employed in private and public enterprises of practically every kind—particularly in manufacturing firms, banks and insurance companies, and national, State, and local government agencies. Almost two-thirds of all typists worked in such establishments in 1965.

Training, Other Qualifications, and Advancement

Most applicants for typing positions are required by employers to meet certain standards of typing speed and accuracy. Usually, therefore, employers have applicants take tests which show how rapidly and accurately they are able to type. For most positions, typists must generally be able to type at least 40 or 50 words a minute.

Practically all prospective typists obtain the training needed by attending day or evening classes in public and private schools. High school graduates are generally preferred by employers. High school business training, including training in the operation of some of the simpler office machines, such as transcribing, copying, and adding machines, may be helpful to the applicant. Typists should generally have a good understanding of spelling, vocabulary, punctuation, and grammar.

Important aptitudes and personality traits for this occupation include finger dexterity, accuracy, neatness, and ability to concentrate in the midst of distractions. A friendly manner and an attractive personality are great assets. Transcribing machine operators should have good hearing.

Promotion for a typist may be from a junior to a senior typing position, or to other clerical work involving greater responsibility and higher pay. Typists who complete training in shorthand may advance to stenographic or secretarial work.

Employment Outlook

Well over 50,000 openings for typists are expected to arise each year during the rest of the 1960's and early 1970's. Most openings will be for workers to replace typists who retire or stop working for other reasons. Turnover in this field is high, because many young women work for only a few years and then leave to care for their families. Additional typists will also be needed to fill new positions and to replace those who transfer or are promoted to other jobs.

During the next 10 years, as the volume of paperwork grows, the number of typists is expected to increase very rapidly. The rate of increase will be somewhat slower than in the past, however, because duplicating machines and other mechanical equipment will probably be used for more and more of the routine typing and clerical work formerly performed by junior typists. The greatest demand is likely to be for typists who are able to do the relatively difficult work involved in senior typing jobs and for typists who can also do other kinds of office work.

Earnings and Working Conditions

The average salaries of women employed as junior typists ranged from $53.50 to $76.50 a week in 80 metropolitan areas surveyed by the Bureau of Labor Statistics in 1963–64. For

senior typists the range was from $59.50 to $96 a week. Earnings were generally highest in cities in the Western and North Central areas of the country, and in manufacturing firms and public utilities.

In the Federal Government, entrance salaries for typists were about $71 a week ($3,730 a year) in early 1965. For exceptionally well-qualified beginners, the starting salary was about $77 a week ($4,005 a year).

Working conditions for typists are usually similar to those of other office workers in the firms where they are employed. (See introductory section of this chapter for information on Working Conditions and on Where To Go for More Information.)

Receptionists

(2d ed. D.O.T. 1–18.43)
(3d ed. D.O.T. 237.368)

Nature of Work

Almost all very large offices and institutions—and many small ones as well—employ receptionists to receive and give information to the customers and other people who call. It is the receptionist's job to find out the nature of each caller's business, and then to direct him to those in the office who may be able to help him.

Receptionists who work for large establishments usually refer each caller to the appropriate company employee or official, or else contact his office by telephone and arrange an appointment. Other receptionists, because of the nature of the business or institution where they work, may have somewhat different duties. In a hospital clinic, for example, the receptionist may direct each patient to the proper waiting room; in a beauty shop, she may arrange an appointment and accompany the customer to the operator's booth; and in a large defense plant it may be part of the receptionist's job to provide the caller with an identity card and see that an escort is available to accompany him to the office of the official with whom he has business. In connection with duties such as these, many receptionists also keep records of the name of each caller and the nature of his business, the time of his call, and the person to whom he was referred.

Most receptionists, particularly in a small office, have some time when they are not occupied with callers, and they may handle other office tasks. Many receive and route telephone inquiries to the proper company officials. Typing, sorting and opening mail, filing, keeping books or petty cash accounts, or operating a PBX switchboard may be among their additional responsibilities.

A good receptionist furthers her employer's business relationships.

Where Employed

It is estimated that about 200,000 receptionists were working in the United States in early 1965. About 1 out of every 4 was a part-time worker who spent fewer than 35 hours a week on the job. More than 95 percent were women.

Although jobs for receptionists exist in practically all kinds of establishments, about half of the people in this occupation are employed in the offices of physicians, attorneys, and other professional people. Many others are employed by hospitals and educational institutions and still others by banks, insurance companies, real estate offices, and beauty shops. The relatively small number of men who are employed as receptionists work prin-

cipally in medical service and hospital jobs, in manufacturing, and in banking and credit agencies.

Training, Other Qualifications, and Advancement

When hiring receptionists, employers seldom specify any formal educational requirements beyond a high school diploma. In 1965, about 1 receptionist in 5 had some college training. Business courses, including typewriting, elementary bookkeeping, and business practice are assets for a beginner. The ability to operate a PBX telephone switchboard may also be desirable, although this skill is often acquired through on-the-job training. (See statement on Telephone Operators.)

Because the receptionist's job is to act as her employer's public representative, personal characteristics such as a pleasant manner and an even disposition are very important. An attractive personal appearance, good judgment, punctuality, and ability to communicate information accurately are also necessary qualities. In order to perform her job effectively, the receptionist should acquire a thorough understanding of how her employer's business is organized.

The receptionist's job generally offers limited opportunities for promotion and advancement. However, work as a receptionist, plus business training, may lead to a better paying position as a secretary or an administrative assistant.

Employment Outlook

The number of receptionists is expected to increase very rapidly through the mid-1970's. An estimated 40,000 to 50,000 workers will probably be needed annually because of employment growth and the need to replace receptionists who retire or stop working for other reasons. Thousands of other openings will arise as receptionists transfer to other types of employment. However, young applicants will probably meet a good deal of competition, because many older and more experienced workers also seek employment in this type of work. A few opportunities will continue to be available for men.

The chief factor affecting employment growth in this occupation is the expected general business expansion associated with population growth and continued economic prosperity. Because the receptionist's work is of a person-to-person nature, it is likely to be little affected by office automation.

Earnings and Working Conditions

According to a Bureau of Labor Statistics survey, switchboard-operator-receptionists earned an average of about $75 a week in 1963–64; a few earned less than $50 a week, others earned $100 a week or more.

In the Federal Government, inexperienced workers employed as information receptionists started at about $71 a week ($3,680 a year) in early 1965. For experienced workers, starting salaries were higher—about $77 or $86 a week ($4,005 or $4,480 a year), depending on the nature of their previous experience.

Limited information available from a private survey indicates that many receptionists are paid salaries comparable to those of keypunch operators and typists. (See statements in this chapter for salary information on workers in these occupations.)

Particularly in large business offices, receptionists usually work in well-furnished front offices, free from noise and overcrowding. In hospitals, beauty shops, and some other types of businesses, scheduled hours may include some weekend and evening work. (See introductory section to this chapter for additional information on Working Conditions and for Where To Go for More Information.)

Bookkeeping Workers

(2d ed. D.O.T. 1–01.00 through .49; 1–02.)

(3d ed. D.O.T. 210.368 through .588; 215.388 and .488; 216.388; and 219.388 and .488)

Nature of Work

Every business concern must have systematic and up-to-date records of its financial affairs. Maintaining these records is the job of bookkeeping workers who record day-to-day business transactions in journals and ledgers and on other accounting forms. At regular intervals they also prepare summary statements showing, for ex-

ample, the amount of money taken in and paid out by the firm, and from whom it came and to whom it went.

In many small establishments, one *general bookkeeper* (D.O.T. 210.388) does all of the analysis, recording, and other work necessary to keep a complete set of books. Although employees in positions of this kind may use simple office equipment such as adding machines, they do most of their work by hand. Often they also file, answer the telephone, prepare and mail out customers' bills, and perform other general office work.

Large business organizations usually have bookkeeping departments where many employees work under the direction of a head bookkeeper. In most departments of this kind, the *bookkeepers* (D.O.T. 210.388), *bookkeeping and accounting clerks* (D.O.T. 219.488), and *bookkeeping machine operators* (D.O.T. 215.388) each handle one or a few of the many kinds of work involved in keeping a complete set of books. Some of these workers may post items in accounts payable or receivable ledgers, and others may take trial balances, prepare summary reports, or do other bookkeeping work. Accounting clerks do much of their work by hand, but occasionally use adding machines. Bookkeeping machine operators use office machines with keyboards not unlike the keyboards on calculating machines.

Courtesy of the President's Committee on Equal Employment Opportunities

Bookkeeping clerk checks invoices.

Where Employed

More than a million workers were employed in bookkeeping jobs in early 1965. Five out of six were women. The great majority of bookkeeping workers either do general bookkeeping or are accounting clerks. Bookkeeping machine operators probably number fewer than 75,000.

Particularly large numbers of bookkeeping workers are employed in retail stores, banks, insurance companies, and manufacturing firms of almost every kind.

Training, Other Qualifications, and Advancement

In selecting workers for bookkeeping jobs, most employers give preference to people who are high school graduates and have taken courses in business arithmetic and bookkeeping. Some look for applicants who have completed a post-high school business course or junior college. Training which includes instruction in typewriting and the use of office machines is often very helpful, since many bookkeeping workers perform a variety of office duties. An increasing number of large companies offer some on-the-job training for newly hired accounting clerks and machine operators. In some localities, companies cooperate in work-study programs operated by high schools and business schools; students enrolled in these programs gain practical experience in part-time jobs that may be helpful to them in obtaining full-time employment after graduation.

Beginning bookkeeping workers, who usually start out recording routine transactions by machine or by hand, may advance to more varied assignments involving greater responsibility—for example, preparing summary reports or operating complex equipment such as the bookkeeping machines used in some banks. Some accounting clerks and bookkeeping machine operators are eventually promoted to supervisory bookkeeping positions. For those bookkeeping workers who complete the college training necessary for this work, advancement to a position as an accountant

may also be possible. (The occupation of Accountant is discussed elsewhere in the *Handbook.*)

General bookkeeping and accounting clerks should have above-average aptitude for working with numbers and the ability to concentrate on details. Bookkeeping machine operators need finger dexterity and good eye-and-hand coordination.

Employment Outlook

The number of bookkeping workers is expected to increase rapidly through the mid-1970's. The number of openings to be filled is expected to exceed 75,000 each year as new jobs are created and replacements are needed for employees who retire or stop working for other reasons. Additional thousands of workers will be needed annually to replace bookkeeping workers who transfer to other types of employment.

Employment opportunities for bookkeepers who are qualified to assume responsibility for a complete set of books are expected to continue to be plentiful over the next decade. In large firms, an increasing number of positions will be available for machine operators and accounting clerks to handle routine assignments, as use of bookkeeping machines, electronic computers, and other modern equipment further tends to break down bookkeeping operations into simpler functions.

Employment in this field is expected to rise mainly because of the continuing business expansion resulting from population growth and economic prosperity. The need for bookkeeping workers will probably considerably outpace the laborsaving impact of office machines over the next 10 years.

Earnings and Working Conditions

A Bureau of Labor Statistics survey, covering office workers in metropolitan areas throughout the country, provides information about the average salaries of some bookkeeping workers in 1963–64. According to this survey, average weekly earnings were considerably higher for "Class A" accounting clerks and bookkeeping machine operators (experienced employees who worked on relatively difficult assignments) than for "Class B" employees (who performed more routine work) as shown below:

	Average weekly earnings, 1963–64	
	Women	*Men*
Accounting clerks:		
Class A	$94.00	$113.50
Class B	74.50	91.00
Bookkeeping machine operators:		
Class A	85.50	-------
Class B	68.50	-------

Working conditions for bookkeeping workers are usually 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 on Where To Go for More Information.)

Cashiers

(2d ed. D.O.T. 1–01.50 through .69; 1–03.05)
(3d ed. D.O.T. 211.138, .368, .468, and .488 and 299.468)

Nature of Work

Practically all cashiers have one thing in common in their jobs—they receive the payments made by customers for goods and services. Apart from this, their duties may vary considerably, according to where they work. Job titles also differ. In a theater, for example, the cashier may be called *box office cashier* or *ticket seller;* in a supermarket, *checkout clerk* or *grocery checker;* in an electric light and power company, *teller* or *bill clerk;* and in a cafeteria, *cashier-checker.* Very large business firms with several cashiers sometimes use other special job titles such as *disbursement clerk*, *cash accounting clerk*, or *credit cashier.* (The occupation of bank cashier, which is altogether different from other kinds of cashier jobs, is discussed elsewhere in the *Handbook.*)

Regardless of job title or employer, most cashiers accept money paid by customers and clients, make change when necessary, and often give some kind of receipt for the payment. Records of the amount of money involved in each

transaction are kept so that cash accounts can be balanced at the end of the day. Many cashiers also prepare cash and checks for deposit at the bank. Some, in addition to receiving and recording cash paid to the company, are authorized to pay out cash or write company checks to cover such expenses as the purchase of supplies and equipment; they may also prepare pay envelopes or paychecks, make out sales tax reports, and do related work.

Cashiers—particularly those employed in very large establishments—often use machines which enable them to do their work more quickly and efficiently. Probably the best known of these machines is the cash register which, as the cashier rings up each sale, prints a record of the amount on a paper tape and releases a money drawer. On some registers, cashiers list and total individual items purchased by each customer and record other details relating to the transaction. Other machines, somewhat like accounting machines, are used by cashiers in hotels and hospitals to record the charges for telephone, medical, and other services which are incurred and to prepare the itemized bills which cashiers present to guests or patients as they check out. Cashiers may also use adding machines, change-dispensing machines, and other special equipment.

Many cashiers have certain additional duties peculiar to the nature of their employers' businesses. In a theater, for example, the cashier may operate a ticket-dispensing machine and answer telephone inquires. A restaurant cashier may handle reservations for meals and special parties, type menus, or be responsible for a sales counter stocked with candy, cigarettes and cigars, chewing gum, and other items. In supermarkets and other self-service stores, cashiers often wrap or bag each customer's purchases and, during slack periods, restock shelves, mark prices on articles, and perform other work. In a hotel or motel the cashier's special duties usually include recording charges for telephone, valet, and other services used by each guest, and notifying the room clerk when guests check out.

Where Employed

Cashiers work for business firms of all types and sizes. About half are employed in grocery, drug, and other retail stores; other large groups

are employed in restaurants and in theaters. Most of these establishments and the other kinds of businesses where cashiers work—hotels, wholesale houses, and telephone companies, to name a few—are located in cities and in the shopping centers of heavily populated suburban areas, but some are also to be found in many small towns.

In early 1965, more than 650,000 cashiers were employed in the United States. About 1 out of 3 was a part-time worker who spent fewer than 35 hours a week on the job, and about 4 out of 5 were women. More than half of all women cashiers work in food stores, restaurants, and department and general merchandise stores. The largest single group of men cashiers work in food stores such as supermarkets.

Training, Other Qualifications, and Advancement

Employers hiring beginners to fill jobs as cashiers prefer people who have completed high school. Courses in business arithmetic, bookkeeping, typing, and other business subjects are considered good preparation. In some large cities, business organizations and schools offer brief courses through which students learn to operate

the cash register and perform other duties of a cashier. Cashier training may also be offered as part of public school distributive education programs which include courses in retail selling or food service work.

For some kinds of cashier jobs, employers want persons with special skills or business experience—cashiers who know how to type, for example, or who have had selling experience. Sometimes cashier jobs are filled by promoting clerk-typists in offices, bag boys in supermarkets, and other qualified people already employed by the firm.

Beginners are usually trained in their duties by their employers. In most cases, this training is given informally as the new cashier works on the job under the close supervision of an experienced employee; sometimes trainees undergo a brief period of classroom instruction, particularly in large firms. Some firms provide training for all newly hired cashiers, regardless of previous experience.

To perform their duties rapidly and efficiently, cashiers should have an aptitude for working with figures, finger dexterity, and a high degree of eye-hand coordination. Accuracy is particularly important. Since cashiers deal with the public, they should also be tactful, neat in appearance, and pleasant in their dealings with customers.

Promotional opportunities for cashiers are likely to be limited, particularly in small firms. The cashier's job, nevertheless, affords a young person a good opportunity to learn how his employer's business affairs are conducted and so may serve as a steppingstone to a more responsible clerical job or to some types of managerial positions. In large hotels, for example, men who have worked as cashiers may advance to jobs as room clerks. In chain stores and other large retailing enterprises, some cashiers may eventually be advanced to positions as department or store managers, particularly if they supplement their experience with college-level work in retail store management.

Employment Outlook

Employment in this large occupation is expected to increase rapidly during the 1965–75 decade. It is estimated that well over 75,000 workers will be needed each year to fill new positions and to replace cashiers who retire or stop working for other reasons. Still other workers will be needed to replace cashiers who transfer to other types of employment.

Employment is expected to increase mainly because of the anticipated expansion in business activities. In addition, more retail stores will undoubtedly adopt self-service and other merchandising techniques which create jobs for cashiers. The increase in employment due to changes of this kind, however, will probably be somewhat less marked than during the 1950's when conversion to self-service on the part of some kinds of retailers was widespread. The continued use of vending machines, changemaking machines, and other mechanical equipment which replaces cashiers or speeds up their work will also tend to limit the expansion in employment during the coming decade.

Competition among applicants for cashier jobs is likely to be keen, since many openings can be filled by persons who have little specialized training. Opportunities will probably continue to be best for cashiers with typing, bookkeeping, or other special skills. There should be many opportunities, also, for cashiers who wish to work part time.

Earnings and Working Conditions

The salaries paid beginners in routine jobs are often at or near the minimum wage required by State and Federal laws. In several States and in establishments covered by the Federal law, the minimum was $1.25 an hour in 1965; elsewhere, starting salaries were somewhat lower. Cashiers in jobs which involve a considerable degree of responsibility or require specialized training may earn considerably more than the legal minimum; included in this group are thousands of hotel cashiers, cashier-checkers in cafeterias, and grocery checkers in supermarkets, some of whom earn more than $2 an hour.

The salaries of cashiers in restaurants are often somewhat lower than in other kinds of establishments because, in addition to their salaries, these workers frequently receive one or two free meals a day. According to a 1963 survey of eating and drinking places in 24 cities throughout the country, the average wages of cashiers ranged from less than $1 an hour in one Southern city to more than $2 an hour in a metropolitan area on the

West Coast. For cashier-checkers employed in cafeterias, the averages were slightly higher—between $1.06 and $2.27 an hour, depending on the geographical area. Within each of the cities included in this survey, the salaries of individual cashiers varied greatly, primarily because of differences in their duties and in the types of restaurants where they were employed; thus, in one midwestern city almost one-fifth of the men in the cashier jobs surveyed earned less than $1.10 an hour, while about one-fifth earned $1.80 or more.

Cashiers' hours may differ from those of many other clerical workers because they often work during rush periods which are outside regular office hours—at mealtimes in restaurants and during evenings and weekends in stores and theaters, for example. Cashiers employed full time in supermarkets and other large retail establishments usually work a 5-day, 40-hour week but, since Saturday is a busy day in retailing, most cashiers usually work on that day and have another day off during the week. Holiday, weekend, and late afternoon work may be required, especially in theaters, restaurants, and food stores. Many cashiers in such establishments work part time or on split shifts.

Most cashiers work indoors, often in small booths or cages or behind counters near the entrances of stores, theaters, and other establishments. In some cases, their quarters may be uncomfortable because they are exposed to cold drafts in the winter and considerable heat during the summer.

See introductory section of this chapter for Where To Go for More Information.

Office Machine Operators

(2d ed. D.O.T. 1–25.)

(3d ed. D.O.T. 207.782 and .855; 208.782; 213.138—.885; 214.488; 216.488 and .588; 217.388; 219.388; 231.588; and 234.582 and .885)

Nature of Work

The types of machines used to speed the paperwork in modern business offices are so varied that it would be almost impossible to list them all. They range from simple mechanical devices that open letters to electronic equipment capable of performing highly involved computations. This statement is concerned with the work done by people whose main job is to operate some of the more common types of office machines. Many of these workers, like the keypunch operator and billing machine operator, have job titles taken from the kinds of equipment they use. (Typists, operators of transcribing and bookkeeping machines, and operators of electronic computer systems are not included in this statement, but are discussed in other sections of this chapter. Others not included are clerical workers who make only occasional use of equipment such as copying machines, adding machines, and other mechanical devices; and statistical clerks who use calculating machines extensively in connection with their regular duties.)

Billing machine operators (D.O.T. 214.288) use machines that both type and add while preparing statements relating to customers' purchases. By striking lettered and numbered keys on the machine, the operator enters on each bill information such as the customer's name and address, the items bought, and the amounts of money involved in each transaction. Then, when other keys are pressed, the machine calculates and prints totals, discounts, and other items.

Adding and calculating machine operators (D.O.T. 216.488) use electrically and manually operated machines to make the computations needed in preparing payrolls and invoices, and in doing other statistical work. By striking numbered keys, operators "put into" these machines the numbers involved in each calculation and then, when other keys are pressed, the machines make the desired calculations and record the results automatically. *Adding machine operators* (D.O.T. 216.488) use their machines to add and subtract numbers, and sometimes to multiply. The calculator is a more complex piece of equipment than the adding machine and has a much larger keyboard. *Calculating machine operators* (D.O.T. 216.488) use the calculator, not only to add, subtract, multiply, and divide, but to get square roots, figure percentage distributions, and do other computations. Many office workers who are expert in operating adding machines and calculators use this equipment part of the time and

also perform other office duties. However, operators of the most complex calculating machines—that is, key-driven (Comptometer-type) calculators which require considerable skill and knowledge on the part of the operators—usually spend full time in this work.

Mail preparing and mail handling machine operators (D.O.T. 234.582 and .885) run automatic equipment which handles incoming and outgoing mail. Only in offices which handle a very large volume of mail does this work require the full time of an operator. Some operators feed incoming mail into machines which open the envelopes. Other operators place outgoing mail on the loading racks of machines which fold enclosures and/or insert them in envelopes or address, seal, or stamp envelopes. Operators of addressing machines, who work mainly in offices where circulars, magazines, and other materials are regularly sent to people on mailing lists, run machines which print addresses and related information either from stencils which have been cut by typists or else from plates prepared by *embossing machine operators* (D.O.T. 208.782) on a special kind of typing machine.

Operators of duplicating and copying machines run equipment which produces copies of typewritten, printed, and handwritten documents more quickly and/or inexpensively than is possible by typing. Some equipment of this kind—particularly copying machines which use photographic and other chemical processes—is used chiefly to make only a limited number of copies of a document and can be operated by almost any office employee who has taken a few minutes to learn how. Full-time machine operators are seldom used for this work. Other, more complicated duplicating machines, which are capable of producing thousands of copies of typewritten and handwritten documents in a single "run," are usually operated by trained *duplicating machine operators* (D.O.T. 207.782, .884 and .885) who spend most of their time doing this work. The operators who run these machines insert in the machine a "master" copy of the document to be reproduced (a stencil on some machines, and on others raised type) and then adjust the mechanism and start the machine. Each operator must see that the machine is kept properly adjusted so that it produces legible copies. On some machines, the operator also feeds in the paper used for making copies and removes finished batches of work manually; on other machines, feeding and offbearing are done automatically.

Operators of tabulating machines and related equipment (D.O.T. 213.782) run machines designed to sort and count large quantities of accounting and statistical information. Information to be processed in a tabulating machine is first transferred to cards by *keypunch operators* (D.O.T. 213.582). Using machines similar in action to typewriters, these workers punch holes in the cards in such a position that each hole can be identified as representing a specific item of information. These punched cards may be used with electronic computers as well as tabulating machines. (See statement on Electronic Computer Operating Personnel elsewhere in this chapter.) *Sorting machine operators* (D.O.T. 213.885) then run the punched cards through sorting machines which automatically separate the cards according to the location of the holes and arrange them in any desired order. Next, *tabulating machine operators* (D.O.T. 213.782) insert the

Some large organizations employ hundreds of keypunch operators.

batches of punched cards into machines which count the various items punched on each card, multiply and make other calculations, and print the results on accounting records and other business forms.

Where Employed

Well over 300,000 people were employed as office machine operators in early 1965. (This total does not include an estimated 125,000 operators who run bookkeeping machines and electronic computer systems. These occupations are discussed elsewhere in this chapter.) About three-fourths of all office machine operators are women. Women outnumber men in practically all types of jobs except those which involve operating tabulating machines.

Office machine operators are employed mainly in firms handling a large volume of recordkeeping and other paperwork. Consequently, a great many operators work in large cities where such firms are usually located. Roughly one-third of all office machine operators work for manufacturing companies. Others work for banks and insurance companies, government agencies, and wholesale and retail firms. Some office machine operators are employed in "service centers"—agencies which are equipped with various kinds of office machines and contract to handle, for other firms without this equipment, such tasks as preparing monthly bills and mailing circulars to lists of prospective customers.

Training, Other Qualifications, and Advancement

Graduation from high school or business school is the minimum educational requirement for all but the most routine office machine operator jobs. For work such as operating Comptometer-type calculators and some kinds of tabulating and duplicating equipment, specialized training is usually necessary. For many beginning positions, however, a general knowledge of the equipment used is usually regarded as sufficient. Public and private school courses in the operation of office machines are helpful, and business arithmetic is valuable for the many jobs involving work with figures. It is helpful also for office machine operators to have some knowledge of typing, or to be able to operate more than one type of office equipment, since many office positions entail varied assignments.

Employers usually give newly hired office machine operators some on-the-job training. Even employees with some earlier training or experience in office machine operation need to become familiar with the particular equipment they will be using on the job; differences exist between the calculating machines produced by one manufacturer and by another, for example, and new models sometimes differ considerably from older models.

The amount of instruction and on-the-job experience needed by a beginner varies, depending chiefly on the type of machine. A few days only may be required to train operators of some duplicating machines, for example, while a few weeks may be needed for the training of keypunch and calculating machine operators. Generally, it takes several weeks for operators of tabulating machines to learn how to set and adjust their equipment and do simple wiring of plugboards. Operators of tabulating equipment are often trained at company expense in special schools established by equipment manufacturers.

Finger dexterity, coordination of eye and hand movements, and good vision are important for most office machine operator jobs. It is helpful for billing and calculating machine operators to have a sufficient sense of mathematical relationships to enable them to detect quickly obvious errors in computations. Some mechanical ability is advantageous, especially for duplicating and tabulating machine operators.

Most employers follow a promotion-from-within policy, taking into consideration seniority and on-the-job performance as shown by supervisors' ratings and recommendations. Promotion may be from a beginning, routine machine job to a more complex one—for example, from keypunch operator to tabulating machine operator—or the promotion may be to a related clerical job, as in the case of a billing machine operator who is promoted to a position as accounting clerk; often, employers provide the additional training required in such cases. Advancement for office machine operators employed in firms with large clerical staffs may be to positions in which they

are responsible for training beginners and for the accuracy of their work, or else to supervisory positions as section or department heads.

Employment Outlook

Well over 50,000 job openings for office machine operators are expected to occur each year during the late 1960's and early 1970's. Most of these openings will arise as business organizations continue to grow in size and number, and the volume of billing, computing, duplicating, and other work continues to mount. Other openings for office machine operators will probably be created by the introduction of new types of mechanical office equipment which speed recording, copying, and other office work. Still other openings will occur because of the need to replace workers who retire or stop working for other reasons. Many machine operators are young women who stop working after a few years of employment in order to stay at home and care for their families.

The number of office machine operators is expected to increase very rapidly through the mid-1970's. In some offices, the number of workers needed to operate tabulating, billing, and possibly some other types of office machines may eventually be reduced because of further advances in office automation. Any reduction in employment that occurs, however, is expected to be limited to a relatively small number of offices and will be more than offset by the new jobs created as the volume of paperwork continues to increase in business establishments of all kinds.

Earnings and Working Conditions

A 1963–64 Bureau of Labor Statistics survey, covering firms in metropolitan areas, provides information about salaries in several office machine operator occupations. For keypunch and tabulating machine operators, the averages are given separately for different skill groups; operators in Class A were generally experienced employees who did comparatively difficult work, whereas Class B and Class C operators worked on more routine assignments and used simpler types of equipment. The average weekly salaries reported by this survey are shown in the accompanying tabulation.

	Average weekly salaries, 1963–64	
	Women	*Men*
Billing machine operators	$73.50	
Comptometer operators	80.00	
Duplicating machine operators	70.50	
Keypunch operators:		
Class A	85.00	
Class B	73.00	
Tabulating machine operators:		
Class A		$114.50
Class B	88.00	96.50
Class C	72.50	79.50

Because of the noise created by their machines, operators often work in groups in areas which are apart from other company offices. In other respects, working conditions for office machine operators are usually similar to those of other office workers in the same firms. (See introductory section to this chapter for additional information on Working Conditions and for Where To Go for More Information.)

Electronic Computer Operating Personnel

(3d ed. D.O.T. 213.138 through .588 and 223.387)

Nature of Work

Operators of several kinds of mechanical equipment may be required whenever an electronic computer is used to prepare a payroll or to "process" other data. First, the computer's "input" must be prepared in a special code—the "machine language" which will enable the computer to process the data; then, the computer console must be operated while the work is being done; and, finally, the computer's "output," must be translated back into words and numbers which can be read. The procedures employed in accomplishing this work vary from one computer system to another; often they are more involved and more difficult to learn than the operation of the equipment itself. The number and kinds of employees needed also vary for different computer installations. A small system—and some computers are no bigger than an office desk—may be operated entirely by one or two employees. A large system, on the other hand, usually requires several workers, each of whom is assigned a specific task.

Console operator follows programer's written instructions.

Most computers are used in business offices for work such as keeping inventories, billing customers, and processing other records. This statement describes the work performed by operators in such offices. Personnel who operate computers used for controlling production lines in factories, analyzing the structure of chemical compounds, and other technical and scientific work often have somewhat different titles and responsibilities and are not covered in this statement.

A computer's input consists of the data to be processed and the step-by-step instructions prepared by programers which tell the machine how to do the work. (Information about the occupation of Programer is given elsewhere in the *Handbook*.) In many computer systems, the input consists of punched cards prepared by *keypunch operators* (D.O.T. 213.582) or of paper tapes prepared by *data typists* (D.O.T. 213.588); less frequently, input may be prepared by operators of adding or bookkeeping machines with special attachments which perforate tapes. These machine operators do much the same work as those who use the same general type of equipment for other purposes. (For additional information on these occupations, see statements on Typists, Office Machine Operators, and Bookkeeping Workers in this chapter.)

In some computer systems, punched cards or paper tapes can be used directly to feed information into the central computer. The fastest computer systems, however, get their input from magnetic tapes (narrow strips of plastic tape, on which data have been recorded in the form of magnetic spots or characters). Such computer systems include auxiliary equipment which transfers data from punched cards or paper tapes to magnetic tape. In some systems, this work is done on small computers. Other machines, used for the same purpose, are called converters and are run by *card-to-tape converter operators*. (D.O.T. 213.382). Converter operators may be required to wire a fairly simple plugboard, and must know how to interpret signals from a panel of lights on the machine. They should also have sufficient understanding of the whole computer system to recognize any errors that may have occurred in preparing input or to identify other situations which could prevent the system from operating properly.

Once the facts and figures to be processed have been converted into the form used by the computer, the data are ready for the "run"—that is, for processing in the computer. Operating the computer is the responsibility of the *console operator* (D.O.T. 213.382), or computer operator, as he is sometimes called. The console operator first examines the programer's instruction sheet for the run and ascertains the procedure to be followed. He then readies the equipment, makes sure the computer is loaded with the tape or cards needed, and starts the run. As he operates the console during the run, he may have dozens of switches to manipulate and lights to observe. If the computer stops running, or its lights signal an error, he must try to locate the source of the trouble.

Before a computer's output can be read, it must be translated from machine language to words and numbers. In some systems, this is done by machines directly connected to the computer and run by the console operator or his assistant. In many large systems, however, this work is done on converters, highspeed printers, and other machines run by auxiliary equipment operators—*tape-to-card converter operators* (D.O.T. 213.382), *high speed printer operators* (D.O.T. 213.382), and others. Like operators of other kinds of auxiliary equipment, these operators may have to wire plugboards and watch for lights on their machines which signify errors. Some types of auxiliary equipment are relatively difficult to

operate and, when computer systems include such equipment, operators sometimes specialize on one kind of machine. Many operators, however, run all kinds of auxiliary equipment used in a computer system.

The tape or cards used in processing data on a computer are stored after the run, and are often used again and again—as, for example, in making up a payroll at the end of every pay period. A *tape librarian* (D.O.T. 223.387), or a console operator or *auxiliary equipment operator*, may be responsible for storing tapes and making them available when they are again needed.

Many electronic computers are operated for as long as 16 to 24 hours a day. In such cases, they may be operated by two or three different shifts of workers. Usually all operators work under the general direction of a chief supervisor, and employees on each shift work under the direct supervision of the console operator on that shift.

Where Employed

The number of console and auxiliary equipment operators employed in 1965 is estimated at roughly 50,000. Both men and women may be employed as operators of computer systems, but men predominate.

Jobs for operating personnel are found chiefly in government agencies and in insurance companies, banks, transportation and public utility companies, and manufacturing firms. Many operators are also employed in service centers which process data for other firms on a fee basis.

Training, Other Qualifications, and Advancement

When installing electronic computers, employers often fill as many of their new operator positions as possible by transferring employees from other types of jobs, frequently from jobs as operators of the tabulating and bookkeeping machines which may no longer be needed after the computer is installed. Many computer operators are also recruited from outside the firm.

In hiring outsiders, private employers usually require at least high school graduation. For positions as console operator, some college training may be preferred. In the Federal Government also, applicants for auxiliary equipment operator jobs must be high school graduates, unless they have had specialized training or previous experience in some related work. Console operators employed by the Federal Government are generally required to have a college education or its equivalent in work experience; or they may be able to qualify for appointment on the basis of previous experience in computer work and general aptitude for it, as demonstrated by special tests. Many private employers also screen applicants for operating positions by giving them tests designed to measure their aptitude for the work, especially their ability to reason logically.

Beginners hired for work of this kind, or transferred to it from other positions in their firms, are seldom expected to have had specific training as operators. Most employers provide the necessary training after the worker is hired. The training of auxiliary equipment operators may require a few weeks, that of console operators somewhat longer. Console operators usually attend classes where they learn how to mount tapes and operate the console and become sufficiently familiar with the equipment they are using to be able to trace the reasons for mechanical failures. This training is supplemented by further instruction on the job.

As they gain experience, operating personnel may be assigned to operate more complex pieces of equipment. Eventually they may be promoted to supervisory positions or jobs which combine some supervisory duties with console operation. Console operators may acquire, through on-the-job experience, an understanding of programing which, with additional training, may enable them to qualify for work as programers.

Employment Outlook

The use of electronic data-processing equipment is expected to continue to increase very rapidly throughout the 1965–75 decade. Computers are being put to new uses almost daily and, as the tasks they perform become even more varied, many more business firms will be utilizing them. Although the size of the staff required to operate a computer installation may be reduced somewhat as new types of equipment are developed, the total number of computer and auxiliary equipment operators is expected to increase very rapidly, nevertheless.

Thousands of operators will be needed to fill new jobs, both in firms with their own computer installations and in service centers which rent computer time to businessmen. Many operators will also be needed to replace operators of computer systems who transfer to other kinds of work or stop working. As in the past, employers will fill some positions by training people already in their employ, but many others will be filled by hiring outsiders.

The equipment changes which are expected in computers may also produce changes in job requirements for console and auxiliary equipment operators. Because of advances in technology, much of the equipment in use today is far less complex to operate than the first computers of the early 1950's; and future changes may bring further simplification. As a consequence, newcomers to this field may find it easier than have applicants in the past to qualify for the openings available, and, as a consequence, competition for those jobs that become available is likely to become correspondingly greater.

Earnings and Working Conditions

Information about the salaries of computer operating personnel in over 1,000 companies throughout the country is available from a private survey conducted in 1964. The average salary for beginning console operators was $83 a week. Experienced console operators averaged up to $133 a week. The salaries of auxiliary equipment operators working with high-speed printers and tape librarians averaged $92 a week. The difference between the salary of the lowest and highest paid employees in each of the job classifications surveyed was much greater than these figures suggest, however. For example, the highest salary reported for a skilled console operator was $250 a week—more than three times the lowest salary reported for a comparable job. Many differences of this kind were due to differences in salary levels in various parts of the country and in individual companies and industries; to some extent, they were also due to differences in the complexity of the work performed by operators with the same job titles.

Salaries of computer personnel in the Federal Government are roughly comparable with those in private industry. In early 1965, beginning console operators started at about $96 a week ($5,000 a year) and auxiliary equipment operators at about $77 a week ($4,005 a year). The maximum salary paid to experienced console operators in the Federal Government was about $180 a week ($9,425 a year); a few in supervisory positions may earn up to about $259 a week ($13,445 a year), usually after several years of experience. Skilled auxiliary equipment operators earned up to about $125 a week ($6,485 a year) after several years of experience.

Operators of electronic computer systems generally work the same number of weekly hours and are allowed the same holidays, vacations, and other benefits as most office employees. Since many computers are operated on a two- or three-shift basis, scheduled hours for some console and auxiliary equipment operators include late evening or nightwork. Tape librarians usually work only when day shifts are on duty. (See introduction to this chapter for additional information on Working Conditions.)

Where To Go for More Information

Information on careers in electronic data processing may be obtained from:

Data Processing Management Association,
524 Busse Highway,
Park Ridge, Ill. 60068.

A bibliography which includes materials giving information about computer operating personnel may be obtained from:

Association for Computing Machinery,
211 East 43d St., New York, N.Y. 10017.

Telephone Operators

(2d ed. D.O.T. 1–42)

(3d ed. D.O.T. 235.862)

Nature of Work

Even though millions of telephone calls are dialed each day without the assistance of a telephone operator, at one time or another practically every telephone user makes a call that cannot be completed without the operator's help. Often the call is a long distance one on which the operator is asked to reverse the charges, locate a particular individual, or provide information about the cost of the call. Frequently, the caller needs help because he does not have the correct telephone number. Or, the operator's services may be needed to call the police in an emergency, assist a blind person who is unable to dial for himself, or arrange a conference telephone call which will enable business executives in several different locations to confer by telephone.

These and many other services are provided by two groups of telephone operators—those who work at the switchboards in central offices of telephone companies; and operators, or attendants, who work at private branch exchange (PBX) switchboards in other types of enterprises. Usually, workers in both groups operate their equipment by inserting and removing plugs attached to cords, manipulating keys and dials, and listening and speaking into their headsets. Some switchboards are of the keyboard type and are operated by pushbuttons and dials.

Most *central office operators* work at telephone company switchboards similar to that shown in the picture on this page. They are usually contacted only when callers need assistance and, because assistance is most frequently sought for long distance calls, most central office operators are *long distance operators.* They obtain from each caller the information needed to complete the call, make the necessary connections with the party being called, and record the details of each call for billing purposes. Many *information operators* (D.O.T. 235.862) also work in telephone companies; they provide callers and long distance operators with telephone numbers by searching in telephone directories and other records for addresses, numbers of new subscribers, and other information. *Central office supervisors* are responsible for training newly hired operators; they also aid operators in completing especially difficult calls. In each central office, all operators work under the direction of a *chief operator* who is responsible for the overall efficiency of the office.

Long distance operator selects circuit to complete customers' calls.

PBX operators (D.O.T. 235.862) operate switchboards which serve groups of telephone users in business offices and other establishments, and which are connected with telephone company lines. In addition to making connections for interoffice or house calls, they answer and relay to the proper parties the calls from the outside, assist other company employees in making outgoing calls, supply information to callers, and record charges for the calls which go through their switchboards. Many operators work at large PBX boards which serve dial telephones; their duties are very much the same as those of central office operators. In many small establish-

ments, however, PBX operators work at switchboards which serve only a limited number of telephones, and, when not busy at their switchboards, they do other office work such as typing, proofreading, or sorting mail. Many act as receptionists or information clerks. (The work of the receptionist is described elsewhere in this chapter.)

Where Employed

More than 325,000 people were employed as telephone operators in early 1965. Practically all were women.

Central office operators in telephone companies slightly outnumbered PBX operators in other types of establishments. Although PBX operators worked in establishments of all kinds, a particularly large number were employed in manufacturing plants, hospitals, schools, and department stores. Jobs for both central office and PBX operators tend to be concentrated in heavily populated areas. Nearly one-fifth of the total operators were employed in the New York, Chicago, and Los Angeles metropolitan area, for example.

Information operator finds number for a caller.

Training, Other Qualifications, and Advancement

In hiring beginners, employers prefer young people to have at least a high school education. Courses in English and business arithmetic provide good preparation. Since many PBX operator positions combine switchboard duties with other office work, courses in typing, and other commercial subjects may also be helpful.

Although brief courses in switchboard operation are available at a limited number of private and public schools, practically all newly hired operators receive some on-the-job training to familiarize them with the equipment which they will use, the kinds of records to be kept, and any additional duties for which they will be responsible. In telephone company central offices, operators first learn, through discussion with their instructors and from instruction manuals, the various procedures used in handling calls. They then put through practice calls. Following this period of instruction and practice—which usually lasts from 1 to 3 weeks—they are assigned to the regular operating force in a central office, where they receive further instruction in handling special types of calls not included in their initial training.

Because many PBX operators handle only comparatively routine calls, their period of training may be somewhat shorter than that of central office operators. In a large business, it is often given by a training supervisor in the company's employ or by an instructor employed by the local telephone company. In a small establishment, it is more likely to be provided by another employee who is experienced in switchboard operation.

