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EMPLOYMENT STATISTICS, 1960-67

BULLETIN 1643
U.S. DEPARTMENT
OF LABOR
Bureau of
Labor Statistics
1970

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OCCUPATIONAL EMPLOYMENT STATISTICS, 1960-67

BULLETIN 1643

U.S. DEPARTMENT
OF LABOR

George P. Shultz,
Secretary

BUREAU OF
LABOR STATISTICS

Geoffrey H. Moore,
Commissioner

1970



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PREFACE

This bulletin is the third in a series of bulletins and reports. It covers the period 1960 through 1967. The first two publications, *Occupational Employment Statistics, Sources and Data* (Report 305, June 1966) and *Occupational Employment Statistics 1960-66* (Bulletin 1579, January 1968), together presented information on occupational employment statistics from 1947 to 1966. The purpose of this bulletin is twofold. First, to provide a handy reference to the various sources of occupational employment statistics and second, to make available in one place the more recent figures on major occupations. This information should be useful to the ever-increasing number of researchers and students of the manpower and employment fraternity concerned with the changing occupational composition of the labor force and its implications for training programs, counseling, and manpower policy.

This bulletin was prepared in the Bureau's Office of Manpower and Employment Statistics by Douglas F. Schmude under the supervision of Richard E. Dempsey. George Silvestri developed the occupational matrix segment and Arthur Gartaganis provided technical assistance to the bulletin.

CONTENTS

Page

Chapters:

1.	Introduction	1
2.	Summary of occupational changes between 1960 and 1967	10
3.	The BLS industry-occupational employment matrix and its use in estimating current occupational employment levels	13
4.	Sources of industry occupational patterns	17
5.	Employment data for selected professional occupations	18
6.	Employment of teachers and librarians	20
7.	Occupational employment data from regulated interstate industries	22
8.	Employment in engineering, scientific, and technical occupations in private industry	25
9.	Employment of engineers, scientists, and technicians by universities and colleges and by scientific and research nonprofit organizations	33
10.	Occupational employment in Federal and State government	37

Tables:

1.	Number of employed persons by occupation and industry, 16 years of age and older, 1960 and 1967	4
2.	Estimated distribution for selected occupations in the communications equipment industry, except telephone and telegraph (SIC 3662), September 1967 and September 1968	16
3.	Occupational employment data available from professional associations, 1960-68	19
4.	Employment of teachers and librarians in fall of school year, 1959-60 through 1967-68	21
5.	Employment in selected occupations, regulated interstate industries, 1960-67	24
6.	Employment of engineers by industry, as of January 1961-67	27
7.	Employment of scientists by industry, as of January 1961-67	28
8.	Employment of technicians by industry, as of January 1961-67	29
9.	Employment of scientists by occupation and industry, as of January 1967	30
10.	Employment of technicians by occupation and industry, as of January 1967	31
11.	Minimum employment size of establishments by industry covered by 1961-67 surveys	32
12.	Employment of engineers and scientists by universities and colleges, as of January 1965	34
13.	Employment of engineers and scientists by universities and colleges, as of January 1967	35
14.	Employment of technicians by universities and colleges, as of January 1965 and January 1967	36
15.	Employment of engineers, scientists, and technicians by independent nonprofit institutions, as of January 1965 and January 1967	36
16.	Federal employment in selected white-collar occupations, as of October 1964, October 1966, and October 1967	38
17.	Employment in selected Post Office occupations, as of October 1960-67	42
18.	Employment of scientific, professional, and technical personnel by State governments, as of January 1964 and January 1967	42

OCCUPATIONAL EMPLOYMENT STATISTICS 1960-67

Chapter 1. Introduction

The need for reliable and timely statistics on the occupational composition of the work force has long been recognized. Nearly three decades ago Alba Edwards performed a vital role in focusing attention on occupational statistics and his influence was largely responsible for the improvements and expanded use of the occupational data collected in the decennial censuses of 1950 and 1960. In 1940, he stated the following evaluation that emphasizes the economic and social importance of information on occupational employment:

The most nearly dominant single influence in a man's life is probably his occupation. More than anything else, perhaps, a man's occupation determines his course and his contribution in life. And when life's span is ended, quite likely there is no other single set of facts that will tell so well the kind of man he was and the part he played in life as will a detailed and chronological statement of the occupation or occupations he pursued. Indeed, there is no other single characteristic that tells so much about a man and his status—social, intellectual, and economic—as does his occupation. A man's occupation not only tells, for each workday, what he does during one-half of his waking hours, but it indicates, with some degree of accuracy, his manner of life during the other half—the kind of house he will live in, and even, to some extent, the kind of food he will eat. And, usually, it indicates, in some degree, the cultural level of his family. In similar manner there probably is no single set of closely related facts that tell so much about a nation as do detailed statistics of the occupations of its workers. The occupations of a people influence directly their lives, their customs, their institutions—indeed, their very numbers. In fact, the social and economic status of a people is largely determined by the social and the economic status of its gainful workers. And, were the figures available, the social and industrial history of a people might be traced more accurately through detailed statistics of the occupations of its gainful workers than through records of its wars, its territorial conquests, and its political struggles.¹

What later observers have noted is that the Nation's economic growth depends greatly upon the way it trains and uses its manpower resources. This development culminated in recent

legislation in the vocational education fields which specifically calls for the development of estimates of occupational manpower requirements as a basic tool in planning vocational programs. It is obvious that if future occupational manpower requirements are to be prepared in a reliable manner, occupational data are needed more often than once in 10 years, and with a degree of detail meaningful to vocational training and education specialists. Unfortunately, the present sources of occupational statistics are inadequate to meet these demands. However, the Bureau is making available what information it possesses and is helping Federal, State, and local manpower agencies to make maximum use of these data.²

The term "occupation" as used in this bulletin means an aggregation of similar types of work. At the broadest level it may mean a grouping of all professional and technical jobs in all the skilled crafts; at a more detailed level it may mean all the engineering jobs or all the metalworking crafts. At a fairly specific level it may mean a distinct occupation—an electrical engineer or a patternmaker. In general, it is the same use of the term as is found in the decennial census of population, but not all the occupations shown in this bulletin were shown separately in the 1960 census publications, for example, "line, cable and conduit craftsmen."

The term occupation in employment statistics refers to the job at which a person is working rather than the specialty, craft, or discipline for which he considers himself best trained. Thus, a person trained as a sociologist but who was reported to be working as a salesman is classified with sales jobs rather than with professional jobs.

¹Alba M. Edwards, *Comparative Occupation Statistics for the United States, 1870 to 1940*, Washington, D.C., 1943. (U.S. Bureau of Census, Sixteenth Census of the U.S.: 1940, Population.)

²*Tomorrow's Manpower Needs* (Bulletin 1606, Washington, D.C.), February 1969.

Many of the estimates in table 1 were derived directly or indirectly from 1960 census statistics, but have been updated by a variety of techniques so as to reflect the occupational and industrial trends. Overall controls for the estimates at the broadest occupational levels were obtained from household-type data collected in the monthly sample survey of the labor force. At the detailed levels, a typical procedure involved the application of occupational ratios³ to current industrial employment statistics. In other words, current (1967) estimates of employment by industry, known to be highly accurate, were used as weights against which the specific occupational ratios were applied. Following this procedure occupational employment estimates are made in each industry and the results summed to national totals. (See discussion in chapter 3.)

Various sources of data other than the census were utilized when they appeared to be reliable, and these sources are presented in later chapters. As a general rule, data on occupations collected directly from employing organizations are considered preferable, if minimum statistical standards have been observed. This preference is based on the assumption that job functions are created by the employer and therefore, are best known to him. If we were interested primarily in the craft or discipline for which a person has been trained, the person himself would be the logical source. For this reason, the census data are considered merely a "proxy" for the type of information which the Bureau of Labor Statistics (BLS) is trying to develop for occupations. Since the overall controls for the estimates at the broadest occupational levels were obtained from households, they may or may not reflect the actual jobs as might be reported by employers.

Some of the statistics in this bulletin are obtained from the Bureau's own direct collection programs, which are expected to cover more industries and occupations in the future. In the past, this work has been mostly in the scientific and engineering professions (chapter 8) but in 1968 it was extended to blue-collar and other jobs in some manufacturing industries (chapter 4).

Table 1 presents the full occupational detail of the 1960 and 1967 industry-occupational employment matrices at the broad industry level. The industry employment estimates presented in the matrix are based on the total employment concept and differ in this respect from other BLS employment data. In addition to private

wage and salary employment, the matrix industries also include self-employed persons, unpaid family workers, and Federal, State, and local government workers employed in activities having counterparts in private industry (for example, Federal Government employees at naval shipyards are included in the matrix durable goods industry). Only government workers involved in activities unique to government are classified into the public administration industry. The matrix estimates are also adjusted to exclude the secondary jobs of multiple jobholders.

In the previous edition of this bulletin, annual averages of employment for selected occupations from the monthly household survey were presented. These data are not included in this edition since more detail can be obtained from table 1. Chapter 3 is devoted to a detailed description of the industry-occupational employment matrix.

Caution should be exercised when comparing the 1960 and 1967 occupational estimates within the major industry groups in table 1. Small changes between 1960 and 1967 estimates should not convey the notion of general reliability but rather should indicate the general level and position the estimates hold in relation to the other occupational estimates within the major industry groups. In general, the smaller the occupational estimates the less the reliability. Small occupational estimates derived independently from highly reliable sources would be more reliable than those which were not.⁴ Obviously, procedural factors, such as rounding, have a greater effect upon a small occupational estimate and its change than upon a large occupational estimate. The Bureau's staff will answer any inquiries regarding the reliability of specific occupational estimates.

Table 2 presents comprehensive occupational data on a specific industry collected directly from employers by BLS through a mail survey. This table contains the results of the September 1967 and 1968 surveys of occupational employment in the communication equipment industry, except telephone and telegraph. Certain occupations were subject to a relatively high degree of sampling error; therefore, the employment data should be used with

³The ratio is represented by a fraction, the numerator being the employment in a given occupation in a given industry, and the denominator being the total employment in all occupations in that industry.

⁴For example, engineers, scientists, and technicians data used from the 1960 and 1967 surveys of scientific and technical personnel in industry.

caution. Preliminary analysis showed no significant response error.

Occupational employment data for seven health occupations, registered architects and foresters are presented in table 3. These data are not subject to sampling error since the data, except where indicated, are based upon licensure data and membership records of professional societies. Response error is generally small.

Tables 4 through 10 and 12 through 18 present occupational employment data collected from industry establishments. These data may differ somewhat from similar occupational estimates shown in table 1 because of time period difference, elimination of double counting, and various other minor adjustments to insure data comparability in the industry-occupational matrices. Table 4 presents data on elementary and secondary school teachers in public and nonpublic schools as well as college instructional staff and librarians. Occupational employment statistics for

the regular industries, such as airlines, railroads, and telephone communications are shown in table 5. Tables 6 through 10 show employment statistics for engineers, scientists, and technicians by industry and occupation during the period 1961 through 1967. Tables 12 through 15 show employment in selected professional and technical occupations by universities and other research organizations in 1965 and 1967. White-collar employment by occupation in the Federal Government excluding the Post Office, is presented in table 16. Table 17 gives data for the Post Office separately. Table 18 shows occupational employment data in State governments for January 1964 and January 1967.

Additional occupational information will be forthcoming as the Bureau expands its direct collection of occupational employment statistics. These data will materially improve the identification of occupational patterns for all major industries.

Table 1. Number of employed persons by occupation and industry, 16 years of age and older, 1960 and 1967

Occupation	(In thousands)											
	Total		Agriculture, forestry, and fisheries		Mining		Construction		Durable goods, manufacturing		Nondurable goods, manufacturing	
	1960	1967	1960	1967	1960	1967	1960	1967	1960	1967	1960	1967
Total, all industries -----	65,778.0	74,372.0	5,590.9	3,937.7	719.8	628.4	4,056.3	4,335.8	9,701.0	11,666.2	7,442.7	8,050.6
Professional, technical, and kindred ----	7,469.0	9,879.0	58.6	57.4	60.2	58.1	225.9	241.8	944.5	1,209.4	420.6	479.1
Engineers -----	810.0	1,028.4	1.1	1.4	19.5	17.7	86.2	90.4	413.9	512.6	69.0	86.0
Aeronautical -----	45.8	62.4	-	-	-	-	-	-	40.1	49.6	-	1.1
Chemical -----	39.6	48.7	-	-	1.9	1.5	3	2	8.5	10.2	24.0	29.4
Civil -----	146.0	167.3	.6	1.1	1.3	1.3	75.8	80.4	9.7	11.3	3.6	3.8
Electrical -----	174.7	220.5	-	-	1.2	1.0	2.5	2.1	109.9	133.0	3.2	3.6
Industrial -----	83.2	111.0	-	-	1.2	1.6	.9	.7	57.1	72.4	10.5	14.8
Mechanical -----	153.5	201.2	-	-	1.4	1.8	3.7	3.1	103.6	135.0	13.8	17.7
Metallurgical -----	20.1	24.0	-	.1	.3	.5	-	-	16.9	18.4	.8	1.2
Mining -----	14.0	13.9	-	-	10.7	8.3	1	1	4	7	1.1	1.2
Sales -----	50.1	64.6	-	-	1.0	1.0	1.2	.8	32.0	37.2	3.7	4.6
Other -----	83.0	114.8	.5	.2	.5	.7	1.7	3.0	35.7	44.8	8.2	9.6
Medical and other health workers ----	1,321.4	1,625.2	15.1	17.2	.3	.2	.3	.2	10.0	7.2	6.7	6.2
Dentists -----	86.7	92.2	-	-	-	-	-	-	-	-	-	-
Dietitians and nutritionists -----	27.1	30.0	-	-	-	-	-	-	3	.5	.2	.3
Nurses, professional -----	495.6	629.0	.1	-	.1	.1	.1	-	5.6	4.6	3.2	2.4
Optometrists -----	17.0	17.0	-	-	-	-	-	-	1	-	-	-
Osteopaths -----	13.1	12.1	-	-	-	-	-	-	-	-	-	-
Pharmacists -----	113.8	122.4	-	-	-	-	-	-	1	.2	1.8	2.1
Physicians and surgeons ¹ -----	220.9	259.3	.1	-	.1	.1	.1	-	.8	.9	.6	.5
Psychologists -----	17.0	27.0	-	-	-	-	-	-	3	.3	.1	.1
Technicians, medical and dental -----	140.8	228.8	.2	-	.1	-	.1	-	2.8	.7	.6	.5
Veterinarians -----	18.6	23.0	14.7	17.2	-	-	-	-	-	-	.1	.2
Other ² -----	170.8	184.4	-	-	-	-	-	-	-	-	.1	.1
Teachers -----	1,945.1	2,706.4	.1	-	.1	.1	.6	.3	2.3	2.4	1.0	1.2
Elementary -----	977.9	1,197.7	-	-	-	-	-	-	-	-	-	-
Secondary -----	602.7	890.3	-	-	-	-	-	-	-	-	-	-
College ³ -----	206.2	399.9	-	-	-	-	-	-	-	-	-	-
Other -----	158.3	218.5	.1	-	.1	.1	.6	.3	2.3	2.4	1.0	1.2
Natural scientists -----	235.6	305.7	10.3	10.8	12.4	14.0	1.7	2.3	38.4	48.9	68.3	78.0
Chemists -----	91.0	111.9	.9	.2	1.3	1.0	.5	.3	16.0	18.1	47.5	55.3
Agricultural scientists -----	30.0	35.7	7.7	8.3	-	-	.1	.1	.8	.4	4.3	3.2
Biological scientists -----	29.5	35.6	1.6	2.2	-	-	.1	.1	.3	.7	7.3	6.8
Geologists and geophysicists -----	18.0	21.9	-	-	10.8	12.3	.6	1.0	.6	.8	1.0	.4
Mathematicians -----	20.7	38.0	-	-	.1	.3	.3	.6	8.3	16.5	1.2	2.7
Physicists -----	24.0	28.2	-	-	.2	.2	-	-	9.7	9.7	1.5	2.5
Other -----	22.4	34.4	.1	.1	-	.2	.1	.2	2.7	2.7	5.5	7.1
Social scientists -----	45.7	57.2	.1	.1	.3	.4	.5	.4	6.7	8.0	4.3	4.5
Economists -----	17.1	22.1	.1	.1	.1	.1	.1	.1	2.9	3.5	2.0	2.0
Statisticians and actuaries -----	22.8	26.9	-	-	.2	.2	.4	.4	3.6	4.3	2.0	2.1
Other -----	5.8	8.2	-	-	-	.1	-	-	.2	.2	.3	.4
Technicians, except medical and dental -----	730.9	911.7	6.0	8.3	15.7	11.6	91.7	98.6	261.4	324.3	70.3	71.6
Draftsmen -----	233.0	294.3	.2	.1	5.6	4.4	26.3	28.1	117.5	131.7	11.1	9.4
Surveyors -----	44.0	41.9	.5	.5	1.7	1.4	13.5	15.1	.4	1.2	.3	.3
Air traffic controllers -----	12.0	13.5	-	-	-	-	-	-	-	-	-	-
Radio operators -----	17.0	20.5	-	.1	.2	.2	.3	.3	.5	.7	.1	.1
Electrical and electronic -----	117.6	187.7	.1	.2	.5	1.2	2.9	5.3	64.7	91.7	.7	3.6
Other engineering and physical -----	238.0	258.0	.8	2.2	6.8	3.1	46.5	47.0	75.6	95.3	43.2	38.5
scientists -----	69.3	95.8	4.4	5.2	.9	1.3	2.2	2.8	2.7	3.7	14.9	19.7
Other professional, technical, and kindred -----	2,380.3	3,244.4	25.9	19.6	11.9	14.1	44.9	49.8	211.8	306.0	201.0	231.6
Accountants and auditors -----	429.3	556.2	1.0	.9	7.3	8.8	10.9	12.6	69.5	89.5	42.7	50.5
Airplane pilots and navigators -----	28.5	51.1	1.6	1.8	.4	.6	.4	.5	1.9	3.0	.6	.9
Architects -----	30.0	32.5	.1	.1	-	-	1.4	1.3	.8	.8	.2	.3
Clergymen -----	200.0	202.0	-	-	-	-	-	-	-	-	.1	.1
Designers, except design -----	66.0	87.5	.6	.6	.1	.1	3.6	4.3	23.0	30.0	14.2	17.5
draftsmen -----	100.0	103.3	.1	-	-	-	.2	.1	4.0	4.5	69.6	68.1
Editors and reporters -----	225.0	270.3	.1	.1	1.4	1.4	1.1	1.2	3.8	4.7	2.5	2.9
Lawyers and judges -----	80.0	116.4	.1	.1	-	-	.1	-	.8	1.5	.6	.6
Personnel and labor relations -----	100.0	140.0	.1	.1	1.0	1.1	1.1	1.6	23.2	30.0	11.7	14.9
workers -----	51.0	54.0	-	-	.1	.1	.2	.1	4.1	4.6	10.8	12.6
Photographers -----	105.0	155.4	-	-	-	-	-	-	.2	.2	.1	.1
Social and welfare workers -----	470.0	632.8	4.5	3.1	-	-	.6	.8	24.3	28.3	20.1	23.5
Teachers, workers in arts and -----	495.5	842.9	17.7	12.8	1.6	1.9	25.3	27.3	56.2	108.9	27.8	39.6
entertainment -----	7,067.0	7,495.0	31.1	23.0	68.0	63.7	471.4	438.7	557.3	623.9	512.6	516.7
Managers, officials, and proprietors ----	7,067.0	7,495.0	31.1	23.0	68.0	63.7	471.4	438.7	557.3	623.9	512.6	516.7
Conductors, railroad -----	43.3	43.0	-	-	-	-	.1	.1	.6	.6	.1	.1
Officers, pilots, engineers, ship -----	35.0	35.0	1.4	1.5	.7	.8	1.3	1.2	.6	.7	.5	.5
Creditmen -----	50.0	60.6	-	-	.2	.2	.1	.1	3.3	4.1	5.5	6.0
Purchasing agents -----	115.0	145.7	.3	.2	1.6	1.8	1.0	1.1	45.7	60.3	21.7	23.9
Postmasters and assistants -----	39.2	37.9	-	-	-	-	-	-	-	-	-	-
Other -----	6,784.5	7,172.8	29.4	21.3	65.5	60.9	468.9	436.2	507.1	558.2	484.8	486.2

See footnotes at end of table.

