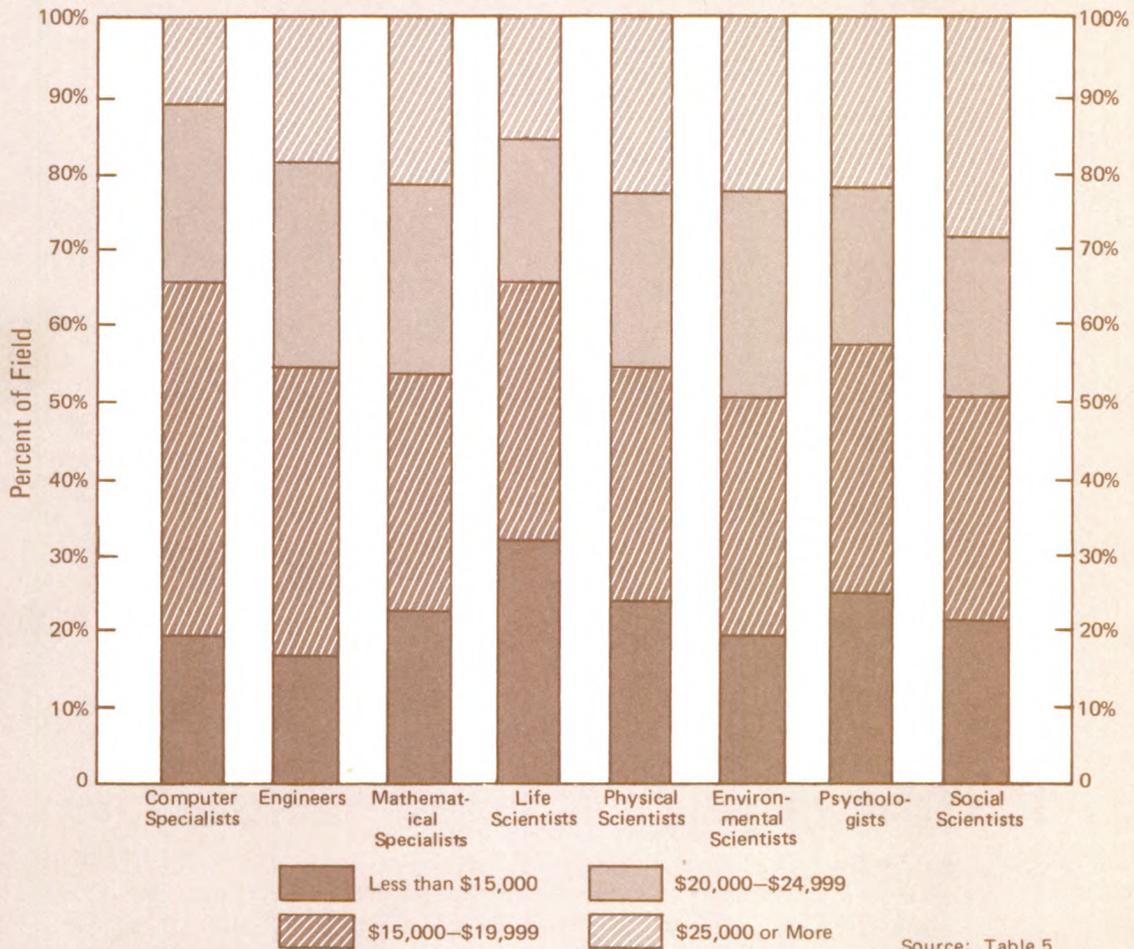


# Special Studies

Series P-23, No. 53  
 Issued July 1975

## SELECTED CHARACTERISTICS OF PERSONS IN FIELDS OF SCIENCE OR ENGINEERING: 1974

Basic Annual Salary Rates in 1974, by Field of Science or Engineering in 1974



Source: Table 5

U. S. DEPARTMENT OF COMMERCE  
 BUREAU OF THE CENSUS



**U.S. DEPARTMENT OF COMMERCE**

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Science or Engineering: 1974

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U.S. Government Printing Office,  
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**CURRENT POPULATION  
REPORTS**

Special Studies  
Series P-23, No. 53  
Issued July 1975

**SELECTED CHARACTERISTICS  
OF PERSONS IN FIELDS OF  
SCIENCE OR ENGINEERING:  
1974**

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The 1974 National Survey of Scientists and Engineers was sponsored by the National Science Foundation, as part of the Manpower Characteristics System, and conducted by the Bureau of the Census.