Because much of the repetitive work associated with completing telephone calls is being eliminated by direct dialing, the telephone operator's job is becoming one in which person-to-person contacts are of special importance. As their employers' representative in dealing with the public, operators must show tact and courtesy and, in providing the services requested by telephone users, they must often exercise initiative as well as patience and persistence. A pleasing telephone

voice with no noticeable speech impediment is important, as is a high degree of eye-hand coordination, and normal eyesight and hearing. Most telephone companies and many large business firms require applicants to pass physical examinations and general intelligence tests. Ability to type and other clerical skills may be required for some PBX positions.

Promotion for an experienced central office operator may be to a position as a central office supervisor and, eventually, to a job as chief operator. Promotion may also be to a clerical job or some other position within the telephone company at a higher salary. Similar opportunities exist for PBX operators in large firms; in many small businesses, however, opportunities for advancement are limited.

Employment Outlook

Although the increase in employment of telephone operators during the 1965–75 decade is expected to be slow, many thousands of job openings will become available annually in this large occupation. Most openings—an estimated 20,000 each year—will be to replace central office and PBX operators who retire or stop working for other reasons. Turnover is high, particularly because most telephone operators are young women who work for only a few years and then leave to care for their families. Additional operators will also be needed to replace workers who transfer to other types of employment.

Direct dialing and other changes have been under way for some years in telephone company offices and have produced a marked decline in central office operator employment. Technological change will probably continue. At the same time, however, further increases are anticipated in the volume of calls handled by telephone companies; consequently, little further decrease in the employment of central office operators is expected over the next 10 years.

The number of PBX operators, on the other hand, is expected to rise fairly rapidly over the 1965–75 decade. Employment in most PBX installations is expected to be relatively unaffected by further technological change. Some large PBX installations may install modern laborsaving equipment but its downward effect on employment should be more than offset by the number of new jobs created for PBX operators as more business require this kind of service.

Earnings and Working Conditions

Central office operators in training averaged $1.74 an hour in December 1964, according to a Bureau of Labor Statistics survey. For experienced telephone operators, the average was $2.11 an hour, for service assistants (central office supervisors), $2.60, and for chief operators, $3.30. Salary levels varied in different parts of the country; they were highest in the Pacific States, where experienced operators average $2.28 an hour. Pay scales established by contracts between unions and telephone companies generally provide for periodic salary increases to operators. Central office operators usually receive extra pay for work on evenings, Sundays, and holidays.

The lowest and highest average weekly earnings of PBX operators in nonsupervisory positions, reported in a BLS survey for cities in four regions, were as follows:

	Average weekly earnings, 1963–64	
	Low	*High*
Northeast	$57.00 (Portland)	$83.50 (New York City)
South	52.50 (Raleigh)	75.50 (Atlanta)
North Central	56.50 (Green Bay)	86.50 (Detroit)
West	62.00 (Albuquerque)	84.50 (Los Angeles–Long Beach)

Earnings varied not only according to the section of the country, but according to the industry in which PBX operators were employed. For example, the average for PBX operators in public utilities was $90 a week; in department stores and other retail trade establishments, the weekly average was $63.

The workweek for most central office and PBX operators averaged between 35 and 40 hours. Often, their scheduled hours are approximately the same as for other workers in the business community. In telephone companies, however, and in hotels, hospitals, and other establishments where telephone service is maintained on a 24-hour basis, operators usually work on shifts and on holidays and weekends. Some central office operators work split shifts—that is, they are on duty during the peak calling periods which occur in the late

morning and early evening, and have time off between these two periods.

Operators in most telephone companies and other large establishments usually work in well-lighted and pleasant surroundings. Attractive lounges are often provided for relaxation during "breaks" in their scheduled hours. Insurance and pension plans and practices relating to paid holidays and vacations are much the same as those for other types of clerical employees. (See introduction to this chapter for more information.)

Many operators employed by telephone companies are members of the Communications Workers of America.

Where To Go for More Information

Additional information about central office operators is available in the following publications:

Women Telephone Workers and Changing Technology (Women's Bureau Bulletin 286, 1963. Superintendent of Documents, Washington, D.C. 20402. Price 25 cents.

Industry Wage Survey: Communications, December 1964 (forthcoming BLS Bulletin 1467). Superintendent of Documents, Washington, D.C. 20402.

See introduction to this chapter for additional sources of information.

Shipping and Receiving Clerks

(2d ed. D.O.T. 1-34.)
(3d ed. D.O.T. 222.138 through .687)

Nature of Work

Shipping clerks and receiving clerks do the clerical work that is often necessary to enable manufacturing companies, wholesalers, and other business firms to keep track of goods transferred from one place to another. In a great many companies, one clerk keeps records of all shipments sent out and received by his employer. In large companies, however, shipping and receiving clerks may be employed in separate departments, working under the direction of supervisors who are often called head shipping clerks or head receiving clerks—or sometimes warehouse managers.

Before a shipment is sent out from a business establishment to a customer, shipping clerks check to be sure the customer's order has been correctly filled. They type or prepare by hand the invoices and other shipping forms needed, look up freight and postal rates, record the weight and cost of each shipment, and check to see that the shipment is properly addressed. They also keep records of the date and other details associated with each shipment. Sometimes shipping clerks requisition from the firm's stockroom the merchandise which is needed to fill each order, wrap and pack the shipment, and direct its loading on company trucks, ensuring that the weight is evenly distributed and fragile items are safely placed.

Receiving clerks do similar work when shipments reach their destination. They find out whether their employer's orders have been correctly filled by comparing the original order with the items received and the accompanying bill of lading or invoice; and they check to see whether the merchandise in each shipment has arrived in good condition. Receiving clerks maintain records of all incoming shipments and the condition in which they were received, and they do other clerical work related to damaged or lost shipments. Routing shipments to the proper department of the company or section of the warehouse or to the stock room may also be part of their job.

Where Employed

The number of shipping and receiving clerks employed in 1965 is estimated at more than 300,000. Two out of every three worked in manufacturing firms and another fairly large group worked for wholesale houses or retail stores. The remainder were employed by transportation and freight forwarding companies, and by many other kinds of business firms. About 90 percent of all shipping and receiving clerks are men.

Shipping and receiving clerks are employed in large factories, warehouses, and stores. The

majority work in metropolitan areas, where such establishments tend to be concentrated.

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 in preparing for the work. The ability to write legibly is important. Dependability and an interest in learning about the firm's business activities are also qualities which employers seek.

New employees are usually given on-the-job training under the supervision of an experienced worker. Special care and skill is required, for example, when the shipments handled include such merchandise as garments or scientific instruments; and a knowledge of the regulations which apply to shipments abroad is necessary when merchandise is forwarded to other countries.

In some firms, beginners may help stockroom workers for a time until they acquire a knowledge of the firm's products and business transactions. In shipping and receiving rooms, newly hired clerks often start by doing routine work such as checking addresses, attaching labels to shipments and checking the items included, or filing. As clerks acquire experience, they may be assigned tasks requiring a good deal of independent judgment—for example, handling problems that arise because of damaged merchandise, or supervising other shipping or receiving room workers.

Work as a shipping or receiving clerk provides an excellent opportunity for an ambitious young man to learn about his company's products and business connections. Some clerks, particularly those who acquire college training or take courses in transportation, may eventually advance to positions as warehouse managers, industrial traffic managers, or purchasing agents. (The work of industrial traffic managers and purchasing agents is discussed elsewhere in the *Handbook*.)

Employment Outlook

During the 1965–75 decade, approximately 10,000 job openings for shipping and receiving clerks are expected to arise annually as employment in this occupation rises and as replacements are needed for workers who retire or stop working for other reasons. In addition, other job opportunities will occur as workers transfer to other types of employment.

As the quantity of goods distributed increases with population growth, rising income levels, and business expansion, the number of shipping and receiving clerks is likely to rise moderately through 1975. Employment will probably rise somewhat more slowly than the volume of goods distributed, however. Shipping and receiving departments in firms handling large quantities of merchandise will undoubtedly be able to handle a greater volume of work with fewer clerks, as they continue to increase efficiency by streamlining recordkeeping and modernizing warehouses through installation of moving belts and other laborsaving equipment. Even so, there will probably be a gradual increase in the number of clerks whose main job assignment is in shipping or receiving work. Competition for the openings that arise may be keen, however, since this kind of work requires relatively little specialized training and the number of qualified applicants seeking entry jobs is sometimes large.

Earnings and Working Conditions

Men employed as shipping and receiving clerks in metropolitan centers surveyed by the Bureau of Labor Statistics in 1963–64 averaged $2.50 an hour. Average earnings were generally lowest in the southern cities included in the survey (in more than half of them, less than $2.25 an hour); they were highest on the West Coast, where shipping and receiving clerks in four cities averaged $2.75 an hour or more. Regardless of the location of the city, salaries tended to be slightly higher in public utilities companies and wholesale firms than in other kinds of establishments.

Shipping and receiving clerks generally work a 40-hour week. Many, when they work more than 40 hours, receive time and a half for overtime. Nightwork and overtime, including work on Saturdays, Sundays, and holidays, may be necessary when raw materials are needed immediately on factory production lines, when shipments have been unduly delayed in arriving, or in other emergencies.

778-316 O—65——21

Shipping and receiving clerks do much of their work in warehouses and shipping and receiving rooms; they may do some of it on outside loading platforms. Work places are often large, unpartitioned areas which may be drafty and cold, and littered with packing materials and containers.

Some of the work done by shipping and receiving clerks requires physical stamina and strength. Most clerks must stand for long periods while they check quantities of merchandise. Locating numbers and descriptions on cartons often requires a great deal of bending, stooping, and stretching. It may be necessary for clerks to help load or unload shipments or move materials about in the warehouse. Occasionally, the work must be performed under considerable pressure in order to move shipments on time. (See introductory section of this chapter for Where To Go for More Information.)

Sales Occupations

Sales work offers career opportunities for young people with less than a high school education as well as for those with a college degree; for men and women who like to travel and those who do not; and for people who want salaried employment as well as those who aspire to run their own businesses. Young people with interests as varied as real estate, electronics, and ladies' fashions will undoubtedly find that among the millions of jobs existing for sales workers, some are in line with their special interests.

Workers in this occupational group sell for manufacturers, insurance companies, and other producers of goods and services; for wholesalers who stock large quantities of goods so that smaller lots may be purchased and resold by retail stores; and for drugstores, dress shops, and other retailers who deal directly with the public. Their customers include housewives buying groceries, college students buying textbooks, and manufacturers and other businessmen purchasing such items as machine tools, office furniture, or stationery. A list of all salable items would be practically endless—shoes, steel, candy, and stocks and bonds, to name a few more examples.

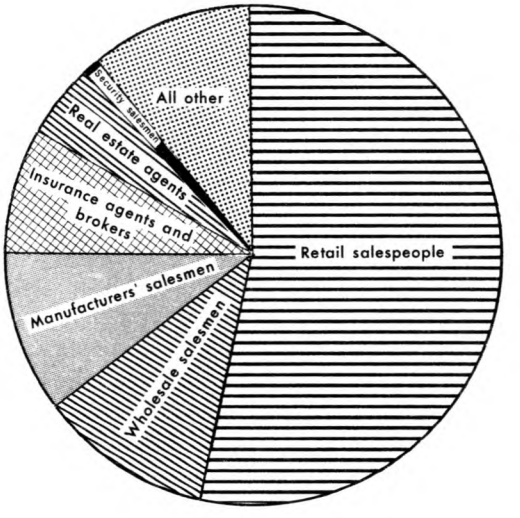
An estimated 4.5 million workers were employed in sales occupations in 1965. About one-fourth were part-time employees who usually worked fewer than 35 hours a week. Two out of every five were women, employed mainly in retail stores. In insurance, real estate, and other sales work outside retail stores, the great majority of employees were men.

This chapter gives information about several sales occupations which, combined, employ 9 out of every 10 sales workers. (See chart 22.)

CHART 22

AMONG THE 4.5 MILLION WORKERS IN SALES OCCUPATIONS IN 1965[1] . . . .

About one-half were retail salespeople



[1] Estimated

Training, Other Qualifications, and Advancement

Training requirements for different kinds of sales work—like the work itself—vary greatly. Thousands of salespersons have routine jobs selling standardized merchandise such as the magazines, candy, cigarettes, and cosmetics stocked by many drugstores. Similarly, the salesgirl behind the counter of a variety store needs to do little more than "wait on" people who have already made their selections from the stock displayed. Salespeople in such jobs are seldom required by their employers to have specialized training. They usually learn their duties on the job as they work with experienced salesclerks or, in some large stores, they may attend brief training courses. Even in the most routine kinds of selling, however, a high school diploma is an asset to a beginner seeking a job. High school courses in business subjects, as well as the specialized courses in distributive education offered in some city school systems, are regarded by most employers as particularly good preparation for sales work.

The salesman who sells complex products or services—electronic equipment or liability insurance, for example—has a job which is altogether different from that of most retail sales clerks. Beginners on jobs of this kind sometimes receive training which lasts many months. For some positions, salesmen must be college graduates who have specialized in engineering or some other field. Other salesmen dealing in specialized services and products may acquire the necessary technical knowledge by taking courses offered at universities or by manufacturers. Still others gain know-how through years of on-the-job experience, often supplemented by home study. Thus, a salesman of real estate may better qualify for his job by attending university extension courses; a beauty counselor in a department store may participate in an industry-sponsored training program before beginning her sales duties; or a salesman of fine jewelry may acquire his knowledge of gems during years of observation and study as he works on the job.

Successful salespeople must have the ability to understand the needs and viewpoints of their customers and a readiness to be of assistance to them. Sales work also requires people with poise who are at ease in dealing with strangers. Other important attributes in many types of selling are energy, self-confidence, imagination, the ability to communicate well, and self-discipline. In almost all sales work outside retail stores, the salesman must have the initiative to locate his own prospective customers and plan his own work schedule.

Employment Trends and Outlook

Since 1950, the number of workers in sales occupations has increased fairly rapidly. In some kinds of sales work, however, the rate of increase has been far greater than in others. Among the large occupations which have had relatively rapid increases are real estate salesman, insurance agent, manufacturers' salesman, and wholesale salesman; the smaller sales occupations of demonstrator, stock and bond salesman, and house-to-house salesman have also increased rapidly. Among the slowest growing of all sales occupations during this same period has been retail sales worker—an occupation which nevertheless employed more people in 1965 than all other sales occupations combined.

During the 1965–75 decade, employment in sales occupations is expected to rise fairly rapidly. Openings created by growth and vacancies which must be filled as sales workers retire or stop working for other reasons are expected to result in a need for about 250,000 workers each year; additional thousands of jobs will be needed to replace people now employed in sales work who transfer to other types of employment.

As employment rises, the proportion of part-time workers—already higher than in most occupational groups—is also likely to increase. In the growing number of suburban shopping centers, particularly where many retail stores remain open for business several nights a week, a larger proportion of the sales force is likely to be made up of "contingents" employed only on Saturdays and during evening shopping hours.

The main reason for the anticipated rise in employment is the prospect of increased sales resulting from rapid population growth, business expansion, and rising income levels. Within retail stores, however, special circumstances which have restricted employment growth in the recent past will probably continue to do so. Information about some of the special circumstances and the employment prospects for sales workers in retail stores and other major fields is given in the statements which follow.

Salesmen and Saleswomen in Retail Stores

(2d ed. D.O.T. 1–70.; and 1–75.; and 1–80)

(3d ed. D.O.T. 260. through 290.068, .118, .128, .158, .250, .258, .383, .858)

Nature of Work

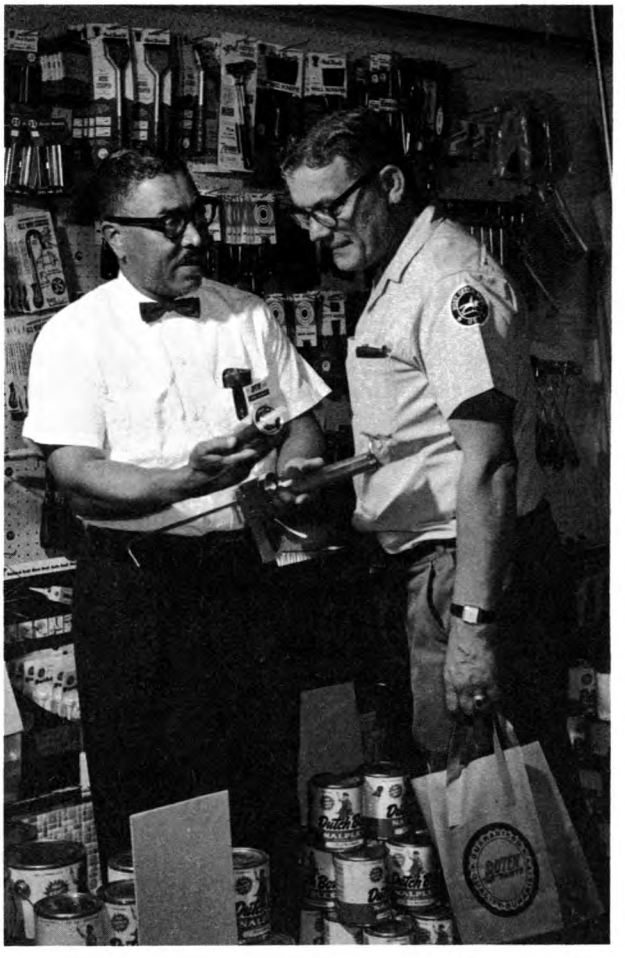
The success of any retail business depends largely on its salespeople. Courteous, efficient service from behind the counter or on the sales floor does much to satisfy customers and to build a store's good reputation. Aside from the contact with customers, which is a part of all sales jobs, there are differences in the duties, skills,

and responsibilities of salespeople which are fully as great as the differences in the kinds of merchandise they sell.

In selling items such as furniture, electrical appliances, or some types of wearing apparel, the sales worker's primary job is to create an interest in the merchandise the store has to offer. The salesman or saleswoman may answer questions about the construction of an article, demonstrate its use, explain how it is cared for, show various models and colors, and otherwise help the customer to make a selection. In some stores, special knowledge or skills may be needed to sell the merchandise carried—for example, in a pet shop, information about the care and feeding of animals or, in a music store, the ability to play an instrument.

People who sell standardized articles, such as many of the items in hardware and drug stores, are called upon less frequently to give customers this kind of assistance. Often, they do little more than assemble and wrap the items purchased by each customer. In stores where goods are clearly labeled and arranged so that customers can easily make their selections from shelves or counters—as in supermarkets and some drugstores—salesclerks may be replaced by cashiers who wrap or bag purchases, receive payment, and make change. (See statement on Cashiers.)

In addition to their selling duties, most retail salespeople make out sales or charge slips, receive cash payments, and give change and receipts. Salespersons are usually responsible for keeping their work areas neat and presentable. In small stores, they may assist in ordering merchandise, stocking shelves or racks, marking price tags, taking inventories, and preparing attractive merchandise displays and promoting sales in other ways. (Route salesmen, who sell bread, milk, and other products directly to customers on a regular route, are discussed in the chapter on Driving Occupations.)



Sales people must be able to explain desirable features of their merchandise.

Where Employed

More than 2.6 million salespersons—nearly three fifths of them women—were employed in early 1965, in close to 100 different kinds of retail businesses. The stores where they worked range in size from the small drug or grocery store, which employs only one part-time salesclerk, to the giant department store with hundreds of salespersons. The largest employers of salespersons are department and general merchandise, food, and apparel and accessories stores. Men predominate in stores selling furniture, household appliances, hardware, farm equipment, shoes, and lumber, and in automobile sales agencies. Women outnumber men in department and general merchandise, variety, apparel and accessories, and drugstores.

Sales jobs are found in practically every community in all parts of the country. However, the vast majority of salespersons work in large cities and in heavily populated suburban areas.

Training, Other Qualifications, and Advancement

Employers generally prefer to hire high school graduates for sales jobs. Subjects such as salesmanship, commercial arithmetic, and home economics help to give the student a good background for many selling positions. Some high schools have distributive education programs, which include courses in merchandising, principles of retailing and retail selling, and also provide an opportunity for students to gain practical experience under trained supervision by working part time in local stores. Such part-time selling experience may be helpful in obtaining full-time employment.

Young people interested in obtaining sales jobs may apply to the personnel office in larger retail establishments. Applicants are interviewed and are sometimes required to take special tests which indicate their aptitude for sales work. Among the characteristics preferred by employers are a pleasing personality, an interest in sales work, a neat appearance, and the ability to communicate clearly. Prospective salespersons should also be in good general health and able to stand for long periods of time.

Newly hired sales personnel usually receive on-the-job instruction in how to make out sales slips and operate the cash register. They learn about credit and other store policies and, if the products they sell require specialized knowledge, they may be given information of this kind also. In a great many small stores, new employees receive their training as they work on the job under the close supervision of an experienced employee or the proprietor. In large stores, training programs are likely to be more formal, and beginners usually attend training sessions for a few days.

Executive positions in large retail stores are often filled by promoting college graduates originally hired as trainees and assigned to sales jobs to gain practical experience. However, retail selling is one of the few fields in which an employee with initiative and ability may be selected for promotion, regardless of his education. Many stores offer opportunities for persons without a college degree to advance to executive positions. Some salespersons eventually become buyers, department managers, or store managers; others, particularly in large stores, may transfer to office positions which afford opportunities for further promotion to administrative work in personnel, advertising, or other fields. Opportunities for advancement are relatively limited in small stores, where one person, often the owner, performs most managerial functions. Sales experience in retail stores is often a valuable asset in qualifying for jobs such as selling for wholesalers or manufacturers.

Employment Outlook

Over the 1965–75 decade, a moderate increase is expected in the number of salespeople employed in retail sales occupations. Openings created by growth, plus vacancies which must be filled as salespersons retire or stop working for other reasons, are expected to total approximately 135,000 each year; additional thousands of jobs will become available as retail sales workers transfer to other types of employment.

Among the major factors contributing to the anticipated rise in retail sales jobs are population and economic growth, and the resulting increase in the volume of sales. The trend for stores to remain open for longer hours, while the number of weekly hours worked by salespersons continues to decline, will also contribute to the need for more salespersons. In addition to full-time sales jobs, there will be many opportunities for part-time workers, as well as for temporary workers during peak selling periods, such as the Christmas season.

Changes in the way goods are sold are likely to limit the number of sales workers employed in some types of stores, and affect the kinds of openings that occur in others. Because self-service—already the rule in most food stores—is rapidly being extended to drug, variety, and other kinds of stores, customers will purchase more articles without the help of salespeople. On the other hand, rising income levels will probably increase the demand for some kinds of merchandise which requires the salesperson to spend a good deal of time with each customer: some examples are electrical appliances and automobiles, which prospective customers may want demonstrated. In view of these developments, it appears likely that sales employment will increase somewhat more slowly than the volume

of sales. Little of the increase is likely to be in routine sales jobs; much of the demand will be for workers who are skilled in salesmanship and well informed about the merchandise they sell.

Sales workers have more stable employment than workers in many other occupations. When retail sales are affected by downturns in the economy, employers—particularly in large stores—can reduce the number of employees by not filling vacancies that result from turnover, or they can eliminate some part-time jobs. Competition for sales jobs tends to increase when other jobs are scarce, however, because workers in other occupations can often qualify for sales work.

Earnings and Working Conditions

In early 1965, young people starting in routine jobs where they were required to do little more than "wait on" customers, were generally paid $1.25 an hour (in many establishments, the minimum wage required by law). In stores where salesmanship is more important, starting salaries were sometimes higher than this, or, in small establishments not covered by the minimum wage law, somewhat lower. Salaries are usually lower in rural than in metropolitan areas.

Experienced sales workers, including those whose pay scales are determined by union contracts, often earn $2 or more an hour. Many are paid on a straight salary basis; some also receive commissions—that is, a percentage of the sales they make; and still others are on a straight commission basis. Earnings are likely to be highest in jobs which require special skill in dealing with customers, or technical knowledge of the merchandise sold. Among the highest paid are people who sell automobiles, major appliances, and furniture; salespeople in jobs such as these often earn $7,500 a year or more.

Salespersons in many retail stores are allowed to purchase merchandise at a discount, often from 10 to 20 percent below regular prices. This privilege is sometimes extended to the employee's family. Some stores, especially the large ones, pay all or part of the cost of employee benefits such as life insurance, retirement, hospitalization, and surgical and medical insurance.

Some full-time salespersons work a 5-day, 40-hour week, although in many stores, the standard workweek is longer. Some stores are required by law to pay overtime rates for more than 40 hours' work a week. Since Saturday is a busy day in retailing, employees usually work that day and have another weekday off. Longer than normal hours may be scheduled before Christmas and during other peak periods, and employees who work overtime receive additional pay or an equal amount of time off during slack periods. Some salespersons regularly work one or more evenings a week, especially in stores in suburban shopping centers.

Part-time salespersons generally work during the store's peak hours of business—daytime rush hours, evenings and weekends.

Salespeople in retail trade usually work in clean, well-lighted places. Many stores are air conditioned. Some sales positions require work outside the store; a salesman of kitchen equipment may visit prospective customers at their homes, for example, in order to assist them in planning renovations, and a used car salesman may spend much of his time working at an outdoor lot.

Where To Go for More Information

Information on retailing courses given in high schools may be obtained from local Superintendents of Schools, or from the State Supervisor of Distributive Education in the Department of Education at each State capital.

Additional information on careers in retailing may be obtained from the personnel offices of local stores or from merchants' associations.

Automobile Salesmen

(3d ed. D.O.T. 280.358)

Nature of Work

Automobile salesmen are important links between the makers and buyers of new cars, and between used car dealers and buyers. Many salesmen sell only new or used cars. Others sell both new and used cars, as well as trucks. (This state-

ment does not discuss salesmen who sell trucks only.)

The automobile salesman spends much of his time waiting on customers in the dealer's showroom or used car lot. After greeting a customer, he finds out the kind of car the customer has in mind and the features that interest him most by asking questions and encouraging him to comment on the cars on display. For example, one customer may indicate that he is primarily interested in economy and ease of operation, while another may be more impressed with styling and performance. Then, in his sales presentation, the salesman emphasizes the points that will satisfy the customer's needs and stimulate his desire to buy. For example, if the customer expresses interest in a compact car, the salesman may stress economical gas mileage, and low cost and upkeep. To illustrate such features as smoothness of ride and ease of operation, he invites the customer to test drive the car.

Because the purchase of a car involves a considerable sum of money, most customers must be thoroughly convinced that they are making a wise decision. Successful salesmen have the ability to overcome the customer's hesitancy to buy, and get the order (called closing the sale). Since closing the sale frequently is difficult for beginning salesmen, experienced salesmen or sales managers often lend assistance. Salesmen may quote tentative prices and trade-in allowances when conferring with customers, but these figures are usually subject to the approval of sales managers. Salesmen may arrange financing and insurance on the cars they sell. They also register cars and obtain license plates for customers.

Automobile salesman and new customer review sales contract.

Before the salesman approves delivery of a car to a customer, he makes sure that it has been properly serviced and has the accessories specified by the customer. He answers the customer's questions on subjects such as the car's controls and the maintenance warranty. A week or so following delivery of the car, he may contact the customer by phone or mail to express appreciation for the customer's business and to inquire about his satisfaction with the car. From time to time, he may also send the customer brochures on new car models and other literature. By keeping in contact with his customers, the salesman builds repeat business.

Automobile salesmen develop and follow leads on prospective new customers. For example, they obtain names of prospects from sources such as automobile registration records and dealer sales, service, and finance records. A salesman can also get leads on prospective customers from gasoline service station operators, parking lot attendants, barbers, and others whose work brings them in contact with large numbers of people. He usually contacts prospects by phone or mail.

Where Employed

An estimated 110,000 automobile salesmen were employed in early 1965. More than four-fifths of automobile salesmen are employed by new car dealers, and the remainder work for used car dealers. While many used car dealers employ only 1 salesman, some new car dealers employ more than 50 salesmen. Some used car dealers do not employ salesmen, or employ them on a part-time basis only.

Automobile salesmen can find employment opportunities throughout the country, although most opportunities are in large urban areas and in the most populous States.

Training, Other Qualifications, and Advancement

Most beginning salesmen are trained on the job by sales managers and experienced salesmen. In many large firms, they also receive formal training in special classes for beginners before they start selling. These classes, which generally last for several days, include instruction on obtaining customer leads, making sales presentations, and closing sales. Beginners are frequently given training manuals and other educational material published by automobile manufacturers. Both experienced and beginning salesmen receive continuing guidance and training from sales managers, both on the job and at periodic sales meetings. Salesmen may also attend training programs offered by automobile manufacturers.

Most sales managers regard a high school diploma as the minimum educational requirement for beginning automobile salesmen. A growing number of automobile salesmen have completed a few years of college. Courses in public speaking, commercial arithmetic, English, business law, psychology, and salesmanship provide a good background for selling. Previous sales experience or work requiring contact with the public is helpful. Many automobile salesmen have been furniture salesmen, route salesmen, door-to-door salesmen, automobile parts countermen, or gasoline service station attendants. However, many sales managers will hire applicants who have little or no sales experience if their personal and educational qualifications are satisfactory. Age requirements for beginning salesmen vary among individual employers, although many prefer that beginners be at least in their mid- or late twenties. Age requirements are sometimes waived if the employer considers the applicant to be a mature individual. However, most employers consider 21 years as the minimum age for beginning salesmen.

Automobile salesmen must be tactful, well groomed, have a cheerful and outgoing personality, be able to express themselves well, and have the other personal qualities that make a good impression on customers. Initiative and aggressiveness are also important because the number of sales is related to the number of prospective customers contacted. Because automobile salesmen occasionally have the discouraging experience of going for days without making a sale, they need self-confidence and determination to get through these slow periods.

Successful salesmen who have managerial ability may advance to assistant sales manager, sales manager, or general manager. Some sales managers and general managers who acquire the necessary capital eventually acquire their own dealerships or become partners in dealerships.

Employment Outlook

Many thousands of job openings for automobile salesmen are anticipated each year during the 1965-75 decade. Most of these openings are expected to result from the need to replace automobile salesmen who transfer to other fields of work. Although selling cars is a rewarding career for many young people, others find that they are not suited for the work and leave to seek other jobs. In addition to employment opportunities resulting from transfers out of the occupation, more than 2,000 openings will arise annually because of the need to replace experienced salesmen who retire or die.

In addition to replacement needs, the number of automobile salesmen is expected to grow slightly, because of expanding demand for cars. Annual sales of cars will rise during the next decade as a result of rising population, family formations, multicar ownership, and income, and the continuing growth of suburbs. Car sales have fluctuated from year to year in the past with changes in general business conditions, consumer preference, and the availability of credit. Employment of automobile salesmen has also fluctuated, but has tended to be more stable than sales.

Earnings and Working Conditions

Almost all automobile salesmen are paid on a commission basis. Commissions are usually based on the selling price of a car or the gross profit received by the dealer. Additional commissions may be paid when cars are financed and insured through the dealer. Although salesmen work year-round, their sales (and their commissions) may vary from month to month. To provide commission salesmen with a steady income, many dealers pay a modest weekly or monthly base

salary. Others advance salesmen money against their future commissions. A few dealers pay their salesmen a straight salary. Dealers may guarantee beginners a modest income for a few weeks or months. Thereafter, they are paid on the same basis as the more experienced salesmen.

The earnings of salesmen vary widely, depending on factors such as individual ability and experience, and geographic location. Most automobile salesmen earn between $5,000 and $10,000 a year, according to the limited data available. However, earnings over $10,000 a year are not uncommon in large cities, and some highly successful salesmen earn more than $20,000 in good years.

A large number of employers furnish salesmen with demonstrator cars free of charge. Others allow salesmen to purchase demonstrator cars at a discount, often at dealer's cost. Salesmen also receive discounts on cars purchased for their personal use. Some dealers provide paid vacations. Many provide life insurance, hospitalization, and surgical and medical insurance.

Most automobile salesmen work 6 days a week. Because many customers find it more convenient to shop after work, salesmen frequently work evenings. In some areas, they may work on Sundays, and take a day off during the week. Many dealers assign salesmen "floor-time"—hours they spend in the showroom greeting customers. For example, a salesman may be scheduled to work on the showroom floor from 9 a.m. to 3 p.m. one week, from 3 p.m. to 9 p.m. the next week, and all day on Saturdays. When not assigned to the floor, salesmen may spend a few hours each day delivering cars to customers and looking for new customers. Many salesmen work more than 50 hours a week.

Where To Go for More Information

National Automobile Dealers Association,
2000 K St. NW., Washington, D.C. 20006.

Automobile Parts Countermen

(2d ed. D.O.T. 1–75.22)
(3d ed. D.O.T. 289.358)

Nature of Work

Automobile parts countermen sell replacement parts and accessories for automobiles, trucks, and other motor vehicles. Most of them work in automobile parts wholesale stores and automobile dealer parts departments where they sell directly over the counter and take telephone orders for varied items such as piston rings, head gaskets, shock absorbers, valve springs, speedometer cables, rear-view mirrors, and seat covers.

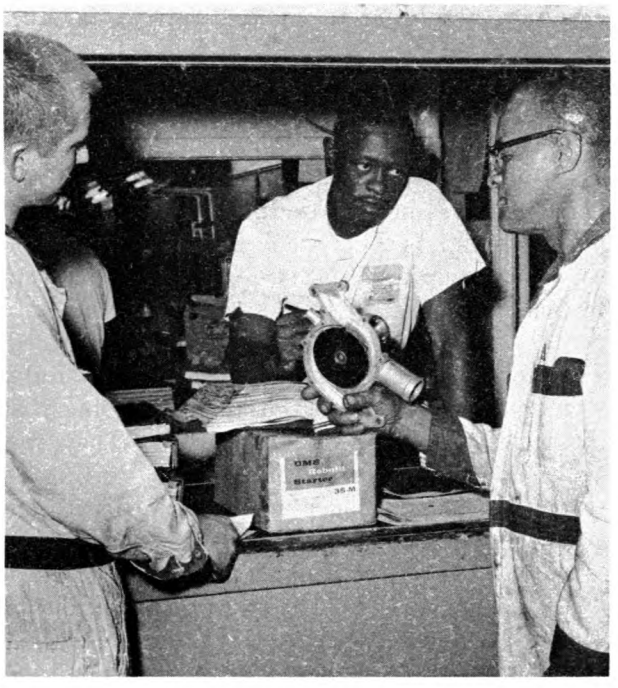
Parts countermen employed by wholesalers sell parts for many different makes of automobiles and trucks to independent repair shops, self-employed mechanics, service station operators, "do-it-yourselfers," and other customers. Parts countermen employed by automobile and truck dealers usually sell only parts used on the particular makes of automobiles and trucks sold by the dealers. They may spend most of their time supplying parts to mechanics employed by the dealer.

A parts counterman identifies the part the customer needs—often, only on the basis of a general description—and locates the part in the stockroom. By knowing how to use parts catalogs and by knowing the layout of the stockroom, he can readily find any one of several thousand items. If a customer needs a part that is not stocked, the parts counterman may suggest one that is interchangeable, place a special order for the part, or refer the customer elsewhere.

The parts counterman determines prices of parts by referring to price lists, receives cash payment or charges the customer's account, fills out sales receipts and, when necessary, packages the item sold.

In addition to their sales duties, parts countermen may keep catalogs and price lists up to date, order parts to replenish stock, unpack incoming shipments of parts and distribute them in the stockroom, maintain sales records, take inventories, and perform related tasks. In many large wholesale stores some of these nonselling duties are performed by workers such as stock clerks and receiving clerks.

Parts countermen may use micrometers, calipers, fan-belt measurers, and other devices to



Automobile parts counterman dispenses part to mechanic.

measure parts for interchangeability. They may also use coil-condenser testers, spark plug testers, and other types of testing equipment to determine whether parts are defective. In some stores—particularly in small wholesale establishments—they may repair parts, using equipment such as brake riveting machines, brake drum lathes, valve refacers, and engine head grinders.

Where Employed

Most of the estimated 60,000 automobile parts countermen employed in early 1965 worked for automobile dealers and automobile parts wholesalers. Most dealers employed one to four parts countermen; many wholesalers employed more than four in this occupation. Other employers of these workers include truck dealers, retail automobile parts stores, automobile parts and accessories departments of department stores, and warehouse distributors of automobile parts. Trucking companies and buslines employ some parts countermen to maintain stockrooms and dispense parts to the mechanics who repair their fleets.

Parts countermen can find jobs throughout the country in automobile dealerships and automobile parts wholesale stores. Parts countermen who work for warehouse distributors, department stores, trucking companies, and buslines are employed mainly in large towns and cities.

Training, Other Qualifications, and Advancement

Automobile parts countermen should have a knowledge of the different types of motor vehicle parts and their functions and an aptitude for working with numbers. They should be neat, friendly, even-tempered, and tactful because they deal with many different types of customers. The ability to write legibly and concentrate on details, and a good memory are also desirable qualifications. High school or vocational school courses in subjects such as automobile mechanics, commercial arithmetic, salesmanship, and bookkeeping are helpful to young men interested in becoming parts countermen. Practical experience gained from working in a gasoline service station or working on automobiles as a hobby is also helpful. For entry jobs, employers generally prefer to hire high school graduates.

Most automobile parts countermen learn the trade through informal on-the-job training. Beginners are usually hired as parts delivery men or trainees. In some large firms, beginners start as stock clerks or receiving clerks. The trainee gradually acquires a knowledge of the different types of parts, learns how to use catalogs and price lists, and memorizes the layout of the stockroom. Although trainees may start waiting on customers after a few months' experience, it generally takes about 2 years to become a qualified parts counterman.

Automobile parts countermen with supervisory and business management capabilities may become parts department or store managers. Others may become "outside salesmen" for parts wholesalers and distributors. These salesmen call on automobile repair shops, service stations, and other businesses that buy parts and accessories in large quantities.

Employment Outlook

Employment of automobile parts countermen is expected to increase by about 1,000 jobs annually during the 1965–75 decade. As many or more opportunities are anticipated each year because of

the need to replace experienced workers who retire, die, or transfer to other fields of work.

Continued growth in the employment of parts countermen is anticipated because more replacement parts will be needed to maintain the increasing number of motor vehicles in use. Registrations of motor vehicles in the United States, which numbered more than 85 million in early 1965, are expected to increase by more than a fourth in the next 10 years. Moreover, the variety of replacement parts is growing. In recent years, automobile manufacturers have offered consumers a greater selection of makes and models, and optional equipment. As a result, automobile dealers and parts wholesalers are selling a much larger variety of parts, although many parts are interchangeable among various models. Employment in this occupation is expected to increase despite the fact that more and more replacement parts are being sold by retail outlets that do not employ parts countermen.

Earnings and Working Conditions

Automobile parts countermen are paid a weekly or monthly salary, or an hourly wage rate. In addition, they may receive commissions based on sales. Inexperienced men beginning as trainees, delivery men, or stock clerks generally receive $55 to $75 a week. Experienced parts countermen employed by automobile dealers in 34 cities had average straight-time hourly earnings of $2.54, on the basis of a survey in late 1964. Average hourly earnings of these workers in individual cities ranged from $1.96 in Memphis, Tenn., to $3.28 in San Francisco-Oakland, Calif. Almost two-thirds of all the parts countermen covered in the survey earned between $2 and $3.20 an hour. Experienced parts countermen who worked for wholesalers had comparable earnings, according to limited data from other sources.

Most parts countermen work between 40 and 48 hours a week. In many firms, they work half a day on Saturday.

Many employers of parts counterman provide paid holidays and vacations, and pay part or all of additional benefits such as life, health, and accident insurance. Others also contribute to retirement plans.

Stock rooms are usually clean and well lighted. The work of parts countermen is not physically strenuous, but they are on their feet much of the time, and do a lot of walking. They frequently have to work rapidly when waiting on more than one customer and simultaneously answering telephone calls.

Unions organizing automobile parts countermen include 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.

Where To Go for More Information

For further information regarding work opportunities for automobile parts countermen, inquiries should be directed to local employers, such as automobile dealers and automobile parts wholesalers; locals of the unions previously mentioned; or the local office of the State employment service. The State employment service also can provide information about the Manpower Development and Training Act and other programs that provide opportunities for training.

General information about the work of automobile parts countermen may be obtained from:

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

Automobile Service Advisors

(3d ed. D.O.T. 620.281)

Nature of Work

Many automobile dealers and some large independent garages employ service advisors to wait on customers who bring their automobiles in for maintenance and repairs. The automobile service advisor (sometimes called *service salesman* or *service writer*) is the link between the customer and the automobile mechanic. He confers with the customer to determine his service needs, and arranges for a mechanic to do the work.

Many times, such as when requests are made for a routine checkup, the advisor merely writes the customer's requests for services on a repair order. However, when the customer complains of mechanical or electrical trouble, the service advisor may have to ask him for information concerning the nature of the trouble. For example, if the customer says his automobile is difficult to start, the service advisor may ask him if the battery will crank the engine, or if the trouble occurs when the engine is cold or after it has warmed-up. The service advisor writes a brief description of these symptoms on the repair order. Such information is helpful to the mechanic in determining the cause of the trouble. The advisor also records other information on the repair order, including identification of the customer and his automobile. If the repairs are covered by a factory warranty, he records the automobile engine and body numbers, and the automobile's mileage and purchase date.

The service advisor tells the customer what repairs are needed and their approximate cost. He also tells him how long the work will take. He may advise on the necessity of having the work done, by pointing out that it will assure improved performance and safer operation, and prevent more serious trouble. In addition to advising on service needs, he may also sell automobile accessories. For example, while talking with customers, the service advisor may suggest the purchase of air-conditioners, radios, and seat covers.