Table 1. Number of employed persons by occupation and industry, 16 years of age and older, 1960 and 1967—Continued

Occupation	(In thousands)											
	Transportation, communication, and public utilities		Wholesale and retail trade		Finance, insurance, and real estate		Private households		Services, except private households		Government public administration	
	1960	1967	1960	1967	1960	1967	1960	1967	1960	1967	1960	1967
Total employment-----	4,508.4	4,756.9	13,208.6	14,509.3	2,832.2	3,408.7	2,303.1	2,012.7	12,206.2	16,928.2	3,208.8	4,137.5
Professional, technical, and kindred ----	241.1	307.0	257.1	320.6	77.1	104.0	3.9	2.2	4,730.9	6,458.0	449.1	641.4
Engineers-----	51.7	61.6	15.4	24.8	2.6	4.4	-	-	91.9	152.8	58.7	76.7
Aeronautical-----	.4	.5	-	-	-	-	-	-	1.7	3.1	3.5	9.1
Chemical-----	.6	.6	.5	.6	-	-	-	-	3.3	5.2	.5	1.0
Civil-----	10.3	10.6	.9	1.4	.7	1.0	-	-	21.7	31.9	21.4	24.5
Electrical-----	26.9	33.2	1.1	1.1	.1	-	-	-	19.1	29.9	10.7	16.6
Industrial-----	2.3	2.9	.8	1.8	1.5	2.9	-	-	6.2	10.7	2.7	3.2
Mechanical-----	6.2	7.1	2.1	3.0	.1	.2	-	-	15.0	25.3	7.6	7.9
Metallurgical-----	.4	.6	.1	.1	-	-	-	-	1.2	2.6	.4	.6
Mining-----	.2	.6	.2	.7	.1	.1	-	-	.6	1.5	.6	.7
Sales-----	1.3	1.6	7.7	12.2	-	-	-	-	3.2	7.2	-	-
Other-----	3.1	3.9	2.0	3.9	.1	.2	-	-	19.9	35.4	11.3	13.1
Medical and other health workers-----	1.5	1.1	111.3	114.4	1.2	1.2	2.6	1.4	1,158.1	1,459.6	14.3	16.7
Dentists-----	-	-	.1	.1	-	-	-	-	86.1	91.4	.5	.7
Dietitians and nutritionists-----	.1	.1	1.0	1.7	.1	.2	-	-	25.0	26.4	.4	.8
Nurses, professional-----	.6	.5	.9	.8	.6	.5	2.4	1.3	478.3	615.8	3.7	3.0
Optometrists-----	-	-	3.2	2.7	-	-	-	-	13.7	14.3	-	-
Osteopaths-----	-	-	-	-	-	-	-	-	13.1	12.1	-	-
Pharmacists-----	-	-	104.7	107.0	-	-	-	-	6.4	12.1	.8	1.0
Physicians and surgeons ¹ -----	.4	.4	.5	.5	.4	.4	-	-	215.6	253.8	2.3	2.7
Psychologists-----	.1	-	.1	-	-	-	-	-	14.4	23.9	2.0	2.7
Technicians, medical and dental-----	.2	.1	.5	1.5	.1	.1	.1	-	134.5	224.1	1.6	1.8
Veterinarians-----	-	-	.1	-	-	-	-	-	1.4	2.1	2.3	3.5
Other ² -----	.1	-	.2	.1	-	-	.1	.1	169.6	183.6	.7	.5
Teachers-----	1.7	1.7	5.2	6.1	.5	.6	.5	.3	1,922.1	2,680.4	11.0	13.3
Elementary-----	-	-	-	-	-	-	.2	.1	977.1	1,197.2	.6	.4
Secondary-----	-	-	-	-	-	-	.1	-	601.9	889.3	.7	1.0
College ³ -----	-	-	-	-	-	-	-	-	206.2	399.9	-	-
Other-----	1.7	1.7	5.2	6.1	.5	.6	.2	.2	136.9	194.0	9.7	11.9
Natural scientists-----	2.2	2.7	2.5	10.0	.7	1.4	.1	-	61.9	85.8	37.1	51.8
Chemists-----	1.1	1.1	1.4	4.3	-	-	-	-	18.1	25.0	4.2	6.6
Agricultural scientists-----	.3	.3	-	1.4	-	.1	.1	-	3.6	7.1	13.1	14.8
Biological scientists-----	-	.1	.1	.3	-	-	-	-	14.8	16.9	5.3	8.5
Geologists and geophysicists-----	.5	.4	-	.2	-	-	-	-	2.1	3.3	2.4	3.5
Mathematicians-----	.2	.7	.8	2.3	.6	1.2	-	-	4.7	8.3	4.5	5.4
Physicists-----	-	-	.1	.3	-	-	-	-	8.4	10.3	4.1	5.2
Other-----	.1	.1	.1	1.2	.1	.1	-	-	10.2	14.9	3.5	7.8
Social scientists-----	4.0	3.9	3.0	3.4	5.5	6.7	-	-	9.4	14.1	11.9	15.7
Economists-----	1.3	1.3	1.6	1.8	1.5	2.1	-	-	3.8	5.6	3.7	5.6
Statisticians and actuaries-----	2.6	2.5	1.4	1.6	3.9	4.5	-	-	3.5	5.0	5.2	6.3
Other-----	.1	.1	-	-	.1	.1	-	-	2.1	3.5	3.0	3.8
Technicians, except medical and dental-----	53.0	71.4	20.6	31.1	2.0	1.5	-	-	135.9	198.5	74.3	94.8
Draftsmen-----	9.3	10.1	5.4	4.8	.1	.7	-	-	50.9	97.8	6.6	7.2
Surveyors-----	3.4	3.7	.3	-	.5	-	-	-	16.0	15.2	7.4	4.5
Air traffic controllers-----	-	-	-	-	-	-	-	-	-	-	12.0	13.5
Radio operators-----	7.6	8.7	.2	.1	.1	-	-	-	.4	.6	7.6	9.7
Electrical and electronic-----	21.8	25.9	3.6	17.1	.5	.1	-	-	10.3	23.6	12.5	19.0
Other engineering and physical scientists-----	7.5	17.9	6.5	2.6	.5	.4	-	-	33.1	24.9	17.5	26.1
Other-----	3.4	5.1	4.6	6.5	.3	.3	-	-	25.2	36.4	10.7	14.8
Other professional, technical, and kindred-----	127.0	164.6	99.1	130.8	64.6	88.2	.7	.5	1,351.6	1,866.8	241.8	372.4
Accountants and auditors-----	31.9	38.4	47.6	58.4	36.3	48.2	.1	.1	124.1	169.8	57.9	79.0
Airplane pilots and navigators-----	19.5	37.5	.5	.8	.1	.1	-	-	1.2	2.5	2.3	3.4
Architects-----	.2	.2	.3	.2	.3	.3	-	-	25.5	28.0	1.2	1.3
Clergymen-----	-	-	-	-	-	-	.1	-	199.7	201.8	.1	.1
Designers, except design draftsmen-----	1.2	1.4	5.8	7.3	.1	.2	-	-	16.9	25.4	.5	.7
Editors and reporters-----	4.5	4.5	1.8	2.2	.6	.7	-	-	15.8	19.4	3.4	3.8
Lawyers and judges-----	2.7	2.7	1.6	2.0	8.4	9.9	-	-	167.8	200.0	35.6	45.4
Librarians-----	.3	.3	.2	.2	.2	.3	-	-	76.0	111.3	1.7	2.0
Personnel and labor relations workers-----	7.3	8.8	8.1	11.6	4.4	6.1	-	-	15.0	25.1	28.1	40.7
Photographers-----	1.1	1.2	1.5	1.6	.3	.2	-	-	29.7	30.1	3.2	3.5
Social and welfare workers-----	.1	.1	.1	-	.2	.3	-	-	42.9	62.1	61.4	42.6
Teachers, workers in arts and entertainment-----	7.3	8.9	17.5	23.2	.5	.6	.3	.2	389.4	537.3	5.5	6.9
Other-----	50.9	60.6	14.1	23.3	13.2	21.3	.2	.2	247.6	454.0	40.9	93.0
Managers, officials, and proprietors-----	376.4	389.1	3,231.5	3,129.0	578.3	721.3	1.0	.7	929.9	1,201.3	309.5	387.6
Conductors, railroad-----	42.2	41.9	-	-	.1	.1	-	-	-	-	.2	.2
Officers, pilots, engineers, ship-----	28.4	28.4	.4	.3	-	-	.9	.7	.4	.5	.4	.4
Creditmen-----	1.0	.9	29.2	34.0	7.9	11.1	-	-	2.8	4.2	-	-
Purchasing agents-----	4.3	4.7	20.2	23.7	3.1	4.1	-	-	10.5	16.8	6.6	9.1
Postmasters and assistants-----	-	-	-	-	-	-	-	-	-	-	39.2	37.9
Other-----	300.5	313.2	3,181.7	3,071.0	567.2	706.0	.1	-	916.2	1,179.8	263.1	340.0

See footnotes at end of table.

Table 1. Number of employed persons by occupation and industry, 16 years of age and older, 1960 and 1967—Continued

Occupation	(In thousands)											
	Total		Agriculture, forestry, and fisheries		Mining		Construction		Durable goods, manufacturing		Nondurable goods, manufacturing	
	1960	1967	1960	1967	1960	1967	1960	1967	1960	1967	1960	1967
Clerical and kindred workers -----	9,762.0	12,333.0	33.1	27.3	64.2	67.3	175.1	199.1	1,211.9	1,438.6	924.3	1,036.6
Stenographers, typists, and secretaries -----	2,383.0	3,190.0	9.1	7.2	21.3	22.9	51.2	59.0	319.0	392.8	220.5	258.9
Office-machine operators -----	375.2	482.2	.3	.2	1.1	1.9	1.7	2.1	50.9	68.7	47.4	55.4
Other clerical and kindred -----	7,003.8	8,660.8	23.7	19.9	41.8	42.5	122.2	138.0	842.0	977.1	656.4	722.3
Accounting clerks -----	382.7	440.5	1.1	.9	3.1	3.1	21.1	24.5	44.0	50.1	45.0	45.8
Bookkeepers, hand -----	667.3	769.5	8.2	6.7	5.0	5.0	27.5	31.0	42.3	44.2	55.2	58.0
Bank tellers -----	127.0	189.6	-	-	-	-	-	-	-	-	-	-
Cashiers -----	478.8	691.4	.4	.1	.1	.1	.3	.4	3.7	4.2	6.5	6.6
Mail carriers -----	205.5	230.2	-	-	-	-	-	-	-	-	-	-
Postal clerks -----	242.7	295.6	-	-	-	-	-	-	-	-	-	-
Shipping and receiving clerks -----	325.0	371.5	.6	.2	.7	.9	1.0	.8	103.6	120.9	101.1	106.6
Telephone operators -----	355.2	388.9	.1	-	.7	.7	1.6	1.6	13.9	15.2	14.0	14.5
Other -----	4,219.6	5,283.6	13.3	12.0	32.2	32.7	70.7	79.7	634.5	742.5	434.6	490.8
Salesworkers -----	4,224.0	4,525.0	8.3	5.6	3.0	3.1	11.9	12.5	175.7	198.6	301.3	306.9
Insurance agents -----	365.0	407.0	-	-	-	-	-	-	-	-	-	-
Real estate agents -----	195.0	205.0	-	-	.1	.1	.5	.6	-	-	.1	.1
Other -----	3,664.0	3,913.0	8.3	5.6	2.9	3.0	11.4	11.9	175.7	198.6	301.2	308.8
Craftsmen, foremen, and kindred -----	8,554.0	9,845.0	27.4	27.6	172.8	162.9	2,119.7	2,307.0	2,187.4	2,633.1	1,079.0	1,163.1
Construction craftsmen -----	2,552.0	2,763.0	7.9	7.3	44.5	40.3	1,803.7	1,931.2	260.2	290.5	81.3	80.0
Carpenters -----	832.0	840.0	4.2	3.9	3.6	2.8	656.5	648.5	62.9	67.1	15.5	13.3
Brickmasons and tile setters -----	186.0	209.7	.3	.4	.7	.7	162.8	183.2	11.9	12.4	2.0	2.1
Cement and concrete finishers -----	46.0	54.1	-	-	-	-	45.0	53.1	.3	.3	.2	.2
Electricians -----	359.0	406.5	.2	.1	11.0	9.4	137.0	166.4	89.4	101.8	31.3	31.6
Excavating, grading machine operators -----	245.0	267.1	2.1	1.9	26.0	24.6	184.8	203.2	9.2	8.9	3.2	3.7
Painters and paperhangers -----	416.0	466.5	.9	.9	1.2	.9	299.0	324.3	22.4	23.4	3.6	3.3
Plasterers -----	50.0	52.3	-	-	-	-	47.5	49.2	.3	.3	.2	.2
Plumbers and pipefitters -----	303.0	335.0	.2	.1	1.8	1.7	186.9	209.5	38.3	44.1	24.6	24.7
Roofers and slaters -----	50.0	53.2	-	-	-	-	46.7	49.6	.6	.6	.4	.5
Structural metalworkers -----	65.0	78.6	-	-	.2	.2	37.5	44.2	24.9	31.6	.3	.4
Foremen, n. e. c. -----	1,137.0	1,427.0	5.6	6.3	39.7	41.7	90.6	118.3	414.3	541.0	297.9	345.0
Metalworking craftsmen, except mechanics -----	1,090.0	1,260.0	.5	.2	10.0	8.1	48.2	56.9	874.9	1,032.2	64.4	71.8
Machinists and related occupations -----	495.3	575.7	.3	.2	3.8	3.6	2.8	3.0	413.7	493.6	29.4	32.6
Blacksmith, forgemen, and hammermen -----	33.6	31.9	.2	-	4.9	3.4	1.1	1.5	16.5	17.3	.9	1.0
Boilermakers -----	24.1	24.8	-	-	.6	.4	4.0	4.8	10.8	11.6	3.3	3.1
Heat treaters, annealers -----	20.4	23.6	-	-	-	-	.2	.1	20.0	23.2	-	-
Millwrights -----	69.0	78.3	-	-	.4	.4	5.0	6.8	43.1	48.6	18.5	20.3
Molders, metal, except coremakers -----	54.2	60.3	-	-	-	-	.1	-	53.9	60.0	.1	.2
Patternmakers, metal and wood -----	40.4	48.4	-	-	-	-	.1	-	36.7	43.1	1.3	1.8
Rollers and roll hands -----	31.5	32.7	-	-	-	-	.1	.1	31.2	32.4	-	-
Sheet-metal workers -----	138.5	161.3	-	-	.1	.1	34.6	40.5	77.4	92.1	4.1	3.8
Toolmakers, diemakers, and setters -----	183.0	223.0	-	-	.2	.2	.2	.1	171.6	210.3	6.8	9.0
Mechanics and repairmen -----	2,014.0	2,539.0	10.7	11.6	28.6	32.0	96.3	102.8	319.8	419.5	167.9	209.4
Air conditioning, heating and refrigeration -----	62.7	111.2	-	-	.1	.2	18.4	38.4	5.6	11.7	3.1	5.3
Airplane mechanics and repairmen -----	111.6	155.0	.3	.6	.1	.1	-	-	38.7	52.4	.3	.4
Motor vehicle mechanics -----	678.9	802.6	1.2	1.1	1.3	1.5	5.8	6.6	35.9	38.1	8.5	9.0
Office machine mechanics -----	51.0	73.4	-	-	-	-	-	-	6.0	9.1	.3	.3
Radio and television mechanics -----	103.3	118.5	.1	.1	.1	.2	.8	.8	6.7	9.6	.1	.1
Railroad and car shop mechanics -----	39.2	37.0	-	-	.1	.1	.1	.1	1.2	1.6	.1	.1
Other -----	967.3	1,241.3	9.1	9.8	26.9	29.9	71.2	57.0	225.7	297.0	155.5	194.2
Printing trades craftsmen -----	302.0	311.5	-	-	.1	.1	.3	.3	13.0	15.0	271.1	273.9
Compositors and typesetters -----	182.5	178.0	-	-	.1	.1	.1	.1	5.2	5.5	165.1	156.8
Electrotypers and stereotypers -----	9.0	6.5	-	-	-	-	-	-	.1	.2	8.8	6.2
Engravers, except photoengravers -----	10.9	12.7	-	-	-	-	.1	.1	4.0	4.6	5.5	6.6
Photoengravers and lithographers -----	24.2	33.0	-	-	-	-	-	-	1.6	2.1	21.5	29.5
Pressmen and plate printers -----	75.4	81.3	-	-	-	-	.1	.1	2.1	2.6	70.2	74.8
Transportation and public utility craftsmen -----	373.8	401.8	.1	.1	1.4	1.4	7.3	10.7	8.5	14.6	.9	1.1
Line and servicemen, telephone and power -----	285.7	336.9	.1	.1	.1	.1	7.2	10.5	6.2	11.7	.5	.7
Locomotive engineers -----	46.5	43.6	-	-	1.2	1.2	.1	.1	2.1	2.7	.4	.4
Locomotive firemen -----	41.6	21.3	-	-	.1	.1	-	-	.2	.2	-	-
Other craftsmen and kindred -----	1,085.2	1,142.7	2.6	2.1	48.5	39.3	73.3	86.8	296.7	320.3	195.5	181.9
Bakers -----	102.5	100.0	-	-	.1	.1	.2	.1	.2	.2	69.7	62.4
Cabinetmakers -----	66.0	67.1	-	-	-	-	6.3	6.7	35.5	36.2	.8	.8
Cranemen, derrickmen, and hoistmen -----	124.0	140.9	.2	.1	6.2	6.0	16.7	20.9	78.4	86.8	6.1	6.6
Glaziers -----	15.8	18.8	-	-	-	-	5.0	6.7	3.2	3.6	.2	.2
Jewelers and watchmakers -----	37.0	35.8	-	-	-	-	-	-	10.1	10.2	-	-
Loom fixers -----	25.0	24.8	-	-	-	-	-	-	.2	.2	24.8	24.6
Opticians, lens grinders and polishers -----	20.4	21.2	-	-	-	-	-	-	9.2	9.1	-	-
Inspectors, log and lumber -----	19.5	19.7	.2	.2	-	-	.1	.1	15.9	15.5	.9	1.0
Inspectors, other -----	95.5	99.0	.6	.5	2.6	2.0	13.1	17.6	10.6	10.6	2.1	1.9
Upholsterers -----	59.0	61.9	-	-	-	-	.4	.4	26.4	27.0	1.3	1.6
Other -----	520.5	553.5	1.6	1.3	39.6	31.2	31.5	34.3	107.0	120.9	89.6	82.8

See footnotes at end of table.