The principal participants for the National Science Foundation in developing and coordinating the survey were J. James Brown, Study Director, Manpower Characteristics Studies Group, and Robert W. Cain, Head, Manpower and Education Studies Section, both members of the Division of Science Resources Studies. Assistance was provided by Nancy Conlon, Analyst, Manpower Characteristics Studies Group.

At the Bureau of the Census, Charles L. Kincannon, until March 1974, and subsequently, Paula J. Schneider, Chief, Labor Force Statistics Branch, Population Division, had primary responsibility in planning and conducting the survey. This report was prepared by Thomas J. Palumbo, assisted by Victor M. Valdisera. Mary K. Friday, Ann M. Gifford, and Patricia L. Marks developed the systems and processing procedures and programs. Overall direction was provided by Murray S. Weitzman, Assistant Division Chief (Socioeconomic Statistics Programs), Population Division.

## RELATED MATERIALS

Statistics from a related survey, the 1972 Professional, Technical, and Scientific Manpower Survey, are found in U.S. Bureau of the Census, **Characteristics of Persons in Engineering and Scientific Occupations: 1972**, Technical Paper No. 33, U.S. Government Printing Office, Washington, D.C. 1974; U.S. Bureau of the Census, **Current Population Reports**, P-23, No. 45, "Persons in Engineering, Scientific, and Technical Occupations: 1970 and 1972" U.S. Government Printing Office, Washington, D.C. 1973; National Science Foundation, **Science Resource Studies Highlights**, "Selected Characteristics of Five Engineering and Scientific Occupational Groups, 1972" (NSF 73-306) Washington, D.C. 20550; and National Science Foundation, **Science Resource Studies Highlights**, "The 1972 Scientist and Engineer Population Redefined" (NSF 75-305) Washington, D.C. 20550.

A National Science Foundation report based on the results of the 1974 National Survey of Scientists and Engineers is: **Science Resource Studies Highlights**, "National Sample of Scientists and Engineers: Changes in Employment 1970-72 and 1972-74" (NSF 75-309) Washington, D.C. 20550.

## PREFACE

This is the first Bureau of the Census report based on the 1974 National Survey of Scientists and Engineers, which was sponsored by the National Science Foundation and conducted by the Bureau of the Census. The 1974 National Survey of Scientists and Engineers was the first in a series of longitudinal surveys, known as the National Sample of Scientists and Engineers, and was based on a subpopulation of the 1972 Professional, Technical, and Scientific Manpower Survey\*. Included in this report are selected inventory statistics on the demographic, educational, and career-related characteristics of (1) persons who were classified into one of the following fields of science or engineering in 1974: computer specialists, engineers, mathematical specialists, life scientists, physical scientists, environmental scientists, psychologists, and social scientists, and (2) persons who were in one of the above fields in 1972 but were not in any of these fields in 1974. Summary information on the age, sex, and 1972 field for persons who did not respond to the 1974 survey is also provided.

More detailed statistics, based on results from both the 1972 and 1974 surveys, will be issued in future reports. These reports will present information on such subjects as salary distributions, geographic and occupational mobility, and educational attainment.

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\*For a description of the 1972 survey and related matters, see U.S. Bureau of the Census, **Characteristics of Persons in Engineering and Scientific Occupations: 1972**, Technical Paper No. 33, U.S. Government Printing Office, Washington, D.C. 1974.