If the service advisor is unable to tell the customer what repairs are needed until a mechanic has inspected the automobile, he takes the customer's phone number and contacts him later to obtain permission to make the necessary repairs.

The service advisor gives the repair order to the shop dispatcher who in turn usually computes the cost of repairs and assigns the work to a mechanic. In some shops, service advisors may compute the cost of repairs. If the mechanic has questions concerning the repair order, he contacts the service advisor.

When the customer returns for his automobile, the service advisor answers any questions regarding the repairs and tactfully deals with any complaints about their cost or quality. If the automobile is to be returned to the shop because the customer is dissatisfied with the work, or the cost of repairs is to be adjusted, the service advisor must usually obtain the authorization of his supervisor, the service manager. In some dealerships, the most experienced service advisor substitutes for the service manager when he is absent.

Service advisor records customer's maintenance needs.

Where Employed

An estimated 10,000 automobile service advisors were employed in early 1965. Most of them worked for large automobile dealers that employed from one to four service advisors. Service advisors are employed by comparatively few small automobile dealers. Some service advisors are employed by large independent automobile repair shops.

Training, Other Qualifications, and Advancement

Service advisors are trained on the job under the guidance of experienced service advisors and the service manager. In many shops, the trainee's first assignment is to assist the service department dispatcher or cashier for a few weeks. By working with the dispatcher, he learns how repair orders are routed through the shop, how

long it takes to complete different types of repairs, and how to compute repair costs. At the cashier's counter, he learns the costs of different types of repairs and how experienced service advisors tactfully handle customer complaints. The beginner can usually become a qualified service advisor in 1 to 2 years, although it may take longer if his duties include estimating automobile-body repairs.

Employers typically promote qualified young men from within their own organization, when vacancies for service advisor trainees arise. For example, a young man may apply for a job as service advisor trainee after he has gained experience in the firm as an automobile mechanic trainee or parts counterman trainee.

For service advisor trainees, employers prefer high school graduates who are over 21 years of age and have had some work experience in automobile repair or related activities. Some employers hire only qualified automobile mechanics. A driver's license is usually a requirement. Because he is likely to be the employee who deals directly with the customer, the way the service advisor does his job is very important in establishing customer satisfaction. Therefore, employers look for applicants who are neat, courteous, tactful, even-tempered, attentive listeners, and good conversationalists. High school and vocational school courses in automobile mechanics, commercial arithmetic, salesmanship, public speaking, and English are helpful to young men interested in becoming service advisors.

Service advisors with supervisory ability may advance to the position of service manager. Some service advisors open their own automobile repair shops.

Employment Outlook

Employment of automobile service advisors is expected to increase rapidly during the 1965–75 decade as a result of the increasing number of automobiles in use. However, because this is a relatively small occupation, only a few hundred new service advisor jobs will be added annually. In addition to the job opportunities resulting from employment growth, several hundred job openings will result annually because of the need to replace experienced service advisors who retire, die, or transfer to other fields of work.

The number of automobiles registered in the United States is expected to rise by more than a fourth in the next 10 years because of increases in population, new families, consumer purchasing power, and multicar ownership. The growing number of automobiles and their increasing complexity will result in additional repair work; consequently, many automobile dealers will need additional service advisors. Also, some small dealers, who do not employ service advisors now, are expected to hire them because of increases in the volume of service work.

Earnings and Working Conditions

Most service advisors are paid a salary plus a commission. The commission is usually based on both the labor cost of repairs and the price of accessories sold. Some service advisors are paid a fixed salary or a straight commission. Service advisors' commission earnings may vary as a result of fluctuations in the volume of repair work.

Experienced service advisors employed by automobile dealers in 34 cities had average straight-time hourly earnings of $3.22, based on a survey in late 1964. Average hourly earnings of these workers in individual cities ranged from $2.45 in Richmond, Va., to $3.70 in San Francisco—Oakland, Calif. Almost three-fourths of all the service advisors covered in the survey earned between $2.40 and $4 an hour.

Many employers of service advisors provide paid holidays and vacations, and pay all or part of the cost of life, or health and accident insurance. Others also contribute to retirement plans. Laundered uniforms are furnished free of charge by many employers.

Most service advisors work from 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 for them. During these peak hours, some advisors may be rushed to wait on customers.

Service advisors are on their feet much of the time and may have to be outdoors in all kinds of weather, but their work is not physically strenous. They also have to deal with occasional

disgruntled customers, but most of their contacts with customers are pleasant.

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, Chauffeurs, Warehousemen and Helpers of America (Ind.).

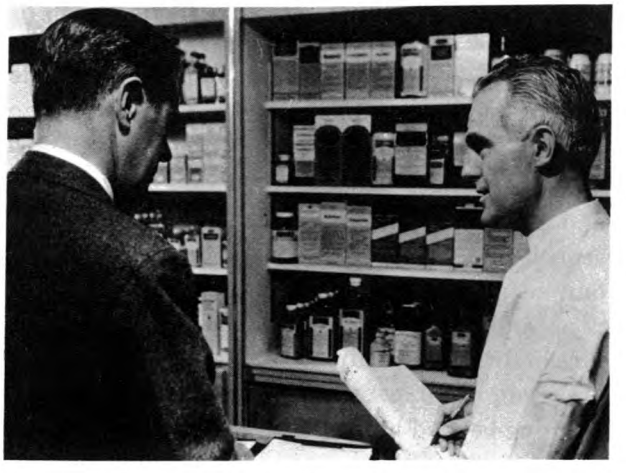
Salesmen in Wholesale Trade

(2d ed. D.O.T. 1–85. and 1–86.)

(3d ed. D.O.T. 260. through 289.068, .118, .128, .151, .158, .250, .258, .383, .858)

Nature of Work

Salesmen in wholesale trade have an important part in the movement of goods from factory to consumer. They represent companies that assemble hundreds—sometimes thousands—of similar products and thus enable their customers to purchase merchandise from one or a few nearby wholesale firms rather than from many widely scattered manufacturers. A wholesale drug company, for example, may stock its warehouse with many brands of drugs, soap, and cosmetics to supply drug, variety, and other stores that sell to the consumer. In much the same way, wholesale building materials dealers sell millwork, hardware, and other construction materials to builders who would otherwise have to deal with many manufacturers.



Druggist checks stock while wholesale salesman takes order.

At regular intervals, the salesman visits retailers and buyers for industrial and commercial firms and for institutions such as schools and hospitals. He shows them samples, pictures, or catalogs of the items his wholesaler stocks. The salesman seldom urges customers to purchase any particular product, since he may handle a very large number of items; rather, his objective is to persuade buyers to become regular customers of the wholesale firm he represents. His success depends on establishing a good reputation by keeping his customers well supplied at all times and otherwise giving prompt and dependable service.

Wholesale salesmen render a variety of special services which are becoming an increasingly important part of their job. Retailers sometimes depend on them to check the store's stock and prepare orders for items which will be needed before the next visit. In addition, they often advise retailers how to advertise new products, what prices to charge, and how best to arrange window and counter displays. A salesman of specialized products—for example, air-conditioning equipment—may give technical assistance on problems such as installation and maintenance.

Salesmen are responsible for some paper and detail work. They must write orders and send them to the wholesale house, prepare expense accounts and reports, plan their work schedule, make appointments, compile lists of prospects, and study literature relating to the products they sell. Some salesmen also collect the money owed to their companies.

Where Employed

An estimated 540,000 salespeople—about 95 percent of whom were men—worked for wholesalers in 1965.

Wholesale houses are located mainly in cities, but the territories assigned to their salesmen may be in any part of the country. A salesman's territory may cover a small section of a city with many retail stores and industrial users, or, in less populated regions, it may cover half a State or more.

Leading employers of wholesale salesmen are companies that sell foods and food products. Other large employers are wholesalers dealing in drugs, dry goods and apparel, motor vehicles and equipment, and electrical appliances and other items for home use, or who sell products such as machinery and building materials for use by industrial and business firms.

Training, Other Qualifications, and Advancement

In hiring trainees for sales work, most wholesalers look for young men with friendly, outgoing personalities. Other traits helpful to salesmen include self-confidence, enthusiasm for the job, and an understanding of human nature. High school graduation is the usual educational requirement, although many companies selling technical and scientific products such as heating and air-conditioning equipment, medical supplies, and electronic equipment prefer men with specialized training beyond high school.

A prospective salesman may start with a wholesale firm in a nonselling job, or he may be hired as a sales trainee. In either case, the beginner usually must work in several kinds of nonselling jobs before being assigned as a salesman. He may begin in the stockroom or shipping department, where he becomes familiar with the thousands of items the wholesaler carries. Later, he may transfer to the pricing desk to learn prices of articles and discount rates for goods sold in quantities. Next, he is likely to be an "inside salesman," writing orders that come from customers by telephone. In this job, and later as he accompanies an experienced salesman on his calls, the trainee comes to know many of the firm's customers. The amount of time spent in these initial jobs varies among companies; it usually takes 2 years or longer to prepare the trainee for outside selling. Only after he has become familiar with the company's products and the proper techniques of selling is he assigned a territory of his own.

Experienced salesmen with the necessary leadership qualities and sales ability may advance to supervisory and managerial jobs in the sales field or to other executive positions in wholesale firms.

Employment Outlook

Employment opportunities for salesmen in wholesale trade are expected to be good during the rest of the 1960's and early 1970's. In addition to new positions which will be created as the economy expands, thousands of job openings will occur each year as salesmen retire, die, or enter other types of employment. Retirements and deaths alone may result in more than 10,000 job openings annually. Additional openings will arise as workers transfer to other kinds of work; a considerable amount of turnover occurs among new entrants.

The number of wholesale salesmen is expected to rise rapidly, mainly because the amount of business transacted by wholesale houses is expected to increase as the population and the general economy grow. It is probable also that in the next decade, wholesale salesmen will be spending an increasing proportion of their time rendering special services to customers—advising about displays and assisting in other ways—and this in turn will add to the need for sales personnel. As chain stores and other large business firms continue to centralize their purchasing activities, the value of the sales which wholesalers make to individual customers will become larger and competition for sales correspondingly greater. To meet this competition, wholesalers can be expected to place an increasing amount of emphasis on sales activities.

Earnings and Working Conditions

Earnings of most junior or beginning salesmen in wholesale houses were between $450 and $550 a month in 1964, according to the limited information available. Experienced wholesale salesmen generally earn $6,500 a year, or more, the amount depending, in part, on the nature of the product sold. Many salesmen make considerably more than $10,000 a year.

Most employers pay a salary plus a commission which is a percentage of the dollar sales of each salesman; others pay a straight commission. Practically all wholesale salesmen have steady year-round work; but their sales (and their commissions) vary from month to month because the demand for some things—for example, air-con-

ditioning equipment or apparel—is greater during certain seasons than others. To provide salesmen with a steady income regardless of how sales fluctuate from one month to another, it is becoming increasingly common for companies to pay their experienced salesmen, at regular intervals, a "draw" against the commissions they can be expected to earn annually. Most companies provide each salesman with a car, or an allowance if he uses his own car, and reimburse him for certain expenses on the road.

The salesman often works long, irregular hours. He calls on customers when they are open for business and, if his territory is large, he may travel at night or on weekends to meet his schedule. However, most salesmen are seldom away from their homes for more a than a few days at a time. Many of their evenings may be spent writing reports and orders. Salesmén generally carry heavy catalogs and sample cases and are on their feet for long periods of time.

Most salesmen have paid vacations of from 2 to 4 weeks, depending on length of service with their employers. Some are covered by company benefit programs, including health and life insurance and retirement benefits.

Where To Go for More Information

Information on jobs in wholesale selling may be obtained directly from local wholesale houses or from associations of wholesalers in many of the larger cities. If no local association is available, write to:

National Association of Wholesalers,
1725 K St. NW., Washington, D.C. 20006.

Manufacturers' Salesmen

(2d ed. D.O.T. 1–85. and 1–86.)

(3d ed. D.O.T. 260. through 289.068, .118, .128, .151, .158, .250, .258, .383, .858)

Nature of Work

Practically all manufacturers—whether they make electronic computers or everyday can openers—employ salesmen. Manufacturers' sales representatives sell mainly to other businesses—factories, railroads, banks, wholesalers, and retailers; they also sell to hospitals, schools, and other institutions. The manner in which they go about this depends to a large extent on whether they are selling technical products such as factory machinery, metals, or chemicals, or nontechnical products such as clothing, canned foods, or stationery.

The great majority of manufacturers' salesmen sell nontechnical products—chiefly to wholesalers, less often to big retail stores. Salesmen in this kind of work must be well informed about their firms' products—which sometimes number in the hundreds—and also about the special requirements of their customers. When a salesman visits firms in his assigned territory, he uses a sales approach adapted to the particular line of merchandise he carries. Thus, a salesman of crackers or cookies may emphasize the wholesomeness of his manufacturer's products, the attractive way they are packaged, and the many kinds available. A clothing salesman, on the other hand, may stress style, design, fabrics, and the details of manufacture. Sometimes salesmen promote sales of their companies' products by setting up displays in hotels and holding conferences with wholesalers and other customers.

A saleman of highly technical products—electronic equipment, for example—is often called a *sales engineer* or an *industrial salesman.* In addition to having a thorough knowledge of his firm's products and the art of selling, he must be able to help prospective buyers with technical problems. For example, he may spend days or weeks analyzing a firm's manufacturing problems in order to determine the kinds of equipment and materials best suited to its operation. He then presents his solution to company officials—usually department heads or other executives—and tries to negotiate the sale. Often, sales engineers work with the research and development departments of their own companies, devising ways to adapt products to a customer's specialized needs. Salesmen of technical products sometimes train their customers' employees in the operation and maintenance of new equipment, and make frequent return visits to be sure that it is giving the desired service.

778–316 O—65——22

Manufacturer's salesman and prospective customer discuss a technical product.

Although manufacturers' salesmen spend most of their time visiting prospective customers, they also do some paperwork. They must write sales reports, plan their work schedules, make appointments, compile lists of prospects, conduct some sales correspondence, make out expense accounts, and study literature relating to their products. They may also be required to write reports on sales prospects in their territories, or on their competitors' products or customers' credit ratings.

Where Employed

Nearly 600,000 manufacturers' salesmen were employed in 1965; about 40,000 were sales engineers in manufacturing industries. Some manufacturers' salesmen work out of company "home offices," which are often located at manufacturing plants. The majority, however, work out of branch sales offices, which are usually in big cities where the greatest numbers of prospective customers are found.

More salesmen work for companies which produce food products than for any other industry. Other industries employing large numbers of salesmen include printing and publishing firms and manufacturers of chemicals, fabricated metal products, and electrical and other machinery. The largest employers of sales engineers are companies producing transportation equipment, fabricated metal products, and heavy machinery. About 10 percent of all manufacturers' salespeople are women, most of whom are employed in industries producing food products.

Training, Other Qualifications, and Advancement

College graduates are generally preferred for training as salesmen because most employers believe a college education is helpful in dealing with company officials. However, many persons with little or no training beyond high school who are well qualified in other respects can achieve successful careers as manufacturers' salesmen.

Manufacturers of nontechnical products often prefer college graduates with a degree in liberal arts or business administration. Some training at a college of pharmacy is usually required for jobs as drug salesmen. As a rule, the sales engineer or industrial salesman who sells complicated equipment needs a technical education. For example, manufacturers of electrical equipment, heavy machinery, and some types of chemicals prefer to hire college-trained engineers or chemists. (Information on chemists, engineers, and other professionally trained workers who may be employed as industrial salesmen is given elsewhere in the *Handbook*.)

Although prospective salesmen can often get jobs by applying directly to sales offices of manufacturing concerns, many are recruited by manufacturers who send representatives to colleges to interview students who will soon graduate. Recruiters look for students who are academically well qualified and who have participated in extracurricular activities. As salesmen must be able to meet and get along well with many types of people, recruiters also consider the student's personality traits and appearance. Preference is likely to be given to those with pleasant but forceful personalities who make a favorable impression in manner, speech, and dress. A recruiter may hire directly for his company or he may arrange for those applicants he feels are qualified to be interviewed by company officials before final selections are made.

Most beginning salesmen are given some training before they start on the job. Some companies,

especially those manufacturing complex technical products, have formal training programs lasting 2 years or longer. In some of these programs, trainees are rotated among jobs in several departments of the plant and office to learn all phases of production, installation, and distribution of the product; other trainees receive formal instruction in classes at the plant, sometimes followed by intensive on-the-job training in a branch office under the supervision of field sales managers.

Sales representatives with good sales records and leadership ability may advance to positions as sales supervisors, branch managers, or district managers. Those with unusual ability and managerial skill may eventually advance to sales manager or other executive positions; many top executive jobs in industry are filled by men who started as salesmen.

Because salesmen have frequent contacts with businessmen in other firms, they often find opportunities to transfer to better jobs with companies to which they sell products. Some salesmen go into business for themselves as manufacturers' agents selling similar products of several manufacturers. Experienced salesmen often find opportunities in advertising, market research, and other fields related to selling.

Employment Outlook

Employment opportunities for manufacturers' salesmen are expected to be good during the 1965–75 decade. About 35,000 openings will occur annually as employment in this occupation rises and as existing jobs become vacant due to retirement or death. Still other vacancies will occur as salesmen leave their jobs to enter other types of employment.

The number of manufacturers' salesmen is expected to rise very rapidly, partly because of general economic growth resulting from increases in population and industrial production, and also because manufacturers will be placing greater emphasis on their sales activities. The development of new products and improvements in marketing techniques will probably heighten competition between the manufacturers. And with the increase in the volume of business transacted with some customers—modern industrial complexes, chain store organizations, and large institutions of many kinds—competition between the manufacturers supplying these organizations will further the need for effective sales organizations. Despite the fact that they will be filling thousands of sales jobs each year, manufacturers are expected to be selective in hiring. They will look for ambitious young people who are both well trained and temperamentally suited for their jobs. As markets for technical products expand, demand is likely to be particularly strong for the technically trained salesmen.

Earnings and Working Conditions

According to information available from private surveys, starting salaries for inexperienced salesmen generally averaged between $5,000 and $6,600 a year in 1964. With commissions and bonuses, beginners averaged nearly $7,200 a year. The highest starting salaries were generally paid by manufacturers of electrical and electronic equipment, construction materials, hardware and tools, and scientific and precision instruments.

Some manufacturing concerns pay their experienced salesmen a straight commission, based on the dollar amount of sales made; others pay a fixed salary; and still others—the majority—use a combination salary-plus-commission plan. The amount earned through commissions varies according to the salesman's ability, the percentage commission, location of his sales territory, nature of the products sold, types of customers, and other factors. The earnings of many experienced salesmen ranged from $9,000 to $14,000 in 1964; some earned $25,000 or more.

Some manufacturers' salesmen have large territories and do considerable traveling. Others usually work in the neighborhood of their "home base." For example, a salesman of heavy industrial equipment may be assigned a territory covering several States and often may be away from home for days or weeks at a time. On the other hand, a salesman of food products may work in a small area which is within commuting distance of his home.

When away from home on business trips, salesmen are usually reimbursed for such expenses as transportation costs, hotel bills, meals, tips, telephone calls, and stenographic services. Some com-

panies either provide a car or pay an allowance to salesmen who use their own cars.

Salesmen often work irregular hours. They make calls at the time most convenient to their customers, and often have to travel at night or on weekends to meet their schedules. Frequently, they spend evening hours writing reports and planning itineraries. However, some salesmen, because of the nature of their positions, can plan their work schedules so they can take time off when they want it. Most salesmen who are not paid on a straight-commission basis receive paid vacations of from 2 to 4 weeks, depending on their length of service. They usually share in company benefit programs, including life insurance, pensions, and hospital, surgical, and medical benefits.

Where To Go for More Information

For more information on the occupation of manufacturers' salesmen, write to:

Sales and Marketing Executives, International, Youth Education Division,
630 Third Ave., New York, N.Y. 10017.

The Council on Opportunities in Selling, Inc.,
630 Third Ave., New York, N.Y. 10017.

Insurance Agents and Brokers

(2d ed. D.O.T. 1–57.10)
(3d ed. D.O.T. 250.258)

Nature of Work

Insurance agents and brokers sell policies or contracts which protect individuals and businesses against future losses and financial pressures. They also provide their customers with many services related to the insurance they sell. They may, for example, assist in planning how to provide financial protection which best meets the special needs of a customer's family; advise about the types of insurance best suited for the protection of an automobile, home, business establishment, or other property; or help a policyholder in obtaining settlement of an insurance claim.

The many kinds of insurance available are of two main types—life insurance, and property and liability (or casualty) insurance. Agents and brokers usually specialize in selling one of these two types of insurance. Policies sold by life insurance agents provide payment to survivors in the event of the policyholder's death; they may also provide annuities, funds for the education of children when they reach college age, and other benefits which the policyholder has arranged for, anticipating he would need these funds at some future time. Property and liability insurance policies protect policyholders from financial losses which they might otherwise incur because of automobile accidents, fire and theft, or other hazards. Agents selling either of these two types of insurance may also sell health insurance.

An insurance agent may be either an insurance company employee or an independent businessman who is under contract to act as the authorized representative of one or more insurance companies. A broker occupies a somewhat different position; he is not under contract to any particular company, but places the policies he sells with whatever insurance company he feels best meets his clients' needs. In other respects, agents and brokers do much the same kind of work.

Agents and brokers spend most of their time discussing different types of insurance policies with prospective customers. Some time must be spent in office work—planning insurance programs that are specially tailored to prospects' needs, preparing reports, maintaining records, and drawing up lists of prospective customers. An agent's or a broker's success depends on his ability to make sales. Therefore, he must have the initiative to locate new prospects, and he must have a thorough knowledge of insurance fundamentals so that he will be able to evaluate his client's insurance needs and explain policy terms clearly. Equally important is the ability to establish friendly relations and maintain the confidence of his clients, many of whom seek advice as well as information about their insurance requirements.

(See chapter on Occupations in the Insurance Business for additional information about life insurance and property and liability insurance companies.)

Insurance agent explains policy terms to clients.

Where Employed

An estimated 400,000 agents and brokers sold insurance in 1965. About half of them were engaged primarily in selling life insurance, and the remainder sold property and casualty insurance. Nine out of every ten agents and brokers were men. Many additional agents—both men and women—sold insurance on a part-time basis.

Insurance agents and brokers are employed in all parts of the country, but the greatest number work in large cities.

Training, Other Qualifications, and Advancement

Although employers seldom specify age limits or formal educational requirements, practically all agents hired in recent years have been at least 21 years of age and more than half of them have had some college training. Many were college graduates. College training, although not essential, may be an aid to the agent in grasping insurance fundamentals and in establishing good personal relationships with prospective clients. Courses in accounting, economics, finance, and business law, as well as courses in insurance subjects, are considered helpful. A liberal arts curriculum may be equally desirable in preparing the prospective agent. Sales ability is also important. Some skill in salesmanship can be acquired through experience and from a study of the principles and techniques of selling, but much comes from natural aptitude—a capacity for meeting and talking easily with strangers, together with a cheerful personality, self-confidence, and enthusiasm.

All insurance agents and most brokers must obtain licenses in the States 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.

Before they start selling, new agents usually receive training at insurance company home offices or at the agencies and brokerage firms where they will be working. Some insurance companies sponsor classes in sales problems and insurance principles. This instruction may be given over a period of several weeks or a few months. In other cases, training takes the form of working on the job under the direct supervision of experienced sales personnel.

Agents and brokers have opportunities to broaden their knowledge of the insurance business by enrolling in intermediate and advanced courses available at many colleges and universities and by attending institutes, conferences, and seminars sponsored by insurance organizations. As an agent or broker acquires experience and broadens his knowledge of the insurance business, he can, by passing a series of examinations given by the American Society of Chartered Life Underwriters, qualify for the designation Chartered Life Underwriter (CLU). In much the same way, a property and liability agent, by passing an examination given by the American Institute for Property and Liability Underwriters, Inc., will qualify for the Chartered Property Casualty Underwriter (CPCU) designation. The CLU and CPCU designations are recognized marks of attainment in their respective fields.

Insurance agents who demonstrate sales ability and leadership qualities may be promoted to positions as sales or agency managers in district or sales offices or to other managerial positions in home offices of insurance companies. A few may advance to top positions as agency superintendents or company vice-presidents or presidents. Many agents who have built up a good clientele prefer to remain in sales work, however.

Some, particularly in the property and liability field, eventually establish their own independent agencies or brokerage firms.

Employment Outlook

More than 15,000 job openings for insurance agents and brokers are expected to arise each year throughout the rest of the 1960's and early 1970's. Some will be new jobs created as employment expands, and others will be to replace agents and brokers who retire or stop working for other reasons. Because the rate of turnover is high among beginners in this occupation, many workers will also be needed to replace insurance agents who leave to enter other types of employment.

The number of insurance agents and brokers is expected to continue to increased moderately. As population and incomes rise and life expectancy increases, more families will depend on life insurance and on policies which provide protection in the form of retirement income, medical care, and funds for a college education for their children. Expansion in industrial plant and equipment and increases in major consumer purchases such as a home or automobile, will contribute to increased sales of property and liability insurance. Despite the expected increase in the number of policies issued, however, insurance selling will remain a keenly competitive field.

Earnings and Working Conditions

Beginners in this occupation are often guaranteed moderate salaries or advances on commissions while they are learning the business and building up a clientele. Thereafter, most agents are paid on a commission basis. The size of the commission varies, depending on the type and amount of insurance sold and on whether the transaction involves a new policy or the renewal of a policy already in force. After a few years, an agent's commissions on new policies sold and on renewals may range from $5,000 to $15,000 annually. A few highly successful agents and brokers earn up to $25,000 or more.

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 are usually free to arrange their own hours of work, they often schedule appointments during evenings and weekends for the convenience of clients. Some agents spend more than the customary 40 hours a week on the job.

Where To Go for More Information

General information on the occupation of insurance agent and broker may be obtained from the home office of many life insurance and property and liability insurance companies. Information on State licensing requirements may be obtained from the department of insurance at any State capital.

Additional information about life insurance agents may be obtained from:

Institute of Life Insurance,
277 Park Ave., New York, N.Y. 10017.
Life Insurance Agency Management Association,
170 Sigourney St., Hartford, Conn. 06105.
The National Association of Life Underwriters,
1922 F St. NW., Washington, D.C. 20006.

Information about property and liability agents and brokers can be obtained from:

Insurance Information Institute,
110 William St., New York, N.Y. 10038.
National Association of Insurance Agents, Inc.,
96 Fulton St., New York, N.Y. 10038.
Insurance Institute of America, Inc.,
270 Bryn Mawr Ave., Bryn Mawr, Pa. 19010.

Real Estate Salesmen and Brokers

(2d ed. D.O.T. 1–63.10 and .20)
(3d ed. D.O.T. 250.358)

Nature of Work

Real estate salesmen and brokers are at the center of most property transactions. They represent property owners who want to sell and find potential buyers for residential and commercial properties. Salesmen and brokers may also be called *real estate agents*, or if they are members of organizations affiliated with the

National Association of Real Estate Boards, "*Realtors.*"

Salesmen are employed by brokers to show and sell real estate; some handle rental properties. Brokers are independent businessmen who not only sell real estate but sometimes rent and manage properties, make appraisals, arrange for loans to finance purchases, and develop new building projects. In addition, brokers manage their offices, advertise properties, and do other things necessary to operate their businesses. Some of those who possess the necessary qualifications combine other work, such as selling insurance or practicing law, with their real estate businesses.

Most real estate salesmen and brokers sell residential property, sometimes specializing in homes within a certain price range or in a particular area of a city. A few, usually those in large real estate firms, handle multimillion dollar hotels, giant office buildings, and other valuable commercial properties. Still other brokers and salesmen specialize in resort and vacation properties, farm properties, industrial properties, or unimproved land.

Because a real estate purchase is a large investment, most people buy only after careful investigation and deliberation. A real estate salesman must therefore spend much time away from his office showing and discussing properties with prospective buyers. In answering questions, he emphasizes those selling points which are likely to be most important to each buyer. To a housewife looking at a house, for example, he may point out the convenient floor plan and the fact that schools and shopping centers are close by; to her husband, he may emphasize the soundness of the construction and the attractive financing arrangements available; and with a businessman, he may discuss the income potential of the property and answer questions about zoning, transportation, and community facilities. He must also be familiar with tax rates and insurance needs. It is important that he try to meet the buyer's needs and preferences and, at the same time, follow the seller's instructions. When bargaining on price is necessary, the salesman or broker must be a skillful negotiator who considers both the buyer's and the seller's interests. In the closing stages of the sale, the real estate salesman or broker often arranges for a loan, a title search, and the meeting at which details of the transaction are agreed upon and the new owner takes possession of the property.

Real estate salesman shows a home to prospective buyers.

Real estate salesmen and brokers usually spend some of their time checking listings of properties for sale or rent and making telephone calls to prospective clients. They may also answer telephone inquiries about properties, arrange appointments to show real estate, and keep records of properties sold.

Where Employed

The number of people whose main occupation was selling real estate in 1965 is estimated at more than 200,000, of whom three-fourths were men. A very large number of people also sold real estate occasionally. The total number of men and women licensed to sell was about 700,000 in 1964, according to the National Association of License Law Officials.

Most real estate salesmen work for small business establishments; a few, in metropolitan centers, work for firms having large sales staffs. Brokers are generally self-employed. Salesmen and brokers are found in every part of the country, but are concentrated in large urban areas and in smaller rapidly growing communities.

Training, Other Qualifications, and Advancement

A license is required for work as a real estate salesman or broker in every State and in the

District of Columbia. All States require prospective agents to pass written examinations which generally include questions on the fundamentals of real estate transactions and on laws affecting the sale of real estate. The examination is more comprehensive for brokers than for salesmen. In more than one-fourth of the States, candidates for the broker's license must also have a specified amount of experience as a real estate salesman (generally from 1 to 3 years); in some States, college credits in real estate courses may be substituted for experience. State licenses usually can be renewed annually without reexamination.

Although a specified amount of education is seldom required, employers prefer to hire persons who have at least a high school education. Most real estate agents have some college training, and many are college graduates. Among the characteristics important for success in selling real estate are enthusiasm for the job, maturity, integrity, and tact and patience in dealing with prospective customers. Agents must also have an understanding of the problems of their customers and an ability to gain their confidence.

Young men and women interested in beginning jobs as real estate salesmen often apply to brokers in their own communities, where they can use to advantage their knowledge of local neighborhoods. The beginner usually works under the direction of an experienced salesman or broker while he learns the practical aspects of his job.

Training opportunities are available for both beginners and experienced agents. More than 200 colleges and universities offer one or more courses in real estate and, at many, a student can earn the bachelor's degree with a major in real estate; some offer advanced degrees. Many local real estate boards which are members of the National Association of Real Estate Boards (NAREB) sponsor courses in subjects such as real estate fundamentals, principles, and practices; real estate law; and real estate financing. Advanced courses in appraisal, mortgage financing, and property development and management are also available through local real estate boards and NAREB affiliates such as the American Institute of Real Estate Appraisers and the Institute of Real Estate Management.

Salesmen with experience and training can advance in many ways. Those who become licensed brokers may open their own offices. Training and experience in estimating the value of property can lead to work as a real estate appraiser. Persons familiar with the problems of operating and maintaining rental properties may specialize in property management. Those who gain wide general experience in real estate and a thorough knowledge of business conditions and property values in their localities may enter the field of mortgage financing or real estate counseling.

Employment Outlook

Several thousand openings for real estate salesmen are expected to arise each year during the 1965–75 decade. Many will be new positions created by the need for more salesmen to serve a growing population. The majority, however, will be openings resulting from turnover. Because the average age of real estate salesmen and brokers is considerably higher than that of workers in most occupations, death and retirement losses are high. In addition, a relatively large number of agents—many of them beginners—transfer to other types of work.

Most of the full-time jobs that become available will be for men. Women will find increasing opportunities in real estate, however, because of their familiarity with home features of special interest to housewives, who share decisions on home purchases. Many openings are likely to be filled by mature workers, including persons who transfer from other kinds of sales work. Although part-time workers will continue to find opportunities for employment, the proportion employed on this basis may decline, as State licensing requirements change and more specialized knowledge is necessary for the agent who handles real estate transactions.

Employment of real estate salesmen and brokers is expected to rise rapidly, particularly during the early 1970's when the many young people born shortly after World War II will be purchasing or renting their own homes. Other factors contributing to a growing need for agents are: The expected expansion in residential and commercial construction resulting from the increase in population and economic activity, migration to metropolitan areas, and urban renewal.

Although this field is likely to remain highly competitive, persons with an aptitude for selling real estate will therefore find that it offers many career opportunities in the future.

Earnings and Working Conditions

Commissions on sales are the usual source of earnings for most real estate salesmen and brokers. A few are paid on a straight salary basis, although this is the exception rather than the rule. The usual commission on the sale of a moderately priced home was 5 percent in early 1965, although 6 percent was being paid in a growing number of localities. Thus, the sale of a house for $20,000 would bring a commission of $1,000 to $1,200. Somewhat higher commissions might be paid on the sale of farm and commercial properties and unimproved land.

Commissions on the sale of properties may be shared by several employees of a real estate firm. Often, when a sale is made, a small proportion of the commission is paid to the salesman who obtained the listing of the property. The rest of the commission is either retained by the broker, if he made the sale, or, if the property was sold by an agent in his employ, it is shared by the broker and the agent. An agent's share of the commissions on the sales he makes varies greatly from one real estate firm to another; frequently it is about half of the commission.

Most full-time real estate agents earn between $5,000 and $10,000 a year, according to the limited data available. Beginners usually earn less. At the other extreme, there are many experienced salesmen whose yearly incomes are $20,000 or more.

Income usually increases as an agent gains experience, but earnings are also affected by individual ability, type of property sold, geographic location, economic conditions, and other factors. Those salesmen who are active in community organizations and on local real estate boards can broaden their contacts and, as a result, may increase their earnings. Earnings, especially for beginning salesmen, are often irregular; a few weeks or even months may go by without a sale, and then several sales may be made close together. For this reason, some brokerage firms pay their salesmen a "draw" against future commissions; this is not the usual practice with beginners, however, and most new salesmen should have enough money to support themselves until their income from commissions becomes large enough to meet their living expenses.

Salesmen are provided with office space by the brokers for whom they work. They are expected to furnish their own automobiles. Although salesmen and brokers have much independence in planning their working schedules, it is often necessary for them to work in the evening hours and during weekends because of the nature of the work and the need to meet the convenience of customers.

Where To Go for More Information

Information on licensing requirements for real estate salesmen and brokers is available from the real estate commission or board located in each State capital. This information can also be obtained from most local real estate organizations. Many States can furnish manuals which help applicants prepare for the required written examinations.

Additional information on opportunities in the real estate field, and a list of colleges and universities offering real estate courses may be obtained by writing to:

Department of Education, National Association of Real Estate Boards.
36 South Wabash Ave., Chicago, Ill. 60603.

Securities Salesmen

(2d ed. D.O.T. 1-65.03)
(3d ed. D.O.T. 251.258)

Nature of Work

Almost every time an investor buys or sells securities—stocks, bonds, or shares in mutual funds—it is the securities salesman who puts the "market machinery" into operation. A salesmen's services are usually required not only by the individual with a few hundred dollars to invest, but also by the large institution with millions.

Securities salesmen are often called *customers' brokers*, *registered representatives*, or *account executives*.

In executing a buy or sell order, a securities salesman usually relays the order through his firm's order room to the floor of a securities exchange or, if the security is traded in the over-the-counter market, he sends it to his firm's trading department; later, after the transaction has been completed, the salesman notifies the customer to that effect. He also provides many kinds of related services for his customers. To an inexperienced investor, for example, he may explain the meaning of terms and trading practices such as "stock split" and "buying on margin." For customers with a variety of holdings, the salesman may offer suggestions about the purchase or sale of a particular security, when circumstances indicate this is advisable. Or, in order to meet a customer's investment objectives—whether they are to make long-term investments designed to provide a steady income over the years or to invest for the short run in securities which appear likely to rise in price quickly—a salesman may furnish information about the advantages and disadvantages of certain types of investments. Salesmen are often expected by their customers to furnish the latest stock and bond quotations as well as information regarding the activities and financial positions of corporations.

Securities salesman discusses investment objectives with customer.

Some salesmen perform these services for all types of customers, while others deal either with individual investors or institutional investors. Many specialize in certain kinds of securities; for example, because of the nature of the firm where he works, a salesman may handle only transactions in municipal bonds or only shares in mutual funds. Salesmen employed by investment bankers and by other firms which underwrite "new issues," such as the securities issued by corporations needing funds for plant expansion, may take part in the initial sale of these securities.

Building a clientele is very important to the securities salesman's success. Most salesmen new to the occupation, therefore, spend much of their time contacting friends and relatives who are potential investors and individuals who once did business with their firm, or seeking new customers in other ways. On the other hand, an experienced salesman—although always on the alert for new clients—may spend most of his time servicing the accounts of his established customers.

Where Employed

In early 1965, there were about 75,000 men and women who spent all or a part of their time selling securities. The great majority were men. Approximately three-fifths were full-time employees of securities firms, most of whom were salesmen; the rest—partners, branch office managers, security analysts, and others—spent only part of their time in sales activities. Other people who sold securities—roughly 30,000 in all—were men and women regularly employed in jobs outside the securities business, most of whom sold shares in mutual funds in the evenings and on weekends.

Securities salesmen are employed by hundreds of brokerage firms, investment bankers, and mutual fund firms in all parts of the country. Many of these firms are very small. Most salesmen, however, work for a relatively small number of large firms, which, in addition to their main offices located in big cities (especially in New York City), operate nearly 5,000 branch offices.

Training, Other Qualifications, and Advancement

Almost all States require securities salesmen to be licensed. State licensing requirements vary: character investigations may be made, for ex-

ample, or personal bonds may be required, or it may be necessary for applicants to pass written examinations.

In addition, practically every salesman must be registered as a representative of his firm in accordance with the regulations of the securities exchange or exchanges through which it does business or the National Association of Securities Dealers, Inc. (NASD), or both. Before beginners with no previous experience in selling securities can qualify as registered representatives, they must pass written examinations, prepared by the exchanges and/or the NASD, which test their knowledge of the securities business. Character investigations are also required.

To assist their salesmen in meeting the requirements for registration, most employers provide training for beginners. In many firms, including all those which are members of the New York Stock Exchange, the training period lasts for at least 6 months. In large firms, training programs are sometimes quite elaborate: trainees may receive classroom instruction in subjects such as security analysis and effective speaking, take courses offered by schools of business and other institutions and associations, and undergo a period of on-the-job training. Other training programs, particularly in small firms, may be relatively informal and brief—the trainee may read assigned materials and observe other salesmen transact business.

Because a securities salesman must be well informed about economic conditions and trends, a college education is becoming increasingly important for beginners who seek to enter this field. Although employers seldom require specialized training, a degree in business administration or economics, or a broad background in liberal arts subjects is regarded as especially good preparation for the work. Courses in finance and other subjects related to the securities business, available at colleges and universities throughout the country, are also helpful.

Many employers consider certain personality traits fully as important as academic training in specialized fields. Before being hired, applicants are sometimes given tests to determine their aptitude for this kind of sales work. Employers seek people who are well groomed and have a pleasing personality, who possess the ability to deal with people, and who are ambitious and have a sense of responsibility. Because maturity is also important, many employers feel that it is desirable for prospective salesmen to have had a few years of experience in other kinds of jobs.

Increasing the number and the size of the accounts they handle—and therefore their earnings—is often the principal form of advancement for securities salesmen. Thus, beginning salesmen, who usually start by servicing the accounts of individual investors, may in time handle very large accounts such as those of institutional investors. Some experienced salesmen may advance to positions as branch office managers, supervising the work of other salesmen while executing buy and sell orders for their own customers, and a few may eventually become partners in their firms or do other administrative work.

Employment Outlook

Employment opportunities for securities salesmen are expected to be good during the rest of the 1960's and early 1970's. Approximately 20,000 openings are likely to arise each year. Some will be new positions created to serve the growing number of individuals and institutions investing money in securities of all kinds. Most positions, however, will be vacancies that occur as salesmen retire or leave the occupation for other reasons. Turnover tends to be high, especially among beginners.

The number of securities salesmen has more than doubled during recent years; and, although the rate of increase may be slowed somewhat during the next 10-year period, employment is expected to continue to rise very rapidly. The number of individual investors and the funds they have to invest will continue to increase, not only because of economic growth and rising personal incomes, but because of a number of other factors; for example, interest stimulated by the activities of investment clubs and associations, plans enabling small investors to make monthly payments toward the purchase of securities, and the increasing need for parents to set aside funds for their children's education and their own retirement. Institutional investors can also be expected to have more funds for investment, as more people purchase insurance, participate in pension plans, contribute to the endowment funds

of colleges and universities and to other nonprofit institutions, and deposit their savings in banks. Many more securities salesmen will also be needed to sell new securities issued by expanding corporations and by State and local governments which are financing the construction of new roads and other public improvements.

Earnings and Working Conditions

Trainees are usually paid a salary until such time as they are able to meet licensing and registration requirements. The salaries paid by some companies during the training period may be modest or may, particularly in large firms, range from $350 to $500 or more a month, depending on the locality, the individual's educational background, and other factors.

Once the salesman has completed his training, earnings are usually in the form of commissions from the sale and purchase of securities by customers. The size of the commission depends partly on the policies of the firm where the salesman works and partly on the type of security bought or sold and whether it was traded on a stock exchange or in the over-the-counter market. Commission earnings may fluctuate a great deal because of extremes in market activity. When there is much buying and selling of securities, earnings are likely to be high, whereas when there is a severe slump in market activity the opposite is likely to be true. To provide their salesmen with a steady income, most firms pay a "draw against commission"—that is, a minimum salary based on the commissions which salesmen can be expected to earn—plus any commissions from additional sales.