Table 1. Number of employed persons by occupation and industry, 16 years of age and older, 1960 and 1967—Continued

Occupation	(In thousands)											
	Transportation, communication, and public utilities		Wholesale and retail trade		Finance, insurance, and real estate		Private households		Services, except private households		Government public administration	
	1960	1967	1960	1967	1960	1967	1960	1967	1960	1967	1960	1967
Clerical and kindred workers -----	1,097.3	1,176.6	1,865.3	2,327.2	1,286.1	1,586.4	4.0	4.3	1,729.6	2,773.6	1,371.1	1,695.9
Stenographers, typists, and secretaries -----	129.4	149.7	270.7	321.5	369.4	456.7	2.9	3.0	721.1	1,163.6	268.5	354.7
Office-machine operators -----	36.7	42.5	99.8	119.2	78.5	103.7	-	-	25.0	44.5	33.8	44.0
Other clerical and kindred -----	931.2	984.4	1,494.9	1,886.5	838.2	1,026.1	1.1	1.3	983.5	1,565.5	1,068.8	1,297.2
Accounting clerks -----	46.5	48.0	102.3	116.3	41.8	46.2	-	-	39.0	56.5	38.8	49.1
Bookkeepers, hand -----	16.2	17.8	269.9	296.5	138.2	166.4	.2	.1	104.6	143.8	-	-
Bank tellers -----	-	-	-	-	127.0	189.6	-	-	-	-	-	-
Cashiers -----	27.8	34.5	348.5	513.2	30.3	40.1	-	-	54.7	84.0	6.5	8.2
Mail carriers -----	-	-	-	-	-	-	-	-	-	-	205.5	230.2
Postal clerks -----	-	-	-	-	-	-	-	-	-	-	242.7	295.6
Shipping and receiving clerks -----	10.0	12.4	96.8	112.9	1.2	1.7	-	-	7.5	11.7	2.5	3.4
Telephone operators -----	230.9	228.0	22.2	27.9	13.4	16.2	-	-	48.7	73.0	9.7	11.8
Other -----	599.8	643.7	655.2	819.7	486.3	565.9	.9	1.2	729.0	1,196.5	563.1	698.9
Salesworkers -----	39.3	46.8	3,010.9	3,163.9	581.4	661.9	-	-	88.5	121.4	3.7	4.3
Insurance agents -----	.2	.1	.2	.2	363.9	405.9	-	-	.1	.1	.6	.7
Real estate agents -----	-	-	.5	.7	193.3	202.9	-	-	.2	.3	.3	.3
Other -----	39.1	46.7	3,010.2	3,163.0	24.2	53.1	-	-	88.2	121.0	2.8	3.3
Craftsmen, foremen, and kindred -----	959.1	1,010.9	902.3	1,095.6	46.1	61.1	6.8	6.0	784.2	1,021.3	269.2	356.4
Construction craftsmen -----	92.6	86.6	69.0	72.3	16.0	21.9	4.7	3.9	102.8	147.1	69.3	81.9
Carpenters -----	13.7	12.0	27.6	28.6	5.5	7.3	2.3	2.0	26.5	40.4	13.7	14.1
Brickmasons and tile setters -----	.6	.7	4.8	6.0	.2	.2	.2	.1	1.5	2.6	1.0	1.3
Cement and concrete finishers -----	.1	.1	.2	.2	-	-	-	-	.1	.1	.1	.1
Electricians -----	38.4	34.8	8.6	8.5	1.2	1.3	-	-	20.1	27.0	21.8	25.6
Excavating, grading machine operators -----	7.8	9.0	2.8	2.9	.4	.5	-	-	1.6	3.0	7.1	9.4
Painters and paperhangers -----	9.5	8.8	11.8	13.1	7.5	11.3	2.1	1.8	42.4	59.3	15.6	19.4
Plasterers -----	-	-	.1	.1	.5	.6	-	-	1.2	1.6	.2	.3
Plumbers and pipefitters -----	21.2	20.0	11.4	11.1	.7	.7	.1	-	8.9	12.4	8.9	10.7
Roofers and slaters -----	.1	-	1.5	1.6	-	-	-	-	.3	.5	.4	.4
Structural metalworkers -----	1.2	1.2	.2	.2	-	-	-	-	.2	.2	.5	.6
Foremen, n. e. c. -----	122.3	131.8	98.8	136.7	3.9	5.9	-	-	37.0	61.2	26.9	39.1
Metalworking craftsmen, except mechanics -----	44.4	37.1	8.0	7.3	.1	.1	-	-	16.3	19.2	23.2	27.1
Machinists and related occupations--Blacksmith, forgemen, and hammermen -----	30.6	24.5	.6	.6	-	-	-	-	3.1	4.9	11.0	12.7
Boilermakers -----	2.8	2.4	.4	.4	-	-	-	-	6.4	5.4	.4	.5
Boilermakers -----	3.6	2.9	.2	.2	-	-	-	-	1.2	1.5	.4	.3
Heat treaters, annealers -----	-	-	-	-	-	-	-	-	-	-	.2	.3
Millwrights -----	.6	.6	.7	.6	-	-	-	-	.4	.8	.3	.2
Molders, metal, except coremakers -----	.1	.1	-	-	-	-	-	-	-	-	-	-
Patternmakers, metal and wood -----	.1	-	.2	.2	-	-	-	-	.8	1.5	1.2	1.8
Rollers and roll hands -----	-	-	.2	.2	-	-	-	-	-	-	-	-
Sheet-metal workers -----	5.8	6.0	5.0	4.6	.1	.1	-	-	2.9	4.2	8.5	9.9
Toolmakers, diemakers, and setters -----	.8	.6	.7	.5	-	-	-	-	1.5	.9	1.2	1.4
Mechanics and repairmen -----	244.2	292.0	542.8	684.6	15.4	21.5	1.8	1.9	467.9	596.7	118.6	167.0
Air conditioning, heating, and refrigeration -----	1.3	2.5	16.0	28.5	.2	.5	-	-	15.1	17.2	2.9	6.9
Airplane mechanics and repairmen -----	37.6	55.5	1.7	2.9	-	-	-	-	1.8	3.8	31.1	39.3
Motor vehicle mechanics -----	56.6	69.9	320.6	394.9	.2	.4	-	-	233.9	260.4	14.9	20.7
Office machine mechanics -----	.3	.2	33.9	49.9	.3	.4	-	-	9.7	12.9	.5	.6
Radio and television mechanics -----	3.6	3.8	32.1	34.7	-	-	-	-	51.1	58.0	8.7	11.2
Railroad and car shop mechanics -----	37.5	34.9	-	-	-	-	-	-	.1	.1	.1	.2
Other -----	107.3	125.2	138.5	173.7	14.7	20.2	1.8	1.9	156.2	244.3	60.4	88.1
Printing trades craftsmen -----	1.2	1.1	3.5	4.0	2.4	2.6	-	-	6.1	9.0	4.3	5.5
Compositors and typesetters -----	.8	.7	2.5	3.1	2.0	2.2	-	-	4.6	6.8	2.1	2.7
Electrotypers and stereotypers -----	.1	.1	-	-	-	-	-	-	-	-	-	-
Engravers, except photoengravers--Photoengravers and lithographers--Pressmen and plate printers -----	.1	.1	.6	.6	-	-	-	-	.2	.2	.4	.5
Photoengravers and lithographers--Pressmen and plate printers -----	.1	.1	.1	.1	.1	.1	-	-	.3	.4	.5	.7
Pressmen and plate printers -----	.1	.1	.3	.2	.3	.3	-	-	1.0	1.6	1.3	1.6
Transportation and public utility craftsmen -----	351.7	367.0	.4	.5	-	.1	-	-	.6	1.5	2.9	4.8
Line and servicemen, telephone and power -----	268.0	307.2	.4	.5	-	.1	-	-	.6	1.5	2.6	4.5
Locomotive engineers -----	42.5	38.9	-	-	-	-	-	-	-	-	.2	.3
Locomotive firemen -----	41.2	20.9	-	-	-	-	-	-	-	-	.1	-
Other craftsmen and kindred -----	102.7	95.3	179.8	190.2	8.3	9.0	.3	.2	153.5	186.6	24.1	31.0
Bakers -----	.2	.2	23.5	25.4	.1	-	.1	-	8.1	11.3	.3	.3
Cabinetmakers -----	.4	.3	16.8	16.2	.1	.1	-	-	5.3	5.9	.8	.9
Cranemen, derrickmen, and hoistmen -----	7.6	8.7	6.1	8.3	.1	.1	-	-	.7	1.2	1.9	2.2
Glaziers -----	-	-	6.7	7.6	.1	.1	-	-	.5	.5	.1	.1
Jewelers and watchmakers -----	-	-	17.0	17.0	-	-	-	-	9.8	8.5	.1	.1
Loom fixers -----	-	-	-	-	-	-	-	-	-	-	-	-
Opticians, lens grinders and polishers -----	-	-	9.3	9.2	-	-	-	-	1.8	2.7	.1	.2
Inspectors, log and lumber -----	.2	.1	1.9	2.0	-	-	-	-	.2	.7	.1	.1
Inspectors, other -----	46.5	41.6	6.7	7.1	3.0	3.2	-	-	10.3	14.5	-	-
Upholsterers -----	.9	.7	9.3	10.7	-	-	-	-	19.9	20.6	.8	.9
Other -----	46.9	43.7	82.5	86.7	4.9	5.5	.2	.2	96.6	120.7	19.8	26.2

See footnotes at end of table.

Table 1. Number of employed persons by occupation and industry, 16 years of age and older, 1960 and 1967—Continued

Occupation	(In thousands)											
	Total		Agriculture, forestry, and fisheries		Mining		Construction		Durable goods, manufacturing		Nondurable goods, manufacturing	
	1960	1967	1960	1967	1960	1967	1960	1967	1960	1967	1960	1967
Operatives and kindred workers -----	11,950.0	13,883.0	103.0	91.7	343.0	266.1	318.5	412.9	3,717.7	4,727.4	3,651.4	4,072.8
Drivers and deliverymen -----	2,367.0	2,511.0	65.0	60.3	33.1	32.1	144.8	162.7	168.8	171.0	316.1	311.8
Drivers, bus, truck, and tractor -----	1,769.2	1,859.2	62.3	58.3	32.7	31.5	142.4	160.2	157.3	156.9	142.9	136.7
Deliverymen, routemen, and cab drivers -----	597.8	651.8	2.7	2.0	.4	.6	2.4	2.5	11.5	14.1	173.2	175.1
Semiskilled metalworking occupations -----	1,452.8	1,898.4	.4	.6	7.8	9.5	30.9	46.1	1,336.6	1,744.5	16.3	20.6
Assemblers, metalworking, class A -----	101.1	142.7	-	-	-	-	-	-	101.1	142.7	-	-
Assemblers, metalworking, class B -----	467.9	599.6	-	-	-	-	-	-	467.9	599.6	-	-
Inspectors, metalworking, class B -----	179.0	231.2	-	-	-	-	-	-	179.0	231.2	-	-
Machine-tool operators, class B -----	258.9	321.5	-	-	-	-	-	-	258.9	321.5	-	-
Electroplaters -----	11.7	15.8	-	-	-	-	-	-	11.7	15.8	-	-
Electroplater helpers -----	20.2	26.4	-	-	-	-	-	-	20.2	26.4	-	-
Furnacemen, smeltermen, and pourers -----	52.1	60.6	-	-	.2	.3	-	-	51.6	59.9	.2	.2
Heaters, metal -----	6.9	8.3	-	-	-	-	-	-	6.9	8.3	-	-
Welders and flamecutters -----	355.0	492.3	.4	.6	7.6	9.2	30.9	46.1	239.3	339.1	16.1	20.4
Transportation and public utility operatives -----	156.4	148.8	-	-	.6	.6	2.3	2.8	6.8	7.5	3.6	4.3
Brakemen and switchmen, railroad -----	103.2	92.9	-	-	.2	.2	-	-	4.7	4.9	.4	.4
Power station operators -----	20.9	22.1	-	-	.1	.1	.4	.5	1.7	2.1	2.8	3.5
Sailors and deckhands -----	32.3	33.8	-	-	.3	.3	1.9	2.3	.4	.5	.4	.4
Semiskilled textile occupations -----	780.0	992.6	-	-	-	-	-	-	28.9	39.0	750.6	952.9
Knitters, loopers and topplers -----	44.0	47.3	-	-	-	-	-	-	-	-	44.0	47.3
Spinners, textile -----	50.0	50.1	-	-	-	-	-	-	.1	.1	49.9	49.9
Weavers, textile -----	61.0	61.3	-	-	-	-	-	-	.5	.5	60.0	60.2
Sewers and stitchers, manufacturing -----	625.0	833.9	-	-	-	-	-	-	28.3	38.4	596.7	795.5
Other operatives and kindred -----	7,193.8	8,332.2	37.6	30.8	301.5	223.9	140.5	201.3	2,176.6	2,765.4	2,564.8	2,783.2
Asbestos, insulation workers -----	19.6	23.6	-	-	-	-	11.4	13.4	4.2	5.7	2.3	2.7
Auto attendants, gas and parking -----	380.0	397.0	-	-	-	-	.3	.3	1.4	1.6	.6	.5
Blasters and powdermen -----	5.1	4.9	-	-	3.2	2.7	1.2	1.5	.4	.5	.3	.2
Laundry and drycleaning operatives -----	392.1	405.0	-	-	-	-	-	-	.2	.1	3.1	2.0
Mine operatives, laborers, n. e. c. -----	281.0	204.3	-	-	281.0	204.3	-	-	-	-	-	-
Meat cutters, except meat packing -----	189.9	203.4	.1	-	.1	.1	-	-	.3	.2	.8	.9
Other -----	5,926.1	7,094.0	37.5	30.8	17.2	16.8	127.6	186.1	2,170.1	2,757.3	2,557.7	2,776.9
Service workers -----	8,023.0	9,325.0	12.9	10.3	8.6	7.2	20.3	18.8	174.9	172.1	153.9	131.3
Private household workers -----	1,973.0	1,769.0	-	-	-	-	-	-	-	-	-	-
Protective service workers -----	765.0	954.0	2.2	1.4	4.2	3.1	7.4	5.7	76.7	74.4	40.1	33.4
Firemen -----	148.0	192.0	-	.1	-	-	.2	.1	2.0	2.7	.6	.6
Policemen and other law enforcement -----	287.0	396.3	.1	-	.1	.1	.5	.2	2.6	2.7	1.3	1.8
Guards, watchmen, and doorkeepers -----	330.0	365.5	2.1	1.3	4.1	3.0	6.7	5.4	72.1	69.0	38.2	31.0
Food service workers -----	1,653.0	2,061.0	3.5	2.3	.7	.7	1.8	1.6	8.1	9.0	11.9	11.5
Bartenders -----	163.7	188.0	-	-	-	-	-	-	-	-	.1	.1
Cooks, except private households -----	530.0	676.1	3.3	2.2	.7	.7	1.1	.9	2.6	2.7	4.7	4.3
Counter and fountain workers -----	150.4	232.3	-	-	-	-	.3	.3	3.6	4.2	3.0	3.1
Waiters and waitresses -----	808.9	964.6	.2	.1	-	-	.4	.4	1.9	2.1	4.1	4.0
Other service workers -----	3,632.0	4,541.0	7.2	6.6	3.7	3.4	11.1	11.5	90.1	88.7	101.9	86.4
Airline stewards and stewardesses -----	12.9	23.5	-	-	-	-	-	-	-	-	-	-
Attendants, hospital and other institutions -----	450.0	713.1	3.8	3.8	-	-	-	-	.3	.7	.2	.2
Charwomen and cleaners -----	200.0	273.4	.2	.1	.3	.4	2.6	3.1	11.6	13.4	14.7	12.9
Janitors and sextons -----	625.0	849.2	.8	.3	2.2	1.9	4.5	4.9	47.0	46.2	45.1	40.1
Nurses, practical -----	225.0	304.2	.1	-	-	-	-	-	.5	.4	.2	.2
Other -----	2,119.1	2,377.6	2.3	2.4	1.2	1.1	4.0	3.5	30.7	28.0	41.7	33.0
Laborers, except farm and mine -----	3,553.0	3,533.0	140.5	140.8	-	-	713.5	705.0	731.6	663.1	399.6	344.1
Farmers and farm workers -----	5,176.0	3,554.0	5,176.0	3,554.0	-	-	-	-	-	-	-	-

See footnotes at end of table.

Table 1. Number of employed persons by occupation and industry, 16 years of age and older, 1960 and 1967—Continued

Occupation	(In thousands)											
	Transportation, communication, and public utilities		Wholesale and retail trade		Finance, insurance, and real estate		Private households		Services, except private households		Government public administration	
	1960	1967	1960	1967	1960	1967	1960	1967	1960	1967	1960	1967
Operatives and kindred workers -----	1,188.1	1,235.1	1,695.2	1,901.8	11.4	15.1	13.9	8.6	796.4	1,011.0	111.4	140.5
Drivers and deliverymen -----	839.6	890.6	615.1	635.7	2.6	3.2	10.6	6.2	134.9	191.0	36.4	46.4
Drivers, bus, truck, and tractor -----	700.7	758.6	420.2	397.5	1.7	2.0	.3	.1	76.2	115.6	32.5	41.8
Deliverymen, routemen, and cab drivers -----	138.9	132.0	194.9	238.2	.9	1.2	10.3	6.1	58.7	75.4	3.9	4.6
Semiskilled metalworking occupations -----	15.0	16.1	15.6	20.1	-	-	-	-	26.3	35.5	3.9	5.4
Assemblers, metalworking, class A -----	-	-	-	-	-	-	-	-	-	-	-	-
Assemblers, metalworking, class B -----	-	-	-	-	-	-	-	-	-	-	-	-
Inspectors, metalworking, class B -----	-	-	-	-	-	-	-	-	-	-	-	-
Machine-tool operators, class B -----	-	-	-	-	-	-	-	-	-	-	-	-
Electroplaters -----	-	-	-	-	-	-	-	-	-	-	-	-
Electroplater helpers -----	-	-	-	-	-	-	-	-	-	-	-	-
Furnacemen, smeltermen and pourers -----	.1	.1	-	-	-	-	-	-	-	.1	-	-
Heaters, metal -----	-	-	-	-	-	-	-	-	-	-	-	-
Welders and flamecutters -----	14.9	16.0	15.6	20.1	-	-	-	-	26.3	35.4	3.9	5.4
Transportation and public utility operatives -----	140.5	131.1	1.1	.9	-	-	-	-	.3	.7	1.2	.9
Brakemen and switchmen, railroad -----	97.4	86.9	.3	.3	-	-	-	-	-	-	.2	.2
Power station operators -----	15.2	14.8	.2	.2	-	-	-	-	.2	.5	.3	.4
Sailors and deckhands -----	27.9	29.4	.6	.4	-	-	-	-	.1	.2	.7	.3
Semiskilled textile occupations -----	-	.1	.3	.4	-	-	-	-	.2	.2	-	-
Knitters, loopers and toppers -----	-	-	-	-	-	-	-	-	-	-	-	-
Spinners, textile -----	-	.1	-	-	-	-	-	-	-	-	-	-
Weavers, textile -----	-	-	.3	.4	-	-	-	-	.2	.2	-	-
Sewers and stitchers, manufacturing -----	-	-	-	-	-	-	-	-	-	-	-	-
Other operatives and kindred -----	193.0	197.2	1,063.1	1,244.7	8.8	11.9	3.3	2.4	634.7	783.6	69.9	87.8
Asbestos, insulation workers -----	.3	.3	1.0	1.1	-	-	-	-	.2	.2	.2	.2
Auto attendants, gas and parking -----	1.8	1.6	351.4	364.6	1.4	1.6	-	-	22.0	24.7	1.1	2.1
Blasters and powdermen -----	-	-	-	-	-	-	-	-	-	-	-	-
Laundry and drycleaning operatives -----	.1	.1	1.5	1.4	.1	.1	-	-	385.1	399.6	2.0	1.7
Mine operatives and laborers -----	-	-	-	-	-	-	-	-	-	-	-	-
Meat cutters, except meat packing -----	2.9	2.5	181.9	193.6	-	-	.1	-	3.0	5.2	.7	.9
Other -----	187.9	192.7	527.3	684.0	7.3	10.2	3.2	2.4	224.4	353.9	65.9	82.9
Service workers -----	148.0	137.7	1,687.7	1,959.5	207.8	201.6	2,037.0	1,807.7	2,991.5	4,119.9	580.4	758.9
Private household workers -----	-	-	-	-	-	-	1,973.0	1,769.0	-	-	-	-
Protective service workers -----	33.0	28.4	17.0	16.7	19.4	20.8	.4	.3	75.6	110.5	489.0	659.3
Firemen -----	.4	.4	.1	-	-	-	-	-	1.2	1.8	143.5	186.5
Policemen and other law enforcement -----	6.6	6.8	1.4	1.8	1.0	1.3	-	-	13.3	18.1	260.1	363.5
Guards, watchmen, and doorkeepers -----	26.0	21.2	15.5	14.9	18.4	19.5	.4	.3	61.1	90.6	85.4	109.3
Food service workers -----	19.1	16.6	1,194.3	1,448.0	4.3	4.1	.3	.1	399.0	555.4	10.0	11.7
Bartenders -----	.3	.2	141.2	164.0	-	-	-	-	22.1	23.7	-	-
Cooks, except private households -----	10.1	9.0	302.6	377.3	1.4	1.3	-	-	197.0	269.8	6.5	7.9
Counter and fountain workers -----	1.1	1.0	87.8	129.7	1.2	1.2	-	-	52.2	91.4	1.2	1.4
Waiters and waitresses -----	7.6	6.4	662.7	777.0	1.7	1.6	.3	.1	127.7	170.5	2.3	2.4
Other service workers -----	95.9	92.7	476.4	494.8	184.1	176.6	63.3	38.3	2,516.9	3,454.0	81.4	88.0
Airline stewards and stewardesses -----	12.9	23.5	-	-	-	-	-	-	-	-	-	-
Attendants, hospital and other institutions -----	-	-	.2	.2	-	-	4.5	3.9	438.5	695.9	2.5	8.4
Charwomen and cleaners -----	6.8	7.2	23.6	34.6	26.5	27.3	3.1	2.6	103.2	163.1	7.4	8.7
Janitors and sextons -----	24.0	21.7	47.1	51.5	74.8	76.1	5.4	4.1	332.1	561.0	42.0	41.4
Nurses, practical -----	.1	.1	.1	.1	.2	.2	49.0	26.7	179.2	274.0	1.9	2.5
Other -----	52.1	40.2	405.4	408.4	82.6	73.0	1.3	1.0	1,470.2	1,760.0	27.6	27.0
Laborers, except farm and mine -----	459.1	453.7	558.6	611.7	44.0	57.2	336.5	183.2	155.2	221.7	114.4	152.5
Farmers and farm workers -----	-	-	-	-	-	-	-	-	-	-	-	-

¹ In 1967 physicians on the faculty of medical schools were counted as college teachers, and those doing full-time research were counted as scientists. In 1960 all physicians, regardless of function, were counted as physicians.