# CONTENTS

	Page
Introduction . . . . .	1
Highlights . . . . .	1
Summary of Results . . . . .	2
A. Sex, Age, and Field in 1972 . . . . .	2
B. Social Characteristics . . . . .	4
C. Educational Characteristics . . . . .	4
D. Employment Characteristics . . . . .	5
E. Job-Related Characteristics . . . . .	10
The Sample . . . . .	15
The Questionnaire . . . . .	15
Definitions and Explanations . . . . .	15
Weighting and Estimating Procedures . . . . .	17

## TEXT TABLES

Table	
A. Percent Distribution—Scientists or Engineers in 1972 Who Responded in the 1974 Survey, by Field of Science or Engineering in 1974 . . . . .	3
B. Percent Distribution—Scientists or Engineers in 1974 with a Degree, by Major Field of Study for Highest Degree Held . . . . .	5
C. Percent Distribution—Scientists or Engineers in 1974 with Supplemental Training in 1973, by Type of Supplemental Training . . . . .	6
D. Percent Distribution—Employed Scientists or Engineers by Full-Time and Part-Time Work Status, for January 1974 and January 1973 . . . . .	6
E. Percent Distribution—Scientists or Engineers in 1974 Employed Part Time in January 1974, by Reasons for Part-Time Work Status . . . . .	8
F. Percent Distribution—Scientists or Engineers in 1974 not in the Labor Force in January 1974, by Reasons for Nonparticipation . . . . .	8
G. Percent Distribution—Employed Scientists or Engineers Working in Positions not Related to Science or Engineering, by Reasons: January 1974 . . . . .	9
H. Percent Distribution—Scientists or Engineers in 1974 Reporting Unemployment During 1973, by Duration of Unemployment . . . . .	9
I. Percent Distribution—Employed Scientists or Engineers by Occupation: January 1974 . . . . .	11
J. Percent Distribution—Employed Scientists or Engineers Reporting Basic Annual Salary, by Basic Annual Salary: 1974 . . . . .	12
K. Percent Distribution—Scientists or Engineers in 1974 by Job Mobility: 1973 to 1974 and 1972 to 1974 . . . . .	13
L. Percent Distribution—Scientists or Engineers in 1974 Who Changed Jobs Between January 1973 and January 1974, by Occupational Mobility . . . . .	13
M. Percent Distribution—Scientists or Engineers in 1974, by Professional Identification in 1974 . . . . .	14
N.1a.—N.7b. Standard Errors of Totals and Percentages . . . . .	19

## DETAILED TABLES

Table	
1. Field of Science or Engineering in 1974, by Field of Science or Engineering in 1972, by Sex, and by Age in 1974 for All Persons . . . . .	26
2. Selected Social Characteristics by Field of Science or Engineering: 1974 . . . . .	27
3. Selected Educational Characteristics by Field of Science or Engineering: 1974 . . . . .	29
4. Selected Employment Status Characteristics by Field of Science or Engineering: 1974 . . . . .	30
5. Selected Job-Related Characteristics by Field of Science or Engineering: 1974 . . . . .	32

## Appendix

## APPENDIXES

A. Questionnaire and Reference Lists . . . . .	37
B. Source of Data . . . . .	45
C. Criteria for Fields of Science or Engineering in 1974 . . . . .	49
D. Sample Selection . . . . .	52
E. Analysis of Response . . . . .	56

# SELECTED CHARACTERISTICS OF PERSONS IN FIELDS OF SCIENCE OR ENGINEERING: 1974

## INTRODUCTION

The National Sample of Scientists and Engineers sponsored by the National Science Foundation, is intended to include a series of biennial surveys designed to provide current data on the educational, employment, and career characteristics of persons in scientific and engineering fields. This report is based on the first survey in this series, the 1974 National Survey of Scientists and Engineers. The panel for the 1974 survey is a subpopulation of participants in the 1972 Professional, Technical, and Scientific Manpower Survey.

From characteristics determined in the 1972 Professional, Technical, and Scientific Manpower Survey, persons were classified into the following eight fields of science and engineering—computer specialists, engineers, mathematical specialists, life scientists, physical scientists, environmental scientists, psychologists, and social scientists—or as not in any of these fields. All persons who were classified into one of the eight fields in 1972 were included in the 1974 National Survey of Scientists and Engineers. Respondents in the 1974 survey were then classified into one of the scientific or engineering fields in 1974 or as not being in a field of science and engineering in 1974.