According to the limited data available, securities salesmen working full time generally earned between $5,000 and $15,000 a year in 1965. Many successful salesmen have yearly incomes in excess of $20,000 or $25,000 a year, however. In addition to their commissions, some salesmen receive annual bonuses from their firms when business is good.

A securities salesman works in an office which is usually the scene of a great deal of activity. In large offices, there are likely to be rows of salesmen sitting at desks in front of "quote boards" and wall screens, which continually flash information on securities transactions and prices. Seats are usually provided in most offices so that customers and others may watch the latest market developments.

Although securities salesmen are not usually required to observe a fixed schedule of hours of work, many work approximately the same hours as others in the business community. Some salesmen must adjust their time to accommodate those customers who can meet with them only outside business hours—for example, at lunch time, or at home in the evenings and on weekends.

Where To Go for More Information

Further information about the work of the securities salesman in firms which are members of the New York Stock Exchange and about the nature of the securities business is available from:

New York Stock Exchange,
11 Wall St., New York, N.Y. 10005.

Information about the investment banking business and sales positions with investment bankers may be obtained from:

Investment Bankers Association of America,
425 13th St., NW., Washington, D.C. 20004.

General information about the over-the-counter market and requirements for becoming a registered representative of a member firm of the NASD is available from:

National Association of Securities Dealers, Inc.,
1707 H St., NW., Washington, D.C. 20006.

Service Occupations

The service occupations are composed of workers who provide services to the American people—they police streets, serve food, put out fires, help clean our homes and buildings. The more than 9 million service workers employed in 1965 included a wide range of diverse occupations such as baby sitters, elevator operators, policemen, firemen, cleaning women, golf caddies, theater ushers, barbers, laundresses. The major groups of service workers are discussed below:

Private household workers—2½ million—are the largest single group of service workers, comprising about one-quarter of total employment in the service group. These workers are employed in private households, performing tasks which are familiar to all homemakers. They prepare and serve meals, make beds, do cleaning and laundering, and take care of children. An exceptionally high proportion are women—97 out of 100. The proportion of part-time workers is also high. About two-thirds of all private household workers are dayworkers, babysitters, and others who work fewer than 35 hours a week.

This chapter includes a statement covering the domestic service occupations.

Protective service workers—900,000—are another large group of service workers who are needed largely to protect lives and property from harm. The great majority are policemen, guards, and firemen.

Policemen and detectives together account for over one-third of the total number of protective service workers. Most policemen and detectives are government employees, but some work for hotels, stores, and other business establishments. Guards and watchmen, the second largest group, are employed chiefly by private companies to protect their property and enforce company rules and regulations; some guards and watchmen are employed in jails and other government establishments. Firemen, also a significant group, work mainly for city governments. The remaining protective service workers are sheriffs and bailiffs, crossing watchmen and bridge tenders, and marshal and constables. This chapter includes statements describing three protective service occupations: FBI agent, policeman and policewoman, and fireman.

Other service workers—about 6 million in all—comprise a conglomerate group that can be roughly separated as follows:

Service related to—	*Occupations such as—*	*Number employed (in millions)*
Food preparation and service in restaurants, hotels, institutions.	Waiters and bartenders, counter girls.	2.3
Cleaning and servicing hotels and other buildings.	Janitors, charwomen, elevator operators, custodians, porters.	1.8
Health care	Hospital attendants, nurse aids.	.8
Improving personal appearance.	Barbers and cosmotologists.	.6
Entertainment in many different places.	Ski instructors, ushers, checkroom girls.	.1
Miscellaneous activities	Fashion models, airline stewardesses, travel guides.	.3

Some of the largest of these occupations are described in this chapter—cook and chef, waiter and waitress, hospital attendant, barber and cosmotologist. Two other personal service occupations, airline stewardess and hotel bellman, are discussed elsewhere in the *Handbook*.

Training, Other Qualifications, and Advancement

Training and skill requirements differ greatly among the various service occupations. FBI agents, for example, must have a college degree. Barbers, beauty operators, and some other workers need specialized vocational training. But for still other occupations—general maid, waitress, elevator operator, and hotel bellman, for example—formal educational requirements for entry are usually not specified. A high school diploma is always an advantage, however.

For many service occupations, special personality traits and abilities may be as important as formal schooling. Thus, physical strength and

endurance are a necessity for work as a porter, life guard, or window cleaner; and a pleasing manner and appearance are especially important in such occupations as theater usher, elevator operator, checkroom girl, and fashion model. Other service workers, including store and hotel detectives and travel guides, should possess good judgment and ingenuity and 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. Others, such as elevator operators and ushers, may work up to supervisory positions. Advancement from service occupations that require little specialized training or skill may be difficult, however, particularly for young people without a good basic education and some knowledge of the business in which they are employed.

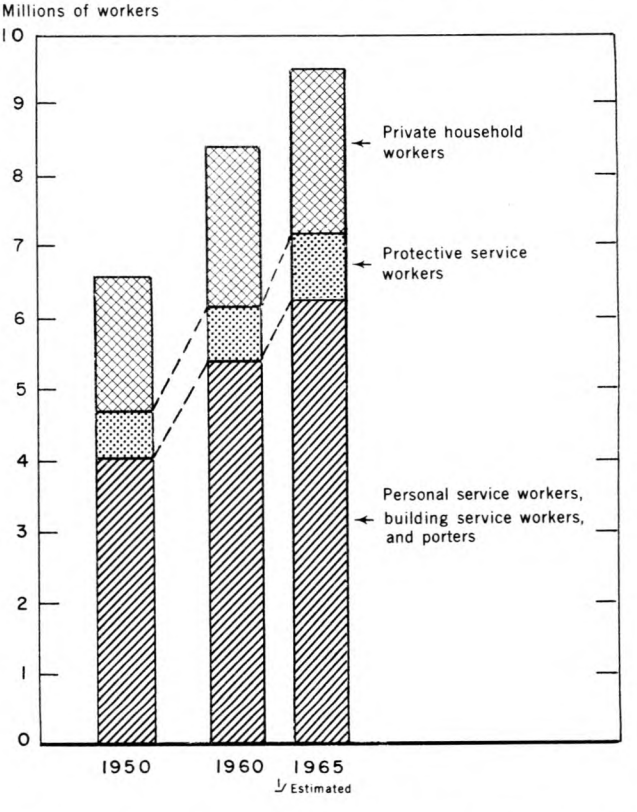
Employment Trends and Outlook

The number of workers in service occupations has been increasing much faster than the labor force as a whole for many years. Since 1950, overall employment has increased by close to one-half. Private household workers increased slowly—by about one-fifth in the 15-year period since 1950, and protective service workers increased by close to half. The remaining occupations together increased by over half since 1950. (See chart 23.)

CHART 23

BETWEEN 1950 AND 1965, ALMOST 3 MILLION [1] NEW SERVICE JOBS WERE CREATED . . . .

425,000 private household workers
275,000 protective service workers
2,200,000 in other service occupations



Employment in service occupations is expected to continue to increase very rapidly in the years ahead as income levels rise and leisure time increases. By 1975, as many as 4 million more workers may be providing the services that add to people's comfort and enjoyment and protect life and property. As total employment rises, however, different occupations within the service group are likely to be affected quite differently—some growing very rapidly, others only moderately, and a few decreasing in size.

Most of the employment increase during the next decade is expected to be among policemen and other protective service workers; attendants in hospitals and in businesses rendering other professional and personal services; beauty operators; cooks, waiters, and others who prepare and serve meals outside private homes; and janitors, caretakers, and building cleaners. Practically all of these large occupations are expected to grow rapidly. Some of the factors responsible for their growth are the added medical care and other health service related to the increase in population, and especially in the number of older people; the greater need to protect life and property as urbanization continues and cities become more crowded; and the more frequent use of restaurants, beauty parlors, and other services by families and individuals as income levels rise and as an increasing number of housewives take jobs outside the home.

Only a moderate increase is anticipated in the numbers of workers employed full time in pri-

vate homes. New products and equipment will continue to limit the number of domestic workers needed. Timesavers such as frozen foods, drip-dry textiles, automatic washer-dryers, and garbage disposal units tend to restrict demand for household workers. Some other service occupations also affected by new products and equipment are expected to show employment declines; some of these are theater usher, elevator operator, porter, bowling alley pinboy, bootblack. However, the employment decline in these occupations is expected to be more than offset by employment generated as other occupations in the service group expand.

Service workers are employed in every city and village in the Nation. Hospital attendants, maids, bellmen and other hotel service employees, and ushers and attendants at theaters and other places of amusement are found chiefly in the larger towns and cities, however.

PRIVATE HOUSEHOLD WORKERS

(3d ed. D.O.T. 301.887; 302.887; 303.138 and .878; 304.887; 305.381; 306.878; 307.878; and 309.138 through .999)

Nature of Work

Private household work is one of the largest areas of work for women, who accounted for nearly all of the approximately 2½ million household workers employed in 1965. Although all household workers are engaged in providing help in the home, many different job titles are used.

The great majority of women household employees work as maids of various kinds. The *general maid* (or *day worker*, if employed by the hour or day), as instructed by her employer, performs a variety of duties, such as cleaning household furnishings, floors, and lavatories; changing and making beds; attending children at play; washing dishes; buying, cooking, and serving food; and washing and ironing clothes. The *mother's helper*, under her employer's supervision, performs similar duties while learning on-the-job. More specialized duties are performed by other kinds of maids. The *personal maid* performs personal services for a woman employer, such as keeping her employer's clothes in good condition by mending, cleaning, washing, and pressing garments, or by having these services performed; cleaning and keeping private quarters tidy; and helping her employer dress. The *nursemaid* performs duties concerned with the care of children, such as giving baths, supervising play activities and outings, washing and ironing clothes, and preparing meals. When caring for infants, she is called an *infant's nurse* and her duties include sterilizing bottles and other feeding equipment, preparing formulas, and feeding the child at scheduled periods during the day and night. *Babysitters* may perform some or all of the duties of a nursemaid or infant's nurse, but on a daily or an hourly basis.

Housekeepers usually have more responsibility and are under less supervision than maids. The *home housekeeper* manages a household where there is a large staff of other household employees. She directs their activities, orders food and cleaning supplies, keeps an expenditure record, and may hire and discharge employees. The *working housekeeper*, or her rural counterpart, the *farm housekeeper*, often is the only employee in homes where the housewife is absent or is unable to do her own housework. These have domestic duties similar to those of the general maid in addition to a housekeeper's responsibilities. The farm housekeeper also assists in light farm chores, such as feeding chickens, and picking fruits and vegetables for the table.

The *cook* and *laundress* usually take care of only one aspect of domestic work, as their titles suggest. The laundress washes and irons household laundry, seldom doing other housework. The cook prepares meals, planning her own menus or following instructions. She prepares vegetables and meats for cooking, or supervises a *cook's helper* who performs these tasks and other work requiring little skill. The cook may also serve meals and perform special cooking duties such as making preserves and fancy pastries.

A *companion* lives with a convalescent or a person who is alone, acting as an aid and friend, and is generally one who has the same social background as the employer. The duties of a companion include attending to the employer's personal needs, looking after social or business affairs, and keeping the employer amused by reading, conversing, and playing games. A *governess* has charge of children in a home, usually supervising their recreation, diet, health, deportment, and education, according to parents' instructions. Among her duties are teaching music and languages, arranging outings, and, sometimes, taking disciplinary measures.

Although women predominate in household work, some occupations are typically performed by men. The *man-of-all-work*, sometimes called the *handyman* or *odd-job man*, performs a variety of duties to keep a private home clean and in good condition, such as dusting furniture, washing windows, waxing and polishing floors, tend-

ing the furnace, repairing screens, painting fences, and caring for the yard. When employed the year-round he may be called the *caretaker*, and when concerned only with taking care of the house, a *houseman*. The *valet* performs personal services for a male employer, such as brushing, cleaning, ironing, mending, and laying out clothing; mixing and serving drinks; and running errands. The *butler* may supervise household workers, assigning and coordinating their work; receive and announce guests; answer the telephone; handle the serving of food and drinks; and he may also act as a valet and perform other services. In households not large enough to require the services of both a butler and a chauffeur, or butler and a houseman, a combination of the duties of both occupations may be performed by one person who is referred to as *butler-chauffeur*, or *butler-houseman*.

Where Employed

Almost half of all domestic workers in 1960 worked in the South; most of the rest were about evenly divided between the North Central States and the Northeastern States, and only about 10 percent were in the West. About three-fourths of all household workers were in city areas.

Almost all domestic workers spend most of their working time in their employer's residence; laundresses, the exception, may perform their work in their own or their employer's home. Less than 10 percent of all domestic workers "live in," that is, live in their employer's home.

Training, Other Qualifications, and Advancement

For most domestic workers, there are no formal education requirements. The ability to cook, sew, wash and iron, clean house, and care for children is generally acquired by girls while helping with the housework in their own homes. This ability also can be acquired by working for about a year as an assistant to an experienced domestic worker or housewife (as a mother's helper). Most employers prefer workers who can operate household equipment such as vacuum cleaners, floor waxers, dishwashers, and electric mixers. Home economics courses offered in high schools, vocational schools, and junior colleges, as well as training courses sponsored by Federal agencies, State employment service offices, and local welfare departments are all helpful in developing home service skills beyond the level ordinarily reached in the home.

With the knowledge acquired at home, or as a mother's helper, a woman can take a job as a general maid or nursemaid. With this experience or with the skill acquired in a special training program, a woman can progress to a job as a personal maid, infant's nurse, cook, or housekeeper.

For the positions of governess and companion, actual work experience is less important than educational and cultural background. A companion should be similar to the employer in age, interests, and background. Practical nursing experience is helpful if the employer is feeble or an invalid. A broad educational background in the arts is useful to a governess. Special skills in music, in a foreign language, and in teaching young children are helpful.

Because of the close contact between domestic workers and other members of the household, employers look for agreeable and trustworthy workers who are neat, clean, and in good health. Some employers require their household workers, particularly cooks and infant's nurses, to have a health certificate; they may arrange and pay for the necessary physical examination. Many employers look for domestic workers whose manners, morals, and habits are acceptable.

Men may acquire domestic abilities in their own homes by helping with the cleaning, maintenance, and other household chores. This experience may be sufficient to enable a man to take a job as a houseman or man-of-all work. From these he can progress to valet, and then to butler.

Advancement other than by a wage increase is generally not available within households with only one or two domestics. To get a better job, a domestic worker usually must change to a home where a job requiring greater skill is available, and these opportunities are limited in number.

Employment Outlook

Many thousands of private household workers will be needed each year through the mid-1970's. Most opportunities will result from the need to replace workers who transfer to other fields of work or leave their jobs for other reasons. Many

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opportunities for part-time work are expected to continue to be available. In 1965, the demand for household workers to "live in" exceeded the supply.

Well-trained, competent domestic workers (both to "live out" as well as to "live in") are expected to continue to be in great demand. Because an increasing number of housewives are working outside their homes, and family incomes are increasing, a rising demand for competent household workers is expected for many years to come.

Earnings and Working Conditions

Wages of household workers vary according to such factors as the size of the employer's income, kind of work performed, and local standards of pay. Wages tend to be higher in large cities, especially in the northern part of the country. Workers who "live in" generally are paid the same wage rates as those who "live out," and get free room and board. Workers who "live out" usually receive a free meal plus the cost of their transportation. According to the limited data available for five selected cities in different regions of the country, wage rates quoted by employment agencies for household occupations were as shown below: (Hours worked per day and days worked per week are shown if available.)

Washington, D.C.

Occupation	Hours	Days	Pay
Day worker	8		$1.25 an hour
Laundress	8		$1.25 an hour or $50–$60 a week
Housekeeper	8–9	5–5½	$50–$60 a week
Cook	7–8	5–6	$50–$60 a week
General maid	8–9	5	$35–$50 a week
Personal maid	9	5–6	$50 a week
Companion	4–9	5–7	$30–$60 a week
Nursemaid	8–10	5	$25–$35 a week
Babysitter	4–6		$1.00–$1.25 an hour

Uniforms are furnished by employer on full-time jobs.

Chicago, Ill.

Day worker	8 or more		$1.25 an hour
Man-of-all work	8 or more		$1.25–$1.75 an hour
General maid (also cooking—live in).		5½	$50 a week and up
General maid (no cooking—live in).		5½	$40–$45 a week
Mother's helper (live in)		5½	$30 a week
Nursemaid (live in)		5½	$30–$35 a week

Uniforms frequently furnished full-time workers.

New York, N.Y.

Day worker (female)			$1.50 an hour
Day worker (male)			$1.75 an hour
General maid (live out)			$1.25 an hour

Uniforms frequently furnished full-time workers—Continued

New York, N.Y.—Continued

General maid (also cooking—live in).			$55 a week
General maid (no cooking—live in).			$50 a week
Mother's helper (live in)			$35 a week
Cook (live in)			$70 a week
Working housekeeper (live in)		5½	$60 a week
Babysitter (until 8 p.m.)			$1.25 an hour
Babysitter (after 8 p.m.)			$1.00 an hour
Companion (live in)			$85 a week and up
Butler-chauffeur			$85 a week and up
Butler-houseman (live in)	40 weekly		$100–$125 a week

New Orleans, La.

Day worker	7		$5–$6 a day
General maid		5	$25–$35 a week

San Francisco, Calif.

Day worker (female)			$1.50 an hour
Day worker (male)			$1.75–$2.00 an hour
Nursemaid			$125 a month and up
Babysitter (no housework—days).			.75 cents an hour
Babysitter (no housework—nights).			$1.00 an hour
Working housekeeper			$150–$250 a month
General maid (no cooking—live out).			$35 a week
Houseman			$2.00 an hour or $250 a month and up.
Man-of-all-work			$2.00 an hour or $250 a month and up.
Cook (male)			$2.00 an hour or $250 a month and up.
Butler (live in)			$400–$600 a month

Even though modern washing and cleaning equipment and materials have helped considerably, housework involves some hard labor at times, especially for dayworkers, who are usually given the heavier tasks in the home. "Live-ins" in homes with no other household workers are likely to be alone most of the time; this situation, plus the length and irregularity of working hours, tends to isolate the worker from family and friends. There are few benefits such as paid holidays, sick leave, and unemployment compensation.

Dayworkers generally acquire customers for whom they do cleaning on a part-time basis at specific intervals (once or twice a week, or maybe at longer intervals) for part or all of a day. Duties are negotiated with each employer, sometimes on a day-to-day basis, and frequently there is no supervision, as, for example, when the employer works away from home during the day and the employee has her own key to let herself into the home or apartment.

Most household workers work part time. Of the full-time workers, more than half worked 35 to 40 hours a week in early 1965, the rest

worked more hours. There is some seasonal demand for dayworkers during holiday seasons; the demand for other workers remains steady throughout the year, but slackens somewhat during the summer vacation months.

Where To Go for More Information

Information about employment opportunities in private-household work or about available training programs may be obtained from the local office of the State employment service.

PROTECTIVE SERVICE

FBI Agents

(2d ed. D.O.T. 2–66.99)
(3d ed. D.O.T. 375.168)

Nature of Work

Federal Bureau of Investigation (FBI) agents investigate many types of violations of Federal laws, such as bank robberies, kidnappings, frauds against the Government, thefts of Government property, and cases of espionage or sabotage. The FBI, which is part of the U.S. Department of Justice, has jurisdiction over some 170 Federal investigative matters. Agents may be assigned to any type of case, but those with specialized training in accounting are likely to be assigned chiefly to cases involving complex financial records; for example, frauds involving Federal Reserve Bank records.

The FBI is a fact-gathering and fact-reporting agency, and its agents function strictly as investigators. (Its authority does not include affording personal protection to individuals nor does it include police functions to assure that the law is obeyed. Such matters are within the purview of local and State law enforcement agencies.) To perform their duties, agents may interview people, observe the activities of suspects, and participate in raids; their duties may involve extensive travel. Because of the highly confidential nature of the FBI's work, agents may not disclose any of the information which they gather in the course of their official duties to unauthorized persons, including members of their families. Agents may have to testify in court about cases that they investigate, but they do not make recommendations pertaining to prosecution, express opinions concerning the guilt or innocence of suspects, nor issue "clearances" of any kind.

In most assignments, agents work alone but must maintain continued contact with their superiors by radio or telephone. For potentially dangerous duties, such as arrests and raids, two agents or more are assigned to work together.

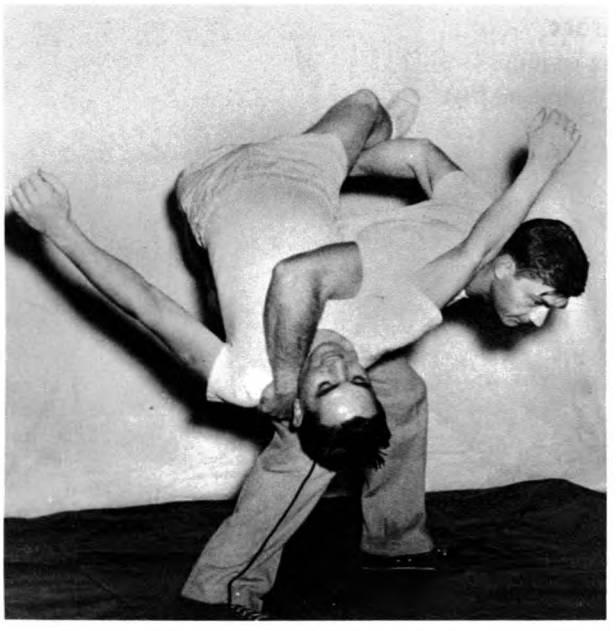
Where Employed

Most of the 6,300 agents employed in 1965 were assigned to the FBI's 56 field offices located throughout the Nation and in Puerto Rico. These agents work either in the city where the field office headquarters is located or in resident agencies (suboffices) established under the supervision of the field office to provide prompt and economic handling of investigative matters arising throughout the field office territory. Some agents are assigned to the Bureau headquarters staff in Washington, D.C., which supervises all FBI activities.

Training, Other Qualifications, and Advancement

To be eligible for appointment as an FBI agent, an applicant must have graduated from a State-accredited resident law school or a 4-year resident accounting school. The law school training must have been preceded by at least 2 years of resident undergraduate college work. Accounting graduates must also have had at least 3 years of experience in accounting or auditing or a combination of both.

Applicants for the position of FBI agent must be male citizens of the United States, at least 23 and not more than 40 years of age, and willing to serve anywhere in the United States or Puerto Rico. They must be at least 5 feet 7 inches tall and capable of strenuous physical exertion; they must have unimpaired hearing, very good vision, normal color perception, and no physical defects which would prevent their using firearms or participating in dangerous assignments. Each applicant must pass a rigid



Courtesy of the Federal Bureau of Investigation

FBI trainees are instructed in defensive tactics.

physical examination, as well as written and oral examinations testing his knowledge of law or accounting and his aptitude for meeting the public and conducting investigations. All of the tests except the physical examinations are given by the FBI at its facilities. Exhaustive 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 agent is given approximately 14 weeks of training before he is assigned to a field office. He receives most of this training at FBI headquarters at Washington, D.C., and the rest at the FBI Academy at the U.S. Marine Corps Base in Quantico, Va. During this period, he receives intensive training in defensive tactics and firearms. In addition, he is also thoroughly schooled in Federal criminal law and procedures, FBI rules and regulations, fingerprinting, and investigative work. After assignment to a field office, the new agent usually works closely with an experienced agent for a period of about 2 weeks before handling any assignments independently.

All administrative and supervisory positions are filled from within the ranks by selecting those FBI agents who have demonstrated the ability to assume more responsible positions.

Employment Outlook

The FBI provides a career service, and its rate of personnel turnover is traditionally low. Nevertheless, the FBI is always interested in applications from qualified men who would like to be considered for the position of agent.

Earnings and Working Conditions

The entrance salary for FBI agents was $7,900 a year in early 1965—somewhat higher than the usual starting salary for college graduates entering employment in other Federal agencies. FBI 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, and they can advance in grade as they gain experience. The top salary for regular field agents was $15,855 in early 1965. Agents in supervisory and administrative positions received higher salaries.

Agents are subject to call 24 hours a day and must be available for assignment at all times and places. They frequently work longer than the customary 40-hour week and, under certain specified conditions, receive overtime pay up to a maximum of $1,080 a year. They are granted paid vacations and sick leave and annuities on retirement.

Where To Go for More Information

The Federal Bureau of Investigation,
U.S. Department of Justice, Washington, D.C. 20535.

Firefighters

(2d ed. D.O.T. 2-63.10)
(3d ed. D.O.T. 373.118 through .884)

Nature of Work

Firefighters help protect us from a hazard that—even with protection—costs hundreds of lives and millions of dollars in property damage each year. Without their services, the loss of life and property from fires would be even greater. This statement gives information about firemen who are full-time, paid employees of city and town fire departments. It does not cover the work in thousands of small communities by part-time volunteer firemen and others who serve only when the alarm signals that they are needed at a fire.

During their hours on duty at the fire station, firemen must be prepared, at a moment's notice, to go to a fire and handle whatever emergency they find. Because firefighting is sometimes very dangerous and complicated, it must be well organized. At every large fire, each firefighter performs a specific job assigned to him by a commanding officer; he may connect hose lines to hydrants, operate a pressure pump, position ladders or perform some other duty. Furthermore, depending on the judgment of the officer in charge, the assigned duties of a firefighter may be changed several times while his company is in action. Firemen must therefore be proficient in many different kinds of firefighting activities, as well as capable of helping people to safety, administering first aid, and taking care of other emergencies as they arise.

Fire prevention is another important responsibility of city fire departments. In big departments, specially trained personnel do some kinds of fire prevention work, but in most cities regular firemen perform practically all of this work. They inspect factories, theaters, and other public buildings for conditions that might cause a fire and for compliance with local regulations relating to fire escape, fire doors, storage of flammable materials, and other possible hazards. Educating the public about fire prevention and safety measures is also a part of the firemen's job. Frequently they speak on this subject before school assemblies and civic groups and, in many communities, they regularly inspect private homes in an effort to prevent fires by pointing out possible hazards to homeowners.

Firemen direct powerful jets of water on a fire.

Between alarms, firefighters spend considerable time at their local stations, improving their knowledge of firefighting and doing maintenance work. They may study fire manuals and textbooks in order to prepare for promotional examinations. They also participate in practice drills, clean and lubricate firefighting equipment, stretch hoses to dry, stand watch at fire alarm instruments, and verify and record alarms.

Where Employed

The number of full-time firefighters employed in 1965 by city fire departments is estimated at more than 150,000. In addition, thousands of paid "call men" and hundreds of thousands of part-time volunteer firemen are organized in small towns and rural communities throughout the Nation to help fight fires. A few very large cities have several thousand firemen, while many small cities have fewer than 25.

Training, Other Qualifications, and Advancement

To become eligible for an appointment as a fireman, an applicant must pass a written intelligence test, a medical examination, and tests of strength, physical stamina, and agility, as specified by local civil service regulations. In most communities, these examinations are open only to men who are at least 21 years of age, meet certain height and weight requirements, and have a high school education. The men who receive the highest grades on their examinations have the best chances for appointment. Extra credit is usually given for military service. Experience gained as a volunteer fireman or through firefighting training in the Armed Forces may also improve chances for an appointment.

As a rule, beginners in large fire departments are given training for several weeks at the city's fire service school. Through classroom instruction and practice drills, the recruits study such fundamentals as firefighting techniques, local building codes, fire prevention, and first aid; and learn about the use of axes, chemical extinguishers, ladders, and other firefighting equipment. Upon completion of this training, they are assigned to local fire companies. As they gain experience, they may be advanced to progressively higher ratings and, after 5 to 10 years or more of service, become eligible for promotion to the grade of lieutenant. The line of further promotion is usually to captain, then battalion chief, assistant chief, and finally to chief. Chances for advancement generally depend upon each candidate's position on the promotion list, as determined by his rating on a written examination, his work as a fireman, and his seniority. Throughout their service, many firemen continue to study fire prevention, incendiarism, and related subjects, in order to improve their performance on the job and prepare for promotional examinations. Programs conducted by many State governments and city fire departments throughout the country provide training of this kind for tens of thousands of firefighters each year, and courses in fire engineering are available in about 30 colleges and universities.

Among the important personal qualities for firefighters are mental alertness, courage, mechanical aptitude, and endurance. Initiative and good judgment are extremely important because firefighters must often make quick decisions as situations change while companies are in action. Leadership qualities are valuable assets for officers, who have the responsibility for establishing and maintaining a high degree of discipline and efficiency, as well as planning and directing the activities of the firemen in their companies.

Employment Outlook

Several thousand openings for firefighters are expected to arise each year through the mid-1970's. Most openings—probably more than 5,000 a year—will arise from the need to replace men who retire, die, or otherwise leave the occupation. The replacement rate is higher than that for many occupations, largely because firefighters are often permitted to retire at an earlier age than people in many other occupations. New jobs will also become available as city fire departments enlarge their staffs and as new departments replace volunteer fire companies in smaller, growing communities. In addition, some openings will probably be created as city fire departments continue to shorten the scheduled hours that individual firemen are on duty.

The number of young men who qualify for firefighter jobs in large cities is usually greater than the number of job openings, even though the written examination and physical requirements eliminate many applicants. Competition among candidates is apt to be particularly keen when there is considerable unemployment, since employment in this occupation is very stable.

The number of firefighters is expected to increase very rapidly during the next 10 years to meet the needs for fire protection in growing urban communities. As cities become more crowded, however, officials will give more emphasis to activities associated with fire prevention and many firemen will spend a greater amount of their time inspecting buildings for compliance with fire regulations and participating in fire prevention campaigns.

Earnings and Working Conditions

Average (median) beginning salaries of firefighters in late 1963 and early 1964 ranged from about $4,400 a year in small cities (10,000 to 25,000 population) to about $5,500 in larger

cities (over 500,000 population), according to the most recent study by The International City Managers' Association. In a few cities—all of them relatively small—entrance salaries were $3,000 or less; however, in some large cities they were $7,000 or more. Generally, firemen receive salary increases annually during the first 2 to 5 years of service. Maximum salaries of firemen (below the rank of officer) averaged about $4,900 in small cities and $6,300 in the largest ones. For fire chiefs, the averages ranged from $6,600 a year in the smallest cities to $16,000 in the largest. Practically all city fire departments furnish or pay allowances for protective firefighting clothing (helmets, boots, and rubber coats) and many also provide for dress uniforms.

In most cities, firemen are on duty for a 24-hour shift, and then off for 24 hours, with an extra day off at intervals. In some cities the day shift is 10 hours, and the night shift is 14 hours, with firemen rotating shifts at frequent intervals. Firemen's scheduled hours range from 40 hours a week in some cities to 96 hours in others; many observe a workweek of between 55 and 65 hours. The scheduled workweek in metropolitan centers with large fire departments tends to be considerably shorter than in small communities. Scheduled hours on duty usually include some time when firemen are free to read, play cards, or pursue other personal interests.

In addition to their scheduled hours, firemen must work as many extra hours as necessary to bring a fire under control. When overtime is worked, many city fire departments either give compensatory time off or extra pay for the additional hours.

The job of a firefighter involves risk of life or injury from sudden cave-ins of floors or toppling walls, as well as hazards associated with exposure to flames, smoke, and bad weather. In fighting fires in industrial establishments, firemen may come in contact with poisonous, flammable, and explosive gases and chemicals.

Firemen are generally covered by liberal pension plans, many of which provide for 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 regular paid vacations. Provisions for sick leave are usually very liberal; health and surgical benefit plans are offered in many fire departments; and compensation is also provided for firefighters injured in the line of duty. Most fire departments either allow paid holidays—ranging up to 11 or more a year—or time off for working on holidays.

Many firefighters are members of the International Association of Fire Fighters (AFL–CIO).

Where To Go for More Information

Information on how to obtain a job as a firefighter may be secured from your local civil service commission or fire department.

General information on the occupation may be obtained from:

International Association of Fire Fighters,
905 16th St. NW., Washington, D.C. 20006.
International Association of Fire Chiefs,
232 Madison Ave., New York, N.Y. 10016.

Additional information on the salaries and hours of work of firemen in various cities is published by The International City Managers' Association in its *Municipal Yearbook*, available in many libraries.

Policemen and Policewomen

(2d ed. D.O.T. 2–66.)
(3d ed. D.O.T. 375.118 through .868)

Nature of Work

Police officers—whether directing traffic at busy intersections or arresting dangerous criminals—are helping to preserve law and order. As municipal government employees, their job is to prevent criminal activities, to investigate crimes, and to apprehend and assist in the prosecution of offenders. Whether on or off duty, they are expected to exercise their authority whenever necessary. (This report covers policemen and policewomen employed on the police forces in cities and towns. It does not include

civilian employees of police departments; State, county, and Federal Government police employees; or policemen and detectives employed by railroads, stores, and other private businesses.)

The policeman who works in a small community customarily handles many kinds of police duties. He may, for example, direct traffic at the scene of a fire, investigate a housebreaking, and give first aid to an accident victim—all in the course of a day's work. In a large city police department, each officer is usually assigned to a specific type of police duty. Most city policemen are detailed either to patrol or traffic duty; smaller numbers are assigned to special work such as accident prevention or operating radio and other communications systems. Some officers are detectives (plainclothesmen) assigned to criminal investigation, and others are experts in chemical and microscopic analysis, firearms identification, handwriting and fingerprint identification, and other investigative specialties. In very large cities, a few officers may be specially trained for work with mounted police, harbor patrols, canine corps, mobile rescue teams, or other special units.

Courtesy of the New York Police Department

A policeman observes flow of traffic from helicopter.

An increasing number of city police departments—more than 150 in early 1965—are including women on their police forces. Policewomen are assigned mainly to work which involves women and young people—for example, they may work with juvenile delinquents, try to locate lost children and runaways, or question, book, and fingerprint women prisoners. Usually policewomen are in crime prevention work. Less frequently, they are assigned to detective squads, where they work mainly on crimes involving women; or they may work on other special police assignments. Policewomen are practically never assigned traffic duty, however.

Patrol duty has become particularly important as a means of preventing crime and providing other services to the public in large metropolitan districts; most newly recruited policemen start with an assignment of this kind. Patrolmen may be assigned to congested business districts, outlying residential areas, thoroughfares, or other sections of a city; they may cover their beats alone or with other patrolmen; and they may be on "foot" patrol, or ride in a car or on a motorcycle. In any case, they become thoroughly familiar with conditions throughout their area and, while on patrol, remain alert for anything out of the ordinary. They note suspicious circumstances such as open windows or lights in vacant buildings, for example, as well as hazards to public safety such as burned-out street lights or fallen trees. Patrolmen may also watch for stolen automobiles and enforce traffic regulations by apprehending speeding motorists or making out tickets for parking violations and other offenses. They report to police headquarters at regular intervals through call boxes or by radio, giving and receiving information about any situations which require action. They also prepare and turn in reports about their activities and observations and, in cases which result in legal action, they may be called upon to give testimony in court.

Where Employed

An estimated 190,000 full-time policemen and policewomen were employed in 1965 by city and town police departments. The great majority—well over 95 percent—were men. Some cities—

including New York City with more than 26,000 police officers, and Chicago with over 10,000—have very large police forces, while hundreds of small cities employ fewer than 25 policemen each. Policewomen work mainly in large cities.

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 years of age, and be able to meet certain height and weight standards. Eligibility for appointment is also determined by the candidates' performance on competitive examinations, their physical and personal qualifications, and their education and experience. The physical examinations often include tests of strength and agility. Also, because personal characteristics such as honesty, good judgment, and a sense of responsibility are especially important in police work, candidates are usually interviewed by a senior officer at police headquarters, and their character traits and background may also be investigated.

Some cities accept men with less than a high school education as police recruits, particularly if they have had work experience in a field related to law enforcement. In large police departments, where most jobs are to be found, applicants must usually have at least a high school education; a few cities require some college training.

More than 100 colleges and universities offer major programs in law enforcement, and many police officers receive training for their work at these institutions. Other courses—high school as well as college—which are considered helpful in preparing for a police career include English, American history, civics and government, business law, psychology, sociology, and physics. Physical education and sports activities are especially helpful to men in developing the physical stamina and agility needed in police work. College training is likely to be required for policewomen, because of their specialized assignments. Training or experience in social work, teaching, or nursing is considered desirable.

Young men who have completed high school and do not want to wait until they are 21 years old before entering police work can start in some very large cities by working as police cadets, or trainees, while still in their teens. As paid civilian employees of the police department, they attend classes part of the time to learn various aspects of police science, and also do clerical and other nonenforcement work. When police cadets or trainees reach the age of 21—and provided they qualify in other respects—they may be appointed to the police force.

Before being sent out on their first assignments, policemen usually go through a period of training. The instruction is given informally in many small communities, as recruits work for a week or so with experienced officers. More extensive training, such as that provided in large city police departments, may extend over a period of several weeks or a few months and include classroom instruction in State laws and local ordinances, and in the procedures to be followed in accident investigation, patrol, traffic control, and other police work. Recruits learn how to use a gun, defend themselves from attack, administer first aid, and deal with other emergencies.

Policemen and policewomen in most cities become eligible for promotion after completing specified periods of service on the force; and in a large city department, this may open the way for an officer to specialize in one of several kinds of law enforcement activities—laboratory work, traffic control, communications, work with juveniles, and many others. Promotions to the rank of sergeant, lieutenant, and captain are made in accordance with each candidate's position on a promotion list, as determined by his performance on written examinations and his work as a police officer. Opportunities to advance are generally most numerous in large city police departments where the work is carried on in separate bureaus, under the direction of administrative officers and their assistants. Most top ranking positions are occupied by men. Opportunities for women to advance beyond the rank of sergeant are mainly in the few city police departments which have separate bureaus for women and juveniles.

Many types of training are available to help police officers improve their performance on the job, and prepare themselves for advancement.

Through training given at police department academies, and at colleges and other institutions, officers have opportunities to become informed on such varied subjects as crowd-control techniques, civil defense, and the interrogation of suspects and witnesses. Many police departments encourage officers to work toward college degrees, and some pay all or part of the tuition. Each year, also, a limited number of policemen are selected for administrative training given in an intensive 12-week course at the National Academy of the Federal Bureau of Investigation, Washington, D.C.

Employment Outlook

During the 1965–75 decade, more than 10,000 opportunities will occur each year for qualified candidates to enter police work. Thousands will be new positions which arise as cities increase the size of their police forces to meet the needs of growing population. Most openings, however, will be vacancies that occur as policemen and policewomen retire or leave their jobs for other reasons. Police officers usually retire at a somewhat younger age than workers in most other occupations, and replacement rates are relatively high for this reason.

Police employment will continue to rise very rapidly during the next 10 years, as population and economic growth create a need for more officers to protect life and property, regulate traffic, and provide other police services. Although the vast majority of new jobs that arise will be for men, many openings will occur for women also.

The kinds of police jobs that arise in the future are likely to be affected to a considerable degree by changes now taking place in police methods and equipment. Specialists are becoming more and more essential in the effective operation of modern city police departments. In an increasing number of departments, for example, electronic data processing is being used to compile administrative, criminal, and identification records. There is a greater need also for officers with specialized training as engineering techniques are applied to traffic planning and control, and social work techniques are used in crime prevention. At the same time, relatively fewer officers are required for routine assignments such as directing traffic, because of the use of automatic signal lights to control traffic at busy intersections.

Earnings and Working Conditions

In late 1963 and early 1964, entrance salaries for police officers ranged from less than $3,000 a year in a few small cities to more than $7,000 in several large ones, according to a report on salaries issued by The International City Managers' Association. The average (median) entrance salary in middle-size cities (50,000 to 100,000 population) was about $5,000 a year.

Most policemen and policewomen receive regular pay increases during the first few years of employment, until a specified maximum is reached. Sergeants, lieutenants, and captains are paid progressively higher basic salaries than patrolmen in the same police departments. Top salaries paid to police chiefs or commissioners in 1963–64 ranged from less than $5,000 a year in several small cities to more than $20,000 in the largest.

Police departments usually provide officers with special allowances for uniforms, and furnish revolvers, night sticks, handcuffs, and other equipment required.

In most cities, including practically all very large ones, the scheduled workweek for police officers is 40 hours, and in many localities where the workweek is longer than this—up to 48 hours or, in a few instances, more—weekly hours are being gradually reduced. Police protection must be provided round the clock and, in all but the very smallest communities, some officers are usually on duty over weekends, on holidays, and at night. Policemen are subject to call at any time their services may be needed, and in emergencies may work long hours of overtime. Overtime, in some city departments, is paid at straight time or time and a half; in others, officers may be given an equal amount of time off on another day of the week.

City police officers are generally covered by liberal pension plans under which many are able to retire at half pay by the time they reach age 55. Paid vacations, sick leave, and medical,

surgical, and life insurance plans are among the other benefits frequently provided.

Policemen may be assigned to work outdoors for long periods in all kinds of weather. The injury rate is higher than in many occupations, and reflects the risks police officers take in pursuing speeding motorists, capturing lawbreakers, and dealing with disorderly conduct cases.

Where To Go for More Information

Information about local entrance requirements may be obtained from local civil service commissions or police departments.

Additional information on the occupations of policeman and policewoman may be obtained from:

International Association of Chiefs of Police,
1319 18th St. N.W., Washington, D.C. 20036.
International Association of Women Police,
100 North LaSalle St., Chicago, Ill. 60602.

Additional information on the salaries and hours of work of policemen in various cities is published by The International City Managers' Association in its *Municipal Yearbook*, available in many libraries.