² In 1960, "other medical and health workers" included all enrolled student nurses, but in 1967 only that portion of enrolled student nurses actually working and in the labor force were counted.

³ The 1960 definition of college teachers was expanded in 1967 to include faculty for extension courses, resident nondegree credit courses, instruction by mail, radio or television, short courses, and individual lessons.

SOURCE: U.S. Department of Labor, Bureau of Labor Statistics.

Chapter 2. Summary of Occupational Changes Between 1960 and 1967

During the past few years many new occupations have been created and the occupational relationships of many others have been altered by technological and other factors affecting American industry. Many of the occupational changes are inconsequential in themselves but the cumulative impact is undeniable. New products and services have been created to meet new demands, and both the old and new industries have been affected as occupational patterns changed. For instance, new specialties have arisen in the scientific and engineering profession especially in fields such as bionics, cryogenics, microelectronics, and ultrasonics. Electronic data processing has eliminated many routine clerical jobs in addressing, billing, payroll, and inventory control but it often requires many new and higher grade jobs in program planning and equipment operation and repair. Likewise, many new skills are required for the operation and repair of numerically controlled machine tools of which more than 8,000 were installed by mid-1966 mainly in the aircraft and missile, motor vehicle, and machinery industries.

Some of the occupational effects resulting from these technological and other changes, over the past 7 years, and shown in table 1 are summarized below.

Professional, technical, and kindred workers

Between 1960 and 1967 the professional, technical, and kindred worker broad occupational group recorded the sharpest employment gains, increasing by 33 percent. Over 70 percent of this growth was centered in the service industry and largely reflects the rapid expansion in employment being experienced in the medical and educational service industries. The number of teachers (including college) alone jumped over 750,000 during the 1960-67 period and 300,000 new medical workers were added to the work force.

Engineer employment topped 1 million in 1967, growing 218,000 or by 27 percent during the 7-year period. Durable goods manufacturing, by far the largest employer of engineers, experienced nearly 50 percent of the employment gains; government and service industries also recorded significant employment increases.

The number of natural scientists was up nearly 30 percent as employment gains were recorded in every major industry division. Mathematicians experienced the sharpest employment increases among the various scientific occupations; their numbers rose over 83 percent during the 7-year period as the growth in computer technology and increases in research and development activities spurred demand for these highly trained workers.

Technician (except medical and dental) employment rose by nearly 25 percent to over 911,000. More than two-thirds of the increase was centered in durable goods manufacturing and the service industry divisions. Draftsmen remained the largest occupation among the technician group, over 294,000 workers in 1967, up 61,000 from 1960. Electrical and electronic technicians recorded the largest and sharpest employment gains during the 1960-67 period, increasing by nearly 60 percent or by 70,000 workers.

Managers and salesworkers

Managers, officials, and proprietors employment increased by 6 percent during the 1960-67 period, the slowest growth rate experienced by a white-collar occupational group. The trade industries recorded a decline in the number of these workers during the 7-year period but remained their principal employer with 3.1 million in 1967. Employment was also down significantly in the construction industry, while above average gains were recorded in services, government, and durable goods manufacturing.

Over 4.5 million salesworkers were employed in 1967, up 7 percent from 1960. Employment remained highly concentrated, 70 percent of the

workers were located in the trade industry. With the exception of agriculture, employment gains were recorded in all major industry divisions during the 1960-67 period. The trade industries had over 50 percent of the total increase but the sharpest growth rates were experienced in the service; and finance, insurance, and real estate sectors where the number of salesworkers grew by 37 and 14 percent, respectively.

Clerical and kindred workers

Over 2.5 million new clerical jobs were added during the 1960-67 period, the largest expansion experienced by a broad occupational group. With the exception of agriculture, all major industry divisions recorded gains in clerical employment during the 7-year period. By far the largest and most rapid increases were centered in the service industry division where clerical employment jumped by 1 million, up 60 percent over the 1960 level.

The employment of stenographers, typists, and secretaries rose by 807,000 between 1960 and 1967, an increase of 33 percent. More than 50 percent of the rise was concentrated in the service industries, but strong gains were also experienced in most other industry divisions.

Bank tellers recorded the sharpest employment growth rate among the clerical workers; the number of such workers increased by 49 percent over the 7-year period. Cashier employment also rose sharply by 44 percent as population growth, rising incomes, and the trend towards larger self-service stores contributed to their expansion.

Telephone operators employment, while up slightly overall, experienced a decrease in the telephone industry where the new direct dialing systems eliminated the need for many long distance operators.

Craftsmen, foremen, and kindred workers

The number of craftsmen, foremen, and kindred workers grew to 9.8 million workers in 1967, up 15 percent from 1960. Durable goods manufacturing widened its lead as the largest employer of these skilled workers, employing 445,000 or more—a 20 percent increase. Durable goods employment increases were largely centered in production occupations such as machinists or among the workers required to maintain and

service the increasingly complex production machinery. Significant increases in skilled workers were also experienced in the trade industries where requirements for motor vehicle mechanics rose in new car dealerships and the number of skilled installation, maintenance, and service workers grew sharply at wholesale distributors of machinery and equipment.

Construction craftsmen increased by only 8 percent, considerably below the average of all skilled workers, as growth in construction activity was slowed by rising interest rates. The total number of carpenters increased less than 1 percent during the period, and in the construction industry, their employment dropped slightly.

The number of skilled mechanics and repairmen rose by 525,000 between 1960 and 1967, an increase of over 25 percent. The spreading residential and business use of air-conditioning spurred especially sharp increases in the number of air-conditioning and heating repairmen. Employment rose 77 percent over the 7-year period. The employment of office machine mechanics and repairmen also experienced significant gains, as the growth in the utilization of data-processing equipment generated a sharp rise in employment of maintenance and installation workers. Airplane mechanics recorded well above average increases in employment in response to the growing maintenance requirements of the Nation's larger and more complex commercial and general aviation aircraft fleets.

Operative and kindred workers

Operatives and kindred workers were the largest of the broad occupational groups in 1967; they numbered 13.9 million workers or over one-sixth of the total work force. During the 1960-67 period, the number of these semiskilled workers rose by nearly 2 million, an increase of 16 percent, a rate slightly faster than the work force as a whole.

Manufacturing continued as the principal employer of operatives in 1967, with over 8.8 million workers divided between durable and nondurable goods manufacturing. Between 1960 and 1967, the number of operatives in durable goods manufacturing increased by more than 1 million workers, approximately 52 percent of the total employment growth experienced by this occupational group. A significant gain was also recorded by nondurable goods manufacturing,

where over 420,000 workers were added. Most of the operatives employed in manufacturing are machine operators and tenders, assemblers, or other production process workers and much of the recent employment increases can be traced to rapidly expanding demand for military related products during the past 5 years. For example, employment in semiskilled metalworking occupations, almost entirely concentrated in durable goods manufacturing, increased by 445,000—an increase of over 30 percent between 1960 and 1967.

Drivers—bus, truck, and tractor; experienced a modest employment gain of 90,000 or 5 percent during the 7-year period. Deliverymen and routemen increased at a faster pace (9 percent) with most of the growth centered in the trade industries.

Mine operatives and laborers experienced a significant decline in employment, a drop of 27 percent to an all-time low of 204,000 in 1967. The continued trend towards larger more highly mechanized mining operations has led to a substantial reduction in the requirements for mine workers.

The textile occupational group recorded a strong employment gain; sewers and stitchers in apparel manufacturing accounted for nearly all the increase. Rising personal incomes together with increased military orders has resulted in a sharp rise in demand for nearly all types of apparel.

Service workers

The employment of service workers grew by 1.3 million between 1960 and 1967, an increase of 16 percent or only slightly above the 13 percent increase experienced by the total work force. However, if private household workers are excluded, the remaining service worker employment shows a much sharper increase of 25 percent during the 7-year period, a rate nearly double that of total employment.

Service workers such as janitors, cleaners, and guards are found in nearly every industry, yet, in 1967, 6 out of 7 service workers were concentrated in 1 of 3 major industry divisions—services, trade, and private households—and between 1960 and 1967, nearly all the growth in service worker employment occurred either in the trade or service industry divisions. The rapid

expansion in medical and health services resulted in sharp employment growth in health related occupations such as practical nurses and hospital attendants, up 35 and 58 percent, respectively, over 1960 employment levels. Food service workers, largely concentrated in retail trade, increased substantially; counter and fountain workers' employment was up by 54 percent, and cooks (except private household) increased 28 percent. Waiters and waitresses also recorded employment gains, 155,000 workers during the 1960-67 period.

Firemen and policemen were among the service workers experiencing significant employment gains. Population growth, together with further urbanization, and the growing public concern over the rising crime rate were largely responsible for increases in employment in these important occupations.

Laborers (except farm and mine)

The employment level of laborers remained relatively stable during the 1960-67 period, decreasing less than 1 percent. Although little overall employment change was recorded, several important shifts did occur within the individual industries. Increased mechanization of production, and material movement functions have reduced the requirements for laborers in some industries. For example, in manufacturing, the number of laborers declined by 9 percent in durable goods and nearly 14 percent in nondurable goods, and during the same 7-year period total employment in these industries was increasing. Offsetting these decreases in manufacturing were employment gains in the trade, service, and government industries. The construction industry remained a large employer of unskilled workers; the employment of laborers experienced only a small decrease during the 1960-67 period.

Farmers and farm workers

Farmers and farm workers employment continued its long run downward trend; it dropped by 1.6 million between 1960 and 1967, or by over 30 percent. Much of the decrease occurred in the smaller marginal farms unable to keep pace with the new agricultural technology.

Chapter 3. The BLS Industry-Occupational Employment Matrix and Its Use in Estimating Current Occupational Employment Levels

An industry-occupational employment matrix is a table showing the distribution of total employment in the economy by industry and by occupation. From the matrix it is possible to analyze the occupational structure of industries, and also, to determine how total employment in an occupation is distributed by industry. The Bureau of Labor Statistics has prepared an employment matrix for 1960 containing 124 specific industries and 163 specific occupations or groupings of occupations. This matrix, based primarily on the occupational statistics obtained from the decennial census⁵ represents the compilation in one comprehensive table of the best occupational employment data obtained from many varied sources.⁶

The need for a comprehensive and systematic method of estimating current employment by occupation arose because reliable inter-census information is scanty. This chapter describes how the BLS employment matrix has been used to fulfill that need. It also describes the procedures used to estimate total employment for 163 occupations for 1967. (Table 1 shows the 1960-67 trends in employment for each of these occupations for 11 broad industry sectors, as well as in total.)

Development of an employment matrix for 1967

The use of the BLS matrix as a tool for estimating current occupational employment is based on the fact that each industry's occupational structure (defined as the percent of total industry employment found in each occupation), changes slowly, and that the occupational pattern within many industries is relatively stable over short periods of time. Therefore, shifts in employment among industries have a significant effect on the short-run growth or decline of specific occupations, and on the changing occupational structure of total employment for the United States as a whole. For example, a more

rapid growth in employment for the insurance industry than for the printing and publishing industry will create a greater growth of demand for clerical workers than for printing trades craftsmen. Thus, if a good set of occupational patterns is available for a particular year, reasonably reliable employment estimates for specific occupations in the next year can be obtained by applying the occupational structure for each industry in the first year to estimates of total employment for each industry in the second year and then summing the resulting occupational employment estimates to national totals.

The first experiment using the occupational matrix as a tool for estimating current employment was the development of a matrix for 1967. Occupational patterns for 124 specific industries were obtained by extrapolation of trends in the structures of industries from 1950 to 1960, allowing for factors such as changing technology of production, shifting product mix, and changing supply of workers to each occupation.⁷ The pattern for each mining and manufacturing industry was then modified to achieve consistency with 1960-67 production-nonproduction worker trends reported in the BLS current industry employment statistics series.

The resulting preliminary set of occupational patterns then were applied to the total employment in their respective industries for 1967. The resulting occupational employment estimates within each industry were summed to national totals,

⁵ *United States Census of Population: 1960, Subject Reports, Occupation by Industry, Final Report (PC(2)-7C, May 1963)* (U.S. Department of Commerce, Bureau of the Census).

⁶ See *Occupational Employment Patterns for 1960 and 1975* (Bulletin 1599), December 1968, for a detailed description of how the basic matrix was developed and how national manpower requirements were projected to 1970 and 1975. This bulletin also describes the classification of industries and occupations in the matrix.

⁷ For a complete discussion of the procedures followed in projecting occupational patterns see Bulletin 1599, *op. cit.*

and analyzed for reasonableness. Outside data on occupational employment from a variety of sources (for example, from BLS survey programs, from regulated industries, and other sources shown in tables 2-10 and 12-18) were inserted into their appropriate matrix cells. Employment in the remaining cells were made consistent with industry employment levels (developed from BLS payroll data) and intermediate occupational group employment levels (available from the current population surveys) through an iterative forcing procedure. This procedure forces the internal cells of the matrix into consistency with known control levels by alternately forcing first to industry employment controls then to occupation controls. (The procedure is repeated until the internal cells are consistent with both sets of marginal controls.)

Once completed, the procedure results in national employment estimates for 163 specific occupations and occupational employment patterns for 124 industries that are consistent with (a) national employment by industry (b) Current Population Survey (CPS) employment by broad intermediate occupational groups (c) trends in production worker employment by industry (d) trends in occupational structure within industries, and (e) reliable estimates of occupational employment available from other sources.

Employment estimates for specific matrix industries

One of the first steps necessary in developing the 1967 occupational estimates through the matrix system was to establish employment controls for each matrix industry. The authoritative estimate of total employment in the United States for a particular year is an annual average of the monthly data collected from the Census Bureau's Current Population Survey and published by BLS in *Employment and Earnings*.⁸ However, because of gaps between CPS estimates and estimates of total employment for specific matrix industries which are based on the current industry employment statistics (CES) collected and published by BLS,⁹ CES data had to be adjusted to CPS employment concepts.

The employment data reported for specific industries by the CES, consist only of private wage and salary employees; government workers are shown as a separate industry group. However, the CPS, Census, and the occupational

matrix estimates of employment, include all classes of workers—self-employed workers, government employees, unpaid family workers, as well as private wage and salary employees. The CES data were adjusted to include an estimate for each of the omitted categories. Unpublished CPS estimates for unpaid family workers were used in all industries, and also for estimates for self-employed and government workers in industries for which no other sources of information were available.¹⁰

Another difference between the CPS household data and the CES establishment data is that in the former, workers with a job but on unpaid leave are counted as employed. Therefore, the number of unpaid absences in each broad Monthly Report on the Labor Force (MRLF) industry was distributed proportionately to specific matrix industries. Finally, since the same worker may be counted more than once in the CES survey depending upon whether he is employed by more than one establishment, the number of secondary jobholders reported in the CPS survey was subtracted proportionately from each matrix industry. Once completed, the above procedures bridged the gap between the two authoritative sources of data—CES data for industry employment and MRLF data for total employment.

⁸ However, recent research by the Census Bureau of the undercount in Population Censuses and research by BLS on the possible implication of this for the estimates of employment suggest that we have not included about 2 million workers in the CPS. See Denis F. Johnston and James R. Wetzel, "Effect of the Census Undercount of Labor Force Estimates," *Monthly Labor Review*, March 1969.

⁹ Labor force data from the Current Population Survey are obtained from a nationwide sample of about 50,000 households and pertain to the noninstitutionalized population 16 years of age and over. CES survey data are based on monthly payroll reports from a sample of establishments and provide, among other things, detailed industry information on nonagricultural wage and salary employment. The only industry estimates not based on CES data were for agriculture, forestry, and fisheries, private households, and government public administration (except postal service) which were based on Monthly Report of the Labor Force data.

¹⁰ Estimates for some industries of the number of government workers were derived from *Public Employment in 1967*, U.S. Department of Commerce, Bureau of the Census, July 1968 and *Employment and Wages of Workers Covered by State Unemployment Insurance Laws and Unemployment Compensation for Federal Employees by Industry and State—Fourth Quarter 1967 and Annual Summary*, U.S. Department of Labor, Manpower Administration. Ratios on the number of self-employed to total employed in several industries were obtained from the *1963 Census of Business*, U.S. Department of Commerce, Bureau of the Census, 1965. These ratios were used to estimate the number of self-employed for 1967.

Employment estimates for specific matrix occupations

While the simple application of the initial set of occupational structures to industry employment estimates provides a complete and systematic procedure for estimating total employment by occupation, certain reliable estimates of occupational employment are available from other sources. Therefore, a framework was necessary to achieve consistency among estimates derived from the matrix system and estimates derived from other sources. The CPS provides this framework through the published estimates of broad and intermediate group occupational employment.

One major justification for using CPS data in a census-based employment matrix is that the classification of industries and occupations in the monthly household survey is the same as that used in the decennial population census. However, the occupational data obtained from a sample of households and complete censuses have certain deficiencies. For example, responses obtained from individuals concerning the occupations of family members often do not correspond to the job titles used by employers. In addition, the size of the CPS sample is too small to provide reliable results for most specific occupations.¹¹ The data for nine broad socioeconomic occupational groups and a few specific skill groups, however, are considered to be very reliable and are published monthly. Therefore, in developing estimates for specific matrix occupations, the 1967 annual averages for the following occupational categories were used as overall control totals:¹²

Total employment
Professional and technical
Managers, officials, and proprietors
Clerical workers,
 Stenographers, typists, and secretaries
 Other clerical workers
Salesworkers
Craftsmen and foremen,
 Carpenters
 Construction craftsmen, except carpenters
 Mechanics and repairmen
 Metal craftsmen, except mechanics
 Other craftsmen and kindred workers
 Foremen, not elsewhere classified
Operatives,
 Drivers and deliverymen
 Other operatives
Nonfarm laborers

Service workers,
 Private household workers
 Protective service workers
 Waiters, cooks, and bartenders
 Other service workers
Farm workers

Wherever possible, other specific occupational employment estimated were made independently of the matrix. In some cases unpublished CPS data were used when it was felt that both response error and sampling error were relatively small. Other estimates were derived from BLS occupational surveys, the reports of professional societies and licensure statistics, Federal regulatory and other agencies, and other sources.¹³ Estimates derived from these sources include about 60 percent of the individual occupations in the matrix. The remaining occupational totals were developed through the matrix system described earlier.

While there is a great overall lack of reliable occupational information between census years, this lack is not evenly distributed among white-collar and blue-collar occupations. Blue-collar occupations, for example, made up about three-quarters of the matrix derived employment estimates. Among the white-collar occupations, most of the independently derived estimates are found in the professional group. In addition to the availability of current data for many white-collar occupations from nongovernmental sources, BLS, in cooperation with the National Science Foundation, conducts an annual survey of scientists, engineers, and technicians in private industry. Other industry surveys have been developed that will provide additional information on employment in certain white-collar occupations, and also, much needed data on employment in many blue-collar occupations.¹⁴ As more such data become available and are incorporated into the employment matrix, they will provide a more sound basis for estimating employment changes by occupation.

¹¹ The reliability of the estimates was increased somewhat in 1967, when the number of households was increased from 35,000 to about 50,000.

¹² *Employment and Earnings and Monthly Report on the Labor Force*, January 1968, table A-14.

¹³ These sources are presented elsewhere in this bulletin.

¹⁴ BLS has just concluded a survey that will provide data for about 60 specific blue-collar and white-collar occupations in the metalworking industries (except primary metals, SIC 33). In addition, a new survey will soon be undertaken to collect data for about 100 occupations in the printing and publishing industry.