OTHER SERVICE WORKERS

Cooks and Chefs

(2d ed. D.O.T. 2-26.)

(3d ed. D.O.T. 313.131 through .887; 314.381 through .878; and 315.131 through .381)

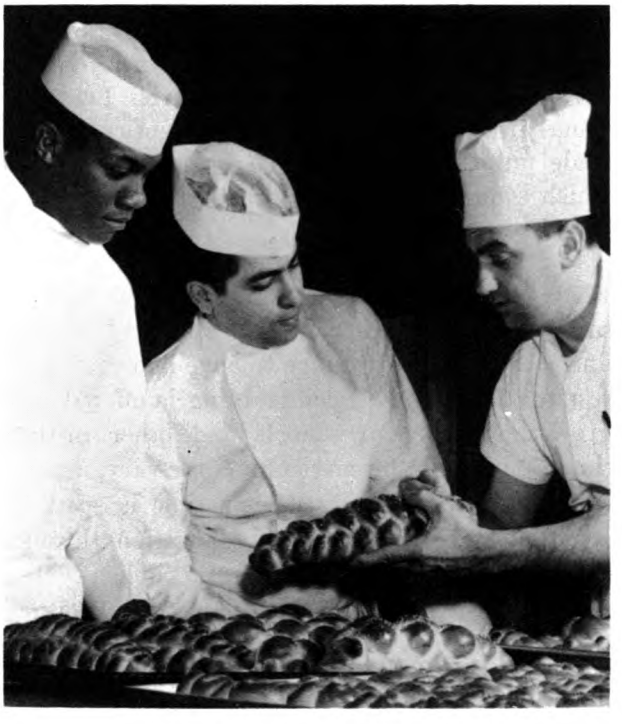
Nature of Work

Every one of the millions of people who eat meals away from home each day appreciates the work of a good cook—or chef, as an expert in this occupation is often called. A restaurant's success as a business enterprise depends in large part on the skill of the workers who prepare the dishes served. Hotels, railroads, and many other enterprises that serve meals are also judged at least partly on the same basis. This statement discusses the work of cooks and chefs employed in business establishments and institutions. It does not cover cooks who work in private homes.

The nature of a cook's job depends partly on the kind of establishment where he works. There is a good deal of difference, for example, in preparing food for students in a high school cafeteria, for passengers on a jet airliner, or for patients in a hospital. Similarly, the "home cooking" which is the trademark of many small establishments is far different from the elaborate cuisine featured in some cosmopolitan restaurants; and the cook who works in a steak house uses skills which are quite different from those of the cook in a restaurant which serves Chinese dishes.

Equally important, from the standpoint of a cook's duties, is the size of the establishment in which he works. In many small restaurants, one cook—perhaps aided by a short order cook and one or two kitchen helpers—prepares all the foods served. Often the menu consists of a few dishes prepared on a short order basis, plus pies and other baked goods purchased at a local bakery.

Large eating places are more likely to have varied menus, and to prepare on the premises all of the food served. The kitchen staff in a large establishment often includes several cooks—sometimes called assistant cooks—and many kitchen helpers. Each cook usually has a special assignment and often a special job title—pastry cook, fry cook, roast cook, vegetable cook, or sauce cook, for example. The head cook or chef—or, in a large restaurant or hotel, the executive chef—who coordinates the work of the kitchen staff is almost always a highly skilled cook and may often take direct charge of certain kinds of food preparation. He decides on the size of the food portions served and sometimes plans menus and purchases food supplies. In addition, he has the important responsibility of seeing to it that the dishes served taste good and are attractive in



Student cooks learn baking skills.

appearance. Because of their skill in creating new dishes and improving the flavor of familiar ones, some chefs who rank at the top in this occupation have acquired national and international reputations for themselves and for the restaurants and hotels where they work.

Where Employed

The number of men and women employed as cooks and chefs in early 1965 is estimated at more than 625,000. Most of these workers were restaurant cooks, but large numbers were also employed in public and private schools and in hotels and hospitals. Railroad dining cars, ocean liners, government agencies, manufacturing plants, private clubs, and many other kinds of establishments also employ cooks and chefs.

Three out of every five of these workers are women. About half of the cooks in restaurants and the great majority of those employed in schools and hospitals are women. Men outnumber women in hotels and private clubs, aboard ships, and on railroad dining cars. Also, most head cooks and practically all chefs are men.

Training, Other Qualifications, and Advancement

Most cooks—particularly those who work in small eating places—acquire their skills on the job while employed as kitchen helpers. Less frequently, they are trained as apprentices under trade union contracts or the training programs which some large hotels and restaurants conduct for their new employees.

For work in some large restaurants and hotels, where hiring standards are often higher than in small establishments, young people will usually find it a distinct advantage to have had courses in restaurant cooking. Such training is offered in a growing number of schools and other institutions. Although the curriculum may vary, usually a major part of each student's time is spent in learning professional food preparation through actual practice in well-equipped kitchens. The student receives instruction in baking, broiling, and other methods of preparing food, and in the use and care of kitchen equipment. Instruction may also be given in selecting and storing food, determining the size of individual portions, planning menus, and buying food supplies in quantity, as well as in hotel and restaurant sanitation and the public health aspects of food handling. Many vocational schools—both public and private—afford this kind of training for high school students. Other courses, open in some cases only to high school graduates and ranging from a few months to 2 years or more in length, are given under the auspices of restaurant associations, hotel management groups, and trade unions, and in technical schools and colleges.

Advancement for a beginner may be to a different cooking assignment which requires more skill, or he may obtain a job in another establishment which pays more or offers him a better opportunity to learn new cooking skills. Acquiring the all-round skill necessary to qualify as an expert and eventually advance to a position as head cook or chef in a fine restaurant often takes many years. For those cooks with an exceptionally good background of training and experience, this occupation offers excellent prospects of reaching the top. A few experienced cooks eventually go into business for themselves as caterers or restaurant proprietors, while others may become instructors at vocational schools and other institutions offering training in this occupation.

Cleanliness, the ability to work under pressure during busy periods, physical stamina, and a keen sense of taste and smell are among the important qualifications needed for this occupation. A cook or chef in a supervisory position not only must be an expert cook, but must be able to organize and direct kitchen operations effectively. Health certificates, indicating that cooks and chefs are free from communicable diseases, are required by the laws of many States.

Employment Outlook

This occupation is expected to offer excellent opportunities for employment during the 1965–75 decade. The number of cooks and chefs will probably rise very rapidly, as new restaurants, hotels, and other establishments which serve food are opened. Most of the openings will become available as workers retire or leave their jobs for other reasons, however; retirements and deaths alone will create an estimated 25,000 to 35,000 vacancies each year.

Small restaurants and other eating places where the food preparation is fairly simple will afford young people the greatest number of opportunities to obtain starting jobs as cooks. Beginners—especially those who have taken training in restaurant cooking—will also find starting positions available in hotel and restaurant kitchens where foods are prepared more elaborately. The shortage of skilled cooks and chefs is acute and employment opportunities for well qualified beginners will be especially good.

A continued expansion in the business of serving meals away from home—and in the number of workers who prepare these meals—is expected, not only because of population growth, but because of the relatively rapid increases which are likely among some groups in the population who customarily eat meals away from home. Large increases are expected in the number of young people entering jobs for the first time, the number of married women taking employment outside their homes, and the number of students attending schools and colleges. In hospitals and other institutions, a continued increase is foreseen in the number of patients, attendants, and others who regularly eat meals prepared on the premises. In addition, travel for business and pleasure is expected to increase, with the result that more people will be patronizing eating places.

Earnings and Working Conditions

Information about the average hourly wages of restaurant cooks employed in 24 metropolitan areas is available from a Bureau of Labor Statistics survey. The accompanying tabulation shows the lowest and highest averages reported for these cities in June 1963; all of the low averages given are for cities in the southern part of the country, and most of the high averages are for cities on the West Coast. In most areas surveyed, the averages for women were somewhat less than those for men. There was also a wide spread between the wages of the lowest and highest paid workers in each of the 24 cities. In one area, for example, where the average wage for 2,103 men employed as assistant cooks was $2.94 an hour, there were 80 who earned less than $2.20 an hour, and there were 110 others who earned $3.80 or more an hour.

	Average hourly wages	
	Lowest	*Highest*
Assistant cooks:		
Men	$1. 16	$2. 94
Women	. 80	2. 58
Short order cooks:		
Men	1. 08	2. 69
Women	. 68	2. 54
Head cooks:		
Men	1. 32	3. 50
Women	. 95	2. 48

Salaries in this occupation also vary greatly according to the type of establishment in which the worker is employed. In large restaurants and hotels, many cooks earn considerably more than the averages reported here for restaurants surveyed by the Bureau of Labor Statistics. Head cooks and chefs in such establishments may earn up to $15,000 annually; some chefs with national reputations make more than $25,000 a year. In still other kinds of eating places (such as school cafeterias, which serve only one meal daily), cooks work on part-time schedules and in the course of a week accordingly earn less than full-time workers of comparable skill.

In addition to their wages, restaurant cooks usually receive one or more free meals a day at their place of work and are furnished with uniforms. Paid vacations and holidays are common, and various types of health insurance programs also are available. Scheduled hours in restaurants include late evening, holiday, and weekend work, and range from 40 to 48 a week, depending on the section of the country.

Many of the kitchens in which these workers are employed are air conditioned, have convenient work areas, and are furnished with modern equipment and laborsaving devices. Others—particularly kitchens in small eating places—are often less well-equipped, and working conditions may be less desirable. In kitchens of all kinds, however, cooks often spend long periods on their feet and may be required to lift heavy pots and other objects, or work near hot ovens or ranges. Work hazards include the possibility of burns and scalds, and injury from knives, broken glass, or mechanical equipment.

The principal union organizing cooks and chefs is the Hotel & Restaurant Employees and Bartenders International Union.

Where To Go for More Information

General information about restaurant cooks and chefs is available from the:

Educational Director, National Restaurant Association,
1530 North Lake Shore Dr., Chicago, Ill. 60610.

A list of public and private schools offering courses in cooking may be obtained from:

Council on Hotel, Restaurant, and Institutional Education,
Statler Hall, Cornell University, Ithaca, N.Y. 14850.

Additional information about the wages and working conditions of restaurant cooks is available in:

Industry Wage Survey: Eating and Drinking Places, June 1963 (BLS Bulletin 1400, 1964). Superintendent of Documents, Washington, D.C. 20402. Price 40 cents.

Waiters and Waitresses

(2d ed. D.O.T. 2–27.01 through .12)
(3d ed. D.O.T. 311.138 through .878)

Nature of Work

Whether they work in small lunchrooms or fashionable nightclubs, all waiters and waitresses have jobs that are essentially the same. They take customers' orders, serve food and beverages, make out customers' checks, and sometimes they take payments as well. The way waiters and waitresses go about their work may vary considerably, however, because food service in very small eating places differs from that in large ones; and service in restaurants that emphasize speed and efficiency is different from that where dining is formal and leisurely. (This statement covers the work of table waiters and waitresses employed in restaurants, hotels, and other eating places. It does not cover workers employed in private homes or counter waiters and waitresses in restaurants, hotels, and other establishments.)

Many thousands of eating places, such as those which are often patronized by working people on their lunch hours, emphasize quick service with a minimum of frills. In addition to waiting on tables, the waiters and waitresses in these establishments usually perform a variety of other duties associated with food service. Often they set up and clear tables, and carry dishes back to the kitchen; and sometimes, when the establishment is very small, they may combine waiting on tables with counter service, preparing sandwiches, or cashiering.

In other eating places—particularly in large restaurants, and where meal service is formal—waiters and waitresses are relieved of most of these additional duties associated with meal service. In such establishments, busboys and busgirls often set up tables, keep water glasses filled, and perform other routine tasks, leaving the waiters and waitresses free to devote practically all of their time to taking guests' orders and seeing that meals are properly served. In those eating places where meals are served elaborately and a great deal of emphasis is placed on the satisfaction and comfort of each guest, a waiter may be called upon to advise about the choice of a wine or answer questions about the preparation of items on the menu. Sometimes, from a side table, he may prepare and serve salads to guests or flame certain dishes such as crepes suzettes.

Where Employed

The number of waiters and waitresses employed in the United States in 1965 is estimated at more than 900,000. The great majority—about 9 out of every 10—were women. The proportion of part-time workers employed for fewer than 35 hours a week is high—almost 2 out of every 5.

Approximately four-fifths of all workers in this occupation are employed in restaurants, drugstores, and other retail establishments which serve food to the general public. Hotels and educational institutions of all kinds also employ many waiters and waitresses. Waitresses work in all kinds of eating places, but jobs for waiters tend to be concentrated in those restaurants, hotel dining rooms, private clubs, and other establishments where meal service is formal.

Training, Other Qualifications, and Advancement

Although this occupation includes many workers who do not have extensive schooling, more and more employers prefer that beginners have at least 2 or 3 years of high school. Home economics courses and special courses for waiters and waitresses which are offered by some public and private schools provide good preparation. Restaurant associations also offer training in this field.

Practically all newly hired workers without previous experience as a waiter or waitress undergo a period of on-the-job training, during which they learn about the type of food service offered in their employer's establishment. Sometimes they work for a period as busboys or busgirls before being assigned a station as a waiter or waitress.

Waiters and waitresses must be able to make the calculations necessary to total guests' checks and compute taxes. Neatness in personal appearance is very important, as is a pleasant manner and—in a great many jobs—an even disposition and the ability to cope with the rush of business that usually occurs at mealtimes. In a few restaurants, knowledge of a foreign language may be desirable. Waiters and waitresses are often required by State law to obtain health certificates in order to assure that they are free of communicable diseases. Physical stamina is also needed because they are on their feet during their working hours.

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In many small eating places, opportunities for promotion are limited. However, a waiter or waitress who starts in a job of this kind may, after gaining experience, transfer to a larger restaurant where earnings and prospects for advancement are likely to be better. Advancement may be to a position as cashier or to supervisory work as a headwaiter or hostess. Some supervisory workers eventually advance to managerial positions in restaurant operation.

Employment Outlook

Employment opportunities for waiters and waitresses are expected to be good during the 1965–75 decade. Most of the openings will occur as workers retire or leave their jobs for other reasons; retirements and deaths alone will create an estimated 45,000 openings each year. Turnover is particularly high in the many eating places which employ waitresses, because many women leave their jobs to take care of family responsibilities.

In addition to the vacancies that occur because of turnover, thousands of jobs will be created by employment growth, as the number of eating places increases to meet the needs of the country's growing population. Also contributing to an increased need for restaurant services are such factors as rising income levels; more travel, both for business and pleasure; and the expected increase in the number of housewives employed outside the home. Eating places which employ waiters and waitresses will probably share only part of the additional business created, however; some of it will be handled by the growing number of vending machines dispensing prepared foods, and some of it will go to the drug stores, limited price variety stores, and cafeterias where meal service is provided by counter and fountain workers. Nevertheless, the number of waiters and waitresses will probably rise rapidly through the mid-1970's.

Most of the job openings that arise because of growth and turnover will be for waitresses. The number of men in this occupation has been diminishing for some years, while at the same time jobs for waiters have become more concentrated in formal dining establishments; these trends are expected to continue. As in the past, both waiters and waitresses seeking employment in res-

taurants of this kind will find competition keen for the jobs that become available; since there are relatively few such positions, hiring standards are high, and turnover is usually very low. Beginners will continue to find their best opportunities for employment in the thousands of establishments where food service is less elaborate.

Earnings and Working Conditions

Because most waiters and waitresses receive tips from the guests they serve as well as wages paid by their employers, it is difficult to estimate average weekly earnings. Wages are generally lower than in other occupations, and the amount received in tips is usually somewhat greater than the wages paid. Tips vary greatly in amount, however, depending on the skill of the waiter or waitress, the tipping customs in the community, and especially on the type of restaurant. Because tips often average between 10 and 15 percent of guests' checks, earnings from tips are usually highest in restaurants where prices are also highest.

In all but a few of the 24 metropolitan areas included in recent Bureau of Labor Statistics surveys, wages averaged less than $1 an hour for table waiters and waitresses employed in restaurants, hotels, and motels. The averages tended to be somewhat higher for waiters than for waitresses, and slightly higher in the restaurants surveyed than in the hotels and motels.

In addition to wages and tips, the majority of waiters and waitresses receive free meals at their place of work. Many are also furnished with uniforms. Paid vacations after qualifying periods of service are customary, and various types of health, insurance, and pension plans may also be offered.

Waiters and waitresses often 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. Scheduled hours include some work on holidays and weekends. Large restaurants and dining rooms are usually comfortably furnished, with convenient working areas, and are often air conditioned. Workers in other eating places—particularly small ones—may find working conditions less desirable and the pace of work very rushed at times. In restaurants of all types, workers often spend long periods on their feet, and may be required to lift heavy trays. Work hazards include the possibility of burns and cuts.

The principal union organizing waiters and waitresses is the Hotel & Restaurant Employees and Bartenders International Union.

Where To Go for More Information

General information about restaurant waiters and waitresses is available from:

Educational Director, National Restaurant Association,
1530 North Lake Shore Dr., Chicago, Ill. 60610.

Additional information about wages and working conditions is available in:

Industry Wage Survey: Eating and Drinking Places, June 1963 (BLS Bulletin 1400, 1964). Superintendent of Documents, Washington, D.C. 20402. Price 40 cents.

Industry Wage Survey: Hotels and Motels, June 1963 (BLS Bulletin 1406, 1964). Superintendent of Documents, Washington, D.C. 20402. Price 40 cents.

Hospital Attendants

(2d ed. D.O.T. 2-42)
(3d ed. D.O.T. 079.368 and .378; and 355.687 through .887)

Nature of Work

Hospital attendants are members of the nursing team which cares for people who are physically or mentally ill. Under the direction of registered professional nurses and licensed practical nurses, they perform a variety of duties, most of which require relatively little specialized training but all of which contribute to the comfort and care of their patients. Because of the help provided by hospital attendants, nurses are able to devote more time to work which requires professional and technical training.

Women employed as hospital attendants are usually called *nurse aids* (D.O.T. 355.878), and men are often known as *orderlies* (D.O.T. 355.878). Other job titles which are used include *nurs-*

ing assistant, *auxiliary nursing worker*, and (in mental institutions) *psychiatric aid.* Among the tasks often performed for patients by nurse aids are answering call bells and delivering messages, serving meals and feeding patients who are unable to feed themselves, making beds with fresh sheets and pillow slips, bathing patients, and arranging flowers. Duties may also include giving back rubs, taking temperatures, and assisting patients in getting out of bed and walking. Orderlies provide many of the same services for male patients and, in addition, perform such tasks as wheeling patients to operating and examining rooms, and transporting and setting up heavy equipment. Attendants may also be assigned to tasks less directly associated with patient care—for example, working in hospital pharmacies or helping with sterile supplies.

Other duties that may be performed by hospital attendants depend on the policies of the institutions where they are employed, the type of patient being cared for, and—equally important—the capacities and resourcefulness of the nurse aid or orderly. In some hospitals, for example, the nurse aid's work includes household tasks such as cleaning patients' rooms, and in others it is limited to assisting in the care of patients. Even the tasks performed for patients may differ considerably, depending, for example, on whether the patient is confined to his bed following major surgery, or is learning to walk again after a severe accident or a disabling illness such as infantile paralysis, or is infirm because of advanced age and requires assistance with the activities of daily living.

Courtesy of the U.S. Office of Education

Nurse aid brushes a nursing home patient's hair.

Where Employed

An estimated 550,000 hospital attendants were employed in 1965. About 3 out of 4 were women.

The great majority of workers in this occupation are employed in hospitals, and most of the rest work in sanitariums, nursing homes, and other institutions providing facilities for care and recuperation. Such establishments are found in every part of the country, but most opportunities for employment as nurse aids and orderlies are in heavily populated areas.

Training, Other Qualifications, and Advancement

Although some employers hire persons with less than a high school education as hospital attendants, high school graduates are nevertheless preferred. Courses in home nursing and first aid, offered by many public school systems and other community agencies, provide a useful background of information for the work. Volunteer work and temporary summer jobs in hospitals and similar institutions may also furnish experience that is helpful.

Many employers accept applicants 17 or 18 years of age. Others—particularly in nursing homes and in mental hospitals—prefer to hire more mature men and women who are at least in their mid-twenties. All applicants for work of this kind should be in good health. Personal qualities such as tact, patience, understanding, emotional stability, and dependability are all important. For work as an attendant, as in other health occupations, a basic requisite is a genuine interest in people and a desire to be of help to them.

Hospital attendants are generally trained in their duties after they are hired. In some institutions, on-the-job training under the immediate direction of registered and licensed practical nurses is combined with classroom instruction that includes demonstrations in taking and recording temperatures, bathing patients, changing linens on beds which are occupied by patients, moving and lifting patients, and other duties. Training may be continued over a period of several days or a few months, depending on the policies of the hospital, the attendant's aptitude for the work, and the nature of the duties assigned.

Promotional opportunities are limited for workers in this occupation, unless they undertake further training. With specialized training, some hospital attendants may prepare themselves for better paying positions such as hospital operating room or oxygen technicians. (For employment as licensed practical nurses, hospital attendants must first complete the year of training usually required for licensure. See statement on Licensed Practical Nurses elsewhere in the *Handbook*.)

Employment Outlook

Employment opportunities will be excellent for hospital attendants during the 1965–75 decade. A very rapid rise in employment is anticipated. More than 30,000 job openings are expected each year as a result of growth in the occupation and the need to replace employees who retire or stop working for other reasons. At least as many additional openings will probably arise as attendants leave their jobs to enter other types of employment.

Most of the new jobs that become available for nurse aids and orderlies during the next 10 years will be in hospitals, but many openings will also occur in nursing homes, convalescent homes, and similar institutions. Among the reasons for expecting employment to rise are the increase in population and in the number of people covered by hospital, medical, and surgical insurance; the increasing numbers of elderly people in the population—a group which is particularly susceptible to long-term illness; and the emphasis being placed on rehabilitation in mental hospitals and other institutions. Many additional jobs for aids and orderlies are expected also as hospitals continue their efforts to have attendants perform tasks which, although associated with the care of patients, do not require the training of registered and licensed practical nurses.

Earnings and Working Conditions

The earnings of hospital attendants (nursing aids) averaged $53.50 a week in mid-1963, according to a Bureau of Labor Statistics survey of 549 hospitals in metropolitan areas throughout the country. Average earnings were lowest in the Southern cities surveyed ($40.50 a week) and highest in the western part of the country ($63.50). The averages were lower—by from $3.50 to $8 a week—for nurse aids than for orderlies employed in the same sections of the country.

In some institutions, free lodging may be furnished hospital attendants. Free meals, or meals at cost, as well as uniforms and laundering of uniforms, may also be provided hospital attendants in some institutions.

With few exceptions, the scheduled workweek of the attendants in the hospitals surveyed by the Bureau of Labor Statistics was 40 hours or less. Because nursing care must be available to patients on a 24-hour-a-day basis, scheduled hours include nightwork and work on weekends and holidays.

According to the limited information available, those attendants who are employed in hospitals and similar institutions generally receive paid vacations which, after 1 year of service may be a week or more in length. Paid holidays and sick leave, hospitalization and medical benefits, and pension plans are also available to many hospital employees.

Where To Go for More Information

Information about employment opportunities and duties may be obtained from local hospitals and other health agencies.

Additional information about the work of hospital attendants may also be obtained from:

National League for Nursing,
10 Columbus Circle, New York, N.Y. 10019.

American Nurses' Association,
10 Columbus Circle, New York, N.Y. 10019.

Barbers

(2d ed. D.O.T. 2-32.01)

(3d ed. D.O.T. 330.371)

Nature of Work

Barbers provide many services related to the care of hair, face, and scalp. Their main task, however, is to cut hair in accordance with the preference of each customer. They also give hair and scalp treatments, provide services such as shaves, facial massages, and shampoos, and fit hair pieces.

A barber builds a steady clientele by giving good haircuts, putting customers at ease, giving them efficient, courteous service, and keeping a clean, attractive shop. In a small shop, it may be part of his job to keep his own work area clean and sometimes sweep the shop. Each barber is usually responsible for keeping his barbering instruments sterilized and in good condition. Those who run their own shops have managerial responsibilities such as ordering supplies, paying bills, keeping records, and hiring employees.

Where Employed

The total number of barbers employed in 1965 is estimated at about 200,000. The great majority were men. More than half of all barbers own and operate their own shops. Small shops, in which the owner either works alone or with one other barber, provide employment for the majority of workers in this occupation. Many barbers also work in large shops such as those in suburban shopping centers and in hotels and office buildings in downtown city districts. Some barbers work in combination barber and beauty shops, and a few for government agencies and in such places as hospitals, and on ocean liners.

All cities and towns and many very small communities have barbershops. However, employment is concentrated in large cities and in the most populous States.

Training, Other Qualifications, and Advancement

In practically all States, barbers must be certified or licensed. To obtain their licenses, candidates must be graduates of State-approved barber schools. In addition, they must meet certain health requirements, usually be at least 16 (or 18) years old, and have completed at least the eighth grade. In all but a very few States, the beginner is required first to take an examination for an apprentice license; then, usually after working 1 or 2 years as an apprentice barber, he takes a second examination for his license as a registered barber. The examinations usually include both a written test and a demonstration of the applicant's ability to perform barbering services. The fees charged for these examinations generally range from $5 to $20. A few States do not require a fee for their apprentice examination. Barbers who move to another State must meet the licensing requirements of that State.

Barber training is offered in many public and private schools. Courses usually run from 6 to 9 months and include from 1,000 to 1,800 hours of instruction. A trainee studies the basic services—haircutting, shaving, massaging, and facial and scalp treatments—and, under supervision, practices these services on fellow students and customers in school "clinics." Besides attending lectures on barber services and the use and care of barber instruments, the student takes courses in

anatomy, sanitation, and hygiene, and learns how to recognize certain skin conditions. Instruction is also given in salesmanship and general business practices. Advanced courses are available in some localities for those registered barbers who wish to specialize in such areas as hair styling and coloring.

A beginner may locate his first job through the barber school he attended, or through the local barber's union or employer's association. He customarily purchases his own tools—often at a cost of $100 or more.

Some experienced barbers advance themselves by becoming managers of large shops or by opening their own shops. A few, who meet the requirements, may become teachers at barber schools. Barbers who go into business for themselves must have the capital to buy or rent a shop and install equipment. The amount of capital needed differs, because some owners buy used equipment and fixtures at reduced prices, whereas others pay higher prices for new equipment. The cost of equipping a one-chair shop with new equipment is roughly estimated at from $1,000–$1,500.

Dealing with customers may require patience and a better-than-average disposition. Good health and stamina are important also, as a barber must stand for long periods, much of the time working with both hands at shoulder level.

Employment Outlook

Several thousand openings for barbers are expected to arise each year during the 1965–75 decade. The majority will be positions that become vacant through turnover; retirements and deaths alone are expected to create more than 5,000 openings yearly. Replacement needs in this occupation are relatively high, because barbers are somewhat older, on the average, than workers in many other occupations.

Other openings will occur as more barbering services are required to meet the needs of the growing population. A moderate rise in employment is anticipated during the next 10 years. The small shop with only one or two barbers will probably remain the most common type of establishment; however, the continued growth of suburban communities should result in opportunities to open large shops in these areas, and also to expand staffs in established shops.

Earnings and Working Conditions

Employed barbers receive income from commissions or wages as well as from tips. Most barbers who are not in business for themselves are paid on a straight commission basis—normally 65 to 75 percent of the money they take in—and a few are paid straight salaries.

Weekly earnings, including tips, generally ranged between $65 and $150 in early 1965, according to the limited information available. A few expert barbers, as well as some barbers who operated their own shops, made more than $200 a week.

Earnings depend on such factors as the size and location of the shop, customers' income levels and tipping habits, competition from other barbershops, the barber's skill at his trade, his ability in attracting and holding regular customers, and the prices he can charge for his services. In 1965, for example, the cost of a haircut ranged from $1 in some shops to more than $2 in others. Earnings will also vary considerably within a given area; the earnings of apprentices are usually lowest, and those of barbers who own and work in their own shops are generally highest.

Most full-time barbers work more than 40 hours a week; a workweek in excess of 50 hours is not uncommon. A barber may have to serve a steady stream of customers during peak hours and on especially busy days such as Saturdays, but during slack periods he may have time off to attend to personal matters. Under some union contracts, barbers receive 1- or 2-week paid vacations, insurance, and medical benefits.

The principal union which organizes barbers—both employees and shopowners—is the Journeymen Barbers, Hairdressers, Cosmetologists and Proprietors' International Union of America. The principal trade association which represents and organizes shopowners and managers is the Associated Master Barbers and Beauticians of America.

Where To Go for More Information

Information on State licensing requirements may be obtained from the State Board of barber

examiners or other State authority at each State capital; and information about approved barber schools, from the division of vocational education at each State capital.

General information on training facilities, and State licensing laws may also be obtained from:

National Association of Barber Schools, Inc.,
750 Third Ave., Huntington, W. Va. 25701.

Additional information on this occupation is also available from:

Associated Master Barbers and Beauticians of America,
537 South Dearborn St., Chicago, Ill. 60605.

Journeymen Barbers, Hairdressers, Cosmetologists and Proprietors' International Union of America,
1141 North Delaware St., Indianapolis, Ind. 46207

Cosmetologists

(2d ed. D.O.T. 2–32.11 through .31)
(3d ed. D.O.T. 332.271 and .381; 331.878; and 339.371 and .878)

Nature of Work

Cosmetologists provide a variety of beauty services, most of which are related to the care of the hair. They give permanent waves, and they shampoo, cut, set, style, straighten, bleach, and tint the hair. They may also give manicures and scalp and facial treatments, provide makeup analysis, shape eyebrows, and clean and style wigs and chignons. Other duties include making appointments for customers, cleaning the equipment they use, and sterlizing implements. Often, cosmetologists are called *beauty operators*, *hairdressers*, or *beauticians*.

Particularly in large salons, but in many small ones also, operators may specialize in different phases of the work. When they do, they often have job titles which relate to their specialties—manicurist, tint specialist, or hair stylist, for example. Many of the men employed as cosmetologists are hair stylists.

The owner-operator of a beauty shop, in addition to working as an operator, usually performs a number of managerial duties, such as record-keeping, property maintenance, control of supplies, and supervision of employees.

As she gives haircut, cosmetologist thins and shapes a customer's hair.

Where Employed

An estimated 400,000 people were employed as hairdressers and cosmetologists in 1965. More than 10 percent were men. The proportion of part-time workers is relatively high.

Most cosmetologists are employed in shops and salons which are operated as independent establishments or in conjunction with hotels and department and specialty stores. Smaller numbers work in a variety of other establishments—for example, in motion picture and television studios, in hospitals, and on ocean liners.

Employment generally is concentrated in urban areas, although many operators work in small towns and rural areas in all parts of the country. The great majority of beauty shops are small establishments with fewer than four employees. Almost half of all beauticians are owner-operators of their shops.

Training, Other Qualifications, and Advancement

All States require that beauty operators be licensed. Before applicants are eligible to take State examinations in the theory and practice of cosmetology which they are required to pass in order to be licensed, they usually must be at least 16 years of age, present certificates of good health, and have completed at least the 8th grade—in many States the 10th, and in a few the 12th. Successful completion of a State-approved cosmetology course is recognized as adequate preparation for these examinations in all States; in some, a period of apprenticeship may be substituted. More than three-fourths of the States provide for reciprocity, and therefore operators licensed to work in one State can often move to another and continue their work without taking an examination to qualify for another license.

In 1964, more than 2,500 public vocational schools and private schools offered training which met State licensing requirements for cosmetologists. In many of them, instruction preparing students for a general operator's license was available in evening classes as well as in full-time day classes. Many daytime courses offered by public and private schools require from 6 months to a year to complete. Other public school courses, which include academic subjects required for a high school diploma, last from 2 to 3 years. Apprentice training usually continues over a period of 1 or 2 years. Many States issue special manicurists' licenses which require substantially fewer hours of training than general operators' licenses.

Both public and private school training programs include classroom study, lectures, demonstrations, and practical work. Students who are beginners usually practice by working on each other or on manikins and, when they have satisfactorily completed a period of preliminary training, they may practice on customers in school "clinics." Practically all beauty schools try to help their students find jobs after graduation.

Some cosmetologists start as manicurists or shampooers, while others begin as all-around operators performing a variety of services. Advancement may come in the form of higher earnings, as operators gain experience and build up a steady clientele, or as they become skilled specialists in one or more phases of the work. For those who wish to specialize, advanced courses in hair styling, hair coloring, and other types of work are available in many localities, sometimes offered by public or private schools, and sometimes by manufacturers of beauty preparations or by other individuals and organizations. Experienced operators may also advance to positions in which they manage large salons or open shops of their own. Others advance to teaching positions in cosmetology schools, or use their knowledge and skills in some different type of employment—working as demonstrators for manufacturers of cosmetics, for example, or as beauty editors for newspapers and magazines, or inspectors for State cosmetology boards.

To be successful, a cosmetologist should keep abreast of changing hair styles and beauty techniques. Ability to establish and maintain friendly relationships with people is also important, as are good grooming, dexterity, a sense of form and artistry, and willingness to follow instructions and customers' wishes. A prime requisite is a sense of responsibility. An operator's job also calls for physical stamina, since a great deal of standing is normally required.

In a few shops, operators may be required to furnish such equipment as brushes, combs, and clips. They almost always furnish their own uniforms.

Employment Outlook

During the rest of the 1960's and early 1970's, job opportunities are expected to be good for newcomers to this field, as well as for experienced cosmetologists and those who are seeking part-time work. The number of replacements needed as cosmetologists retire or stop working for other reasons will probably average 20,000 or more each year. Still other openings will become available as jobs are vacated by workers leaving to enter other kinds of employment and as more cosmetologists are required to meet the needs of the growing population. Employment in this occupation is expected to expand very rapidly, as it has for some years past.

Earnings and Working Conditions

The earnings of cosmetologists depend on such factors as experience, speed of performance, skill,

and ability to please customers and build up a clientele. The type of shop and its location may be factors also. In cities, for example, earnings are usually higher than in rural areas and, even within the same city, earnings are often higher in large multiservice salons than in small shops.

Many cosmetologists are paid on a straight commission basis. Others receive a salary plus commission and still others a straight salary. It is difficult to estimate total earnings because, in addition to salaries and commissions, most cosmetologists receive customers' tips and tipping practices vary in different localities. In large cities, tipping is more prevalent and the tips more liberal than elsewhere. Many beginning operators earn between $50 and $75 a week, according to the limited information available; earnings are somewhat less than this in most small communities, however. A very few top stylists and others in highly specialized jobs, may earn up to $300 or more a week.

Most full-time operators work 40 hours or longer a week. The scheduled hours of full-time operators usually include late afternoon and Saturday work. Many part-time operators are also employed during these busy periods.

In many large shops and in establishments such as department stores and hotels, operators may participate in group life and health insurance and other employee benefit plans sponsored by the employer. Some shops allow their employees annual paid vacations of at least 1 week after a year's service.

The most active union in this occupational field is the Journeymen Barbers, Hairdressers, Cosmetologists and Proprietors' International Union of America. Other organizations in the field are the National Hairdressers and Cosmetologists Association, which includes both shopowners and operators; The Associated Master Barbers and Beauticians of America, representing shopowners and managers; and the National Beauty Culturists' League, made up of Negro operators, teachers, managers, and shopowners.

Where To Go for More Information

State boards of cosmetology can supply information about approved training schools and requirements for licensing.

Additional information about careers in beauty culture, and State licensing requirements, can be obtained from:

National Association of Cosmetology Schools, Inc.,
3839 White Plains Rd., Bronx, N.Y. 10467.

Information about careers in cosmetology may also be obtained from:

National Hairdressers and Cosmetologists Association,
175 Fifth Ave., New York, N.Y. 10010.

Skilled and Other Manual Occupations

The more than 25 million manual (blue-collar) workers—skilled, semiskilled, and unskilled—employed in 1964 made up more than one-third of all employed workers. They worked in hundreds of different occupations, including such diverse jobs as instrument maker, sewing machine operator, and construction laborer. Men and women in manual occupations perform important functions in our economy. They help transform the ideas of scientists and the plans of engineers into goods and services. They help operate transportation systems, communication facilities, and atomic installations. They build homes, office buildings, and factories. They work in factories where they build, install, control, maintain, and repair the complex equipment needed by our highly mechanized society. They repair automobiles, and television sets, washing machines, and other household appliances. Manual workers move raw materials, wrap and pack finished products, and load and unload supplies of all kinds.

Young persons with mechanical interests and abilities, or others who like to work with their hands, will find most of their employment opportunities among the hundreds of different occupations in this group.

Technological progress is causing major changes in the occupational composition of the labor force. Rapid advances in the industrial applications of scientific knowledge and invention, particularly in electronics, are making possible greater use of electronic, mechanical, hydraulic, pneumatic, and other devices to feed, control, handle, and adjust the machinery and equipment used in manufacturing. The specific effects of these developments on employment and occupational skills are still not completely clear. However, the numbers of skilled and semiskilled workers are expected to continue to increase during the decade ahead, despite rapid mechanization and automation of production processes. With respect to skill requirements, it is expected that our increasingly complex technology generally will require higher levels of skill.

Although manual workers declined slightly as a proportion of total employment between 1954 and 1964, their number increased by more than a million. Half of the increase was accounted for by skilled workers and half by semiskilled workers. Employment of unskilled workers remained relatively constant throughout that decade. Between 1964 and 1975, manual workers are expected to increase almost 20 percent, compared with about 25 percent for all workers. However, employment of skilled workers is expected to increase at about the same rate as total employment. Semiskilled workers are expected to grow at a much slower rate—about 16 percent, while no significant change is expected in the number of unskilled workers.

In addition to the large number of job opportunities expected to be available for blue-collar workers because of employment growth, an even larger number of job openings is expected to result from the need to replace experienced workers who retire, die, or transfer to other lines of work. Replacement needs due to retirements and deaths alone should provide more than 600,000 job openings annually in this large field of work. For skilled workers, replacement needs are expected to offer about the same number of job opportunities as growth; for semiskilled workers, almost twice as many job opportunities as growth; and, for unskilled workers, virtually all the job opportunities.

The skilled, semiskilled, and unskilled occupation groups are discussed separately in the following sections. Following these general discussions are more detailed statements on individual manual occupations. Many other manual occupations are also described in the individual industry statements, elsewhere in the *Handbook*.

Skilled Workers (Craftsmen, Foremen, and Kindred Workers)

The Nation's economic and military strength depends to a great extent on the initiative and competence of its craftsmen. Skilled workers make the patterns, models, tools, dies, machines, and equipment without which industrial processes could not be carried out by semiskilled and unskilled workers. They repair the equipment used in industry and the mechanical equipment and appliances used by consumers. They also construct homes, commercial and industrial buildings, and highways.

In 1964, there were almost 9 million skilled workers. More than half of these workers were employed in two broad occupational groupings—mechanics and repairmen, and construction craftsmen. (See chart 24.) There were three-fourths of a million automotive mechanics and an even greater number of carpenters. At least 10 additional skilled occupations had more than 100,000 workers each. (See chart 25.) Many skilled occupations, for example, electrotypers, blacksmiths, and glaziers, however, had fewer than 20,000 workers each.

CHART 24

NEARLY 9 MILLION WORKERS ARE EMPLOYED IN SKILLED OCCUPATIONS. MORE THAN HALF ARE IN MAINTENANCE, REPAIR, AND CONSTRUCTION JOBS.

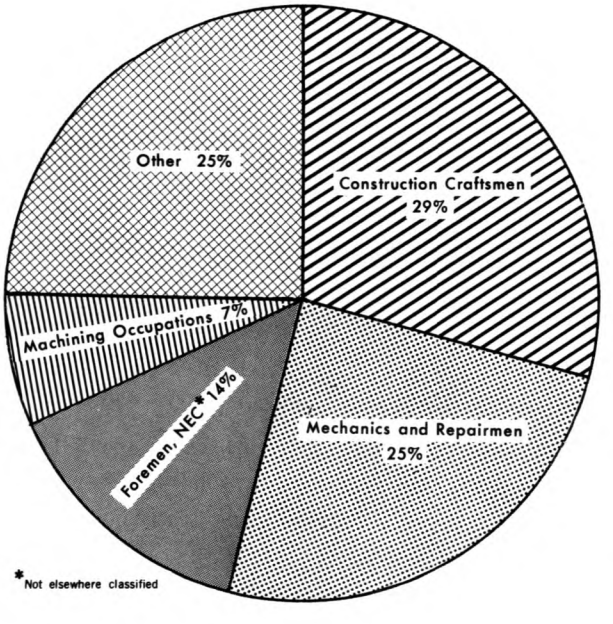
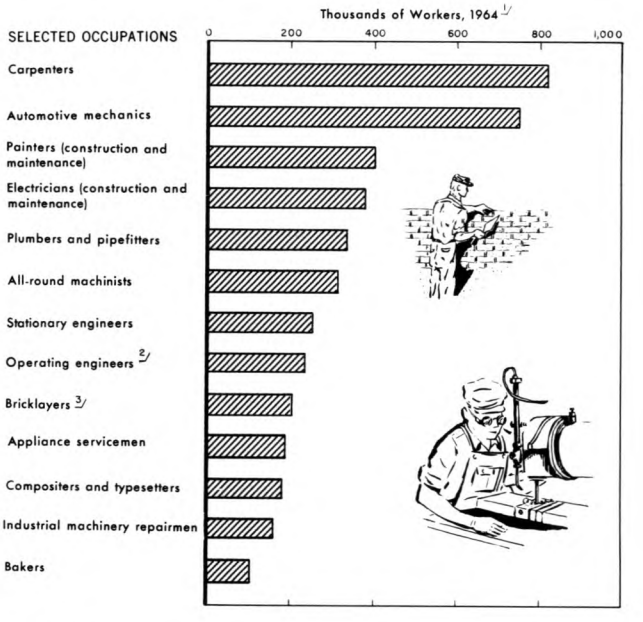


CHART 25

MANY SKILLED OCCUPATIONS HAVE MORE THAN A HUNDRED THOUSAND WORKERS. . . . .