Table 2. Estimated distribution for selected occupations in the communications equipment industry, except telephone and telegraph (SIC 3662), September 1967 and September 1968¹

Selected occupation	1967 employment	1968	
		Employment	Percent distribution
Total employment	385,300	390,600	100.0
Administrative, managerial, professional, sales, and technical personnel	172,700	172,200	44.1
Clerical workers	63,400	64,000	16.4
Accounting clerks	3,500	3,400	.9
Expeditors	5,500	5,700	1.5
Office machine operators	5,300	5,200	1.3
Console operators	1,200	1,100	.3
Key punch operators	2,100	2,000	.5
Tabulating-machine operators, A, B, C	600	700	.2
Other office-machine operators	1,400	1,500	.4
Payroll or timekeeping clerks	1,000	1,100	.3
Secretaries	12,300	12,500	3.2
Shipping or receiving clerks	1,700	1,900	.5
Stenographers	3,400	3,100	.8
Typists	5,300	5,500	1.4
Stock clerks	2,900	3,500	.9
Other	22,500	22,100	5.7
Skilled trades and other	143,400	148,100	37.9
Assemblers, A	9,400	11,000	2.8
Assemblers, B	16,100	17,700	4.5
Assemblers, C	22,000	23,600	6.0
Coil winders	2,100	2,000	.5
Electricians	900	1,100	.3
Filers, grinders, and polishers	900	1,100	.3
Foremen (nonworking)	5,600	5,700	1.5
Inspectors, A	4,100	4,200	1.1
Inspectors, B	3,700	4,300	1.1
Inspectors, C	3,400	3,600	.9
Machine-tool operators, A	3,100	3,300	.8
Machine-tool operators, B	1,900	2,400	.6
Machine-tool operators, C	1,700	1,400	.4
Machinists	4,100	4,400	1.1
Mechanics and repairmen	2,400	2,700	.7
Millwrights	300	200	.1
Painters, maintenance	400	400	.1
Painters, production	900	1,100	.3
Platers	800	900	.2
Platers, helpers	300	200	.1
Plumbers and pipefitters	400	400	.1
Power truckers	300	400	.1
Punch-press operators, A	400	500	.1
Punch-press operators, B	600	700	.2
Setup men, machine tool	500	500	.1
Sheet-metal mechanics	1,700	2,000	.5
Stationary engineers	100	200	.1
Testers, A	3,500	3,000	.8
Testers, B	4,500	4,000	1.0
Testers, C	1,200	1,700	.4
Toolmakers and diemakers	2,200	2,000	.5
Truckdrivers	700	700	.2
Welders, hand	800	700	.2
Welders, machine	300	400	.1
Wiremen, A	2,400	2,900	.7
Wiremen, B	2,200	2,700	.7
Wiremen, C	4,500	5,900	1.5
Other skilled trades and other manual occupations	32,900	27,900	7.1
Service workers	7,100	6,400	1.6

¹ 1967 data revised; 1968 data preliminary.

NOTE: Because of rounding, sums of individual items may not equal totals.

SOURCE: U. S. Department of Labor, Bureau of Labor Statistics.

Chapter 4. Sources of Industry Occupational Patterns

Occupational patterns for various industries during intercensal years usually are limited in their occupational detail. However, some industry occupational patterns are available which show a good quantity of detail. Table 2, for instance, presents employment data by occupation as of September 1967 for the communication equipment industry, except telephone and telegraph.¹⁵ In the future, the Bureau's occupational employment survey program will be expanded and will provide additional important occupational employment data.

The Bureau also conducts numerous other industry based surveys on a regular basis. Industry Wage Surveys currently cover about 70 in-

dustries, the major of which are surveyed every 5 years and most of the remainder every 3 years. Area Wage Surveys (formerly called Community Wage Surveys) are conducted annually. Data are collected in these surveys¹⁶ for approximately 50 occupations in six industry divisions representing more than 60 industries in over 160 regions—over three-quarters of which are Standard Metropolitan Statistical Areas.

¹⁵ "Occupations in Radio-TV Communication Equipment Manufacturing," *Monthly Labor Review*, June 1968.

¹⁶ See *Occupational Employment Statistics, Sources and Data* (Report 305), June 1966, pp. 55-73, for a detailed description of the nature and uses of these surveys.

Chapter 5. Employment Data for Selected Professional Occupations

Virtually all the information in table 3 is from professional associations and societies, which maintain and publish annual or biennial information on occupational employment from licensure statistics, from their own membership records, and from other sources. Their estimates have been adjusted to eliminate double counting due to multiple licensing in various States, association membership overlap, nonmembers, and retirees. Current sources and descriptions of the occupations are presented below.

Dentists

The employment estimates for dentists exclude the military and the retired. In 1968, 6,800 dentists were in the Armed Services. The data on the American Dental Association's annual report, *Distribution of Dentists in the U.S. by State, Region, District and County* are based on a count of licensed dentists listed in the American Dental Directory.

Nurses

Facts about nursing, 1968 edition, an annual report of the American Nurses Association, contains biennial employment estimates for professional nurses. The interagency Conference on Nursing Statistics, including representatives of the American Nursing Association, the National League for Nursing, and the U.S. Public Health Service, meets biennially to prepare a joint estimate based on their data and on records, registration data, and employment data obtained from the American Hospital Association, American Osteopathic Association, State Boards of Nursing, American Red Cross, National Student Nurses' Association, National Federation of Licensed Practical Nurses, and Bureau of Labor Statistics.

Osteopaths

The American Osteopathic Association publishes an annual report, *A Statistical Study of the Osteopathic Professions*. These estimates exclude the retired and those for whom status was not reported.

Pharmacists

Licensure Statistics and Census of Pharmacy, annual report, published by the National Association of Boards of Pharmacy (NABP). The data for 1968 are preliminary estimates from NABP. Data prior to 1967 is from the *NABP Bulletin* published by the National Association of Boards of Pharmacy. The data from both sources represent a count of registered pharmacists in practice obtained from NABP census and licensing data.

Physicians

Distribution of Physicians, Hospitals and Hospital Beds in the U.S., Regional, State, County, Metropolitan Area 1968, annual report, published by the Department of Survey Research, American Medical Association (AMA). Data for years prior to 1967 are from *AMA Directory Reports Service*, a quarterly report of the American Medical Association. Data in table 3 refer to licensed physicians as of the end of each year shown except for 1966, which are mid-year estimates. In order to conform to a civilian labor force concept the estimates exclude military, retired, and physicians other than those in Federal employment who have a temporary foreign address.

Podiatrists

American Podiatry Association reports based on State licensing: *Podiatry as a Career*, by Wilfred E. Belleau revised 1965 edition for 1962 data;

Numbers and the Podiatry Professions, by Lloyd E. Blauch, for 1963 data, and *Journal of the American Podiatry Association*, March 1965; "1964 Survey of the Podiatry Profession: The Podiatrist; Distribution, Education, Organizational Relationships," by Lloyd E. Blauch, for 1964 data. Estimates for 1965, 1966, 1967, and 1968 furnished by the American Podiatry Association.

Architects

The 1968 estimate is from the National Architectural Accrediting Board, Washington, D.C. Data for previous years are from the Architectural Institute of America. Both sources may include some retired registered architects.

Foresters

Data for 1961 are from a survey of alumni by colleges granting degrees in forestry plus a count of the nondegree members of the Society of American Foresters. The data were published in an article "How Many Foresters" by F. H. Eyre in the *Journal of Forestry*, 1962. The 1962 and 1966 data are estimates made by the Society. They are based upon the 1961 figure and have been adjusted to include recent entrants (degree recipients) and exclude retired personnel. The data for 1968 are estimates of the Bureau of Labor Statistics.

Veterinarians

Dimensions of Veterinary Medicine and various editions of *AVMA Directory* a biennial publication, published by the American Veterinary Medical Association. Data refer to licensed veterinarians and excludes the military and those who are retired. Data for 1968 are estimates made by AVMA.

Table 3. Occupational employment data available from professional associations, 1960-68

(In thousands)									
Occupation	1968	1967	1966	1965	1964	1963	1962	1961	1960
Health professions:¹									
Dentists -----	93	92	91	91	90	89	89	88	87
Nurses, professional -----	659	(2)	621	(2)	582	(2)	550	(2)	504
Osteopaths -----	12	12	12	11	11	11	³ 11	12	12
Pharmacists -----	122	122	121	118	118	117	117	117	117
Physicians -----	289	275	272	265	255	248	239	231	224
Podiatrists -----	9	8	8	8	8	8	8	(2)	(2)
Veterinarians -----	24	23	23	(2)	21	(2)	21	(2)	20
Other professions:									
Architects, registered -----	34	(2)	32	32	30	(2)	27	(2)	26
Foresters -----	25	(2)	23	(2)	(2)	(2)	20	18	(2)

¹ For a detailed and comprehensive presentation of employment and other characteristics of health professions and occupations, see *Health Resources Statistics, 1968*, 1968, U. S. Department of Health, Education, and Welfare, Public Health Service.

² No estimates made.

³ Approximately 2,200 osteopaths in California were awarded M. D. degrees in 1962, thus decreasing the number of Doctors of Osteopathy in that year.

Chapter 6. Employment of Teachers and Librarians

Occupational data relating to the educational system are available from the Office of Education, U.S. Department of Health, Education and Welfare. The annual publication *Projections of Educational Statistics* contains occupational data on elementary and secondary and college and university teachers for the most recent past 10 years as well as projections for the next 10 years. The occupational statistics for teachers and librarians in educational institutions presented in table 4 are based on the academic year; those

estimates included in the national industry-occupational matrix in table 1 are annual averages.

The number of employed librarians presented in table 4 for the years 1959 to 1966 are contained in the *Digest of Educational Statistics*. The estimates for librarians exclude part-time partly-trained librarians and all elementary and secondary school librarians with less than 15 semester hours of library science. Moreover, the librarian estimates include the full-time equivalents of all the part-time professional librarians.

Table 4. Employment of teachers and librarians in fall of school year, 1959-60 through 1967-68

Occupation	(In thousands)								
	1967-68	1966-67	1965-66	1964-65	1963-64	1962-63	1961-62	1960-61	1959-60
Elementary and secondary teachers -----	1,2, 095	2, 028	1, 951	1, 882	1, 806	1, 727	1, 668	1, 600	1, 531
Elementary school -----	1, 193	1, 159	1, 123	1, 096	1, 062	1, 036	1, 015	991	952
Public -----	1, 040	1, 006	965	940	908	886	869	858	832
Nonpublic ² -----	153	153	158	156	154	150	146	133	120
Secondary school -----	902	869	828	786	743	690	653	609	580
Public -----	815	783	746	708	669	621	592	550	524
Nonpublic ² -----	87	86	82	78	74	69	61	59	56
College instructional staff ³ -----	478	449	427	387	356	334	311	294	282
Instructors or above -----	406	382	363	329	303	285	265	253	243
Full-time -----	271	255	243	220	202	190	177	169	162
Part-time -----	135	127	120	109	101	95	88	84	81
Junior instructional staff -----	72	67	64	58	53	49	46	42	39
Librarians ⁴ -----	(⁵)	(⁵)	81	77	73	69	66	63	62
Public elementary and secondary -----	(⁵)	(⁵)	28	27	25	23	22	20	20
Nonpublic elementary and secondary -----	(⁵)	(⁵)	5	5	4	4	4	3	3
College and university -----	(⁵)	(⁵)	14	12	12	11	10	10	9
Public library ⁶ -----	(⁵)	(⁵)	22	21	21	20	20	20	20
Special library -----	(⁵)	(⁵)	13	12	12	10	10	10	10

¹ Preliminary.

² The estimates of nonpublic classroom teachers and instructional staff during 1960-61 through 1965-66 were revised in 1968 on the basis of the 1965 Office of Education Survey.

³ Data are for the 50 States and the District of Columbia. Data cover only faculty for resident instruction in degree credit courses. Data for 1964-65, 1962-63, and 1960-61 are interpolated. Data for 1967-68, 1966-67, and 1965-66 are estimates.

⁴ Includes full-time equivalent of part-time professional librarians. Excludes part-time partly trained librarians. Elementary and secondary school librarians are those with 15 or more semester hours of library science.

⁵ Not available.

⁶ Based on survey of libraries serving population of 35,000 or over.

NOTE: Because of rounding, sums of individual items may not equal totals.

SOURCE: Data from U.S. Department of Health, Education, and Welfare, Office of Education: For elementary and secondary school teachers from Projections of Educational Statistics to 1977-78, 1968 ed., publication no. OE-10030-68, table 23, and for college instructional staff from table 28; for librarians from Digest of Educational Statistics, 1965 ed., publication no. OE-10024-65, table 128 and 1966 ed., publication no. 10029-66, table 138.

Chapter 7. Occupational Employment Data from Regulated Interstate Industries

Occupational statistics for the regulated industries (transportation, communication, and the utilities) engaged in interstate commerce are compiled annually from mandatory reports filed with the Federal regulatory agencies. Except for trucking, industry coverage is relatively complete, since the greater part of each of these industries is involved in interstate commerce.

However, some of the broader occupational classifications (construction installation and repair employees, business office and sales employees) included in these reports are not consistent with generally accepted occupational classifications, for example, U.S. Census. Nevertheless, the employment trends indicated in the broad occupational categories provide helpful information in discerning the change in employment of occupations within the broad categories.

Selected occupational data from these reports are presented in table 5. The sources are described below.

Railroads

Railroad companies regulated by the Interstate Commerce Commission (ICC) which have 3-year average operating revenues generally of \$5 million or more, are classified as class I railroads. Those railroad companies having 3-year average operating revenue of below \$5 million are classified as class II railroads.

Class I Railroads

In 1967, class I railroads had 88 percent of the railroad transportation industry's employment. The railroad transportation industry is defined as including class I and II line haul railroads, class I and II switching and terminal companies, the Pullman company, the Railway Express Agency Inc., and electric railways.

Class I railroads submit annual reports to the ICC, which summarizes them in Statement No. A300, *Wage Statistics of Class I Railroads in the United States*. Prior to 1966, the employment data for class I railroads were summarized in

Statement No. M300, *ibid*. These statements show employment for 128 occupational categories. A few of these categories consist of a mix of occupations. Only a selected number of occupational categories which do not contain a mix of occupations are shown in this bulletin.

Railway Express Agency

In 1967, the Railway Express Agency had over 4 percent of the employment in the railroad transportation industry. Employment data for 28 occupations and occupational groups employed by the Railway Express Agency are provided in the annual issues of *Transport Statistics in the United States*, Part 1, Section F; The Railway Express Agency Inc., Interstate Commerce Commission, Bureau of Transport Economics and Statistics. Prior to 1966 these data may be found in *Transport Statistics in the United States*, Part 3.

Pullman Company

In 1967, the Pullman Company had less than 1 percent of the employment in the railroad transportation industry. Occupational data for this company are provided on an annual basis for 14 occupations and occupational groups. These data may be found in the annual issues of *Transport Statistics in the United States*, Part 1, Section E. Prior to 1966 these data appeared in Part 2 of *Transport Statistics in the United States*.

Oil Pipelines

Ninety pipeline companies representing over 88 percent of the industry employment filed reports with ICC for the year 1967 compared with 87 companies representing about 85 percent of the industry employment for 1966. These data appear in *Transport Statistics in the United States*, Part 6.

Scheduled Airlines

The Air Transport Association of America annually obtains occupational employment data from airline industry information filed with the Civil Aeronautics Board and publishes them in *Air Transport Facts and Figures*. In 1967, these data covered over 90 percent of the airline industry employment. The Federal Aviation Agency publishes an annual publication *FAA Statistical Handbook of Aviation* in which employment and other scheduled airlines information appears in great detail.

Telephones

Occupational employment information in the telephone industry can be acquired from annual reports of the Federal Communications Commission (FCC) and the U.S. Independent Telephone Association. The U.S. Department of Labor publishes an annual wage survey in the communication industry entitled *Industry Wage Survey: Communications*. The data contained in the wage survey are compiled from annual reports filed with FCC by telephone companies

having annual revenues exceeding \$1 million. Prior to 1965 the revenue test was \$250,000.

Annual employment data for the independent telephone segment of the telephone industry is available in the *Independent Telephone Statistics* published by the U.S. Independent Telephone Association. The combination of the two reports covers all employment in the telephone industry except for officials and managerial assistants employed by the Bell System.

Telegraph

Annual occupational employment data for the telegraph industry are published in the *Industry Wage Survey: Communications*. The data contained in this survey are compiled from annual reports filed with the FCC by all companies in the telegraph industry having annual revenues exceeding \$50,000. The data covers the 26,000 employees of the Western Union Telegraph Company and 5,100 employees of six international telegraph carriers. Approximately 2,300 employees working outside the conterminous United States and the District of Columbia are excluded. These data include, substantially, the whole industry.

Table 5. Employment in selected occupations, regulated interstate industries, 1960-67

Occupation ¹	(In thousands)							
	1967	1966	1965	1964	1963	1962	1961	1960
Class I railroads (line-haul)	610.2	630.9	640.0	665.0	680.0	700.1	717.5	780.5
Conductors, railroad	38.0	38.7	38.0	37.4	37.1	37.0	36.9	39.0
Office-machine operators	6.0	6.1	6.1	6.0	6.0	6.3	6.6	7.0
Secretaries	3.3	3.4	3.4	3.4	3.5	3.5	3.6	3.8
Stenographers and typists	7.6	7.9	8.0	8.3	8.6	9.0	9.5	10.4
Telephone operators	1.8	1.9	2.0	2.1	2.3	2.4	2.5	2.8
Carpenters	5.2	5.5	5.7	6.0	6.1	6.3	6.5	7.1
Linemen and servicemen (telephone and telegraph)	2.1	2.2	2.2	2.3	2.3	2.3	2.4	2.5
Blacksmiths, forgemen, and hammermen	1.5	1.7	1.8	1.8	1.8	1.8	1.7	2.0
Boilermakers	1.7	1.8	1.8	1.9	2.0	2.0	2.1	2.3
Stationary engineers .....	.6	.7	.7	.8	.8	.9	.9	1.0
Locomotive engineers	35.3	36.2	35.1	34.3	33.9	34.2	34.1	36.2
Locomotive firemen	19.2	19.6	21.8	30.0	35.9	36.5	36.6	38.8
Drivers and deliverymen	5.7	5.9	5.9	5.8	5.8	5.8	5.7	5.9
Railway Express Agency, Inc.	29.5	30.9	32.1	31.4	30.4	30.4	30.4	30.8
Drivers and deliverymen	10.0	10.3	10.4	10.0	9.6	9.4	9.2	9.0
Train messengers .....	.5	.7	.9	1.1	1.1	1.2	1.3	1.5
Warehouse and platform laborers	5.0	5.3	5.9	5.7	5.3	5.2	5.3	5.5
The Pullman Company	4.2	4.9	5.3	5.5	5.9	6.4	6.7	7.3
Conductors .....	.4	.5	.5	.5	.6	.6	.6	.7
Porters	1.7	2.0	2.1	2.2	2.2	2.5	2.6	2.9
Oil pipelines	15.9	16.2	16.9	17.1	18.2	19.2	20.3	21.3
Station engineers and pumpers	2.1	2.2	2.3	2.5	2.5	2.8	3.0	3.3
Gager-deliverymen and oil receivers	2.7	2.8	2.9	2.9	3.1	3.2	3.4	3.6
Pipeline repairmen	1.4	1.4	1.5	1.7	1.8	2.0	2.1	2.3
Other mechanics .....	.8	.7	.7	.7	.7	.7	.7	.8
Laborers	1.1	1.1	1.1	1.1	1.2	1.2	1.1	1.1
Scheduled airlines	276.0	244.0	205.9	191.8	178.9	172.8	169.9	166.1
Airline pilots and copilots	23.4	21.0	16.3	15.1	14.3	13.8	13.9	13.5
Airline stewardesses and pursers	25.1	20.9	17.1	14.5	13.1	12.2	11.9	10.6
Other flight personnel	7.5	6.8	4.8	4.4	4.0	4.2	4.2	3.8
Communications personnel	3.3	3.2	3.2	3.2	3.7	3.4	3.7	4.2
Mechanics and maintenance personnel	50.0	45.3	40.7	39.4	34.5	34.9	34.1	34.2
Aircraft and traffic service personnel	74.9	66.6	56.3	51.9	49.1	46.7	44.6	43.3
Office employees	59.3	51.0	42.9	40.3	37.9	37.0	36.6	35.4
Other employees	32.4	29.2	24.7	23.0	22.4	20.7	20.9	21.1
Telephone industry	760.0	750.3	722.5	699.9	678.7	669.6	672.5	694.9
Professional and semiprofessional personnel	74.5	72.4	67.5	64.0	60.9	53.4	52.0	50.5
Business office and sales employees	59.4	58.8	54.3	52.7	51.4	52.0	51.6	49.8
Clerical employees	164.1	161.9	152.2	147.9	142.5	142.9	142.6	144.9
Telephone operators	212.8	212.2	199.1	193.1	189.2	188.5	196.8	216.3
Foremen, telephone craftsmen	32.1	31.4	28.9	27.2	26.1	25.9	25.5	26.0
Central office craftsmen	78.0	75.3	69.0	65.9	63.1	62.0	59.1	58.0
Installation and exchange repair craftsmen	86.8	85.1	79.6	77.7	75.1	73.2	72.0	71.2
Line, cable, and conduit craftsmen	41.2	41.6	39.2	38.3	37.0	38.1	38.8	43.0
Building, supplies, and motor vehicle employees	25.1	25.2	24.9	25.4	26.0	27.2	27.9	28.8
Laborers .....	.5	.4	.4	.4	.4	.5	.5	.5
Other employees	2.8	2.7	2.7	2.3	2.4	1.4	1.5	1.7
Telegraph industry	31.4	31.9	30.9	31.6	32.8	34.9	36.5	37.6
Professional and semiprofessional personnel	1.7	1.7	1.4	1.2	1.2	1.4	1.4	1.4
Office superintendents	2.5	2.5	2.6	2.6	2.8	2.9	3.0	3.1
Sales employees .....	.5	.5	.5	.5	.5	.6	.6	.6
Clerical employees	7.5	7.5	7.2	7.3	7.7	8.1	8.5	8.7
Telegraph operators	6.0	6.2	6.1	6.3	7.0	7.4	8.0	8.7
Telephone operators	1.5	1.5	1.3	1.3	1.5	1.6	1.8	1.9
Construction, installation, and repair employees	7.2	7.4	6.9	6.9	6.5	7.1	6.9	6.6
Building service employees .....	.6	.6	.6	.6	.7	.8	.9	.9
Messengers	3.9	4.1	4.3	4.5	5.0	5.1	5.6	5.9

¹ Group totals include data not shown separately.