1/ Estimated.
2/ Excavating, grading and road machinery operators.
3/ Including tile setters, stonemasons, and marble setters.

Although skilled workers are employed in almost every branch of industry, more than half are employed in manufacturing and construction. More than three-fourths of all craftsmen work for private employers; others are self-employed or work for Federal, State, or local governments. The building trades have a fairly large percentage of self-employed craftsmen. As might be expected, employment of the skilled work force is concentrated in the highly industrialized States such as New York, California, Pennsylvania, Illinois, and Ohio. Job opportunities for skilled workers, however, are found in every State. A very small proportion (less than 3 percent) of skilled workers are women.

Training, Other Qualifications, and Advancement

Skilled workers must have a thorough knowledge of the processes involved in their work. They exercise considerable independent judgment and, in some instances, they are responsible for valuable equipment or products. These workers often need a high degree of manual dexterity.

Workers in skilled occupations usually receive extensive training. Many acquire their skills through apprenticeship or other formal training programs. Many others acquire their skills through work experience, but without participation in a planned training program. Large numbers of young men also acquire skills in the armed services. For others vocational school training plays an important role.

Most training authorities agree that the best way to learn a skilled trade is through a formal apprenticeship program. Apprenticeship is a period of systematic on-the-job training, supplemented by related trade instruction, which is designed to familiarize the apprentice with the materials, tools, and principles of the trade. The apprenticeship program provides the worker with a balanced knowledge of his trade and the ability to perform duties competently. The formal apprenticeship agreement stipulates the number of hours of training the apprentice is to receive in the various aspects of the trade. Most apprenticeship programs last 4 years; they range from 3 to 6 years.

Apprenticeship has a number of advantages over less formal methods of learning a trade. An apprentice receives broad training and experience that enable him to adjust more easily to changing job requirements, and to work in a wide range of jobs. The completion of an apprenticeship gives the worker a recognized status that is an advantage in finding and holding jobs. Many firms select foremen from among their former apprentices, because they are usually familiar with all aspects of the work being performed.

Many companies have other kinds of training programs that also provide systematic on-the-job training and, frequently, supplementary classroom instruction. In these programs, new workers begin on the simplest tasks under the direction of a foreman or an experienced worker and gradually progress to more difficult work.

Many young persons move from one semiskilled job to another and over a period of years, acquire knowledge and skills sufficient to become skilled workers. Others begin learning a skilled trade in vocational, trade, or technical schools. A small proportion of these students move directly into jobs in their trade and, after acquiring experience, qualify as skilled workers. Other young persons, who are already employed in semiskilled or unskilled jobs, move into skilled occupations through vocational training related to their work, such as correspondence courses, manufacturers' training programs, and night school courses.

Large numbers of young men in the Armed Forces acquire skills that enable them to qualify, with some additional training, for skilled jobs in civilian life, such as automobile mechanic, electronic technician, airplane mechanic, electrician, or office machine repairman.

Many supervisors and men in high administrative positions in industry have come from the ranks of craftsmen. Employers have long recognized the value of executives who have both industrial know-how and administrative ability, and thus have drawn many of them from the ranks of skilled workers—especially from among those who have received apprenticeship or other well-rounded training.

Young people who do not expect to go to college should consider the definite advantages that the skilled trades offer, compared with semiskilled and unskilled occupations. Skilled workers have higher earnings, more job security, better chances for promotions, and more opportunities to open their own business, than most of the workers with lesser skills. Of the 11 occupational groups that make up our labor force, only the professional, managerial, and sales worker groups had higher average annual earnings than the average $7,700 earned by craftsmen in 1964.

Employment Trends and Outlook

Employment in skilled occupations grew from about 8.3 million workers in 1954 to nearly 9.0 million in 1964. Continued growth in the number of skilled jobs is expected in the years ahead. Job opportunities will also result from the need to

replace skilled workers who transfer to other fields of work, are promoted, retire, or die. About 230,000 skilled workers are expected to be needed each year to replace those who retire or die.

During the next decade, employment in skilled occupations is expected to rise rapidly because of industrial growth and technological advances that increase the need for skilled workers. As in the past, rates of employment growth will differ among the skilled occupational groups. Employment of mechanics and repairmen, for example, should continue to grow more rapidly than the skilled work force as a whole. The numbers of skilled workers in the building trades and the major skilled machining occupations are expected to increase at more moderate rates. On the other hand, employment in the printing trades is expected to show little or no change over the next decade.

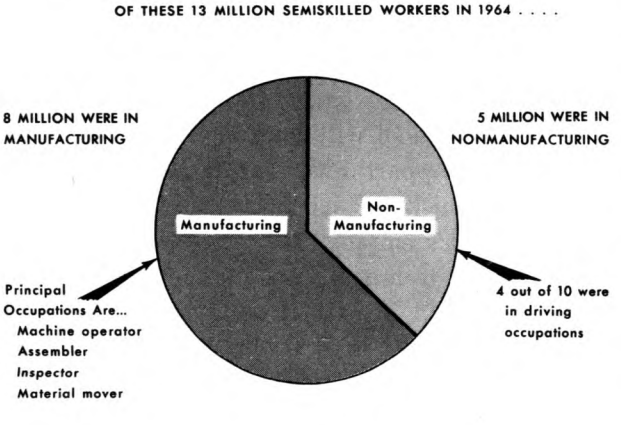
Young men who acquire a good basic education (including courses in mathematics and the sciences), as well as thorough job training, will be better able to compete for the higher paying skilled jobs than applicants without this training.

Semiskilled Workers (Operatives)

Semiskilled workers make up the largest occupation group in the Nation's labor force. Almost 13 million workers—about 1 in every 6—were employed in semiskilled jobs in 1964. Of the 8 million semiskilled workers employed in manufacturing industries (see chart 26), large numbers were engaged in making clothing, automobiles, automobile parts, food, textiles, machinery, and electrical and electronic equipment. The broad field of semiskilled jobs will provide hundreds of thousands of employment opportunities for young people looking for jobs in the years ahead.

CHART 26

MORE THAN 1 WORKER IN EVERY 6 IS EMPLOYED IN A SEMISKILLED JOB



Truckdrivers are the largest group of semiskilled workers. Millions of other semiskilled workers operate power driven machines in factories. Many use sewing machines to join fabrics for clothing, awnings, and other items. Others operate machines to stamp out metal parts; still others use machine tools, such as engine lathes and milling machines, to shape metal to precise sizes. A considerable number of these workers operate materials moving equipment, such as powered forklift trucks, to move raw materials and manufactured products from place to place in factories.

Large numbers of semiskilled workers are employed as assemblers and inspectors. Assemblers install components and subassemblies into end products such as radios and television sets. Inspectors examine and test products to find out whether their quality is satisfactory. Many semiskilled workers in factories are employed as helpers or assistants to more skilled workers. For example, stationary firemen help skilled stationary engineers operate and maintain steam boilers.

In 1964, over 3.5 million women accounted for more than 25 percent of all semiskilled workers. Semiskilled jobs, such as sewing machine operators, packers and wrappers, assemblers, and laundry and dry cleaning operators, were by far the largest source of employment for women in manufacturing industries. The number of women operatives employed in the different manufacturing industries varies considerably. Women ac-

counted for more than 8 out of 10 operatives in the apparel industry. Other manufacturing industries with large numbers of women operatives were textiles and food. On the other hand, plants that produce iron and steel and petroleum products employed relatively few women.

In general, operatives work with their hands. Many of these workers use a variety of handtools such as screwdrivers, pliers, files, soldering irons, measuring devices, and cutting tools. Many of these workers also make elementary adjustments and do minor maintenance work on the machines they use. Some are required to keep simple records of their work.

Training, Other Qualifications, and Advancement

Semiskilled workers ordinarily receive only brief on-the-job training. Usually they are told exactly what to do and how to do it, and their work is supervised closely. They often repeat the same motions or the same jobs throughout the working day.

Semiskilled workers do not need to invest many years in learning their jobs. The simplest repetitive and routine semiskilled jobs can be learned in a day and mastered in a few weeks. Even those jobs that require a higher degree of skill, such as truckdriver, can be learned in a few months. At the same time, adaptability—the ability to learn new jobs quickly, including the operation of new machines—is an important qualification for semiskilled workers.

New employees starting out in semiskilled jobs are not expected to be highly proficient, but only to be physically able to perform the work. After a short training period, however, they must work at a standard, fast, and steady pace. A semiskilled worker must be dependable—come to work regularly, pay attention, and follow instructions carefully. Frequently, good eyesight and good coordination are required.

Semiskilled jobs often pay well. Some operatives who are paid on an incentive basis are among the highest paid workers in manufacturing. The average annual earnings of operatives in 1964, however, were about $1,100 less than those of skilled workers. In addition, semiskilled workers are more likely to lose their jobs during a business recession, and to remain unemployed longer than craftsmen or white-collar employees.

Employment Outlook

The employment of semiskilled workers is expected to increase moderately through 1975; however, it is expected that this group will decrease somewhat as a proportion of the working population. Considerably more than half of all job opportunities for semiskilled workers are expected to result from the need to replace the thousands of workers in this very large occupational group who are promoted, transfer out of semiskilled jobs, retire, or die. About 350,000 semiskilled workers will be needed each year to replace those who die or retire. Transfer rates for semiskilled workers are high because a fairly large proportion of this group are young workers who tend to change jobs frequently, and women workers who leave jobs to marry, raise families, or to move to other areas when their husbands change jobs.

The continued growth in the use of commercial motor vehicles will result in some increase in employment opportunities for truck and bus drivers. Continuing substitution of power equipment for unskilled manual labor in lifting, hauling, digging, and similar heavy physical work will create other employment openings for semiskilled workers, as power equipment operators. Opportunities for employment in manufacturing will be limited by increasing automation of production processes. There are many industrial processes, however, to which automation is not likely to be applied in the next 10 years, and many industries in which the impact of automation will be limited.

Young men and women who have no training beyond high school will continue to find a major area of job opportunities in factory operative and other semiskilled jobs. The most rapid gains in the Nation's employment, however, will be in professional, technical, and other white-collar occupations and in skilled occupations. If possible, young people with ability should obtain the additional training and education that these

occupations require. Semiskilled workers, however, even those who do not complete high school, are not cut off permanently from advancement if they take advantage of the many educational opportunities available in their communities. They may take courses in evening schools, or enter apprentice training programs, and eventually qualify for better jobs.

Unskilled Workers (Laborers)

Unskilled laborers work in manual occupations that generally require no special training. Frequently, these jobs involve handling and moving materials, for example, loading or unloading, digging, hauling, hoisting, wood chopping, wrapping, and mixing. Some of these unskilled jobs involve heavy physical work. Unskilled manual laborers are employed mainly in manufacturing establishments, on construction work, in wholesale and retail trade, and in transportation jobs.

Although some of these jobs pay well, particularly in construction work, the average annual earnings of unskilled workers in 1964 were $1,500 less than those of semiskilled workers. Moreover, unskilled workers are usually the first to lose their jobs during a business recession and have the highest unemployment rate of all major occupation groups.

The longrun decline in employment of unskilled workers has occurred largely because mechanized equipment has replaced manual labor. In 1964, employment of unskilled laborers was approximately 3½ million—about 5 percent of the Nation's work force. In the future, total employment in this occupational group is expected to show little change. Nevertheless, there will be thousands of opportunities for new workers to get jobs as unskilled laborers because of the need to replace workers who transfer to other fields of work, retire, or die. Deaths and retirements alone will result in more than 70,000 job openings each year.

The replacement of unskilled workers by machinery will continue during the decade ahead. Power-driven equipment such as forklift trucks, derricks, cranes, hoists, and conveyor belts will take over more and more materials-handling work in factories, at freight terminals, and in warehouses; other power-driven machines will do excavating, ditchdigging, and similar work. Integrated systems of processing and materials-handling equipment, a more advanced step in automation, will be installed in an increasing number of plants in the years ahead. Anticipated industrial expansion, however, is expected to create a need for unskilled laborers which will about offset reduced requirements for these workers resulting from continuing substitution of mechanical equipment for manual labor.

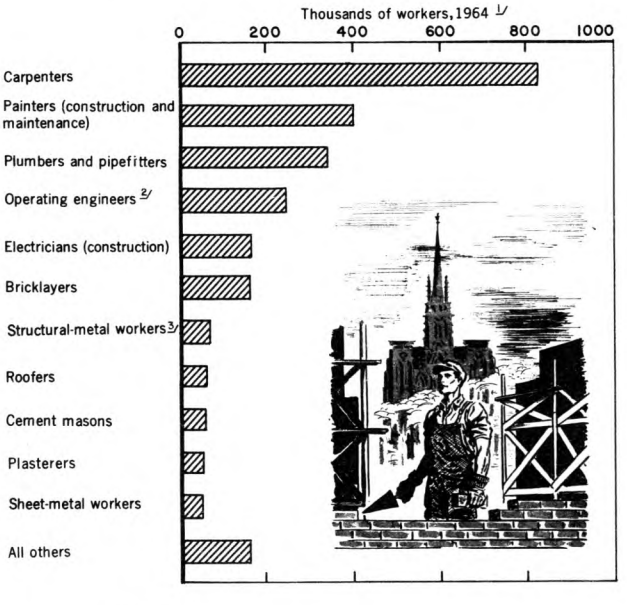
BUILDING TRADES

Building trades craftsmen make up the largest group of skilled workers in the Nation's labor force. Altogether, there were more than 2½ million such craftsmen employed in 1964—about 3 of every 10 skilled workers.

The more than two dozen skilled building trades vary greatly in size. Several major trades—carpenter, painter, plumber, pipefitter, bricklayer, operating engineer (construction machinery operator), and construction electrician—each had more than a hundred thousand workers. (See chart 27.) Carpenters alone numbered more than 800,000—nearly a third of all building craftsmen. By contrast, only a few thousand workers were employed in each of several trades, such as marble setter, terrazzo worker, glazier, and stonemason.

CHART 27

EMPLOYMENT IN THE BUILDING TRADES



1/ Estimated
2/ Excavating, grading, and road machinery operators
3/ Structural-and ornamental-iron workers

What Are the Building Trades?

Building trades craftsmen are employed mainly in the construction, maintenance, repair, and alteration of homes and other types of buildings, highways, airports, and other structures, including substantial work involved in the Nation's missile and space programs. The wide range of materials and skills used in construction work has resulted in specialization of various work operations. Thus, building trades workers who use essentially the same materials or skills have tended to become identified with distinct trades. For example, bricklayers and stonemasons both work with masonry materials. Although operating engineers do not work with particular materials, they have a group of related skills which enables them to handle various types of excavating, grading, hoisting, and other equipment.

The building trades consist primarily of journeymen (craftsmen) who generally must have a high level of skill and a sound knowledge of assembly and construction operations. They are often assisted in their work by apprentices, tenders, and laborers.

The work of journeymen may be grouped into three broad classifications—structural, finishing, and mechanical. However, some craftsmen—for example, carpenters—may do finishing as well as structural work. Generally, each building trade is classified in one of these three categories, as follows:

Occupations mainly concerned with structural work: Carpenter, operating engineer (construction machinery operator), bricklayer, structural-iron worker, ornamental-iron worker, cement mason, reinforcing-iron worker (rodman), rigger and machine mover, stonemason, and boilermaker.

Occupations mainly concerned with finishing work: Lather, plasterer, marble setter, tile setter, terrazzo worker, painter, paperhanger, glazier,

roofer, floor covering installer, and asbestos worker.

Occupations mainly concerned with mechanical work: Plumber, pipefitter, construction electrician, sheet-metal worker, and elevator constructor.

Most of the building trades are described individually later in this chapter. These descriptions are necessarily brief and incomplete. They do not apply fully to all localities because of local differences in the types of work done in the various trades.

Also, they are not statements or recommendations concerning the work jurisdiction of these trades and are inappropriate for use in jurisdictional negotiations or the settlement of jurisdictional questions.

(Detailed descriptions of the nature of the work, training, employment outlook, and other information concerning boilermakers and millwrights appear elsewhere in the *Handbook.*)

Where Building Trades Workers Are Employed

Building trades workers are employed mainly by contractors in the contract construction industry. Many others are employed in industries other than construction, mainly to do maintenance work. Some work directly for business firms or government agencies that have their own construction work force, and others are self-employed.

The building trades craftsmen who work in the contract construction industry are employed by general and special-trade contractors. General contractors may be classified as building (residential, commercial, or industrial), highway, or heavy construction contractors, since most general contractors limit their operations to one of these activities. They construct buildings and other structures, such as dams, bridges, tunnels, and roads, taking full responsibility for the complete job, except for any specified portions of the work that may be omitted from the general contract. General contractors may do a large part of the work with their own crews, but they often subcontract particular phases of the construction job to special-trade contractors.

Special-trade contractors usually do the work of only one trade, such as painting, carpentry, or electrical work, or of two or more closely related trades, such as plumbing and heating, or plastering and lathing. Beyond fitting their work to that of other trades, they have no responsibility for the structure as a whole. The special-trade contractors obtain orders for their work from general contractors, architects, or from property owners. Repair work is almost always done on direct order from the owners, occupants, architects, or rental agents.

There are several hundred thousand contractors (both general and special-trade); most of them operate within a limited geographical area. The great majority are small—generally employing fewer than 10 workers. Some firms employ several thousand workers each.

Thousands of building trades workers are employed in factories, stores, mines, hotels, and most other types of large business establishments. For example, plumbers and pipefitters are employed by firms to maintain, repair, and install piping systems. In addition, large firms frequently employ crews of building trades workers to construct houses, office buildings, and other new structures. Government agencies also employ many construction craftsmen to build, maintain, and repair highway, water, and sanitation systems.

Many building trades workers are self-employed. Self-employed journeymen work directly for property owners on small jobs. They may be paid by the hour or the day, or they may be paid an agreed price for the job, either providing the materials and including them in the price or using materials provided by the owner. Self-employment is most common in carpentry and painting, but is found also in other skilled building trades.

The work of skilled building craftsmen is identified with a specific trade, such as carpentry or bricklaying, rather than with an individual contractor or even a broad group of contractors. Thus, a carpenter may be employed mainly by a particular builder but, in the course of a year, he may be employed also by a concrete contractor to build forms for a concrete bridge; by an electrical or plumbing contractor to build a temporary structure at a large construction site; or he may contract to do a small repair job on his own.

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In some of the trades, work may be performed away from the construction site. For example, sheet-metal workers may be employed in shops where ducts are fabricated for installation in a building. In other trades, craftsmen may work in the central shop of the contractor or in fabrication shops at the job site.

Employment of these workers is distributed geographically in much the same way as the Nation's population. Thus, their employment is concentrated generally in the industrialized and highly populated States, such as California, New York, Illinois, Pennsylvania, Ohio, and Texas.

Training, Other Qualifications, and Advancement

Most training authorities, including national joint labor-management apprenticeship committees established for most of the building trades, recommend formal apprentice training as the best way to acquire the all-round proficiency of craftsmen in the building trades. Apprenticeship is a prescribed period of on-the-job training, supplemented by related classroom instruction, which is designed to develop skill by making the apprentice familiar with the materials, tools, and principles of his trade. This type of training provides the apprentice with a balanced knowledge of his field of work and enables him to perform its operations competently. Formal apprenticeship agreements are registered with a State apprenticeship agency or the U.S. Department of Labor's Bureau of Apprenticeship and Training.

Many building trades workers have acquired the skills of their trades informally, by working for many years as laborers and helpers, observing or being taught by experienced craftsmen. Some building trades craftsmen have acquired their skills, or part of their skills, by attending vocational or trade schools, or by taking correspondence school courses.

Apprentices in the building trades generally are required to be between the ages of 18 and 25, and in good physical condition. (The maximum age limit may be waived for veterans or others with experience or special qualifications.) A high school education, or its equivalent, with courses in mathematics and the sciences, is desirable. Often, applicants are given tests to determine their aptitude for a particular occupation. For some skilled building trades, it is important to have considerable manual dexterity, mechanical aptitude, a discerning color sense, and an eye for quickly determining proper alinement of materials.

The formal registered apprenticeship agreement generally stipulates a training period of 2 to 5 years of relatively continuous employment and training, in addition to a minimum of 144 hours a year of related classroom instruction. The journeymen on the job and the foreman explain to the apprentice how the work is done and show him how different operations are performed and how different tools are used. Ordinarily, most of this instruction is given by a particular journeyman to whom the apprentice is assigned. The apprentice is required to do work of progressively increasing difficulty and with progressively less supervision.

Related classroom instruction varies among the skilled building trades, but usually includes courses such as: History of the trade; characteristics of the materials used; shop mathematics as related to the work of the trade; some basic principles of engineering, where appropriate (particularly for pipework, work on ventilating systems, and electrical work); sketching, elementary drafting, and interpretation of drawings; safety practices; and special-trade theory such as color harmony for painters and elementary sanitation for plumbers. Such related instruction is seldom offered in small communities where there may be only a few apprentices and a small number of journeymen in a particular trade. In these areas, apprentices receive instruction through courses offered in the local high school or by visiting instructors, generally furnished by the State. Other subject matter requirements are met through personal instruction by local journeymen and contractors or, sometimes, through correspondence courses.

The formal registered apprenticeship agreements also stipulate the length of time the apprentice is to be required to work in each major operation of the trade as well as his rate of pay at successive intervals of advancement. The apprentice is paid at an advancing rate, usually starting at 50 percent of the journeyman's pay.

The apprentice's rate increases at 6-month or 1-year intervals until a rate of about 90 percent of the journeyman's rate is reached in the final months of training. Often, advanced apprenticeship standing and pay are given to apprentices who have acquired trade skills in the Armed Forces, or through trade school instruction. Advanced standing is granted on an individual basis and is usually determined by a demonstration of trade skill and knowledge.

In most communities, the apprenticeship programs are supervised by joint apprenticeship committees composed of representatives of the local employers or employer groups and the local union. The apprentices sign their apprenticeship agreements with these committees. The committee determines the need for apprentices in the locality and establishes minimum apprenticeship standards of education, experience, and training. Whenever employers cannot provide the variety of experience necessary to give an apprentice all-round instruction in the various branches of the trade, or relatively continuous employment over the entire period of apprenticeship, the committee transfers the apprentice to another employer. Where specialization by contractors is extensive —for instance, in electrical work—it is customary for the joint committee to rotate apprentices among several contractors in the trade at intervals of about 6 months. In some large cities, the local joint apprenticeship committee employs an apprenticeship program coordinator.

In areas where these committees have not been established, the apprenticeship agreement is solely between the apprentice and an employer or employer group. Many journeymen have received worthwhile training under this type of apprenticeship program, but such a program may involve some element of risk for the apprentice. In such instances, there is no joint committee to supervise the training offered, to settle differences over the terms and conditions of apprentice training, or to arrange a transfer in cases of personal disagreements between the apprentice and the employer. The apprentice's training depends principally on his employer's business prospects and policies. If the employer lacks continuous work or does only a restricted type of work, he cannot provide the apprentice with the all-round training needed to develop journeyman skills.

In 1964, more than 100,000 men were registered in apprentice training programs in the construction trades and perhaps more than 20,000 other apprentices were in unregistered programs. In the years ahead, opportunities for many young men to receive apprentice training will be available in all parts of the country. In addition, thousands of other workers will be able to learn construction trades informally.

Some indication of the location of future apprenticeship opportunities in the building trades is available from the latest data showing the geographical distribution of registered apprentices in these trades. The following eight States accounted for more than half of the number of registered apprentices in training for selected building trades in early 1964: California, New York, Illinois, Ohio, Pennsylvania, Texas, Michigan, and New Jersey.

In many localities, craftsmen, most commonly construction electricians and plumbers, are required to have a journeyman's license to work at their trade. To qualify for such licenses, they must pass an examination, showing a well-rounded knowledge of the job and of State and local regulations.

Building trades craftsmen may advance in a number of ways. For example, a journeyman may become a foreman in charge of a crew. In most localities, small jobs are run by "working foremen" who work at the trade along with members of their crews. On very large jobs, the foremen do supervisory work only. A craftsman can also become an estimator for a contractor. In this job, he estimates material requirements and labor costs to enable the contractor to bid on the work of a particular construction project. Some craftsmen advance to jobs as superintendents on large projects. Other become instructors in trade and vocational schools, or salesmen for building supply companies. In addition, many thousands of journeymen have become contractors, particularly in the homebuilding field.

It is easier to start a small contract construction business than it is to start a small business in many other industries. Only relatively moderate financial investment is needed, liberal credit arrangements make it easier to buy materials, and

it is possible to conduct a fairly substantial business from the proprietor's home. However, the contract construction field is highly competitive, and the rate of business failure is especially high among small contractors. To be successful, the proprietor of a small contracting firm must have the ability to plan work, to foresee needs and problems, to direct others, and to estimate material and time requirements for jobs on which he is bidding. He also must have a sound knowledge of business practices and financing. Sound journeyman knowledge increases chances for success. Some States or municipalities require contractors to be licensed.

Employment Outlook

Employment in the building trades is expected to increase moderately through the mid-1970's, assuming relatively full employment nationally and the high levels of economic activity needed to achieve this goal. (If the high levels of economic activity are not achieved, employment in the building trades will increase at a slower rate than that projected.) In addition to employment growth, tens of thousands of job openings will result from the need to replace experienced workers who transfer to other fields of work, retire, or die. Retirements and deaths alone will provide more than 50,000 job openings in the building trades each year through the mid-1970's.

The moderate increase in total employment in the building trades (7 of every 10 of whom are employed in the construction industry) is expected to result primarily from the rapid rise in the level of construction activity. The factors that will stimulate construction activity include anticipated large increases in population and in the number of households; a continuing shift of families from the cities to the suburbs; increases in government expenditures for highways and schools; a rise in expenditures for new industrial plant capacity; and higher levels of personal and corporate income. In addition, there will be a growing demand for alteration and modernization work on existing structures, as well as maintenance and repair work on the expanding highway system, and on the increasing numbers of dams, bridges, and similar projects.

Employment of building trades workers outside the construction industry is expected to expand as a result of the anticipated high levels of economic activity, which will stimulate the construction of a growing number of commercial and industrial buildings and, therefore, increase maintenance and repair requirements.

The increase in building trades employment will not be as great as the total expansion in construction activity, because continued technological developments in construction methods, tools and equipment, and materials will permit increasing output per construction worker. An important development in construction methods is the increasing use of prefabricated components, which are installed as complete units at the job site, for almost all types of construction projects. For example, preassembled outside walls and partitions can be lifted into place in one operation, and electric circuit boxes and switchboards are being prewired at the factory instead of being wired by the electrician at the job site. An important extension of prefabrication is "module building" in which units, including complete rooms or buildings, are available in standard sizes. Furthermore, standardization of components will contribute to their greater use.

Technological advances in construction tools and equipment will also increase the efficiency of building trades workers. Power handtools, such as shock resistant, cordless, electric-powered tools, are improving worker efficiency. Items formerly unloaded and moved to the construction site by hand, such as concrete and brick, are now being moved by forklift trucks, motorized wheelbarrows, and conveyor belts. The size, speed, durability, and mobility of large construction machines, including cranes, bulldozers, and scrapers, have increased considerably. Many of these machines can do many times more work than even the largest machines of a few years ago, but still require only one operator. New types of machines that reduce labor requirements also are being developed, including concrete paving machines that perform the work formerly done by four separate machines.

New and improved construction materials also are expected to limit employment growth among building trades workers. For example, lightweight and durable plastics are being used for a

growing variety of components, including partitions, wall panels, siding, insulation, and roofing. Other new and improved products are adhesives that eliminate the need for conventional fasteners, nails that have improved holding power, paints that last twice as long as paints in common use, and wood products that come from the factory prepainted with the prime coat and even the final coat.

The rates of employment growth will differ among the various building trades. Employment growth is expected to be most rapid for glaziers; structural-metal workers; excavating, grading, and road machinery operators; lathers, cement masons, and sheet-metal workers. Among the trades that will have a much slower growth are stonemasons, painters, and carpenters.

(A more complete statement covering training, other qualifications, advancement, and employment opportunities in the major building trades is given in the discussions of individual occupations later in this chapter.)

Earnings and Working Conditions

Hourly wage rates paid to building trades craftsmen are among the highest paid to skilled workers. However, because construction work is seasonal and time is lost for other reasons, average annual earnings of building trades craftsmen are not as high as the hourly rates of pay would indicate.

The hourly rates of pay for skilled workers in the building trades vary by trade and locality. Generally, the highest hourly rates are paid in the larger communities. Union minimum hourly rates for journeymen and for helpers and laborers in selected building trades in 68 large cities, as of July 1, 1964, averaged as follows:

	Union minimum average hourly rate
All building trades	$4.25
Journeymen	4.46
Asbestos workers	4.52
Bricklayers	4.72
Carpenters	4.36
Cement masons (finishers)	4.24
Electricians (inside wiremen)	4.68
Elevator constructors	4.73
Glaziers	4.08
Lathers	4.49
Marble setters	4.45
Journeymen—Continued	
Terrazzo workers	$4.48
Tile setters	4.42
Painters	4.11
Paperhangers	4.04
Pipefitters	4.62
Plasterers	4.59
Plumbers	4.70
Roofers, composition	4.17
Roofers, slate and tile	4.13
Sheet-metal workers	4.50
Stonemasons	4.51
Structural-iron workers	4.61
Rodmen	4.50
Helpers and laborers	3.40
Bricklayers' tenders	3.61
Building laborers	3.29
Composition roofers' helpers	2.67
Elevator constructors' helpers	3.44
Marble setters' helpers	3.69
Terrazzo workers' helpers	3.74
Tile setters' helpers	3.67
Plasterers' laborers	3.75
Plumbers' laborers	3.43

Union rates for these occupations are negotiated between trade unions and employers. They do not include overtime, bonuses, or payments for special qualifications or for other reasons.

Construction work frequently requires prolonged standing, bending, stooping, and working in cramped quarters. Exposure to cold, hot, and inclement weather is common, as much of the work is done outdoors or in partially enclosed structures. During the winter, when the buildings are sufficiently enclosed, heat is commonly provided. Many persons prefer construction work to other skilled occupations, because they can work outdoors.

Construction work is generally more dangerous than work in manufacturing, but the risk of injury is lessened considerably when proper work practices are followed.

Forty hours was the standard workweek for a vast majority of union building trades workers in 1964. Time and one-half was generally paid for hours worked beyond the standard workday of 8 hours. Time and one-half or double-time rates were usually paid for work on Saturdays and Sundays or on holidays.

A substantial proportion of organized building trades workers are included in health, insurance,

and pension programs negotiated between unions and employers, and financed entirely by employer contributions.

There are several reasons why young men may wish to consider one of the building trades as a career. These trades offer especially good opportunities for those who are not planning to go to college, but who are willing to spend several years in learning a skilled occupation. Well-trained building trades craftsmen can find job opportunities in all parts of the country. Their hourly wage rates generally are much higher than those of most other manual workers. As previously noted, building trades craftsmen with business ability have greater opportunities to establish their own businesses than workers in many other skilled occupations. In addition, there will be job opportunities for workers in the major building trades in nonconstruction industries, mainly in maintenance and repair activities. This work is generally less seasonal than contract construction work.

A principal disadvantage of work in the building trades is the sharp employment fluctuations that result from changes in general business conditions. Another disadvantage is that even during years of high levels of construction activity, annual earnings of workers in the building trades are somewhat limited by the seasonal nature of construction work. Worktime is lost as a result of bad weather and other interruptions.

A large proportion of building trades workers are members of trade unions affiliated with the Building and Construction Trades Department of the American Federation of Labor and Congress of Industrial Organizations.

Where To Go for More Information

Information on opportunities for apprenticeship or other types of construction employment in a particular locality should be obtained from individual construction firms, employer associations, locals of the building trades unions, the nearest office of the State apprenticeship agency, or the local office of the Bureau of Apprenticeship and Training, U.S. Department of Labor. Many apprenticeship programs are supervised by local joint union-management apprenticeship committees. In these instances, an apprentice applicant may apply directly to the coordinator of the joint apprenticeship committee, if there is one in his locality. In addition, the local office of the State employment service may be a source of information about the Manpower Development and Training Act, apprenticeship, and other programs that provide training opportunities.

For more information on jobs in the building trades, inquiries should be directed to the organizations listed below:

American Federation of Labor and Congress of Industrial Organizations, Building and Construction Trades Department,
815 16th St NW., Washington, D.C. 20006.

Associated General Contractors of America, Inc.,
1957 E St. NW., Washington, D.C. 20006.

National Association of Home Builders,
1625 L St. NW., Washington, D.C. 20036.

For the names of labor organizations and trade associations concerned with specific building trades, see the discussions of individual building trades later in this chapter.

Asbestos and Insulating Workers

(2d ed. D.O.T. 5–33.110 and .210)
(3d ed. D.O.T. 863.381, .781, and .884)

Nature of Work

The principal work of asbestos and insulating workers is to cover pipes, boilers, and other equipment with insulating materials, such as cork, felt, asbestos, fiberglass, polyurethane, and magnesia. These materials are installed by pasting, wiring, taping, stud-welding, spraying, or other methods. Asbestos and insulating workers use handtools, such as trowels, brushes, scissors, hammers, saws, pliers, and stud-welding guns. Powersaws, as well as handtools, are used to cut insulating materials.

The insulating materials which these workers install serve many purposes. For example, the insulation of pipes, ducts, tanks, vats, boilers, and furnaces retains heat and thus saves fuel.

Insulation of piping in refrigeration systems prevent heat absorption.

Where Employed

Most asbestos workers are employed by insulation contractors in new industrial and commercial construction. A substantial number are employed in the alteration and maintenance of insulated pipework in chemical plants, petroleum refineries, atomic energy installations, and other industrial establishments which have extensive steam installations for power and heating. Some large establishments which have cold storage facilities also employ asbestos workers for maintenance work.

Training, Other Qualifications, and Advancement

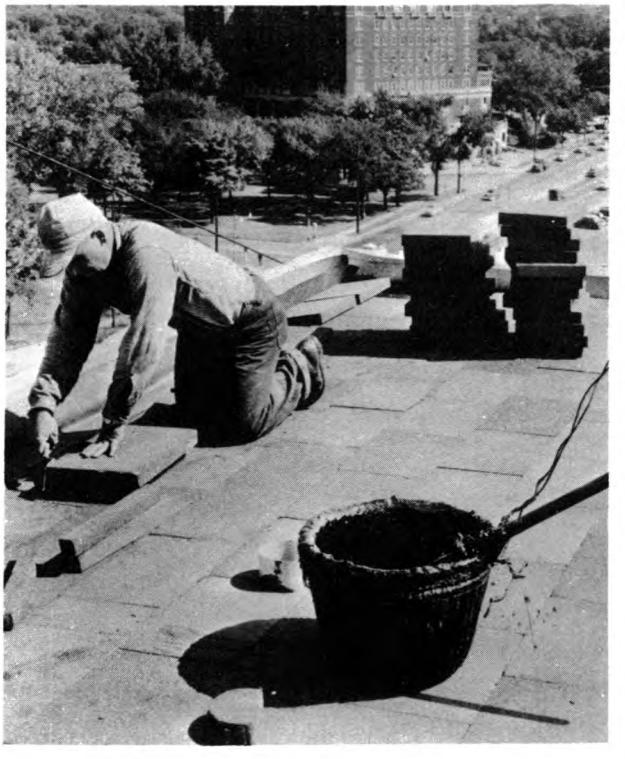
Most asbestos workers learn their trade through a 4-year "improvership" program similar in many respects to apprenticeship programs in other building trades. The improvership program consists of a specified period of on-the-job training in which the new worker learns how to handle the tools of the trade and to work with insulating materials.

Applicants for improvership programs are generally required to be between the ages of 18 and 30 and in good physical condition. Hourly wage rates under the improvership programs start at about 50 percent of the journeyman's rate and, if the trainee's work progresses satisfactorily, increase by 10 percent each year until 80 percent of the journeyman's rate is reached during the final stage of the program. At the end of the improvership program, trainees are required to pass an examination which demonstrates their knowledge of the trade.

A skilled asbestos worker may advance to the job of foreman, shop superintendent, or estimator, or he may open his own insulation contracting business.

Employment Outlook

Employment of asbestos and insulating workers—estimated at about 21,000 in 1964—is expected to increase rapidly during the 1964–75 period, assuming relatively full employment nationally and the high levels of economic activity needed to achieve this goal. Employment growth will result mainly from the anticipated large rise in the volume of construction activity, particularly of commercial and industrial building. (See discussion, p. 370.) The increasing use of industrial pipe in numerous manufacturing processes and for air-conditioning and refrigeration installations will expand the need for asbestos workers in installation and maintenance work. In addition to the job openings resulting from the growth of the trade, other opportunities will arise from the need to replace workers who transfer to other fields of work, retire, or die. Retirements and deaths alone will result in about 300 jobs openings annually through the mid-1970's.



Insulating worker applies glass insulation to building roof.

Earnings

Union minimum hourly wage rates for asbestos workers averaged $4.52, compared with $4.46 for all journeymen in the building trades, as of July 1, 1964, according to a national survey of building trades workers in 68 large cities. Among individual cities, the minimum hourly rates for

asbestos workers ranged from $3.65 in Charlotte, N.C., to $5.25 in New York City.

A large proportion of the workers in this trade are members of the International Association of Heat and Frost Insulators and Asbestos Workers.

Where To Go for More Information

For further information regarding asbestos workers' improvership programs or other work opportunities in this trade, inquiries should be directed to local asbestos contractors or to a local of the International Association of Heat and Frost Insulators and Asbestos Workers. In addition, the local office of the State employment service may be a source of information about work and training opportunities, including training programs operated under the Manpower Development and Training Act.

General information about the work of asbestos and insulating workers may be obtained from:

Insulation Distributor-Contractors National Association, Inc.,
1425 Chestnut St., Philadelphia, Pa. 19102.

International Association of Heat and Frost Insulators and Asbestos Workers,
1300 Connecticut Ave. NW., Washintgon, D.C. 20036.

Bricklayers

(2d ed. D.O.T. 5–24.000 through .199)

(3d ed. D.O.T. 861.131, .381, .781, and .884)

Nature of Work

Bricklayers (or *brickmasons*) are craftsmen who construct walls, partitions, fireplaces, chimneys, and other structures from brick. They also use other masonry materials, such as concrete, cinder, or gypsum block; precast panels made of brick, cement, tile, stone, or marble; or structural tile, or terra cotta (a hard-baked brick used for ornamental purposes). They also install the brick linings of industrial kilns and furnaces.

In laying brick, a bricklayer first spreads a layer or "bed" of soft mortar. He applies mortar to the end of the last brick laid or to one end of a brick to be laid. He places the brick on the bed of mortar and works it into the desired position with his hand. Then he cuts off the excess mortar. When necessary, he breaks bricks with a trowel or brick hammer to fit spaces too small for whole bricks. He keeps the courses (rows) of brick level by using a tightly stretched horizontal cord (gage line) as a guide. At fixed points along the wall he checks the surface with a mason's level to make sure the bricks are lined up. A plumb line is also used to check vertical alinement. Using the point of a trowel or a special finishing tool, he trims the mortar between the bricks to achieve a neat appearance. If two or more thicknesses of brick are being laid, the brickmason lays a "bond" course at regular intervals; that is, he arranges a row of bricks crosswise or in another "bond" pattern in order to tie the bricks together. Whether the bricklayer works with brick, concrete block, structural tile, or other masonry material, the work is essentially the same.

Bricklaying requires careful, accurate work so that the brick structure will have a neat and uniform appearance and the rows of brick will line up with windows, doors, or other openings without excessive cutting of brick. Craftsmen in this trade mainly use handtools, including chisels, trowels, jointers, and tuck pointers (a special finishing tool used to shape mortar joints), bricklayer's hammers, gage lines, plumb bobs, and mason's levels. Powersaws are sometimes used for cutting masonry materials. Journeymen bricklayers are usually assisted by hod carriers or helpers who supply them with bricks and other materials, mix mortar, and set up and move scaffolding.

Where Employed

The great majority of bricklayers work mainly on new building construction. Some are employed in sewer construction to build manholes and catch basins. Bricklayers do a considerable

amount of alteration work, especially in the larger cities where construction of fire-resistant partitions, store front remodeling, and similar modernization work, are often done. They also do a substantial amount of maintenance and repair work.

Bricklayers also work for such industrial establishments as factories making glass or steel, where furnaces and kilns require special fire brick and refractory brick linings. For example, in a steel manufacturing plant, the bricklayer lines converters, cupolas, and ladles which hold molten metal. Bricklayers must have additional training to do refractory brick work.

Training, Other Qualifications, and Advancement

Most training authorities, including the national joint labor-management apprenticeship committee for the bricklaying trade, recommend the completion of a 3-year apprenticeship program as the best way to learn this trade. Many workers in this trade have acquired bricklaying skills informally, by working for many years as helpers or hod carriers, observing or being taught by experienced bricklayers. Many of these persons have gained additional knowledge of their trade by taking trade school courses.

Journeyman bricklayer teaches apprentice to form a corner.