SOURCE: See text, pp. 22 and 23.

Chapter 8. Employment in Engineering, Scientific, and Technical Occupations in Private Industry

Since the middle 1950's, the Bureau of Labor Statistics has been conducting a series of employment surveys of scientists, engineers, and technicians in private industry. The results of the 1967 survey¹⁷ based on an extensive sample (27,000 establishments) are the most reliable estimates available of occupational employment of scientific personnel in 82 industries. Private industry constitute the largest segment of total occupational employment statistics. The remaining segments contributing occupational employment statistics to total employment are colleges and universities, government, and nonprofit organizations all of which are provided for in separate surveys, and the self-employed which are estimated separately. The scientific and technical personnel data for 1966 and earlier years which appeared as preliminary data in the previous bulletin¹⁸ have been revised in this bulletin to agree with final estimates.

Some of the results of the 1961 through 1967 surveys are presented in tables 6 through 10 of this report. Since 1961, these surveys have been on an establishment basis which has improved the industry classification. Consequently, the information from the pre-1961 surveys which were on a company basis are not exactly comparable to those after 1961.¹⁹ Moreover, since 1961, the survey of scientific and technical personnel in industry was refined to show a greater subdivision of industry detail. For instance, the private payroll employment of scientists, engineers, and technicians was tabulated for 82 industries in 1967 compared with 55 in 1961. This expansion and finer classification has provided more detail on the functions and structure of the occupational patterns in industry. Furthermore, the sampling universe covers about 34 million workers in 530,000 establishments from which a sample of 27,000 establishments was drawn.

Some of the more significant "out of scope" components in the 1967 survey of private in-

dustry were those regarding the nature of the industry, the size of the establishment, and the self-employed. For example, analysis of previous surveys indicated that (1) some industry groupings should be omitted from the scope of the survey because of their negligible numbers of scientists and engineers (for example, apparel and accessory stores) and that (2) the minimum employment size of an establishment to be surveyed should be determined separately for each industry in order to improve the efficiency of the survey. Those establishments below the minimum size were omitted from the survey. (See table 11.)

Tables 6, 7, and 8 present occupational employment statistics for total engineers, scientists, and technicians by industry and year. Tables 9 and 10 include the occupational employment of six occupations each of scientists and technicians by industry for January 1967. These tables include only the people working as engineers, scientists, and technicians for a wage or salary, regardless of the field of degree or whether they hold a college degree. For example, an employee trained as an engineer but working as a chemist was counted as a chemist.

Tables 6, 7, and 8 are a composite of several surveys. Each year reflects the results of a separate survey because of additions to the sample, reports not necessarily received from the same establishments each year, and the degree of inconsistency in reporting where different depart-

¹⁷A publication containing the results of the 1967 survey of scientific and technical personnel in industry is in preparation. The latest published in the series which also contains back year data is *Scientific and Technical Personnel in Industry 1961-66* (Bulletin 1609, Washington, D.C., 1968).

¹⁸*Occupational Employment Statistics 1960-66* (Bulletin 1579). Bureau of Labor Statistics, January 1968.

¹⁹For information on the pre-1961 surveys see National Science Foundation: *Scientific and Technical Personnel in Industry, 1960* (1961); *Scientific and Technical Personnel in American Industry, Report on a 1959 Survey* (1962); *Science and Engineering in American Industry, Final Report on a 1953-54 Survey* (Oct. 1956) and *1956 Survey* (Nov. 1956).

ments or company officials may complete the survey for different years. Despite such fluctuations on a year to year basis, the data provide the best estimates available on the employment of scientific and technical personnel in private industry and the only estimates on an establishment basis.

The tabulation shows the relative sampling error for employment estimates of the major scientific and technical occupational groups surveyed, as of January 1967, for all industries. The relative error shows the amount (in percentage terms) of deviation due to sampling variability, assuming no bias due to nonresponse, between an estimate and the figure that would have been obtained had it been possible to take a complete census using the same schedules and

Occupational group	Relative sampling error <hr style="width: 100%; margin: 0;"/> (Percent)
Engineers	1.9
Physical scientists	3.5
Mathematicians	11.5
Technicians	2.4

procedures. The tabulation shows that an estimate will differ 2 times out of 3 from a complete census by less than the above relative error. The effect of nonsampling errors, for example, response errors, processing errors, or bias arising from the collection steps, is not shown in the above tabulation.

Table 6. Employment of engineers by industry, as of January 1961-67

SIC code	Industry	(In thousands)						
		1967	1966	1965	1964	1963	1962	1961
	All industries -----	824.0	776.2	749.2	726.4	711.6	669.7	640.1
07-09	Agriculture, forestry, and fisheries ¹ -----	-	-	-	-	-	-	-
10-14	Mining -----	17.3	17.2	17.3	17.0	17.0	(²)	(²)
15-17	Contract construction -----	43.3	46.7	42.0	38.8	38.8	37.5	36.2
	Manufacturing -----	577.5	536.2	519.9	504.4	503.3	472.3	450.2
19	Ordnance and accessories -----	51.9	51.5	50.7	47.4	46.2	41.1	36.2
20	Food and kindred products -----	6.2	4.9	4.8	4.4	5.8	5.8	5.8
22, 23	Textile mill products and apparel -----	3.7	3.7	3.4	3.8	2.9	2.7	2.6
26	Paper and allied products -----	9.4	9.7	9.6	9.3	9.5	9.5	9.0
28	Chemicals and allied products -----	42.5	40.6	38.6	39.4	34.6	33.2	32.2
29	Petroleum refining and related industries -----	10.7	9.9	10.1	9.8	9.6	9.5	9.4
30	Rubber and miscellaneous plastics products -----	9.7	7.8	7.2	6.0	5.6	5.1	5.3
32	Stone, clay, and glass products -----	9.6	8.9	8.4	7.8	8.0	7.9	7.6
33	Primary metal industries -----	21.4	20.5	20.0	18.6	20.3	21.1	20.5
34	Fabricated metal products -----	29.2	27.9	26.2	24.8	24.7	23.9	23.9
35	Machinery, except electrical -----	81.5	75.1	73.5	72.7	69.6	65.3	62.3
36	Electrical machinery, equipment, and supplies -----	142.0	135.5	132.1	129.6	133.9	122.7	117.7
37	Transportation equipment ³ -----	119.5	103.6	100.6	96.7	97.3	90.5	85.9
38	Professional, scientific, and controlling instruments; photographic and optical goods; watches and clocks -----	32.4	29.6	27.9	26.7	26.8	25.9	24.3
	Other ⁴ -----	7.8	7.0	6.7	6.5	6.7	6.4	6.1
	Transportation, communication, and utilities -----	53.2	51.6	50.8	46.6	44.8	44.7	43.2
40	Railroad transportation -----	4.2	4.1	4.1				
41-47	Other transportation services -----	5.1	4.3	4.3	8.8	8.3	8.7	8.8
48	Communication -----	17.9	17.1	16.8	13.7	12.9	12.8	12.5
49	Electric, gas, and sanitary services -----	25.9	26.1	25.5	24.1	23.6	23.2	21.9
50-59	Wholesale and retail trade -----	24.8	23.0	21.6	23.1	18.2	16.7	15.0
60-67	Finance, insurance, and real estate -----	4.4	4.2	4.0	5.0	3.1	3.1	2.5
	Services -----	103.4	97.3	93.7	90.5	85.5	78.9	75.7
70-79	Hotel, personal, business, repair, amusement, recreation, and legal ⁵ -----	39.4	36.1	35.2	36.5	35.7	30.0	28.8
81	Medical and dental laboratories -----	-	-	-	-	-	-	-
807	Engineering and architectural services -----	64.0	61.2	58.5	54.0	49.8	48.9	46.9

¹ Estimates for engineers in this industry group are included in the total only, since they have averaged fewer than 1,000 over the years.

² No estimates for engineers in mining are shown for 1961 and 1962 because the data are not comparable with later years.

³ Due to a change in estimating procedure and the allocation of consolidated reports in the motor vehicle industry, the 1967 data are not comparable with 1966 and earlier years. This adjustment also affects to a lesser degree ordnance and industries in the electrical machinery group.

⁴ Included are: Tobacco manufactures (SIC 21); lumber and wood products (SIC 24); furniture and fixtures (SIC 25); printing and publishing (SIC 27); leather and leather products (SIC 31); and miscellaneous manufacturing (SIC 39).

⁵ Virtually all the employment is contained in commercial laboratories, research and other business services (SIC 739).

NOTE: Because of rounding, sums of individual items may not equal totals.

SOURCE: Data cover payroll employment in private industry and are drawn from the annual surveys conducted by the U.S. Department of Labor, Bureau of Labor Statistics with the support of the National Science Foundation. (For further details, see Bulletin 1609, *Scientific and Technical Personnel in Industry, 1961-1966*, and a forthcoming bulletin soon to be published entitled *Scientific and Technical Personnel in Industry, 1967*.) Scientific and technical personnel in governments, colleges and universities, and nonprofit institutions were excluded because they are covered in separate surveys.

Table 7. Employment of scientists¹ by industry, as of January 1961-67

SIC code	Industry	(In thousands)						
		1967	1966	1965	1964	1963	1962	1961
	All industries -----	189.1	178.4	168.6	164.6	158.8	154.3	146.9
07-09	Agriculture, forestry, and fisheries ² -----	-	-	-	-	-	-	-
10-14	Mining -----	14.4	12.0	11.6	10.1	10.5	(³)	(³)
15-17	Contract construction ² -----	-	-	-	-	-	-	-
	Manufacturing -----	135.8	129.7	123.5	125.9	122.4	120.1	115.2
19	Ordnance and accessories -----	9.0	8.4	7.8	7.2	6.7	6.1	4.5
20	Food and kindred products -----	7.4	6.9	7.2	7.6	7.1	6.7	7.2
22, 23	Textile mill products and apparel -----	1.8	2.5	2.3	1.2	1.3	1.3	1.2
26	Paper and allied products -----	4.5	4.1	3.9	4.0	3.9	3.9	3.6
28	Chemicals and allied products -----	56.9	57.1	53.4	51.5	50.4	49.9	47.2
29	Petroleum refining and related industries -----	4.0	4.0	4.0	5.1	5.0	4.9	4.9
30	Rubber and miscellaneous plastics products -----	2.7	3.2	3.0	2.0	2.1	2.0	1.9
32	Stone, clay, and glass products -----	2.4	1.7	1.5	2.1	2.1	2.1	2.1
33	Primary metal industries -----	7.8	7.2	7.3	9.5	9.5	10.5	9.9
34	Fabricated metal products -----	2.6	2.3	2.6	2.6	2.3	2.1	2.2
35	Machinery, except electrical -----	7.1	6.5	6.5	7.1	5.8	5.2	4.9
36	Electrical machinery, equipment, and supplies -----	10.5	9.0	8.2	9.7	10.4	9.5	9.2
37	Transportation equipment ⁴ -----	11.3	8.9	8.7	9.1	8.7	8.9	9.5
38	Professional, scientific, and controlling instruments; photographic and optical goods; watches and clocks -----	5.7	6.0	5.4	4.7	4.7	4.6	4.4
	Other ⁵ -----	2.0	1.9	1.7	1.9	1.7	1.6	1.7
	Transportation, communication, and utilities -----	1.9	1.8	1.8	2.0	1.7	1.6	1.6
40-47	Transportation and related services ² -----	-	-	-	-	-	-	-
48	Communication ² -----	-	-	-	-	-	-	-
49	Electric, gas, and sanitary services -----	1.2	1.2	1.2	1.2	1.1	1.0	1.0
50-59	Wholesale and retail trade -----	10.1	8.6	7.9	4.3	3.5	3.1	2.7
60-67	Finance, insurance, and real estate -----	4.8	4.8	4.4	2.3	2.1	2.1	2.1
	Services -----	21.2	20.5	18.6	19.0	17.2	15.3	13.2
70-79,	Hotel, personal, business, repair, amusement, recreation, and legal ⁶ -----	16.6	16.2	15.1	14.7	13.8	12.4	10.3
807	Medical and dental laboratories -----	1.6	1.4	1.3	1.2	1.1	1.1	1.0
891	Engineering and architectural services -----	3.0	2.9	2.2	3.1	2.3	1.8	1.9

¹ Scientists include chemists, physicists, metallurgists, geologists and geophysicists, other physical scientists, agricultural scientists, biological scientists, medical scientists, other life scientists and mathematicians.

² Estimates for scientists in this industry group are included in the totals only, since they have averaged fewer than 1,000 over the year.

³ No estimates for scientists in mining are shown for 1961 and 1962 because the data are not comparable with later years.

⁴ Due to a change in estimating procedure and the allocation of consolidated reports in the motor vehicle industry, the 1967 data are not comparable with 1966 and earlier years. This adjustment also affects to a lesser degree ordnance and industries in the electrical machinery group.

⁵ Included are: Tobacco manufactures (SIC 21); lumber and wood products (SIC 24); furniture and fixtures (SIC 25); printing and publishing (SIC 27); leather and leather products (SIC 31); and miscellaneous manufacturing (SIC 39).

⁶ Virtually all the employment is contained in commercial laboratories, research and other business services (SIC 739).

NOTE: Because of rounding, sums of individual items may not equal totals.

SOURCE: Data cover payroll employment in private industry and are drawn from the annual surveys conducted by the U.S. Department of Labor, Bureau of Labor Statistics with the support of the National Science Foundation. (For further details, see Bulletin 1609, *Scientific and Technical Personnel in Industry, 1961-1966*, and a forthcoming bulletin soon to be published entitled *Scientific and Technical Personnel in Industry, 1967*). Scientific and technical personnel in governments, colleges and universities, and nonprofit institutions were excluded because they are covered in separate surveys.

Table 8. Employment of technicians¹ by industry, as of January 1961-67

SIC code	Industry	(In thousands)						
		1967	1966	1965	1964	1963	1962	1961
	All industries -----	734.7	673.2	646.5	636.5	619.0	589.5	570.0 ²
07-09	Agriculture, forestry, and fisheries ³ -----	-	-	-	-	-	-	-
10-14	Mining -----	12.3	10.1	10.3	10.4	10.4	(⁴)	(⁴)
15-17	Contract construction -----	25.7	30.2	25.4	23.8	27.8	26.2	26.0
	Manufacturing -----	416.0	380.4	369.4	370.0	365.3	355.9	329.6
19	Ordnance and accessories -----	20.9	19.3	19.4	19.2	19.3	18.2	16.9
20	Food and kindred products -----	5.1	4.2	4.1	4.7	4.0	3.9	3.2
22, 23	Textile mill products and apparel -----	2.4	2.6	2.2	2.7	2.8	2.8	2.6
26	Paper and allied products -----	8.1	6.0	6.0	6.3	6.3	6.2	5.7
28	Chemicals and allied products -----	40.8	38.3	36.7	38.0	36.8	35.5	35.6
29	Petroleum refining and related industries -----	6.2	5.8	5.7	4.6	4.7	5.8	5.4
30	Rubber and miscellaneous plastics products -----	5.5	4.9	5.0	4.7	4.9	5.1	5.1
32	Stone, clay, and glass products -----	7.4	5.6	5.6	5.8	5.7	5.4	5.1
33	Primary metal industries -----	18.2	17.6	17.4	17.3	16.5	18.1	16.0
34	Fabricated metal products -----	25.8	24.7	24.7	25.9	25.3	25.8	23.3
35	Machinery, except electrical -----	77.8	67.4	65.5	64.9	61.7	57.9	53.8
36	Electrical machinery, equipment, and supplies -----	104.4	100.9	96.8	93.8	93.8	92.6	84.1
37	Transportation equipment ⁵ -----	64.4	56.8	55.2	56.0	55.4	51.2	47.8
38	Professional, scientific, and controlling instruments; photographs and optical goods; watches and clocks -----	22.5	20.2	19.3	18.7	20.6	20.0	18.5
	Other ⁶ -----	6.2	6.2	5.8	7.9	7.5	6.9	6.5
	Transportation, communication, and utilities -----	62.4	58.4	56.9	57.9	55.6	54.3	42.3
40	Railroad transportation -----	4.0	4.7	4.5				
41-47	Other transportation services -----	2.7	2.1	2.1	6.5	6.0	6.0	6.2
48	Communication -----	34.5	31.7	30.6	31.3	30.7	30.4	29.8
49	Electric, gas, and sanitary services -----	21.2	19.8	19.6	20.1	18.9	17.9	16.3
50-59	Wholesale and retail trade -----	38.0	31.2	29.4	25.8	23.3	21.6	22.9
60-67	Finance, insurance, and real estate -----	7.2	5.8	5.2	4.6	4.6	4.4	4.3
	Services -----	172.5	156.2	149.1	142.5	129.2	113.8	106.6
70-79, 81	Hotel, personal, business, repair, amusement, recreation, and legal ⁷ -----	48.5	39.9	39.6	40.2	39.8	36.0	37.0
807	Medical and dental laboratories -----	20.7	18.5	18.6	18.7	16.2	15.6	13.5
891	Engineering and architectural services -----	103.3	97.8	90.9	83.6	73.2	62.2	56.1

¹ Technicians include draftsmen, surveyors, electrical and electronic technicians, other engineering and physical science technicians, life science technicians, and all other technicians.

² The 1961 technician total includes the addition of 15,000 surveyors, made to insure comparability of the time series on an occupational level, but it has not been possible to allocate this input on an industry level.

³ Estimates for technicians in this industry group are included in the total only, since they have averaged fewer than 1,000 over the years.

⁴ No estimates for technicians in mining are shown for 1961 and 1962 because the data are not comparable with later years.

⁵ Due to a change in estimating procedure and the allocation of consolidated reports in the motor vehicle industry, the 1967 data are not comparable with 1966 and earlier years. This adjustment also affects to a lesser degree ordnance and in industries in the electrical machinery group.

⁶ Included are: Tobacco manufactures (SIC 21); lumber and wood products (SIC 24); furniture and fixtures (SIC 25); printing and publishing (SIC 27); leather and leather products (SIC 31); and miscellaneous manufacturing (SIC 39).

⁷ Virtually all the employment is contained in commercial laboratories, research, and other business services, SIC 739.

NOTE: Because of rounding, sums of individual items may not equal totals.