Apprenticeship applicants are generally required to be between the ages of 17 and 24. A high school education or its equivalent is desirable.

The apprenticeship program generally consists of 6,000 hours (3 years) of on-the-job training, in addition to related classroom instruction. In a typical 3-year bricklayer training program, the apprentice learns, among other things, to use, care for, and handle safely the tools, machines, equipment, and materials commonly used in the trade; lay brick (including mixing and spreading mortar), bond and tie, build footings and foundations; do plain exterior brickwork such as straight wall work; build arches, columns, piers, and corners; plan and build chimneys, fireplaces, and floors; lay stone; point brick and stone; clean stone, brick, and tile with water and acid, and by sandblasting; cut, set, and point cement blocks, artificial stone, glass blocks, and cork; and fireproof. The apprentice receives related classroom instruction in blueprint reading, welding, layout work, and measurements and sketches. In addition, he learns the relationship between bricklaying and other building trades.

In some areas, formal apprentice training for bricklayers includes brief, preliminary instruction at a vocational school or some other type of prejob training which is designed to give the apprentice sufficient skill in the handling of tools and materials to make him productive at the start of his on-the-job training.

Hourly wage rates for bricklayer apprentices generally start at 50 percent of the journeyman rate and increase periodically until 95 percent of the journeyman's rate is reached during the last period of the apprenticeship.

A bricklayer must have an eye for straight lines and proportions. Good physical condition and manual dexterity are important assets. Since the other building craftsmen must usually fit their work to his, he should know how the parts of a structure fit together.

Bricklayers may advance to jobs as foremen.

They may also become estimators for bricklaying contractors. Estimators compute material requirements and labor costs. Some journeymen advance to the position of bricklaying superintendent on large construction projects, while others may start their own bricklaying contracting business.

Employment Outlook

Employment of bricklayers—estimated at about 160,000 in 1964—is expected to rise moderately through 1975, assuming relatively full employment nationally and the high levels of economic activity needed to achieve this goal. In addition, thousands of job opportunities will result from the need to replace experienced workers who transfer to other fields of work, retire, or die. Retirements and deaths alone will result in about 2,700 job openings annually through the mid-1970's.

Much of the expected growth in this trade will result from the anticipated large increase in construction activity. (See discussion, p. 370.) The demand for bricklayers will also be favorably affected by such factors as the increasing use of structural clay tile for fire-resistant partitions; glass blocks for exterior walls; and ornamental brickwork for structures, such as exterior screen-walls and lobbies and foyers. In addition, the use of brick masonry load-bearing walls is growing, particularly in apartment buildings.

These favorable developments will be offset to some extent by construction techniques that reduce the amount of brickwork per structure. For example, the use of steel framework and reinforced concrete in structures permits the elimination of load-bearing exterior brick walls. Also, the use of metal and glass wall panels in buildings results in less masonry work. Precast panels are also being made of brick and other masonry materials and on-site brickwork is reduced where these panels are used. Other recent developments that have increased the efficiency of bricklayers include high-strength mortars that can be applied with caulking guns or compressor-powered extruders. Improved bricklaying machines have been introduced in recent years and, if their use becomes widespread, they could adversely affect the number of job openings for these workers.

Earnings and Working Conditions

Hourly wage rates for bricklayers rank among the highest in the building trades. Union minimum hourly wage rates for bricklayers, as of July 1, 1964, averaged $4.72, compared with an average of $4.46 for all journeymen in the building trades, according to a national survey of building trades workers in 68 large cities. Among individual cities surveyed, the minimum hourly rates for bricklayers ranged from $3.25 in Charlotte, N.C., to $5.50 in New York City.

The work of the bricklayer is active and sometimes strenuous, like the work in other building trades. It involves stooping to pick up materials, moderately heavy lifting, and prolonged standing. Most of the work is done outdoors.

A large proportion of bricklayers are members of the Bricklayers, Masons and Plasterers' International Union of America.

Where To Go for More Information

For further information regarding bricklaying apprenticeships or other work opportunities in the trade, inquiries should be directed to local bricklaying contractors; a local of the Bricklayers, Masons and Plasterers' International Union of America; a local joint union-management apprenticeship committee; or the nearest office of the State apprenticeship agency or the Bureau of Apprenticeship and Training, U.S. Department of Labor. In addition, the local office of the State employment service may be a source of information about the Manpower Development and Training Act, apprenticeship, and other programs that provide training opportunities. Some local employment service offices provide services such as screening applicants and giving aptitude tests.

General information about the work of bricklayers may be obtained from:

Associated General Contractors of America, Inc.,
1957 E St. NW., Washington, D.C. 20006.

Bricklayers, Masons and Plasterers' International Union of America,
815 15th St. NW., Washington, D.C 20005.

Structural Clay Products Institute,
1520 18th St. NW., aWshington, D.C. 20036.

Carpenters

(2d. ed. D.O.T. 5–25.110 through .840)
(3d. ed. D.O.T. 860.281 through .781)

Nature of Work

Carpenters, the largest group of building trades workers, are employed in almost every type of construction activity. They erect the wood framework in buildings, including subflooring, sheathing, partitions, floor joists, studding, and rafters. When the building is ready for trimming, they install molding, wood paneling, cabinets, window sash, doorframes, doors, and hardware, as well as build stairs and lay floors. Carpenters, when doing finish work, must be careful about the appearance as well as the structural accuracy of the work.

Carpenters also install heavy timbers used in constructing docks, railroad trestles, and similar installations. They build forms to enclose concrete until it sets; these are used in the construction of bridges, buildings, and other structures. They also erect scaffolding and temporary buildings on the construction site. Carpenters may also install linoleum, asphalt, tile, and similar soft-floor coverings.

As part of their job, carpenters also saw, fit, and assemble plywood, wallboard, and other materials. They use nails, bolts, wood screws, or glue to fasten materials. Carpenters use handtools such as hammers, saws, chisels, and planes, and power tools such as portable power saws, drills, and rivet guns.

Because of the wide scope of the work performed in the trade, some carpenters tend to specialize in a particular type of carpentry work. For example, some carpenters specialize in installing acoustic panels on ceilings and walls; others specialize in the installation of millwork and finish hardware (trimming), laying hardwood floors, or building stairs. Specialization is more common in the large cities; in small communities, carpenters ordinarily do all types of carpentry work. In rural areas, carpenters may do the work of other craftsmen, particularly painting, glazing, or roofing. Carpenters generally stay in a particular field of construction, such as home, bridge, or highway construction, or in industrial maintenance.

Courtesy of the U.S. Bureau of Apprenticeship and Training

Journeyman carpenter shows apprentice how to line up a door frame.

Where Employed

Most carpenters work in the construction industry and are employed mainly by contractors and homebuilders at the construction site. Carpenters are mostly employed in new construction. A large number, however, are employed on alteration or modernization work. Some carpenters alternate between wage employment for contractors and self-employment on small jobs. Some work for government agencies or nonconstruction firms which employ a separate work force for their own construction work. A large number of carpenters do maintenance work in factories, hotels, office buildings, and other large establishments.

Others are employed in shipbuilding, in mining, and in the production of many kinds of display materials.

Training, Other Qualifications, and Advancement

Most training authorities, including the national joint labor-management apprenticeship committee for the carpentry trade, recommend the completion of a 4-year apprenticeship program as the best way to learn carpentry. A substantial number of workers in this trade, however, have acquired some carpentry skills informally, for example, by working around a farm. Many of these men have also gained some of the knowledge of the trade by taking correspondence or trade school courses.

Apprenticeship applicants are generally required to be at least 17 years of age; a high school education or its equivalent is desirable. Good physical condition, a good sense of balance, and lack of fear of working on structures high off the ground are important assets. Aptitudes which the apprentice should have include manual dexterity and the ability to solve arithmetic problems quickly and accurately.

The apprenticeship program usually consists of 8,000 hours (4 years) of on-the-job training, in addition to a minimum of 144 hours of related classroom instruction each year. During the apprenticeship period, the apprentice learns elementary structural design and becomes familiar with the common systems of frame and form construction, and to use, care for, and handle safely the tools, machines, equipment, and materials used in the trade. He also learns, among other things, how to build forms for holding concrete, framing, outside and inside finishing work, how to fit hardware, how to hang doors and set windows, and how to lay out work.

The apprentice receives related classroom instruction in drafting and blueprint reading, mathematics applicable to layout work, and the use of woodworking machines. Both in the classroom and on the job he learns the relationship between carpentry and the other building trades, because the work of the carpenter is basic to the construction process.

Hourly wage rates for apprentices usually start at about 50 percent of the journeyman rate and increase by about 5 percent in each 6-month period until a rate of 85 to 90 percent is reached during the last period of apprenticeship.

It is important for young men interested in entering the carpentry trade to obtain all-round training of the kind given in apprenticeship programs, particularly because of technological innovations that are increasingly affecting carpentry skills. Carpenters with such training will have especially favorable long-range job prospects. They will be in much greater demand and have better opportunities for advancement than those in the trade who can do only the relatively simple, routine types of carpentry work.

Carpenters may advance to carpenter foremen or to general construction foremen. Carpenters usually have greater opportunities than most building craftsmen to become general construction foremen, since carpenters are familiar with the entire construction process. The proportion of self-employed among carpenters is higher than among most other skilled building trades. Some self-employed carpenters are able to become contractors and employ other journeymen.

Employment Outlook

Employment of carpenters—who numbered more than 800,000 in 1964—is expected to increase slowly through 1975, assuming relatively full employment nationally and the high levels of economic activity needed to achieve this goal. In addition, tens of thousands of carpentry jobs will be available each year, because of the need to replace experienced carpenters who transfer to other fields of work, retire, or die. Retirements and deaths alone are expected to provide about 20,000 job openings annually.

The large rise expected in construction activity (see discussion, p. 370) is expected to result in a growing demand for carpenters. In addition, more carpenters will be needed in the mainte-

nance departments of factories, commercial establishments, large residential projects, and government agencies. However, employment growth will continue to be limited by technological developments. For example, the use of construction materials that are prepared off site is expected to increase. These materials, which include floors, partitions, and stairs, are designed for easy and speedy installation. Walls and partitions can be lifted into place in one operation. Beams and, in some instances, roof assemblies are lifted into place by cranes. With the standardization of prefabricated components, the use of such materials will increase further.

More widespread use of improved tools and equipment will increase the efficiency of carpenters. Such products include new types of nails that have improved holding properties; hence, fewer nails and less hammering are required. Strong adhesives are being used that reduce the time needed to join pieces of wood and other materials. Power tools in use include stud drivers, screwdrivers, sanders, saws, staplers, and nailing machines. One type of power tool can drill and nail in one operation. New types of scaffolding are easier to erect, adaptable to varying construction situations, and safer to use.

Employment of carpenters will also be affected by the increased use of construction materials and techniques that reduce the amount of carpentry work required in residential buildings. For example, where houses are framed with steel, the use of curtain-wall panels, which can be quickly fastened into place, is possible. In addition to the speed with which they can be put in place, curtain-wall panels also may reduce the need for carpenters because they are available in nonwood materials such as glass, aluminum, and porcelain-coated steel. The use of plastics in building construction is in its infancy, but their greater use is expected. Already available are siding, curtain walls, partitions, roofing, ornamental screening, and insulation materials, made of plastic. Under development are foam plastic roofs and even entire houses of plastic that can be constructed on site.

Earnings and Working Conditions

Union minimum hourly wage rates for carpenters averaged $4.36, compared with $4.46 for all journeymen in the building trades, as of July 1, 1964, according to a national survey of building trades workers in 68 large cities. Among individual cities surveyed, the minimum hourly rates for carpenters ranged from $2.90 in Charlotte, N.C., to $5.47 in Newark, N.J.

Like other building trades, the work of the carpenter is active and sometimes strenuous, but exceptional physical strength is not required. However, prolonged standing, as well as climbing and squatting, is often necessary. Carpenters risk injury from slips or falls, from contact with sharp or rough materials, and from the use of sharp tools and power equipment. Many young persons like carpentry because they are able to work outdoors.

A large proportion of carpenters are members of the United Brotherhood of Carpenters and Joiners of America.

Where To Go for More Information

For further information regarding carpentry apprenticeships or other work opportunities in this trade, inquiries should be directed to local carpentry contractors or general contractors; a local union of the United Brotherhood of Carpenters and Joiners of America; a local joint union-management apprenticeship committee; or the nearest office of the State apprenticeship agency or the Bureau of Apprenticeship and Training, U.S. Department of Labor. In addition, the local office of the State employment service may be a source of information about the Manpower Development and Training Act, apprenticeship, and other programs that provide training opportunities. Some local employment services screen applicants and give aptitude tests.

General information on apprenticeship in this trade is also available from:

Associated General Contractors of America, Inc.,
1957 E St. NW., Washington, D.C. 20006.

United Brotherhood of Carpenters and Joiners of America,
101 Constitution Ave. NW., Washington, D.C. 20001.

Cement Masons (Cement and Concrete Finishers)

(2d. ed. D.O.T. 5–26.100 and .200)
(3d. ed. D.O.T. 844.884 and 852.884)

Nature of Work

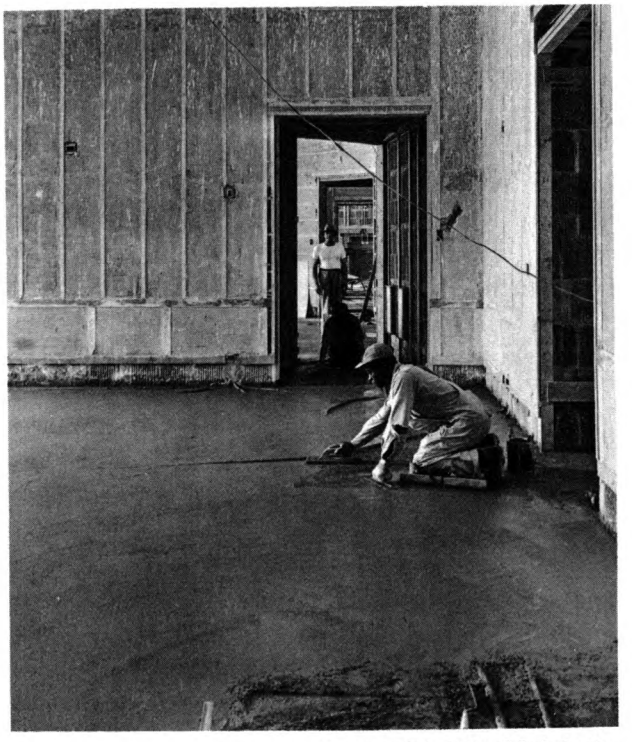
The principal work of cement masons is finishing the exposed concrete surfaces on many types of construction projects. These projects range from small jobs, such as the finishing of patios, floors, and sidewalks, to work on huge dams, miles of concrete highways, foundations and walls of large buildings, airport runways, and missile launching sites. On small projects, a cement mason, assisted by one or two helpers, may do all the concrete work; on large projects, crews of several cement masons and many helpers may be employed.

In preparing the site for pouring (placing) the concrete mixture (cement plus stones of various sizes, and water), the cement mason makes sure that forms, which hold the concrete, are set for the desired slope and depth of the concrete mixture and are properly alined. Materials, such as stone and gravel, may be provided as a foundation for the concrete.

The cement mason pours or directs the pouring of the concrete mixture. He usually supervises laborers who settle the mixture by vibrating it with a special machine. The mason levels the surface further with a "straightedge" (a flat tool long enough to extend across the poured concrete mixture). He then works it with a "float" (a rectangular, flat-surfaced handtool) and other handtools to fill depressions and remove high spots and to draw cement to the surface of the mixture in preparation for final finishing operations.

Final finishing is often delayed for several hours until the concrete has hardened sufficiently. While the concrete is still workable, the cement mason uses a trowel to bring the concrete to the proper consistency and obtain a smooth finish. Concrete finishing may also be done with the aid of power-operated trowels.

On most building projects, concrete finishing work generally involves hand operations. On highways and other large-scale projects, however, power-operated floats and cement finishing machines are used extensively, but supplementary hand operations are also necessary, particularly to finish curved surfaces.



Courtesy of the National Park Service

Cement mason uses a float and trowel to smooth cement surface.

Cement masons also do patching work to correct surface defects on concrete structures. Some cement masons specialize in laying a mastic coating (a fine asphalt mixture) over concrete, particularly in buildings where sound-insulated or acid-resistant floors are specified. The mastic is applied while hot, then smoothed with heavy hand tools.

On large jobs, cement masons work in crews. In such instances, masons perform finishing operations while laborers do routine and heavy work.

The cement mason's knowledge of his materials is essential to the quality of his work. He must be familiar with the working characteristics of various cement and concrete mixes, such as those containing substances to speed or slow the setting time, and those which are used to con-

struct weight-supporting walls or surfaces of specified strengths. In addition, because of the effects that heat, cold, and wind have on the curing of cement, the skilled mason must recognize by sight and touch what is occurring in the cement mixture so that he may be able to prevent defects.

Where Employed

Cement masons work principally on large buildings, but many are employed on highway or other nonbuilding construction. Cement masons work directly for general contractors who are responsible for constructing entire projects such as highways, or large industrial, commercial, and residential buildings. They also work for concrete contractors who do only the concrete work on a large construction project or who work on smaller projects such as sidewalks, driveways, and basement floors. A small number work for municipal public works departments, public utilities, and manufacturing firms which do their own construction work. Some cement masons are self-employed and do small cement jobs, such as sidewalks and steps.

Training and Other Qualifications

Most training authorities, including the National Cement Masonry, Asphalt, and Composition Joint (labor-management) Apprenticeship and Training Committee, recommend the completion of a 3-year apprenticeship program as the best way to learn this trade. A substantial number of workers, however, have acquired some cement masonry skills informally by working for many years on building and road construction jobs as laborers assisting cement masons. Others have worked with specialty contractors constructing sidewalks and doing other masonry work. These workers have learned their skills by observing or being taught by experienced cement masons.

Apprenticeship applicants generally are required to be between the ages of 18 and 25. Good physical condition and manual dexterity are important assets.

The apprenticeship program usually consists of 6,000 hours (3 years) of on-the-job training, in addition to related classroom instruction. During the apprenticeship period, the apprentice learns, among other things, to use and handle the tools, equipment, and materials of the trade. He also learns finishing, layout work, and safety techniques. The apprentice receives related classroom instruction in subjects such as applied mathematics and related sciences, blueprint reading, architectural drawing, estimating materials and costs, and local building regulations. Although a high school education is not required, education above the grade school level, preferably including mathematics, is needed to understand the classroom instruction.

Employment Outlook

Employment of cement masons—estimated at about 55,000 in 1964—is expected to increase rapidly through 1975, assuming relatively full employment nationally and the high levels of economic activity needed to achieve this goal. In addition, thousands of job opportunities will result from the need to replace workers who transfer to other fields of work, retire, or die. Retirements and deaths alone will result in more than 800 job openings annually through the mid-1970's.

Employment of cement masons is expected to increase mainly because the anticipated rapid increase in construction activity (see discussion, p. 370) will be accompanied by the growing use of concrete and concrete products. Prestressed concrete makes possible wide spans where column-free construction is desired. Lightweight concrete wall panels that are fire- and weather-resistant are being used increasingly on nonload-bearing walls. These panels, available in different finishes, colors, and designs, can be speedily fastened into place. In some instances, buildings made with concrete wall panels can be easily dismantled and reerected elsewhere. Artistic and functional shapes can be incorporated into structures where prestressed concrete is used. In addition, the use of concrete and concrete products has expanded to include thin-shell dome roofs, ornamental grill work, and slab and arch roofs in residential buildings; and bridge girders, columns, piles, and beams. Also, concrete can now be poured year-round by using heated, temporary shelters made of sheet plastic.

Employment of cement masons is not expected to increase as rapidly as the use of cement and concrete products, because many concrete products are now precast away from the construction site and these products generally do not require finishing. The efficiency of on-site masons also has increased through the use of new and improved construction methods, materials, and equipment. Concrete slabs for floors and roofs can be processed at ground level and raised into place with synchronized hydraulic jacks or cranes. Walls can be processed in the same manner and tilted into place. For certain jobs, concrete can be applied pneumatically through hoses. Glass-fiber-reinforced plastic forms provide a smooth surface, eliminating rubbing and patching work. Steel and plastic-covered wood forms are now available that can be reused many times. Adhesives eliminate the need for bolts and other types of fasteners. Worker efficiency has also been increased by the introduction in recent years of new machines, including powered concrete conveyors, such as powered wheelbarrows; portable, powered screeds; electric concrete vibrators; hydraulic joint-forming machines; powered concrete cutting saws; and cement-finishing machines.

Earnings and Working Conditions

Union minimum hourly wage rates for cement masons averaged $4.24, compared with $4.46 for all journeymen in the building trades, as of July 1, 1964, according to a national survey of building trades workers in 68 large cities. Among individual cities surveyed, the minimum hourly rates for cement masons ranged from $3.05 in Norfolk, Va., to $5.35 in Newark, N.J.

Cement masons usually receive premium pay for hours worked in excess of the regularly scheduled workday or workweek. Overtime work for these craftsmen often arises, because once concrete has been poured for a job the work must be completed.

The work of the cement mason is active and strenuous, like the work of skilled building tradesmen generally. Since most cement finishing is done on floors or at ground level, the cement mason is required to stoop, bend, or kneel. Much of his work is done outdoors.

A large proportion of cement masons are union members. They belong either to the Operative Plasterers' and Cement Masons' International Association of the United States and Canada or to the Bricklayers, Masons and Plasterers' International Union of America.

Where To Go for More Information

For further information regarding cement mason apprenticeships or other work opportunities in the trade, inquiries should be directed to local cement finishing contractors; locals of unions previously mentioned; a local joint union-management apprenticeship committee; or the nearest office of the State apprenticeship agency or the Bureau of Apprenticeship and Training, U.S. Department of Labor. In addition, the local office of the State employment service may be a source of information about the Manpower Development and Training Act, apprenticeship, and other programs that provide training opportunities.

General information about the work of cement masons may be obtained from:

Associated General Contractors of America, Inc., 1957 E St. NW., Washington, D.C. 20006.

Bricklayers, Masons and Plasterers' International Union of America, 815 15th St. NW., Washington, D.C. 20005.

Operative Plasterers' and Cement Masons' International Association of the United States and Canada. 1125 17th St. NW., Washington, D.C. 20036.

Construction Laborers and Hod Carriers

(2d ed. D.O.T. 9-32.01)

(3d ed. D.O.T. 809.887; 844.887; 850 through 852.887; and 859. through 862.887)

Nature of Work

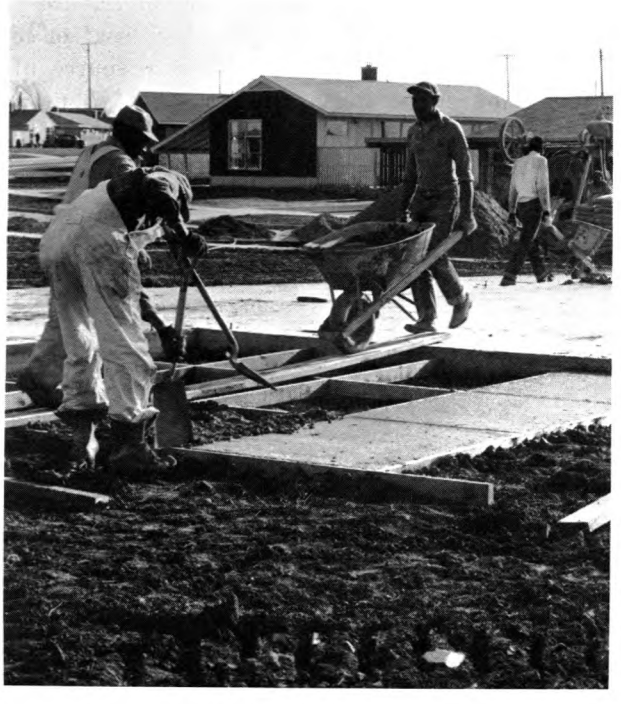
Construction laborers work on all types of building construction and on other types of construction projects, such as highways, dams, pipelines, and water and sewer projects. Their work includes the loading and unloading of construction materials at the worksite and the shoveling and grading of earth. Laborers stack and carry

materials, including small units of machinery and equipment, and do other work that aids building craftsmen. They also erect and dismantle scaffolding, set braces to support the sides of excavations, and clean up rubble at various stages of construction to provide a clear work area and to reduce hazards.

On alteration and modernization jobs, laborers tear out the existing work. They perform much of the work done by wrecking and salvage crews during the demolition of buildings.

When concrete is mixed at the worksite, laborers unload and handle materials and fill hand-loaded mixers with ingredients. Whether the concrete is mixed on-site or hauled in by truck, laborers pour and spread the concrete, and spade or vibrate it to prevent air pockets. In highway paving, laborers clean the right-of-way, fine grade and prepare the site, handle and place the forms into which wet concrete is poured, and cover new pavement with straw, burlap, or other materials to prevent excessive drying.

Bricklayers' tenders and *plaster tenders*, both commonly known as hod carriers, serve journeymen in their respective trades, supplying them with materials, setting up and moving portable scaffolding, and providing the other services needed. Hod carriers must be familiar with the work of the journeymen and have some knowledge of the materials and tools used. It is customary practice in the building trades for hod carriers to be transferred with the journeymen from one construction project to another. Laborers also tend cement finishers, and some who have started as laborers have learned that trade.



Construction laborers haul and pour concrete.

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Building and construction laborers are commonly classified as unskilled workers, but this term can be misleading. Their work covers a wide range of requirements. Some types of construction-laborer and hod-carrier jobs often require experience as well as a broad knowledge of construction methods, materials, and operations. Rock blasting is an example of a type of work in which "know-how" is important. Construction laborers who work with explosives drill holes in rock, handle explosives, and set charges. These workers must know the effects of different explosive charges under varying rock conditions so that proper measures can be taken to prevent injury and property damage. Construction laborers learn how to handle and use blasting materials through job experience and instruction from foremen in charge of blasting work. Also, in the construction of tunnels, and dam and bridge foundations, construction laborers must have specific on-the-job experience. They do all the work in the pressurized area of a tunnel, including operations which would be done by journeymen if the job were located elsewhere.

Where Employed

Laborers are employed by all types of construction contractors. A large number of these workers are also employed by State and municipal public works and highway departments and by public utility companies in road repairing and maintenance, and excavating.

Training, Other Qualifications, and Advancement

Little formal training is required to obtain a job as a building or construction laborer. Generally, to be employed in these jobs, a young man must be at least 16 years of age and in good

physical condition. A laborer's first job is usually on the simplest type of work, but as he gains experience he does more difficult work. If he works closely with a skilled craftsmen for several years, he may be able to pick up the skills of the trade. However, in their work as construction laborers, relatively few workers have such opportunities.

Employment Outlook

Employment of construction laborers and hod carriers—estimated at nearly 800,000 in 1964—is expected to increase slowly through 1975, assuming relatively full employment nationally and the high levels of economic activity needed to achieve this goal. However, thousands of additional job openings will arise from the need to replace workers who transfer to other occupations, retire, or die. Retirements and deaths alone are expected to provide more than 18,000 job openings annually.

The anticipated large increase in construction activity (see discussion, p. 370) is expected to result in a growing demand for laborers and hod carriers, but the increase in their employment will be sharply limited by more widespread use of mechanized equipment. For example, construction materials formerly handled at the construction site, such as brick, concrete, and lumber, are moved by forklift trucks, powered wheelbarrows, and conveyor belts. Materials are lifted to the upper floors of multistoried buildings by automatic lifts and heavy duty cranes. The use of earth moving machines, including specialized equipment such as trenchers and front-end loaders, is also increasing.

Earnings and Working Conditions

Union minimum hourly wage rates for bricklayers' tenders and building laborers averaged $3.61 and $3.29, respectively, as of July 1, 1964, according to a national survey of building trades workers in 68 large cities. Among individual cities surveyed, the minimum hourly rates for bricklayers' tenders ranged from $1.70 in Jacksonville, Fla., to $4.65 in New York City. The rates for building laborers ranged from $1.55 in Jacksonville, Fla to $4.65 in New York City.

Construction work is physically strenuous since it requires frequent bending, stooping, and heavy lifting. Much of the work is performed outdoors. Many laborers are members of the International Hod Carriers', Building and Common Laborers' Union of America.

Where To Go for More Information

For further information regarding work opportunities as a construction laborer, inquiries should be directed to local building or construction contractors, or a local of the International Hod Carriers', Building and Common Laborers' Union of America. In addition, the local office of the State employment service is a source of information about work opportunities.

General information about the work of construction laborers may be obtained from:

International Hod Carriers', Building and Common Laborers' Union of America,
905 16th St. NW., Washington, D.C. 20006.

Electricians (Construction)

(2d ed. D.O.T. 4–97.010)
(3d ed. D.O.T. 821.381; 824.281; and 829.281 and .381)

Nature of Work

Construction electricians lay out, assemble, install, and test electrical fixtures, apparatus, and wiring used in electrical systems on construction projects. These systems are used to provide heat, light, power, air conditioning, and refrigeration in residences, office buildings, factories, hospitals, schools, and other structures. Construction electricians also install and connect electrical machinery, equipment, controls, and signal and communications systems. (Maintenance electricians do work which is similar in many respects to that performed by construction electricians. A discussion of maintenance electricians is presented elsewhere in the *Handbook*.)

Construction electricians install many types of switches, conduits, controls, circuit breakers, wires, lights, signal devices, and other electrical

components, following blueprints and specifications. If there is no electrical drawing, the electrician terminates the incoming electrical service into a central fuse box and installs interior circuits and outlets according to the amount of electrical current expected to be used in the various sections of the building. He installs fuses or circuit breakers of the proper rating in the incoming and interior circuits to prevent overloading, which causes overheating of wires, appliances, and motors. The construction electrician must know and follow National Electrical Code regulations and, in addition, must fulfill State, county, and municipal regulations.

In installing wiring, the construction electrician uses a mechanical or hydraulic bender to shape conduit (pipe or tubing) so that the conduit will fit the contours of the surface to which it is attached, or within the space allotted. He then pulls insulated wires or cables through the conduit. The electrician then connects the ends of the wires or cables to circuit breakers, switch-gear motors, transformers, or other components. When these operations are completed, the electrician tests the electrical circuits to make sure that the entire system is properly grounded, the connections properly made, and the circuits do not carry excessive current. Wires are spliced (joined) by soldering or other methods.

Construction electrician connects a transformer into an electrical circuit.

The electrician furnishes his own handtools, such as pliers, screwdrivers, brace and bits, knives, and hacksaws. The employer furnishes test meters and heavier tools and equipment, such as pipe threaders, conduit benders, chain hoists, electric drills, power fasteners, and ladders. In residential electrical construction work, heavier tools are not usually required.

Where Employed

Most construction electricians work for electrical contractors. Substantial numbers are self-employed. Others work for government agencies or business establishments that do their own construction electrical work. Construction electricians usually work for a large number of different employers during their work life because of the intermittent needs of individual contractors. However, many construction electricians work for the same electrical contractor for several years. During a single year, a construction electrician may work for an electrical contractor in the construction of new homes or office buildings, for a manufacturing firm in remodeling its plant or offices, or he may do electrical repairs for homeowners or business firms.

Training, Other Qualifications, and Advancement

Most training authorities, including the national joint labor-management apprenticeship committee for the electrical contracting industry, recommend the completion of a 4-year apprenticeship program for construction electricians as the best way to learn all the aspects of this trade. In the past, some construction electricians, however, have acquired skills of the trade informally by working for many years as helpers, observing or being taught by experienced craftsmen. Many of these persons have gained some knowledge of the trade by taking trade school

or correspondence courses, or through special training while in the Armed Forces.

Apprenticeship applicants generally are required to be between the ages of 18 and 24. A high school education is required; courses in mathematics and physics are desirable. Applicants are usually required to take tests to determine their aptitude for the trade.

All apprenticeship programs are conducted under written agreement between the apprentice and the local joint union-management apprenticeship committee, which supervises the training. The committee determines the need for apprentices in the locality, establishes minimum apprenticeship standards and schedules a diversified, rotating work program. This program is designed to give the apprentice all-round training by having him work for several electrical contractors who engage in particular types of work.

The International Brotherhood of Electrical Workers and the National Electrical Contractors Association have jointly developed an extensive apprenticeship program.

The apprenticeship program usually requires 8,000 hours (4 years) of on-the-job training, in addition to a minimum of 144 hours of related classroom instruction each year. In a typical 4-year training program, the construction electrician apprentice learns, among other things, to use, care for, and handle safely the tools, equipment, and materials commonly used in the trade; do residential, commercial, and industrial electrical installations; and maintain and repair installations. In addition, he receives related classroom instruction in such subjects as electrical layout, blueprint reading, mathematics, and electrical theory, including electronics. After completing their apprenticeship programs, many journeymen electricians enroll in courses, which may include advanced electronics, to keep abreast of the latest developments in this rapidly changing occupation.

Hourly wage rates of apprentices usually start at 40 to 50 percent of the journeyman rate and increase by 5 percent in each 6-month period until 80 to 85 percent of the journeyman rate is reached during the last period of the apprenticeship.

An experienced construction electrician who has learned all the aspects of the craft through apprenticeship can transfer readily to other types of electrical work. For example, many take jobs as maintenance electricians in factories or in commercial establishments and others work as electricians in shipbuilding and aircraft manufacturing.

Because improperly installed electrical work is hazardous, most cities require electricians to be licensed. To obtain a license, the electrician must pass an examination which requires a thorough knowledge of the craft and of State and local building codes.

Many journeymen electricians become foremen or superintendents for electrical contractors on particular construction jobs. These craftsmen may also become estimators for electrical contractors, computing material requirements and labor costs.

Many construction electricians go into business for themselves. As they expand their activities, they may employ other workers and become contractors. In most large urban areas, a master electrician's license is required in order to engage in an electrical contracting business.

Employment Outlook

Employment of construction electricians—who numbered more than 160,000 in 1964—is expected to increase rapidly through the mid 1970's, assuming relatively full employment nationally and the high levels of economic activity needed to achieve this goal. In addition, many thousands of job opportunities will result from the need to replace experienced workers who transfer to other types of electrical work, leave the trade for other reasons, retire, or die. Retirement and deaths alone will result in more than 3,000 job openings annually.

The increase in employment of electricians is expected mainly because of the anticipated large expansion in construction activity. (See discussion, p. 370.) Other factors expected to contribute to the growth of this trade are greater requirements for electric outlets, switches, and wiring in homes to accommodate the increasing use of appliances and air-conditionings systems; and the

extensive wiring systems needed for the installation of electronic data-processing equipment and electrical control devices being used increasingly in commerce and industry. Other recent developments expected to expand the demand for construction electricians include an increase in the number of "all-electric" homes, and the use of outdoor radiant heating, and snow- and ice-melting systems.

Technological developments are expected to limit the employment growth of this trade. A major technological development increasing the efficiency of electricians is the prefabrication of electrical equipment. For example, preassembled conductors and raceways are available that can be installed in one operation. Switch boxes and switchboards, which formerly had to be wired on site, are now preassembled at the factory. Also available are "packaged" (preassembled and prewired) ceiling units, which the electrician connects to the power source, eliminating the need to wire the complete system and install the fixtures.

Improved tools and equipment being used increasingly by electricians include more efficient conduit benders; multiple spindle drills; cordless electric drills, saws, and other tools; and "kits" of splicing materials that have reduced the time needed to do field insulation of cable splices.

Earnings and Working Conditions

Hourly wage rates of construction electricians are among the highest in the skilled building trades. Furthermore, because the seasonal nature of construction work affects electricians less than most other construction workers, their annual earnings generally are among the highest in the building trades.

Union minimum hourly wage rates for electricians averaged $4.68, compared with $4.46 for all journeymen in the building trades, as of July 1, 1964, according to a national survey of building trades workers in 68 large cities. Among individual cities surveyed, the union minimum hourly rates for construction electricians ranged from $3.60 in Charlotte, N.C., to $5.43 in Los Angeles, Calif.

The work of the construction electrician, like that of other building trades, is active but does not require great physical strength. Frequently, the construction electrician stands for prolonged periods; sometimes he works in cramped quarters. Because most of his work is indoors, the construction electrician is less exposed to unfavorable weather conditions than most other skilled building trades workers. Electricians risk the danger of falls from ladders and scaffolds, cuts from sharp tools, electrical shock, blows from falling objects, and burns from "live" wires. However, safety practice learned during apprenticeship and other types of training have helped to reduce the injury rate for these workers. The number of injuries per million man-hours worked by employees in contract electrical work has been lower than in contract construction work as a whole, but higher than that for production workers in manufacturing industries.

A large proportion of construction electricians are members of the International Brotherhood of Electrical Workers. Some are members of other unions.

Where To Go for More Information

For further information regarding electrician apprenticeships or other work opportunities in the trade, inquiries should be directed to local electrical contractors; a local union of the International Brotherhood of Electrical Workers; a local joint union-management apprenticeship committee, or the nearest office of the State apprenticeship agency or the Bureau of Apprenticeship and Training, U.S. Department of Labor. In addition, the local office of the State employment service may be a source of information about the Manpower Development and Training Act, apprenticeship, and other programs that provide training opportunities. Some local employment service offices provide such services as screening applicants and giving aptitude tests.

General information about the work of electricians may be obtained from:

International Brotherhood of Electrical Workers,
1200 15th St. NW., Washington, D.C. 20005.

National Electrical Contractors Association,
1220 18th St. NW., Washington, D.C. 20036.

National Joint Apprenticeship and Training Committee for the Electrical Industry,
1200 18th St. NW., Washington, D.C. 20036.

Elevator Constructors

(2d ed. D.O.T. 5–83.350 through .359)
(3d ed. D.O.T. 825.381)

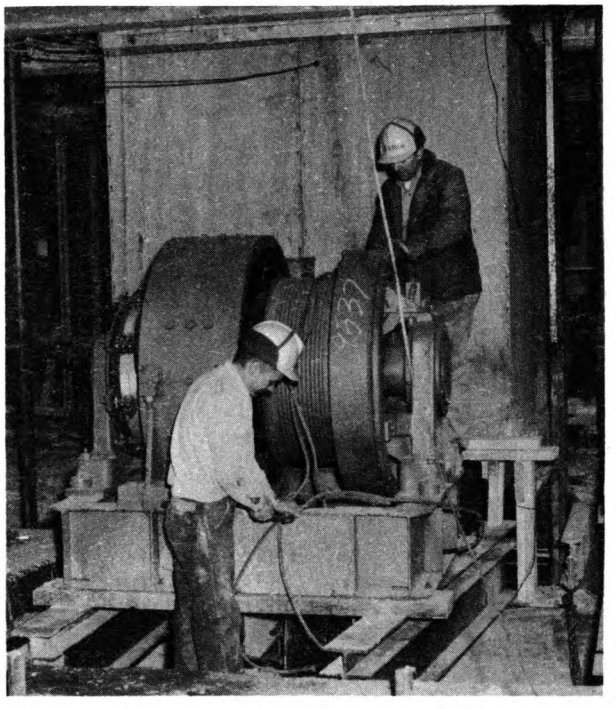
Nature of Work

Elevator constructors (also called *elevator mechanics*) assemble and install elevators, escalators, dumb waiters, and similar equipment. They also do considerable modernization, maintenance, and repair work. The work is done by small crews consisting of skilled mechanics and their helpers.

In elevator construction work, the crew first installs the guide rails of the car in the elevator shaft of the building. Then they install the hoisting machine, the car frame and platform, the counterweight, the elevator chassis, and the control apparatus. Next, the car frame is connected to the counterweight with cables, the cab body and roof are installed, and the control system is wired. Finally, the entire assembly, including cables, wire, and electrical control apparatus, is carefully adjusted and tested.

In maintenance and repair work, elevator mechanics inspect elevator and escalator installations periodically and, when necessary, adjust cables and parts and lubricate or replace parts. Alteration work on elevators is important because of the rapid rate of innovation and improvement in elevator engineering. This work is similar to new installation work because all elevator equipment except the old rail, car frame, platform, and counterweight is generally replaced.

To install and repair modern elevators, most of which are electrically controlled, elevator constructors must have a working knowledge of electricity, electronics, and hydraulics. They must also be able to repair electric motors, as well as control and signal systems. Because of the variety of their work, they use many different handtools, power tools, and mechanical and electrical testing meters and gages.



Elevator constructors set hoisting equipment in place.

Where Employed

Most of the estimated 13,000 journeymen elevator constructors employed in 1964 worked for elevator manufacturers, doing new installation and modernization work and elevator servicing. Some elevator constructors are employed by small, local contractors who specialize in elevator maintenance and repair. Others work for government agencies or business establishments that do their own elevator maintenance and repair. Elevator constructors are also employed as elevator inspectors for municipal or other government licensing and regulatory agencies.

Training and Other Qualifications

Although elevator constructors are among the highly skilled building craftsmen, training is comparatively informal and is obtained through employment as a helper for a number of years. The helper-trainee must be at least 18 years of age, in good physical condition, and have a high school education or its equivalent, preferably including courses in mathematics and physics. Mechanical aptitude and an interest in machines are important assets.

To become a skilled elevator mechanic, at least 2 years of continuous job experience, including 6 months' on-the-job training at the

factory of a major elevator firm, is usually necessary. During this period, the helper learns to perform all of the operations involved in the installation, maintenance, and repair of elevators, escalators, and similar equipment. The helper-trainee generally attends evening classes in vocational schools. Among the subjects studied are mathematics, physics, electrical and electronic theory, and proper safety techniques.

Opportunities for establishing an individually owned small contracting business in this field are very limited.