SOURCE: Data cover payroll employment in private industry and are drawn from the annual surveys conducted by the U.S. Department of Labor, Bureau of Labor Statistics with the support of the National Science Foundation. (For further details, see Bulletin 1609, *Scientific and Technical Personnel in Industry, 1961-1966*, and a forthcoming bulletin soon to be published entitled *Scientific and Technical Personnel in Industry, 1967*.) Scientific and technical personnel in governments, colleges and universities, and nonprofit institutions were excluded because they are covered in separate surveys.

Table 9. Employment of scientists by occupation and industry, as of January 1967

SIC code	Industry	(In thousands)							Life scientists	Mathematicians
		Total physical and life scientists	Physical scientists							
			Total	Chemists	Physicists	Geologists, geophysicists	All other			
	All industries -----	189.1	135.3	85.2	16.2	16.4	17.5	22.4	31.3	
07-09	Agriculture, forestry, and fisheries -----	0.7	(1)	(1)	(1)	(1)	(1)	0.7	(1)	
10-14	Mining -----	14.4	14.0	0.9	0.2	12.3	0.5	.8	0.6	
15-17	Contract construction -----	.2	(1)	(1)	(1)	(1)	(1)	(1)	(1)	
	Manufacturing -----	135.8	100.6	72.6	11.7	1.2	15.2	16.3	18.8	
19	Ordnance and accessories -----	9.0	4.9	1.6	2.5	.2	.6	.3	3.8	
20	Food and kindred products -----	7.4	4.5	4.1	.1	(1)	.4	2.6	.3	
22, 23	Textile mill products and apparel -----	1.8	1.6	1.5	(1)	(1)	.1	(1)	.1	
26	Paper and allied products -----	4.5	3.3	2.7	.1	(1)	.5	.8	.3	
28	Chemicals and allied products -----	56.9	44.3	40.5	2.1	.1	1.5	11.2	1.4	
29	Petroleum refining and related industries -----	4.0	3.8	3.3	.1	.3	.1	(1)	.2	
30	Rubber and miscellaneous plastics products -----	2.7	2.6	2.2	.1	(1)	.3	.1	.1	
32	Stone, clay, and glass products -----	2.4	2.3	1.4	.2	.2	.4	(1)	.2	
33	Primary metal industries -----	7.8	7.4	2.3	.1	.1	4.9	.1	.3	
34	Fabricated metal products -----	2.6	2.0	.9	.3	(1)	.8	(1)	.6	
35	Machinery, except electrical -----	7.1	3.7	1.8	.6	(1)	1.3	.2	3.2	
36	Electrical machinery, equipment, and supplies -----	10.5	7.0	2.5	2.9	.1	1.4	.2	3.4	
37	Transportation equipment ² -----	11.3	6.9	2.9	1.6	(1)	2.4	.2	4.2	
38	Professional, scientific, and controlling instruments; photographic and optical goods; watches and clocks -----	5.7	5.0	3.5	1.0	(1)	.5	.2	.5	
	Other ³ -----	2.0	1.4	1.4	(1)	(1)	(1)	.3	.3	
	Transportation, communication, and utilities -----	1.9	.9	.5	(1)	(1)	.4	.2	.7	
40-47	Transportation and related services -----	.4	.2	.1	(1)	(1)	.1	.1	.1	
48	Communication -----	.4	(1)	(1)	(1)	(1)	(1)	(1)	.4	
49	Electric, gas, and sanitary services -----	1.2	.7	.3	(1)	(1)	.3	.1	.2	
50-59	Wholesale and retail trade -----	10.1	5.0	4.3	.2	.2	.3	2.7	2.3	
60-67	Finance, insurance, and real estate -----	4.8	(1)	(1)	(1)	(1)	(1)	.2	4.5	
70-79,	Services -----	21.2	14.5	6.8	4.0	2.4	1.4	2.1	4.4	
81	Hotel, personal, business, repair, amusement, recreation, and legal ⁴ -----	16.6	12.1	6.0	3.3	1.8	1.1	.7	3.5	
807	Medical and dental laboratories -----	1.6	.4	.3	(1)	(1)	(1)	1.2	(1)	
891	Engineering and architectural services -----	3.0	2.0	.5	.7	.6	.3	.2	.9	

¹ Fewer than 50.² Due to a change in estimating procedure and the allocation of consolidated reports in the motor vehicle industry, the 1967 data are not comparable with earlier years. This adjustment also affects to a lesser degree certain other industries, namely ordnance and industries in the electrical machinery group.³ Included are: Tobacco manufactures (SIC 21); lumber and wood products (SIC 24); furniture and fixtures (SIC 25); printing and publishing (SIC 27); leather and leather products (SIC 31); and miscellaneous manufacturing (SIC 39).⁴ Virtually all the employment is contained in commercial laboratories, research and other business services (SIC 739).

NOTE: Because of rounding, sums of individual items may not equal totals.

SOURCE: Data cover payroll employment in private industry and are drawn from the annual surveys conducted by the U.S. Department of Labor, Bureau of Labor Statistics with the support of the National Science Foundation. (For further details, see forthcoming bulletin *Scientific and Technical Personnel in Industry, 1967*.) Scientific and technical personnel in governments, colleges and universities, and nonprofit institutions were excluded because they are covered in separate surveys.

Table 10. Employment of technicians by occupation and industry, as of January 1967

(In thousands)								
SIC code	Industry	Total	Draftsmen	Surveyors	Electrical and electronic	Other engineering and physical scientists	Life scientists	All other technicians
	All industries	734.7	270.7	22.8	161.0	167.4	29.3	83.6
07-09	Agriculture, forestry, and fisheries.....	0.7	(¹)	(¹)	(¹)	(¹)	0.6	0.1
10-14	Mining	12.3	4.4	1.3	1.2	3.1	.1	2.1
15-17	Contract construction	25.7	17.4	3.1	2.3	.5	(¹)	2.4
	Manufacturing	416.0	140.2	1.4	94.1	128.6	6.9	44.8
19	Ordnance and accessories.....	20.9	4.8	(¹)	9.1	5.7	.2	1.1
20	Food and kindred products.....	5.1	.8	(¹)	.3	1.4	1.1	1.6
22, 23	Textile mill and apparel products.....	2.4	.4	(¹)	.2	.6	(¹)	1.2
26	Paper and allied products.....	8.1	1.5	.1	.7	4.9	.2	.8
28	Chemicals and allied products.....	40.8	4.2	.1	1.5	24.1	3.9	7.0
29	Petroleum refining and related industries.....	6.2	.8	.1	.3	3.8	(¹)	1.2
30	Rubber and miscellaneous plastics products.....	5.5	1.4	(¹)	.2	2.7	.1	1.1
32	Stone, clay, and glass products.....	7.4	2.1	.1	1.5	2.3	.1	1.2
33	Primary metal industries.....	18.2	5.1	.2	1.5	8.5	.1	2.9
34	Fabricated metal products.....	25.8	17.5	.2	1.3	5.1	(¹)	1.6
35	Machinery, except electrical.....	77.8	39.1	.1	12.8	17.6	.2	7.9
36	Electrical machinery, equipment, and supplies.....	104.4	29.9	.4	47.4	19.2	.2	7.3
37	Transportation equipment ²	64.4	23.1	.1	9.8	26.1	.2	5.3
38	Professional, scientific, and controlling instruments; photographic and optical goods; watches and clocks.....	22.5	6.6	(¹)	6.5	5.4	.5	3.5
	Other ³	6.2	2.8	.1	.7	1.4	.1	1.1
	Transportation, communication, and utilities.....	62.4	9.1	2.7	29.0	15.8	.1	5.7
40-47	Transportation and related services.....	6.7	2.0	1.2	1.7	.6	.1	1.2
48	Communication.....	34.5	.8	(¹)	21.0	10.6	(¹)	2.0
49	Electric, gas, and sanitary services.....	21.2	6.3	1.5	6.2	4.5	.1	2.5
50-59	Wholesale and retail trade.....	38.0	4.8	(¹)	17.1	2.6	1.8	11.6
60-67	Finance, insurance, and real estate.....	7.2	.7	(¹)	.1	.4	.1	5.8
	Services.....	172.5	94.0	14.1	17.2	16.4	19.6	11.1
70-79, 81	Hotel, personal, business, repair, amusement, recreation, and legal ⁴	48.2	16.6	.4	13.5	12.4	.7	4.6
807	Medical and dental laboratories.....	20.7	(¹)	(¹)	(¹)	(¹)	18.8	1.8
891	Engineering and architectural services.....	103.3	77.3	13.8	3.7	4.0	.1	4.5

¹ Fewer than 50.² Due to a change in estimating procedure and the allocation of consolidated reports in the motor vehicle industry, the 1967 data are not comparable with earlier years. This adjustment also affects to a lesser degree certain other industries, namely, ordnance and industries in the electrical machinery group. However, the impact of this adjustment is largely restricted to 2 occupations, engineers and engineering and physical science technicians.³ Included are: Tobacco manufactures (SIC 21); lumber and wood products (SIC 24); furniture and fixtures (SIC 25); printing and publishing (SIC 27); leather and leather products (SIC 31); and miscellaneous manufacturing (SIC 39).⁴ Virtually all the employment is contained in commercial laboratories, research and other business services (SIC 739).

NOTE: Because of rounding, sums of individual items may not equal totals.

SOURCE: Data cover payroll employment in private industry and are drawn from the annual surveys conducted by the U.S. Department of Labor, Bureau of Labor Statistics with the support of the National Science Foundation. (For further details, see forthcoming bulletin Scientific and Technical Personnel in Industry, 1967.) Scientific and technical personnel in governments, colleges and universities, and nonprofit institutions were excluded because they are covered in separate surveys.

Table 11. Minimum employment¹ size of establishments by industry covered by 1961-67 surveys

SIC code	Industry	1961-64	1965-67
07-09	Agriculture, forestry, and fisheries	50	10
	Mining:		
10	Metal	10	10
11-12	Anthracite, bituminous, and lignite	10	10
13	Crude petroleum and natural gas	1	4
14	Nonmetallic minerals, except fuels	10	10
15-17	Contract construction	10	4
	Manufacturing:		
19	Ordnance and accessories	1	4
20	Food and kindred products	10	10
21	Tobacco manufactures	10	50
22	Textile mill products	50	50
23	Apparel and other finished products	10	100
24	Lumber and wood products	50	50
25	Furniture and fixtures	50	50
26	Paper and allied products	10	10
27	Printing and publishing	10	100
28	Chemicals and allied products	1	4
29	Petroleum refining and related industries	1	10
30	Rubber and miscellaneous plastics products	10	10
31	Leather and leather products	10	50
32	Stone, clay, and glass products	10	4
33	Primary metal industries	1	4
34	Fabricated metal products	1	4
35	Machinery, except electrical	1	1
36	Electrical machinery, equipment, and supplies	1	4
37	Transportation equipment	1	4
38	Professional, scientific, and controlling instruments; photographic and optical goods; watches and clocks	1	4
39	Miscellaneous	10	10
	Transportation, communication, and utilities:		
40	Railroad transportation	100	50
41-47	Other transportation services	1	50
48	Communication	1	4
49	Electric, gas, and sanitary services	1	4
50-59	Wholesale and retail trade	50	10
60-67	Finance, insurance, and real estate	50	50
	Services:		
739	Commercial laboratories; business and management consulting services	1	1
807	Medical and dental laboratories	1	1
891	Engineering and architectural services	1	1
70-79 (excl. 739), 81	Other services	50	100

¹ Slightly different minimum employment sizes may apply to some sectors within major industry groups.

SOURCE: 1961-66: *Scientific and Technical Personnel in Industry, 1961-66*, Bulletin 1609, p. 64. In 1967 the minimum employment size of the surveyed establishments was the same as during 1965-66.

Chapter 9. Employment of Engineers, Scientists, and Technicians by Universities and Colleges and by Scientific and Research Nonprofit Organizations

This chapter contains information published by the National Science Foundation concerning the employment of scientific and technical personnel employed in universities and colleges and nonprofit organizations. Included with universities and colleges are the Federally funded research and development centers. These research centers were established to satisfy a particular need of a Federal agency and are exclusively or substantially financed by the Federal Government and administered by universities or groups of universities, for example, the Jet Propulsion Laboratory administered by the California Institute of Technology and funded by the National Aeronautical and Space Administration; the Los Alamos Scientific Laboratory administered by the University of California and funded by the Atomic Energy Commission; or the Applied Physics Laboratory administered by John Hopkins University and funded by the Defense Department. These centers had nearly 6 percent of the full-time employment (4 percent of the full-time and part-time employment combined) of engineers and scientists employed by universities and colleges in 1967. The engineers and scientists employed by these centers were almost exclusively engaged in research and development and related activities. Moreover, the research centers though small in employment when compared with total engineering and scientific personnel employed by universities and colleges, nevertheless, employed 20 and 18 percent of the full-time physicists and engineers, respectively.

Tables 12 and 13 contain employment data for engineers and scientists employed by universities and colleges in 1965 and 1967, respectively. Employment data for technicians at universities and colleges for 1965 and 1967 are presented in table 14. Estimates on the annual staffing requirements through 1975 of engineers and scientists in universities and colleges are available from the National Science Foundation.²⁰ In another recent publication, the National Science Foundation has noted the employment characteristics of the 250,000 scientists and engineers employed by universities and colleges in the United States in 1965.²¹

Occupational employment data for engineers, scientists, and technicians employed by independent nonprofit organizations in 1965 and 1967, are presented in table 15. For the interested reader, the National Science Foundation has available two recent publications concerning the number of scientists and engineers employed by independent nonprofit organizations.²²

²⁰ *Science and Engineering Staff in Universities and Colleges, 1965-1975* (May 1967), National Science Foundation.

²¹ *Scientific Activities at Universities and Colleges, 1964* (May 1968). National Science Foundation, Washington, D.C.

²² *Scientific Activities of Nonprofit Institutions—1966, Expenditures and January 1967 Manpower* (1969), NSF 69-16, National Science Foundation and *Scientific Activities of Nonprofit Institutions—1964 Expenditures and January 1965 Manpower* (1967), NSF 67-17, National Science Foundation, Washington, D.C.

Table 12. Employment of engineers and scientists by universities and colleges, as of January 1965¹

Field of employment	(In thousands)					
	Full time			Part time ²		
	Total	Teaching	Other ³	Total	Teaching	Other ⁴
Total	159.6	98.2	61.2	102.1	60.1	42.0
Engineers	22.9	13.2	9.7	14.5	7.1	7.4
Aeronautical	1.1	.6	.6	.9	.4	.6
Chemical	1.6	1.0	.6	1.6	.7	1.0
Civil	2.8	2.2	.6	2.0	.9	1.0
Electrical	6.7	3.2	3.5	3.7	2.1	1.6
Mechanical	4.7	2.9	1.8	2.4	1.5	.9
Industrial	1.0	.8	.3	.6	.4	.1
Other engineers	4.9	2.6	2.3	3.3	1.2	2.1
Physical scientists	38.7	26.6	12.1	29.4	18.2	11.2
Chemists	11.0	7.3	3.7	9.9	5.8	4.2
Earth scientists	3.7	2.7	1.0	2.8	1.6	1.1
Physicists	10.4	6.0	4.4	8.1	4.1	4.0
Mathematicians	11.9	10.0	1.9	7.7	6.4	1.3
Other physical scientists	1.8	.7	1.1	1.0	.3	.7
Life scientists	63.4	29.3	34.1	38.0	20.2	17.8
Agricultural	13.4	2.9	10.5	5.0	1.0	4.0
Biological	21.0	12.7	8.3	12.4	6.7	5.7
Medical	29.0	13.7	15.3	20.6	12.5	8.1
Psychologists	7.1	5.7	1.3	5.7	3.7	2.1
Social scientists	26.6	22.9	3.6	14.3	10.8	3.4
Economists	6.4	5.1	1.3	3.7	2.6	1.1
Sociologists	4.9	4.3	.5	3.0	2.2	.8
Political scientists	4.9	4.5	.4	2.3	1.9	.4
Other social scientists	10.4	9.0	1.4	5.3	4.2	1.1
Other scientists, not specified .....	.9	.5	.4	.2	.1	.1

¹ Includes employment in Federally funded research and development centers administered by universities and colleges. These centers accounted for almost 5 percent of employment and were almost exclusively involved in research and development.

² Graduate students were slightly more than 50 percent of all part-time employees and were concentrated in the physical sciences occupations. Other part-time employees were concentrated in the life sciences occupations.

³ Includes administrative and other functions. Over 70 percent were involved with research and development functions. Less than 20 percent were employed in the Federally funded research and development centers.

⁴ Includes administrative and other functions. Almost all were employed by the universities and colleges, and over 85 percent were involved with research and development functions.

NOTE: Because of rounding, sums of individual items may not equal totals.

SOURCE: Scientific Activities at Universities and Colleges, 1964, May 1968, National Science Foundation, and unpublished data at the National Science Foundation.

Table 13. Employment of engineers and scientists by universities and colleges, as of January 1967¹

Field of employment	(In thousands)			Part time ²		
	Total	Teaching	Other ³	Total	Teaching	Other ⁴
All occupations -----	184.7	107.7	77.2	118.5	67.3	51.4
Engineers -----	25.8	13.4	12.4	17.0	7.5	9.6
Aeronautical -----	1.3	.6	.7	1.0	.3	.8
Chemical -----	1.6	.9	.7	1.7	.7	1.0
Civil -----	3.3	2.3	1.0	2.4	1.0	1.4
Electrical -----	7.6	3.3	4.2	4.5	2.2	2.3
Mechanical -----	5.2	2.7	2.5	2.5	1.3	1.1
Industrial -----	.8	.6	.2	.7	.5	.3
Other engineers -----	5.9	2.9	3.0	4.2	1.5	2.7
Physical scientists -----	47.1	30.8	16.3	34.5	20.8	13.7
Chemists -----	12.9	8.2	4.7	11.5	6.5	5.0
Earth scientists -----	4.6	3.1	1.6	3.7	1.9	1.8
Physicists -----	12.3	6.4	5.9	8.5	4.1	4.5
Mathematicians -----	15.3	12.3	2.9	9.7	7.9	1.8
Other physical scientists -----	1.9	.8	1.2	1.1	.4	.7
Life scientists -----	70.1	30.2	40.1	41.5	21.2	20.3
Agricultural -----	15.3	3.0	12.3	5.4	.9	4.6
Biological -----	23.9	14.3	9.6	15.2	8.0	7.2
Medical -----	30.9	12.8	18.1	20.9	12.3	8.6
Psychologists -----	8.6	6.6	2.0	6.8	4.4	2.4
Social scientists ⁵ -----	32.3	26.4	5.9	17.9	13.1	4.8
Economists -----	7.9	5.9	2.0	4.8	3.1	1.6
Sociologists -----	5.9	4.9	1.0	3.3	2.6	.8
Political scientists -----	5.9	5.2	.7	2.9	2.3	.6
Other -----	12.6	10.4	2.2	6.9	5.1	1.8
Other scientists, not specified -----	.8	.3	.5	.8	.3	.6

¹ Includes employment in Federally funded research and development centers administered by universities and colleges.

² Part-time employment was nearly 40 percent of total employment; graduate students employed as scientists and engineers were over 60 percent of the part-time employment and were concentrated in the physical sciences and mathematics group. Other part-time employees were concentrated in the life sciences occupations.

³ Includes administrative and other functions. Over 70 percent were involved with research and development functions. Less than 15 percent were employed in the Federally funded research and development centers.

⁴ Includes administrative and other functions. Almost all were employed by the universities and colleges, and 90 percent were involved with research and development.

⁵ The social science definition was expanded in 1967 to include research in education.

NOTE: Because of rounding, sums of individual items may not equal totals.

SOURCE: Based on unpublished survey data at the National Science Foundation.

Table 14. Employment of technicians by universities and colleges, ¹ as of January 1965 and January 1967

(In thousands)						
Field of employment	Total		Research and development		Other activities	
	1965	1967	1965	1967	1965	1967
Total	47.0	57.5	36.2	44.8	10.8	12.7
Engineering and physical science	16.0	22.6	14.1	19.0	1.9	3.5
Life science	26.1	30.5	19.0	22.9	7.1	7.6
Social science	1.2	1.3	1.0	1.0	.2	.3
Other	3.7	3.1	2.1	1.8	1.6	1.3

¹ Includes employment in Federally funded research and development centers managed exclusively or primarily by universities and colleges. These centers had about 20 percent of employment in 1965 and 15 percent in 1967 and were engaged almost exclusively in research and development.

NOTE: Because of rounding, sums of individual items may not equal totals.