Employment Outlook

A moderate increase in employment of elevator constructors is expected through the mid-1970's, assuming relatively full employment nationally and the high levels of economic activity needed to achieve this goal. In addition, several thousand job opportunities for new workers will result from the need to replace experienced workers who transfer to other fields of work, retire, or die. Employment growth and retirements and deaths in this small occupation will provide about 500 job openings annually.

More elevator constructors will be needed as the result of the anticipated large expansion in new industrial, commercial, and large residential building. (See discussion, p. 370.) In addition, technological developments in elevator and escalator construction will spur modernization of older installations and thus will contribute to the growing need for these craftsmen. For example, modern high speed elevators with automatic control systems require more work and higher skill for the installation and adjustment of electrical and electronic controls.

Earnings and Working Conditions

Both the hourly wage rates and the annual earnings of elevator constructors are among the highest in the skilled building trades. These craftsmen lose less worktime because of seasonal factors than do most other building trades workers.

Union minimum hourly wage rates for elevator constructors averaged $4.73, compared with $4.46 for all journeymen in the building trades, as of July 1, 1964, according to a national survey of building trades workers in 68 large cities. Among the individual cities surveyed, the minimum hourly rates for elevator constructors ranged from $3.72 in Jackson, Miss., to $5.80 in Newark, N.J., and New York City.

Some work operations in elevator construction involve lifting and carrying heavy equipment and elevator parts, but this is usually done by helpers. Some of the work must be done in cramped or awkward positions. Most of the work is done indoors.

Most elevator constructors are members of the International Union of Elevator Constructors.

Where To Go for More Information

For further information regarding work opportunities as a helper in this trade, inquiries should be directed to elevator manufacturers, elevator constructors, or a local of the International Union of Elevator Constructors. In addition, the local office of the State employment service may be a source of information about work opportunities in this trade.

General information about the work of elevator constructors may be obtained from the International Union of Elevator Constructors, 12 South 12th St., Philadelphia, Pa. 19107.

Floor Covering Installers

(2d ed. D.O.T. 5–32.752 and 7–59.220)
(3d ed. D.O.T. 864.781)

Nature of Work

Floor covering installers (also called *floor covering mechanics* and *floor layers*) install, replace, and repair resilient tile, linoleum and other sheet goods, and carpeting on floors in residential, commercial, and industrial buildings. The mechanic installs these coverings on wood, concrete, metal, and stone floors which may vary in size from a small kitchen or hallway to a large supermarket floor or hotel lobby.

In installing resilient floor covering, such as asphalt tile or vinyl sheet goods, the floor cover-

ing mechanic first inspects the floor to be covered to make sure that it is firm, dry, smooth, and free of loose dust or dirt. He may sand a rough or painted floor; cover cracks, indentations, or other irregularities with a filler material; or, if a floor is extremely uneven, resurface it with plywood, hardboard, or mastic cement.

The installer may also test for moisture content in newly poured concrete floors or floors laid over earthwork at ground level or below. If the moisture in the floor is too great, he may suggest postponing installation of floor covering or recommend a type of adhesive or covering particularly suited to the condition of the floor. For this reason, the mechanic should be familiar with the many types of adhesives and floor coverings recommended by manufacturers for specific subfloor conditions.

The floor covering installer prepares to install resilient floor covering by carefully measuring and marking off the floor in accordance with the floor covering plan. The plan may be in the form of architectural drawings specifying every detail of the floor covering design, or it may be a simple, verbal description by the customer. When the floor layout is completed, the mechanic, assisted, when necessary, by an apprentice or other worker, applies the adhesive and lays the floor covering. He must be careful in cutting, matching, and fitting floor covering, particularly at door openings, along other irregular wall surfaces, and around permanent floor fixtures, such as columns or piping. Special care must be taken in cutting out and setting in decorative designs in the flooring. After the flooring is laid, a roller is run over it to insure good adhesion to the floor.

Installer marks floor covering along an irregular wall before trimming.

The carpet mechanic, like the installer of resilient floor covering, first inspects the floor to be covered to determine its condition. Then he plans his layout carefully to minimize waste of materials. He also allows for expected foot-traffic patterns so that best appearance and long wear will be obtained, and that carpet sections expected to receive heavy traffic can be replaced easily.

In installing the carpet, the mechanic may anchor "tackless strip," with adhesive or nails, along the borders of the installation. (The strip secures the carpet when it is installed.) Instead of using strip, the floor layer may use tacks to secure carpeting. Padding, which is placed under the carpet, is cut and placed within the framework of the strip and the carpet is then placed approximately into position. If the carpet has not been precut and seamed in the workroom of the floor covering firm, the mechanic will do this work before stretching the carpet into place. He then trims the edge of the carpet so that it will be held securely and smoothly by tacks, or by nails protruding from the border strip. Finishing touches may include the use of a special roller to obscure seam markings that may result when carpet sections are joined.

Floor covering mechanics generally specialize either in carpet installations or resilient floor installations, although some mechanics can install both types of coverings. Some may specialize even further. For example, the most skilled installers generally are employed by commercial floor covering firms which install the more expen-

sive carpeting, and resilient sheet flooring with intricate designs. Many floor mechanics specialize in the installation of resilient tile. Some also install resilient wall and counter coverings.

The tools used by floor covering installers include hammers; pry bars; knives, shears, and other cutting devices; measuring and marking tools, such as tape measures, compasses, straightedges, chalk, and chalk lines; and a variety of specialized tools, such as notched adhesive spreaders, carpet stretching devices, and floor rollers.

Where Employed

Most floor covering installers are employed by floor covering contractors who may specialize in commercial and industrial flooring work, in residential floor covering, or in specific types of installations, such as resilient tile. Many others work for retailers specializing in floor covering who provide installation service. Floor covering mechanics also are employed by furniture and department stores that sell and install floor coverings, and by home alteration and repair contractors.

Heavy concentrations of these workers are found in large business centers where high levels of commercial construction as well as residential building prevail.

Training, Other Qualifications, and Advancement

In considering applicants for floor covering installation jobs, employers are particularly interested in those with manual abilities. They prefer applicants with a high school education, but this qualification is not generally required. Most employers want applicants between 17 and 30 years of age and with at least average physical strength. A neat appearance and a pleasant business-like manner are important attributes because the work is performed on the customer's premises.

Training authorities generally recommend a 3- or 4-year apprenticeship program as the best way to learn the floor covering trade. Most apprenticeship programs include 6,000 hours (3 years) or 8,000 hours (4 years) of on-the-job training in addition to related classroom instruction. In these training programs, the trainee learns the techniques of floor installation and how to handle the tools of the trade. Through work assignments with skilled craftsmen on a wide variety of floor covering jobs, he learns to plan and execute different types of jobs in a minimum of time and with the most efficient and decorative use of materials. Most apprentices are required to attend class twice a week to learn about the nature of the materials they will be using, the use and care of tools and equipment, mathematics of layout work, interpretation of architectural drawings, and planning and layout of floor covering installations.

Some apprenticeship programs may combine training in the installation of resilient floor and wall covering with training in laying of carpets. Other programs may be limited to the installation of resilient coverings.

Many workers in this trade have acquired their skills through informal training methods, such as working as a trainee or laborer, and observing or beng taught by experienced floor covering mechanics. Many of these men have also gained some knowledge of floor covering work by attending trade school or floor covering manufacturers' training courses, and through home study.

Many informal training programs limit the trainee's work experience to installation of resilient tile, or to residential floor covering work of limited complexity. This lack of all-round experience, however, may be paritally offset by trade school and home-study courses and manufacturers' training programs. A young man interested in becoming a floor covering mechanic should direct inquiries to several firms about their training programs before accepting employment as a trainee.

Skilled floor covering installers may advance to the position of foreman or installation manager for a large floor laying firm. Some become salesmen or estimators for floor covering firms. Floor covering mechanics with business ability may form their own firms and employ their own mechanics.

Employment Outlook

Employment of floor covering installers—estimated at more than 30,000 in 1964—is expected

to increase rapidly through the mid-1970's assuming relatively full employment nationally and the high levels of economic activity needed to achieve this goal. Many additional job openings will arise from the need to replace experienced workers who transfer to other occupations, retire, or die. Retirements and deaths alone are expected to provide nearly 600 job openings annually through the mid-1970's.

The rapid increase in employment of floor covering installers is expected mainly because of the anticipated expansion in construction activity. (See discussion, p. 370.) Moreover, the use of resilient floor coverings and wall-to-wall carpeting will become more widespread. More versatile materials and colorful patterns are expected to contribute to a growing demand for floor coverings. For example, epoxy (a plastic) is now being used as a floor covering material. This relatively new material is extremely durable and can be used in many ways—as a solid floor covering that can be painted a variety of colors, and as an adhesive or base for laying resilient flooring.

The best job opportunities will be for floor mechanics with all-round training in the installation of resilient tile and sheet goods or carpeting.

Earnings and Working Conditions

No national wage data on floor covering installers are available. However, wage information from a limited number of firms indicates that, in early 1964, most experienced floor layers were paid between $3.50 and $4.50 per hour, although wage rates for skilled workers ranged from $2.50 an hour in some areas to as much as $5.50 an hour in others. Wage rates for such workers may also vary within an area because of differences in level of skill or degree of work specialization. Starting wage rates for apprentices and other trainees usually are about half of the mechanic's rate.

Most floor covering mechanics, including those under union-management agreements, are paid on an hourly basis. In some nonunion shops, part of the mechanic's pay may be in the form of bonuses for work performed within a specified time period. In others, mechanics receive a monthly salary or are paid on the basis of the number of square feet or square yards of floor covering they install.

Floor covering installers generally work regular daytime hours. Particular circumstances, however, such as installing a floor in an occupied home, store, or office, may require work during evening hours or on weekends when families are at home or stores and offices are not open for business.

Floor covering installation work is not affected by weather conditions, since it is performed indoors. During the winter months most work is done in heated buildings. Job hazards are not numerous, but mechanics frequently experience knee injuries because they do much of their work while kneeling; back injuries occur ocasionally as a result of twisting and lifting on the job. Most of these injuries can be avoided, however, if proper work procedures are followed. Generally, a mechanic is assisted by a helper in heavy lifting, and usually has proper equipment available to move heavy objects.

Where To Go for More Information

For further information regarding floor covering apprenticeships or other work opportunities in this trade, inquiries should be directed to local floor covering contractors or floor covering retailers; a local union of the United Brotherhood of Carpenters and Joiners of America (in Eastern States); a local union of the Brotherhood of Painters, Decorators and Paperhangers of America (in Western States); or the nearest office of the State apprenticeship agency or the Bureau of Apprenticeship and Training, U.S. Department of Labor. In addition, the local office of the State employment service may be a source of information about apprenticeship, the Manpower Development and Training Act, and other programs that provide training opportunities.

Publications providing detailed information about training for this trade are available from:

American Carpet Institute,
Empire State Bldg., New York, N.Y. 10001.

Armstrong Cork Co.,
Lancaster, Pa. 17600.

Congoleum-Nairn, Inc.,
195 Belgrove Dr., Kearny, N.J. 07032.

Glaziers

(2d ed. D.O.T. 5–77.010)
(3d ed. D.O.T. 865.761)

Nature of Work

Glaziers engaged in construction work cut, fit, and install plate glass, ordinary window glass, mirrors, and special items such as leaded glass panels. In making a glass installation, the glazier cuts the glass to size or uses precut glass. The glazier puts a bed of putty into the wood or metal sash (frames) and presses the glass into place. He fastens the glass with wire clips or triangular metal points and then places and smoothes another strip of putty on the outside edges of the glass to keep out moisture.

When installing structural glass, which is used to decorate building fronts, walls, ceilings, and partitions, the glazier (and sometimes the marble setter, see discussion, p. 396) applies mastic cement to the supporting backing and presses the glass into it. The glass may have to be trimmed with a glass cutter if it is not precut to specifications. Glaziers (as well as bricklayers, see discussion, p. 374), install glass blocks for building exteriors, interior partitions, and walls.

Glaziers place a glass panel in new office building.

In addition to handtools, such as glass cutters and putty knives, glaziers use power cutting tools and grinders.

Where Employed

Most of the 5,000 construction glaziers estimated to be employed in 1964 worked for glazing contractors engaged in new construction, alteration and modernization work, and on replacement of broken glass, particularly for store windows. Some glaziers were employed by government agencies or business establishments which do their own construction work.

(Nearly 12,000 glaziers worked outside the construction industry. Many are employed in factories where they install glass in sash, doors, mirror frames, and partitions. Others, using skills similar to those used by glaziers, install glass or mirrors in furniture and ships, or replace glass in automobiles.)

Training and Other Qualifications

Most training authorities, including the national joint labor-management apprenticeship committee for the glass and glazing industry, recommend the completion of a 3-year apprenticeship program as the best way to learn the skills of the construction glazier. A substantial proportion of glaziers, however, have learned the trade informally. They have acquired their skills by working for many years with experienced glaziers and observing or being taught by them. In smaller communities, many journeymen painters and paperhangers have learned to do glazier work as part of the apprentice training for their trade.

Apprenticeship applicants generally are required to be at least 18 years of age; a high school education or its equivalent is desirable.

The apprenticeship program usually consists of 6,000 hours (3 years) of on-the-job training, in addition to a minimum of 144 hours a year of related classroom instruction. During the apprenticeship, the apprentice learns how to use and handle the tools, machines, and materials of the

trade. The program also includes on-the-job training in the glazing of wood and metal sash in doors, windows, and partitions and other openings; setting of store front openings, structural glass, mirrors, showcases, automobile glass, shower doors, and tub enclosures; replacement of glass; and scaffolding.

Hourly wage rates for glazier apprentices usually start at 50 percent of the journeyman rate and increase periodically until the journeyman rate is reached at the completion of training.

Employment Outlook

A rapid increase in employment of construction glaziers is expected through the mid-1970's, assuming relatively full employment nationally and the high levels of economic activity needed to achieve this goal. In addition, job opportunities will result from the need to replace experienced construction glaziers who transfer to other fields of work, retire, or die.

The large increase anticipated in construction activity (see discussion, p. 370) and the increasing use of glass in building construction are expected to result in more work for construction glaziers. Replacement and modernization work, frequently involving large glass installations, will also contribute to the demand for these workers.

Earnings and Working Conditions

Union minimum hourly wage rates for construction glaziers averaged $4.08, compared with $4.46 for all journeymen in the building trades, as of July 1, 1964, according to a national survey of building trades workers in 68 large cities. Among individual cities surveyed, the union minimum hourly wage rates for construction glaziers ranged from $2.50 in Lubbock, Tex., to $5.05 in New York City.

Glaziers are exposed to some hazards in their work, such as cuts from glass edges and sharp tools used in cutting glass, back injuries caused by lifting plate glass, and falls from scaffolding. However, employers and unions attempt to eliminate injuries by promoting safety training and procedures.

A large proportion of glaziers employed in construction work are members of the Brotherhood of Painters, Decorators, and Paperhangers of America.

Where To Go for More Information

For further information regarding glazier apprenticeships or other work opportunities in this trade, inquiries should be directed to local glazing contractors or general contractors; a local of the Brotherhood of Painters, Decorators and Paperhangers of America; a local joint union-management apprenticeship committee; or the nearest office of the State apprenticeship agency or the Bureau of Apprenticeship and Training, U.S. Department of Labor. In addition, the local office of the State employment service may be a source of information about apprenticeship and other training opportunities.

General information about the work of glaziers may be obtained from the Brotherhood of Painters, Decorators and Paperhangers of America, 217–219 North Sixth St., Lafayette, Ind., 47901.

Lathers

(2d ed. D.O.T. 5–32.761, .762, and .763)
(3d ed. D.O.T. 842.781)

Nature of Work

Lathers install the supporting backings on ceilings or walls on which plaster or other materials are applied. These supports are usually metal lath (strips of expanded metal or metal wire mesh), or large pieces of perforated or unperforated gypsum lath.

When installing metal lath, the lathers first build a light metal framework (furring), which is fastened securely to the structural framework of the building. The lath is then attached to the furring by nailing, clipping, tying, or machine stapling. After the lath has been installed, the lathers cut openings in them for electrical outlets and piping.

The method of installation varies somewhat in other types of lath work. For example, for plaster cornices, the lather builds a framework

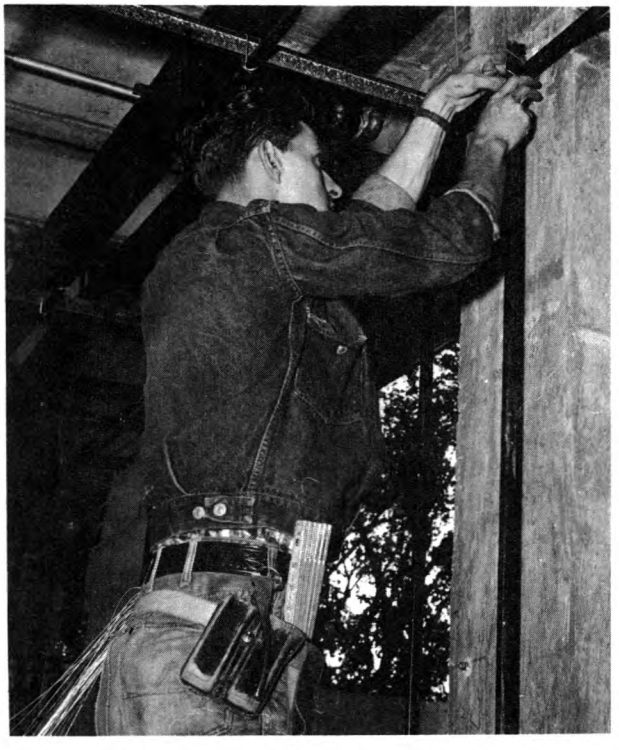
that approximates the desired shape or form. He then attaches metal lath to the framework. Gypsum lath is nailed on studs, or clipped or stapled to the metal furring. Lathers also install metal reinforcements, known as corner beads, used as guides by the plasterer and as protection for the finished corner.

When stucco (a mixture of portland cement and sand) is to be applied over wood framework, the lather installs two layers of wire mesh separated by a layer of felt, to act as a base.

The tools of the trade include measuring rules and tapes, drills, hammers, chisels, hacksaws, shears, wirecutters, boltcutters, punches, pliers, hatchets, and stapling machines.

Where Employed

Most lathers—who numbered more than 25,000 in 1964—work for lathing and plastering contractors on new residential, commercial, or industrial construction. They also work on modernization and alteration jobs. Some lathers are also employed outside the construction industry; for example, they make the lath backing for plaster display materials or scenery.



Lather installs metal furring to support lath.

Training and Other Qualifications

The national joint labor-management apprenticeship committee for this trade and many other training authorities recommend the completion of a minimum of 2 years of apprenticeship as the best way to learn lathing. However, many lathers, particularly in small communities, have acquired skills informally, by working for many years as helpers, observing or being taught by experienced lathers.

Apprenticeship applicants generally are required to be between the ages of 16 and 25, and in good physical condition. Aptitude tests are often given to applicants to determine whether they have manual and finger dexterity as well as the other qualifications required. Apprentices generally must pass examinations that are given at the end of each 6-month period.

During the apprenticeship period, the apprentice learns to use and handle the tools and materials of the trade. For example, he installs gypsum and composition lath, wall furring, and metal lathing. In addition, he generally receives related classroom instruction in subjects such as applied mathematics, geometry, reading of blueprints and sketches, welding, estimating, and safety practices. Today, a high school education is encouraged, and education above grade school level, particularly courses in mathematics, is needed to understand the classroom instruction.

Hourly wage rates for lather apprentices usually start at 50 percent of the journeyman rate. The rate is increased periodically by 5 percent every third or fourth month until a rate of 85 percent is reached in the final quarter of the second year of training.

Employment Outlook

Employment of lathers is expected to increase rapidly through 1975, assuming relatively full employment nationally and the high levels of economic activity needed to achieve this goal. In addition, many job opportunities will result from the need to replace experienced workers who transfer to other fields of work, retire, or die. Retirements and deaths alone are expected to result in about 500 job openings annually.

Growth of the trade will result principally from the anticipated large increase in construction activity. (See discussion, p. 370.) Moreover, there will be a growing need for lathing work because of the increasing use of new kinds of plaster and improved methods of applying plaster. Improved, lightweight plasters are being used increasingly because of their excellent soundproofing, acoustical, and fireproofing qualities. There is also a trend toward the greater use of curved surfaces and ceilings made of plaster, both as a form of architectural treatment and to achieve special lighting and acoustical effects. The use of "plaster veneer" as a surface finish is expected to expand because it does not crack when building foundations settle. Machine plastering and fireproofing are growing in importance. Because these machines reduce the cost of plastering, their greater use should increase the demand for plaster work and for lathers. These developments are expected to more than offset the loss of lathing work resulting from the use of nonplaster (dry-wall) constructions.

Earnings

Union minimum hourly wage rates for lathers averaged $4.49, compared with $4.46 for all journeymen in the building trades, as of July 1, 1964, according to a national survey of building trades workers in 68 large cities. Among individual cities surveyed, the minimum hourly rates for lathers ranged from $3 in Norfolk, Va., to $5.50 for metal lathers in New York City.

A large proportion of lathers are members of The Wood, Wire and Metal Lathers International Union.

Where To Go for More Information

For further information regarding lathers' apprenticeships or other work opportunities in the trade, a young man should apply to a lathing contractor in his area; a local of The Wood, Wire and Metal Lathers International Union; a local joint labor-management apprenticeship committee; or the nearest office of the State apprenticeship agency or the Bureau of Apprenticeship and Training, U.S. Department of Labor. In addition, the local office of the State employment service may be a source of information about the Manpower Development and Training Act, apprenticeship, and other programs that provide training opportunities.

General information about the work of lathers may be obtained from:

Contracting Plasterers' and Lathers' International Association,
304 Landmark Bldg., 1343 H St. NW.,
Washington, D.C. 20005.

National Bureau for Lathing and Plastering, 1725 K St. NW., Washington, D.C. 20006.

The Wood, Wire and Metal Lathers International Union,
6530 New Hampshire Ave., Takoma Park, Md. 20012.

Marble Setters, Tile Setters, and Terrazzo Workers

(2d ed. D.O.T. 5–24.310, .410, and .510)
(3d ed. D.O.T. 861.381 and .781)

Nature of Work

Marble setters, tile setters, and terrazzo workers cover interior or exterior walls, floors, or other surfaces with marble, tile, or terrazzo. Craftsmen in each of these distinct trades work primarily with the material indicated by their job title.

Marble setters install marble, shop-made terrazzo panels and artificial marble, and structural glass when it is used in a building interior. The marble setter does little fabrication work because the marble and other materials are cut to size and polished before they are delivered to the work site. However, he may do some minor cutting to make the materials fit exactly. In setting marble, he lays out the work, then applies a special plaster mixture to the backing material and sets the marble pieces in place. When necessary, he braces them until the setting plaster has hardened. Special plaster is poured into the joints between the marble pieces, and the joints are "pointed up" (slightly indented) with a trowel or wooden paddle. Bolt holes may have to be drilled if attachments to the marble are necessary. Each marble setter has a helper to prepare

Marble setter and helpers install marble panel.

plaster, carry marble slabs, and clean the surface of the completed work.

The tile setter attaches tile (a thin slab of baked clay, stone, or other material) on walls, floors, or ceilings according to blueprints or other instructions. For walls and ceilings, the tile setter applies a setting bed to the surface or other supporting backing. This setting bed consists of a float coat of sand and cement, plus a thin coat of pure cement mixed with water, or one of a number of patented portland cement mixtures. The tiles are then tapped into place with a trowel handle. In laying tile floors, the tile setter adds cement to the fresh concrete subfloor and then lays the tile. He chips the tile with a hammer and chisel or cuts it with pincers to make it fit into irregular areas, into corners, or around pipes.

Small tiles, such as those laid in bathrooms, are available in paperbacked strips and sheets that can be fastened to the floor as a unit, using cement or various adhesives. This eliminates the setting of individual tiles. The tile setter is usually assisted by a helper who mixes mortar, sets up scaffolds, supplies the setter with materials, grouts (fills) the joints after the tile setting is completed, and cleans the completed work.

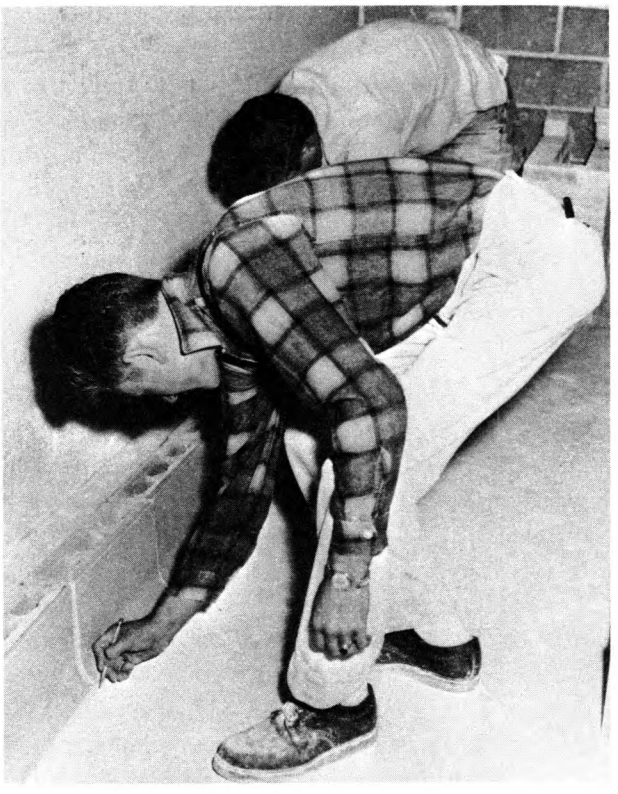
Terrazzo is a type of ornamental concrete used mainly for floors. Marble chips are used as the coarsest concrete ingredient. After the terrazzo hardens, it is ground and polished to give a smooth surface in which the marble chips are exposed against the background of other materials.

A terrazzo worker starts his work by laying a base of either concrete, epoxy (plastic adhesive), or latex. When laying a concrete base, he levels it with a long, flat tool called a straightedge, and tamps it. Then he places metal strips in the base, wherever there is to be a joint or a change of color between panels, and imbeds their bottom edges into the base. If there is to be lettering or an ornamental figure, he also imbeds a shopmade mold. Finally, he mixes the top course of concrete and marble chips, pours it onto the base, and rolls and levels it. A separate mixture is made for each color. After the concrete has hardened for a few days, a semiskilled worker grinds and polishes the floor with an electric-powered grinding machine.

The terrazzo worker is assisted by helpers in the mixing and placing of the base course, but he alone does the leveling and placing of the metal strips. Helpers handle sand, cement, marble chips, and all other materials used by the terrazzo worker. They rub and clean all marble, mosaic, and terrazzo floors and perform other work required in helping a terrazzo craftsman. The terrazzo worker generally supervises mixing of the top course that, along with the grinding, governs its final appearance.

Where Employed

Marble setters, tile setters, and terrazzo workers are employed mainly in new building construction and in the large urban areas. Substantial



Tile setter apprentices mark off a glazed tile wall for second course.

numbers of terrazzo workers are employed in Florida and California.

Training, Other Qualifications and Advancement

Most training authorities, including the national joint labor-management apprenticeship committees that set the training standards in these trades, recommend the completion of a 3-year apprenticeship program as the best way to learn each of these trades. A substantial proportion of tile setters, terrazzo workers, and marble setters, however, have acquired their skills informally by working for many years as helpers, observing or being taught by experienced craftsmen.

Apprenticeship applicants generally are required to be between the ages of 17 and 22; a high school education or its equivalent is desirable. Good physical condition and manual dexterity are important assets. Applicants should have an eye for quickly determining proper alinements of tile, terrazzo, and marble, and have a good sense of color harmony.

The apprenticeship programs in each of these trades generally consist of 6,000 hours of on-the-job training, in addition to related classroom instruction. In a typical 3-year training program for terrazzo workers, apprentices learn, among other things, to use, care for, and handle safely the tools, equipment, and materials commonly used in the trade; mix, place, tamp, and level terrazzo material and concrete; and select, set, and level metal dividing strips. The apprentice also learns the selection and placement of materials according to the design of the job; the rough and final finishing of bases and coves; and hand and machine rubbing.

The apprentice receives related classroom instruction in blueprint reading, layout work, basic mathematics, and shop practice.

Hourly wage rates for apprentices in each of these trades start at about 50 or 60 percent of the journeyman rate and increase periodically until 95 percent of the journeyman rate is reached during the last period of apprentice training.

Skilled and experienced tile, terrazzo, or marble setters may become foremen. Others may be able to start their own small contracting businesses.

Employment Outlook

Combined employment in the three trades—marble setter, tile setter, and terrazzo worker—is expected to increase moderately through 1975, assuming relatively full employment nationally and the high levels of economic activity needed to achieve this goal. In addition, job opportunities will result from the need to replace experienced workers who transfer to other fields of work, retire, or die. However, employment growth and retirements and deaths, together, will provide only several hundred job openings annually.

Total employment in these trades is expected to increase mainly because of the anticipated rapid expansion in construction activity. (See discussion, p. 370.) However, the rate of employment growth will vary sharply among these trades.

The demand for terrazzo workers is expected to increase very rapidly. Because terrazzo is durable and attractive, the number of terrazzo installations is expected to continue to increase greatly. Growth of the trade will also be stimulated by the use of new terrazzo materials,

especially epoxy and latex terrazzo. These products, which are lighter and take less space than cement-based terrazzo, are being used increasingly, especially on the upper floors of multistoried buildings. A small number of skilled terrazzo workers have been recruited from abroad to meet shortages of these workers in some areas.

A moderate increase is expected in the employment of tile setters. Growth of this trade will be limited by the increasing use of competing materials, such as asphalt floor tile, structural glass, plastic tile, and plastic-coated wallboards, which are usually installed by workers other than tile setters.

Little change in the employment of marble setters is expected. However, the excellent properties of marble as a building material will insure its continued use and provide work for marble setters, despite the relatively higher costs of marble compared with competitive materials.

Earnings and Working Conditions

Union minimum hourly wage rates for terrazzo workers averaged $4.48; for marble setters, $4.45; and for tile setters, $4.42; as of July 1, 1964, according to a national survey of building trades workers in 68 large cities. These rates compared with the average of $4.46 for all journeymen in the building trades. Among the individual cities surveyed, the minimum hourly rates for terrazzo workers ranged from $3.25 in Lubbock, Tex., to $5.45 in Newark, N.J., and New York City. For marble setters, the hourly rates ranged from $3.45 in Tampa, Fla., Shreveport, La., and Salt Lake City, Utah, to $4.90 in Trenton, N.J., and New York City. The rates for tile setters ranged from $3.25 in Lubbock, Tex., to $5 in San Francisco–Oakland, Calif.

Marble setters and terrazzo workers work both indoors and outdoors, depending on the type of installation. Tile setters work mostly indoors.

A large proportion of the workers in each of these trades are members of one of the following unions—Bricklayers, Masons and Plasterers' International Union of America; International Association of Marble, Slate and Stone Polishers, Rubbers and Sawyers, Tile and Marble Setters' Helpers and Marble Mosaic and Terrazzo Workers' Helpers; and Operative Plasterers' and Cement Masons' International Association of the United States and Canada.

Where To Go for More Information

For further information regarding apprenticeships or other work opportunities in these trades, inquiries should be directed to local tile, terrazzo and marble setting contractors or to locals of the unions previously mentioned. In addition, the local office of the State employment service may be a source of information about the Manpower Development and Training Act, apprenticeship, and other programs that provide training opportunities.

General information about the work of marble setters, tile setters, and terrazzo workers may be obtained from:

Bricklayers, Masons and Plasterers' International Union of America,
815 15th St. NW., Washington, D.C. 20005.

International Association of Marble, Slate and Stone Polishers, Rubbers and Sawyers, Tile and Marble Setters' Helpers and Marble Mosaic and Terrazzo Workers' Helpers,
821 15th St. NW., Washington, D.C. 20005.

National Terrazzo and Mosaic Association, Inc.,
1420 New York Ave. NW., Washington, D.C. 20005.

Operative Plasterers' and Cement Masons' International Association of the United States and Canada,
1125 17th St. NW., Washington, D.C. 20036.

Tile Contractors' Association of America,
1420 New York Ave. NW., Washington, D.C. 20005.

Operating Engineers (Construction Machinery Operators)

(2d ed. D.O.T. 5–23.000 through .999 and 7–23.000 through .999)
(3d ed. D.O.T. 850.782 through .887; 851.883 and .887; 852.883; 853.782 and .883; 859.782; 859.883)

Nature of Work

Operating engineers operate various types of power-driven construction machinery. These machines include power shovels, cranes, derricks, hoists, pile drivers, concrete mixers, paving machines, trench excavators, bulldozers, tractors, and

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pumps. Operating engineers are often identified by the types of machines they operate—for example, craneman, bulldozer operator, or derrick operator. These craftsmen have a wide range of skills because they work with many different types of machines—some complex and others relatively simple. The range of skills may be illustrated by describing the work performed by an engineer who operates a crane and one who operates an earth-boring machine.

The crane operator manipulates various pedals and levers to rotate the crane on its chassis and to raise and lower the crane boom and the loadline. The operator also manipulates a number of different attachments to the crane boom for various construction purposes. For example, he manipulates buckets for excavation work; pile drivers to drive steel beams, wood, and concrete piling into the ground; and wrecking balls for demolition work. Good eye-hand-foot coordination, skill in precision handling of heavy equipment, and judgment in estimating proper load size are among the essential aptitudes needed to do the crane operator's job. In contrast, the operation of earth-boring machines that dig holes for poles or posts is one of the less skilled tasks performed by operating engineers. The operator sets the proper auger (drill) in the spindle, starts the machine, and stops it when the auger has penetrated to the proper depth.

Scraper operator levels the terrain for a road.

While the skills required of an operating engineer vary, there is an increasing trend toward more versatility in this field, and an individual who desires steady employment, particularly in the construction field, should know how to operate several different types of equipment. Operators prefer to work on the more complex types of machines, because they are paid higher wage rates for operating such machines.

Where Employed

An estimated 235,000 operating engineers were employed as excavating, grading, and road machinery operators in 1964. In addition, thousands of operating engineers were employed as operators of other types of construction machinery, including cranes, derricks, hoists, diesel engines, air-compressors, trench-pipe layers, and dredges.

The majority of operating engineers work on construction projects. Most of the construction machinery operators are employed by contractors engaged in highway, dam, airport, and other large-scale engineering projects. On building projects, they are employed in excavating, grading, landscaping and in hoisting concrete, steel, and other building materials. Others are employed by utility companies, manufacturers, and other business firms that do their own construction work, as well as by State and local public works and highway departments. Relatively few operating engineers are self-employed. Those who are self-employed are owner-operators of construction equipment, such as bulldozers and cranes.

In addition to employment in construction work, operating engineers operate cranes, hoists, and other power-driven machinery in factories and mines. In some cases, the duties of operating engineers in nonconstruction jobs are about the same as those in construction work. For example, operation of a crane to unload cars of coal at a factory is very similar to operation of a crane to unload cars of sand and gravel for a street paving job. On the other hand, the nature of the work of a steel pourer (craneman) in a steel mill differs considerably from that of a crane operator in the construction industry.

Construction machinery operators are employed in every section of the country. Their

work, however, may take them to remote locations where highways and heavy engineering projects, such as dams, are being constructed.

Training, Other Qualifications, and Advancement

Most training authorities, including the National Joint Apprenticeship and Training Committee for Operating Engineers, recommend the completion of a 3-year apprenticeship as the best way to qualify for journeyman status as an operating engineer. Many men with mechanical aptitude, however, enter this occupation by obtaining jobs as oilers (operating engineer's assistants) or as helpers to heavy equipment repairmen. Workers on these jobs gain a knowledge of the machinery, how to keep it in good working order, and how to make repairs. Oilers and helpers must perform their work well and demonstrate initiative before they are given the instruction from experienced operators that is necessary for advancement. They must also demonstrate interest in and ability to learn the correct methods of handling equipment, and be able to recognize hazards that must be avoided.

Some men with mechanical experience, such as that obtained from operating farm equipment, may get jobs operating the simpler construction machines. Operating knowledge of a broad range of related equipment and attachments, however, is ordinarily necessary to obtain continuous employment. This all-round knowledge is best obtained through a formal apprenticeship program or by working as a oiler or helper, usually for a much longer period of time than it takes to complete an apprenticeship.

Apprenticeship standards provide training in the operation of each of the following types of equipment: (1) Universal equipment (hoists, shovels, cranes, and related equipment), (2) grading and paving equipment, and (3) plant equipment (such as material mixing and crushing machines). These standards also provide for the training of heavy-duty construction machinery repairmen. The apprenticeship program for each training classification consists of at least 6,000 hours (3 years) of on-the-job training. Training is given either by a lead engineer, a journeyman, or a master mechanic. In a typical universal equipment training program, the apprentice learns, among other things, to use, care for, and handle safely the equipment and tools used in the trade; set grade stakes; and read plans and instructions. He also learns to use welding and cutting equipment and the different types of greases and oils. In addition to on-the-job training, the apprenticeship program includes a minimum of 144 hours a year of related classroom instruction in subjects such as blueprint reading, elements of electricity, physics, welding, and automative servicing.

Apprenticeship applicants generally must be between the ages of 18 and 25 and must be physically able to perform the work of the trade. A high school education or its equivalent is required to complete satisfactorily the related theoretical instruction. Applicants must also demonstrate the ability and aptitude necessary to master the rudiments of the trade.

Hourly wage rates for apprentices start at a stipulated proportion of the journeyman rate (at least 65 percent in most cases) and increase periodically until the journeyman rate is reached at the completion of the apprenticeship.

Employment Outlook

Employment of construction machinery operators is expected to increase rapidly through 1975. assuming relatively full employment nationally and the high level of economic activity needed to achieve this goal. Thousands of additional job opportunities will result from the need to replace experienced workers who transfer to other fields of work, retire, or die. Retirements and deaths alone are expected to provide about 4,500 job openings annually.

The rapid rise in employment of operating engineers will occur mainly because of the anticipated growth in construction activity. (See discussion, p. 370.) The growing volume of highway construction resulting from the Federal Government's long-range, multibillion dollar highway development program, will be especially important in providing thousands of job opportunities for operating engineers. Job opportunities will also result from the need to maintain and repair the Nation's expanding highway system.

The trend toward the increasing use of construction machinery shows every indication of continuing. More specialized and more complex

machines, particularly those used in earth moving, as well as smaller machines suitable for small construction projects, are continually being developed and are expected to be used to a greater extent. The increasing mechanization of materials movement in factories and mines should also result in growing employment of operating engineers outside of construction.

Technological improvements are expected to limit somewhat the growth in employment of construction machinery operators. For example, the increased size, speed, mobility, and durability of construction machines has expanded operators' work efficiency. Mobile truck cranes are now in use that can lift 125 tons to a height of 330 feet (equivalent to a 33-story building). These mobile cranes can travel over highways at speeds up to 35 m.p.h. Scrapers are in use that can scoop up and carry from 75 to 150 tons of dirt in one load. Earth moving machines now move many times the amount of material that could be moved by the largest machine in use a few years ago. Redesign of equipment has reduced breakdowns and improved maintenance efficiency.

In addition to improvements in conventional machinery, many types of laborsaving equipment developed in recent years are expected to gain widespread use in the next decade. Frequently, these machines combine the functions of several conventional machines. One example is the slip-form paver that spreads, vibrates, forms, and finishes concrete paving in one continuous operation. The slip-form paver replaces at least four other machines formerly used in concrete paving. A pipelaying machine digs a trench, lowers the pipe into the trench, and fills the trench after the pipes are connected. In addition, electronic controls on construction equipment are being used increasingly. For example, the use of electronic grade controls on highway paving equipment results in smoother pavements and greater efficiency of the paving operation.

Earnings and Working Conditions

The wage rate structure for operating engineers is more complicated than for any other construction trade. Hourly rates are established not only for operators of different types of machines, but often for operators of machines of the same type but of different capacity. Moreover, in some cases there are different rates for the same machine, depending upon the type of construction for which it is used. The wage scale also varies among different parts of the country and the operators of machines having the top wage rates in one area do not necessarily receive the top wage rates in other areas.

Shovel operators, who generally are among the highest paid construction machinery operators, had union minimum hourly rates ranging from $3.45 in Charlotte, N.C., to $6.20 in Newark, N.J., as of July 1, 1964, according to a national survey of building trades workers in 68 large cities. The rates for bulldozer operators ranged from $3.08 in New Orleans, La., to $5.03 in New York City.

The operating engineer's work is performed outdoors; consequently, he usually works long days during the summer and may be laid off during the winter. The work is active and sometimes strenuous. The operation of some machines, particularly bulldozers and some types of scrapers, is physically tiring because the constant movement of the machine shakes or jolts the operator.

A large proportion of operating engineers are members of the International Union of Operating Engineers.

Where To Go for More Information

For further information regarding operating engineer apprenticeships or other work opportunities in this occupation, inquiries should be directed to local general contractors, a local of the International Union of Operating Engineers; a local joint apprenticeship committee; or the nearest office of the State Apprenticeship Committee or the Bureau of Apprenticeship and Training, U.S. Department of Labor. In addition, the local office of the State employment service may be a source of information about the Manpower Development and Training Act, apprenticeship, and other programs that provide training opportunities.

General information about the work of operating engineers may be obtained from:

Associated General Contractors of America, Inc.,
1957 E St. NW., Washington, D.C. 20006.

International Union of Operating Engineers,
1125 17th St. NW., Washington, D.C. 20036.