SOURCE: 1965 data, Scientific Activities at Universities and Colleges, 1964, May 1968, and Scientific Activities of Nonprofit Institutions - 1964 Expenditures and January 1965 Manpower, National Science Foundation, 1967; 1967 data, unpublished at the National Science Foundation.

Table 15. Employment of engineers, scientists, and technicians by independent nonprofit institutions, as of January 1965 and January 1967

(In thousands)		
Field of employment	Employment ¹	
	1965 ²	1967 ³
Engineers	4.8	5.5
Physical scientists	4.0	3.7
Mathematicians	1.6	2.5
Life scientists	5.0	4.2
Psychologists .....	.8	1.5
Social scientists ⁴	1.8	2.2
Technicians ⁵	6.9	7.4

¹ Employment includes full- and part-time workers. Employment excludes that in voluntary nonprofit hospitals and health agencies. Almost 90 percent of the employment shown for both years was involved in research and development.

² Includes independent research institutes and operating foundations, Federally funded research and development centers administered by nonprofit institutions, private philanthropic foundations, professional and technical societies, academies of science, science exhibitors, and other nonprofit organizations.

³ Ibid., except that 1967 employment excludes 2,525 scientists and engineers; 2,055 in academies of science and 470 in private philanthropic foundations.

⁴ The definition of social scientists was expanded in 1967 to include research in education.

⁵ Includes engineering and all science fields.

SOURCE: 1965 data, Scientific Activities of Nonprofit Institutions - 1964 Expenditures and January 1965 Manpower, National Science Foundation, 1967; 1967 data, Scientific Activities of Nonprofit Institutions 1966, 1969, National Science Foundation.

Chapter 10. Occupational Employment in Federal and State Governments

Federal Government

The U.S. Civil Service Commission (CSC) compiles comprehensive occupational employment information²³ on the Federal work force. In its latest publications, *Occupations of Federal White-Collar Workers, October 31, 1967*, data are presented for over 450 occupational series for each of 23 agencies (including one catch-all category).²⁴ Some of the white-collar occupational employment information is shown in table 16 which presents data for over 150 series containing employment of 1,000 or more persons at least once during the periods ending October 31, 1964, October 31, 1966, and October 31, 1967. A similar publication, *Occupations of Federal Blue-Collar Workers, October 31, 1966*, contains data for nearly 1,500 categories of craftsmen, operatives, laborers, and related workers for each of 23 agencies (including one catch-all category).²⁵ Unpublished occupational data for both white-collar and blue-collar workers in 1968 are available and will be published in 1970.

White-collar occupational employment data for most of the series contained in table 16 are also published by the CSC.²⁶ The mid-year data are obtained from a 10 percent sample of each series. The yearend data are based upon the October 31 actual count of all Federal employees. Four-year projections of employment in these series are provided in the Commission's annual publication *Federal Workforce Outlook*.²⁷

State Government

Employment of scientific, professional, and technical personnel by State government in

January 1964 and 1967 was obtained from sample surveys conducted by the Bureau of Labor Statistics and is shown in table 18. State data are for the 50 States and exclude State educational institutions. Similar surveys of State government employment were made for 1959 and 1962.²⁸

²³ Excluding the Central Intelligence Agency and the National Security Agency.

²⁴ Earlier data are contained in similarly titled publications dated Oct. 31, 1966; Oct. 31, 1961; Oct. 31, 1960; Oct. 31, 1959; Oct. 31, 1958; Feb. 28, 1957; and Aug. 31, 1954. Unpublished data are available for 1964 and 1962. Data for 1951 and 1947 are in Bulletin 1117, which was published in cooperation with the U.S. Civil Service Commission.

²⁵ Earlier data are contained in similarly titled publications dated Oct. 31, 1960; Oct. 31, 1958; and Feb. 28, 1957. Unpublished data are available for 1961, 1962, and 1965.

²⁶ *Current Federal Workforce as of December 1966 and June 1967* (U.S. Civil Service Commission, June 1968). This publication contains total government employment, excluding the Post Office, the Central Intelligence Agency, and the National Security Agency, as of June 30 and December 31. Data for December 1967 and June 1968 are expected to be published in 1970. Earlier data are contained in similarly titled publications dated September 1966 and August 1965.

Employment in selected postal occupations during 1960-67 is presented in table 17.

²⁷ The fifth report in this series, covering fiscal years 1969-72 was published in July 1969. The sixth report covering the fiscal years 1970-73, is expected to be available in 1970.

²⁸ *Employment of Scientific and Technical Personnel in State Government Agencies, 1962* (Bulletin 1412).

Employment of Scientific and Technical Personnel in State Government Agencies, Report on a 1959 Survey, 1961, NSF 61-17 National Science Foundation. This survey was sponsored by the National Science Foundation and conducted by the Bureau of Labor Statistics.

Table 16. Federal employment in selected white-collar occupations, as of October 1964, October 1966, and October 1967

Series code	Series	1967	1966	1964
	All white-collar occupations	1,261,697	1,204,565	1,097,396
	Professional occupations	236,915	226,435	220,654
	Social science	8,602	8,116	7,633
0110	Economics	4,451	4,136	3,641
0180	Psychology	1,936	1,879	1,843
0185	Social work	2,215	2,101	2,149
	Biology and agriculture	18,422	15,370	16,263
0401	General biological science	2,437	1,235	1,027
0457	Soil conservation	4,819	4,825	4,780
0460	Forestry	6,086	6,094	5,974
0470	Soil science	1,887	1,876	1,903
0475	Agricultural management	3,173	3,216	2,579
	Accounting	33,781	32,263	31,038
0510	Accounting	19,791	19,030	18,265
0512	Internal revenue agent	13,990	13,233	12,773
	Medical	37,936	37,552	38,742
0602	Medical officer	10,121	9,689	11,653
0610	Nurse	22,727	22,959	22,570
0630	Dietitian	1,066	1,113	1,161
0644	Medical technologist	1,550	1,403	1,147
0660	Pharmacist	1,184	1,144	939
0680	Dental officer	1,288	1,244	1,272
0701	Veterinary science	2,393	2,338	2,285
	Engineering	78,325	79,025	79,358
0801	General	12,396	11,562	10,359
0808	Architecture	1,513	1,428	1,383
0810	Civil	17,585	17,562	8,461
0811	Construction	-	-	3,451
0812	Structural	-	-	1,286
0813	Hydraulic	-	-	2,178
0819	Sanitary	1,285	1,034	975
0820	Highway	-	-	1,938
0830	Mechanical	9,723	8,796	8,376
0840	Nuclear	1,062	1,009	879
0850	Electrical	4,426	4,388	4,370
0855	Electronic	14,991	13,935	13,176
0861	Aerospace	9,371	8,898	8,211
0870	Marine	1,021	953	887
0871	Naval architecture	1,184	1,045	1,100
0893	Chemical	1,544	1,326	1,290
0896	Industrial	2,224	2,089	2,038
0905	Attorney	9,447	9,086	9,057
1224	Patent examining	1,149	1,107	1,106
	Physical science	27,639	26,964	26,018
1301	General physical science	6,267	6,227	6,466
1310	Physics	5,806	5,531	5,026
1320	Chemistry	8,302	8,135	7,716
1340	Meteorology	2,394	2,257	2,190
1350	Geology	1,858	1,949	1,965
1370	Cartography	3,031	2,865	2,655
	Mathematics	5,790	4,961	4,149
1515	Operation research	1,088	852	637
1520	Mathematics	4,113	3,591	3,089
1529	Mathematical statistics	589	518	423
1710	Education and vocational training	13,431	14,653	14,005
	Administrative-technician (general) occupations	347,774	323,159	292,001
0018	Safety management	1,781	1,646	1,420
0080	Security administration	2,602	2,329	2,113
0132	Intelligence	3,152	3,046	2,776
0188	Recreation	2,247	2,025	1,811

See footnotes at end of table.

Table 16. Federal employment in selected white-collar occupations, as of
October 1964, October 1966, and October 1967—Continued

Series code	Series	1967	1966	1964
	Personnel	16,952	16,177	14,987
0201	Personnel management	9,196	8,795	7,959
0212	Personnel staffing	3,543	3,305	2,949
0221	Position classification	2,384	2,339	2,433
0235	Employee development	1,829	1,738	1,646
	Computer and management services	63,371	53,934	44,195
0330	Digital computer systems administration	1,231	1,238	1,107
0331	Digital computer programmer ²	-	-	5,438
0332	Digital computer systems operation	6,550	5,523	3,728
0334	Computer specialist ³	14,802	12,092	3,354
0335	Computer aid and technician	2,076	903	-
0340	Program management	3,048	2,842	2,562
0341	Administrative officer	9,574	9,444	9,500
0342	Office services and management and supervision	2,291	1,992	2,008
0343	Management analysis	8,820	8,479	8,313
0344	Management technician	4,123	3,929	3,529
0345	Program analysis	4,992	2,518	-
0362	Electric accounting machine project planning	701	877	1,509
0392	General communication	3,237	2,489	2,010
0393	Communication specialist	1,926	1,608	1,137
	Agricultural support	9,026	8,697	6,329
0403	Microbiology	1,394	1,382	1,215
0404	Biological technician	4,680	4,432	2,237
0458	Soil conservation technician	2,952	2,883	2,877
	Accounting, finance support	26,774	26,100	26,805
0501	General accounting, clerical, and administration	10,750	10,581	11,073
0525	Accounting technician	12,867	12,553	12,990
0570	Financial institution examiner	3,157	2,966	2,742
	Medical	4,663	4,551	4,114
0645	Medical technician	2,983	2,920	2,639
0647	Radiology technician	1,680	1,631	1,475
	Engineering support	60,517	54,817	49,853
0802	Engineering technician	27,295	25,262	21,785
0809	Construction inspection	3,037	2,985	2,772
0817	Surveying technician	3,932	4,228	4,597
0818	Engineering drafting	4,034	3,870	3,863
0856	Electronic technician	20,320	18,334	16,836
0895	Industrial engineering technician	1,899	138	-
	Fine arts	15,896	14,739	13,365
1020	Illustrating	2,763	2,570	2,369
1060	Photography	3,205	2,922	2,500
1081	Public information	2,323	2,077	1,731
1082	Writing and editing	1,888	1,828	1,719
1083	Technical writing and editing	1,836	1,673	1,471
1085	Foreign information	2,000	1,870	1,884
1087	Editorial assistance	1,881	1,799	1,691
	Business and industry	41,962	39,649	36,068
1101	General business and industry	2,799	2,486	1,942
1102	Contract and procurement	18,036	16,981	14,971
1104	Property disposal	1,224	1,234	1,336
1150	Industrial specialist	5,161	4,590	3,802
1152	Production control	6,598	6,314	6,531
1165	Loan specialist	2,627	2,399	2,179
1170	Realty	2,888	2,876	2,751
1171	Appraising and assessing	2,629	2,769	2,556
	Physical science support	9,554	9,238	8,039
1311	Physical science technician	3,642	3,445	2,898
1341	Meteorological technician	2,523	2,390	2,607
1371	Cartographic technician	3,389	3,402	2,534
1410	Librarian	3,528	3,483	3,387
1530	Statistician	2,268	2,307	2,337
	Equipment and construction	16,401	15,316	13,704
1640	Construction and maintenance	2,625	2,651	2,568
1670	Equipment specialist	13,776	12,665	11,136
1712	Instruction	9,306	8,432	6,622
	Investigation	4,531	4,403	4,373
1810	General investigation	2,896	2,853	2,821
1825	Aviation safety officer	1,635	1,550	1,552

See footnotes at end of table.

Table 16. Federal employment in selected white-collar occupations, as of October 1964, October 1966, and October 1967—Continued

Series code	Series	1967	1966	1964
1901	Quality control and inspections	13,696	12,841	10,447
	General commodity quality control and inspection	2,233	2,043	2,123
1903	Quality control and inspection management	1,957	1,776	1,550
1936	Electronic equipment quality control and inspection	3,108	3,047	2,368
1940	Mechanical equipment quality control and inspection	2,681	2,381	1,480
1942	Aircraft quality control and inspection	1,702	1,619	1,008
1948	Ammunition quality control and inspection	1,214	1,063	828
1950	Missile quality control and inspection	801	912	1,090
	Supply	30,797	31,190	31,299
2001	General supply	9,394	10,152	11,785
2010	Inventory management	14,451	14,431	13,033
2030	Distribution facilities and storage management	1,146	1,116	1,172
2050	Supply identification systems	4,206	4,027	3,917
2090	Publications supply	1,600	1,464	1,392
	Transportation	8,750	8,239	7,957
2101	General transportation	1,906	1,784	1,794
2130	Traffic management	1,802	1,706	1,486
2131	Freight rate	2,236	2,155	2,263
2132	Travel	1,668	1,549	1,401
2181	Aircraft operation	1,138	1,045	1,013
	Administrative-technician (Government) occupations	98,501	93,647	88,002
0007	Correctional officer	2,703	2,788	2,905
0105	Social insurance administration	9,922	9,652	9,503
	Accounting	18,099	17,051	15,396
0526	Tax technician	3,012	2,991	2,798
0560	Budget administration	6,759	6,351	6,209
0592	Tax accounting	8,328	7,709	6,389
0685	Public health program specialist	2,374	1,925	1,646
	Claims examining	12,808	11,808	10,177
0962	Contract representative	1,318	1,285	1,168
0963	Legal instruments examining	2,192	2,112	2,186
0993	Social security claims	7,070	6,231	5,071
0996	Veterans claims	2,228	2,180	1,752
1169	Internal revenue officers	6,434	6,199	6,422
	Investigation	25,181	24,324	22,428
1811	Criminal investigation	12,618	12,295	11,258
1813	Wage and hour law	1,191	1,202	1,162
1816	Immigration inspection	1,207	1,186	1,159
1854	Alcohol, tobacco tax inspection	1,150	1,144	1,149
1863	Food inspection	4,915	4,449	3,723
1890	Customs inspection	2,848	2,777	2,667
1896	Immigration patrol inspection	1,252	1,271	1,310
1980	Agricultural commodity grading	2,931	2,952	2,923
2152	Air traffic control	18,049	16,948	17,602
	Aid-assistant occupations	45,691	44,674	42,194
	Medical support	42,703	42,115	39,903
0621	Nursing assistant	38,147	37,427	35,955
0636	Physical-medical rehabilitation therapy assistant	1,115	1,061	1,047
0681	Dental assistant	1,972	1,758	1,308
0699	Medical aid	1,469	1,869	1,593
1411	Library technician	2,988	2,559	2,291
	Clerical (specialized) occupations	114,856	108,209	93,721
	Personnel clerical	18,000	15,568	13,491
0203	Personnel clerical and assistance	9,046	7,827	7,522
0204	Military personnel clerical and technician	8,954	7,741	5,969

See footnotes at end of table.

Table 16. Federal employment in selected white-collar occupations, as of October 1964, October 1966, and October 1967—Continued

Series code	Series	1967	1966	1964
0309	Correspondence clerk	1,850	1,855	1,729
	Accounting clerical	29,293	28,056	27,080
0520	Accounts maintenance clerical	11,788	11,632	11,626
0540	Voucher examining	5,807	5,524	5,447
0544	Payroll	4,602	4,515	4,355
0545	Military pay	5,098	4,517	3,598
0590	Time and leave	1,998	1,868	2,054
0998	Claims clerical	10,734	9,239	2,873
1531	Statistical assistant	6,757	6,778	7,019
	Supply clerical	48,222	46,713	41,529
2020	Purchasing	9,124	8,624	8,186
2040	Supply clerical and assistance	33,594	32,680	28,994
2091	Sales store clerical	3,014	2,845	2,451
2134	Shipment clerical	2,490	2,564	1,898
	Clerical (general) occupations	278,550	276,374	243,883
	Office occupations	275,715	273,599	240,567
0302	Messenger	1,958	1,928	1,702
0304	Information receptionist	1,155	1,174	801
0305	Mail and file	27,640	26,661	23,967
0312	Clerk-stenographer and reporter	51,827	53,256	51,859
0316	Clerk-dictating machine transcribing	6,685	6,689	6,493
0318	Secretary	59,512	57,140	54,935
0322	Clerk-typist	93,430	93,970	70,647
0350	Office-machine operating	1,704	1,708	1,487
0356	Card punch operation	17,145	16,075	12,276
0357	Coding	2,031	1,724	1,466
0359	Electric accounting machine operation	3,773	4,412	5,836
0382	Telephone operating	6,610	6,713	6,756
0385	Teletypist	2,245	2,149	2,342
0530	Cash processing	2,835	2,775	3,316
	Other occupations	139,410	132,067	116,941
	Protective	28,837	27,860	26,785
0081	Fire protection and prevention	12,291	11,829	11,406
0083	Police	2,737	2,638	2,254
0085	Guard	13,809	13,393	13,125
0301	General clerical and administrative	110,573	104,207	90,156

¹ Coverage of 0870 expanded to include series 0811, 0812, 0813, and 0820, which were discontinued in 1966.

² Included in 0334 computer specialist after 1964.

³ Includes digital computer programmer after 1964.

SOURCE: 1967, *Occupations of Federal White-Collar Workers, October 31, 1967*, Pamphlet SM 56-7, October 1968; 1966, *Occupations of Federal White-Collar Workers October 31, 1966*, Pamphlet MS 56-6, June 1968; 1964 unpublished data at the U.S. Civil Service Commission.

Table 17. Employment in selected Post Office occupations, as of October 1960-67

Occupation	(In thousands)							
	1967	1966	1965	1964	1963	1962	1961	1960
All occupations ¹	705	692	610	593	590	585	580	568
Postmasters	32	33	33	34	34	35	35	35
Supervisors	34	33	32	32	32	31	31	30
Postal clerks	304	300	250	240	239	239	239	234
Mail carriers	230	225	207	202	200	198	195	190
Special delivery carriers	5	5	4	4	4	4	4	5
Mail handlers	44	44	32	32	31	31	30	29

¹ Includes data not shown separately.

SOURCE: Post Office Department, Bureau of Finance and Administration, Paid Employees Report, form 1988.

Table 18. Employment of scientific, professional, and technical personnel by State governments, as of January 1964 and January 1967

Occupation	(In thousands)	
	1967	1964
All occupations ¹	200.5	156.8
Engineers	34.2	34.5
Civil engineers ²	30.6	31.0
Sanitary engineers	1.3	1.2
Other engineers	2.3	2.3
Scientists	20.6	16.7
Chemists	1.7	1.4
Geologists and geophysicists	1.1	1.0
Other physical scientists	.4	.1
Agricultural scientists	4.6	3.3
Biomedical scientists	2.4	2.0
Other life scientists	3.3	2.9
Mathematicians	.3	.3
Statisticians	1.6	1.6
Economists	.9	.7
Sociologists and anthropologists	.3	.2
Other social scientists	1.0	.5
Clinical psychologists	2.3	2.0
Social psychologists	.2	.1
Other psychologists	.5	.4
Social workers ³	42.8	9.2
Selected health professions ⁴	41.0	36.2
Public health officers (M. D.)	1.0	.8
Psychiatrists (M. D.)	4.1	3.8
All other physicians (M. D. and D. O.)	4.9	4.4
Dentists (D. D. S. or D. D. M.)	1.2	1.0
Professional nurses (R. N.)	25.3	21.6
Veterinarians (D. V. M.)	1.0	1.1
Sanitarians	3.5	3.4
Technicians	61.9	60.2
Draftsmen	7.1	7.9
Surveyors ⁵	7.8	12.0
Engineering technicians	33.1	30.5
Physical science technicians	2.5	1.5
Agricultural technicians	2.1	2.0
Biological technicians	1.8	1.8
Medical and dental technicians	4.5	3.7
Other technicians ⁶	3.1	.8

¹ The 1964 and 1967 totals are not comparable. See footnote 3.

² Includes electrical, mechanical, and traffic engineers.

³ Data for 1967 are not comparable with 1964 because of a change in definitional requirements. The 1967 data include holders of bachelor's degrees and above, while the 1964 data include only holders of master's degrees and above.

⁴ The relevant occupations do not include physicians and dentists dealing with patients.

⁵ Data for 1964 were overstated to the extent that chainmen and rodmen were included.

⁶ Computer programmers included for the first time in 1967.

NOTE: Because of rounding, sums of individual items may not equal totals.

SOURCE: 1964 data, Employment of Scientific, Professional, and Technical Personnel in State Governments January 1964, Bulletin 1557 (1967). 1967 data, Bureau of Labor Statistics, unpublished sample survey preliminary data.

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