Table 1 of this report describes the sex and age composition of all categories of respondents and nonrespondents<sup>1</sup> in the 1974 survey,<sup>2</sup> and provides a distribution of the persons in the fields of science and engineering in 1972 by their 1974 reclassification. The remaining tables of this report deal exclusively with the characteristics of respondents in 1974. For convenience, persons in the category "not in a field of science or engineering" are referred to as "out-of-scope."

<sup>1</sup> Data on nonrespondents are found in the "Did not report in 1974" category of table 1.

<sup>2</sup> Since the National Sample of Scientists and Engineers is a series of sample surveys, the words "respondent" or "nonrespondent", when applied to members of the universe, refer to the number in the universe represented by sample persons who responded or did not respond, respectively, to the 1974 survey.

## HIGHLIGHTS

Some highlights of this report are summarized under the following subjects:

1. **Sex**—Approximately 85 percent or more of the persons in most of the fields of science or engineering were men. Women, however, made up about 28 percent of the psychologists and 21 percent of the social scientists.

2. **Age**—Computer specialists had the lowest median age of all the fields—34.4 years. Engineers and environmental scientists, with medians of 43.0 years and 43.3 years, respectively, were the oldest groups.

3. **Field of Science or Engineering in 1972**—The majority of persons in each 1972 field were classified in the same field in 1974. However, a significant proportion of persons in some 1972 fields were not in any field of science or engineering in 1974.

4. **Race**—Nearly 93 percent or more of the persons in the fields were white. The proportions of blacks ranged from about 4 percent for mathematical specialists to less than 1 percent for engineers.

5. **Place of Birth and Residence**—About 14 percent of the physical scientists were born outside the United States; native-born Americans made up nearly 90 percent or more of the remaining fields. In 1974, 97 to 99 percent of the persons in every field resided in the United States and, except for life scientists, about 75 percent to 85 percent lived in metropolitan areas.

6. **Highest Degree Held**—Nearly 70 percent of the computer specialists and engineers held their highest academic degree at the bachelor's level; over 50 percent of the persons in the other fields, however, possessed a master's or doctorate degree in 1974.

7. **Major Field of Study for Highest Degree Held**—About three-fourths or more of the persons in most fields had majored for their highest degree in a

corresponding academic discipline. However, computer specialists had more varied academic backgrounds.

**8. Supplemental Training in 1973**—From about one-fourth to 60 percent of the persons in each field had received supplemental training (e.g., on-the-job training) during calendar year 1973. Most of this training was provided by employers.

**9. Employment Status: January 1973 and January 1974**—At each of the reference periods—the last week of January 1973 and of January 1974—over 90 percent of the persons in each field participated in the labor force. The unemployment rate for each field was only about 1 percent. Approximately 90 percent of the employed persons worked full time; and the majority of those working part time indicated that this was their preference. Retired persons constituted the largest proportion of persons not in the labor force.

**10. Employment in Engineering and Science: January 1973 and January 1974**—In general, 90 percent or more of the employed persons in each field worked in positions related to science or engineering during each of the reference weeks.

**11. Unemployment in 1973**—Fewer than 10 percent of the persons in each field experienced any unemployment during calendar year 1973. Those who did, however, were likely to be out of work for a month or more.

**12. Occupation in January 1974**—Over three-fourths to almost 98 percent of the employed persons in the fields worked in a corresponding occupation (e.g., the occupations "mathematician and statistician" correspond to the field "mathematical specialists"). Most of the fields also had large proportions employed as managers and administrators.

**13. Industry of Employment: January 1974**—Employed computer specialists, engineers, and physical scientists were concentrated in manufacturing industries, whereas large proportions of nearly every other field were employed by educational institutions. Environmental scientists, however, were more evenly distributed, with about 28 percent in mining and petroleum extraction and 21 percent in educational institutions.

**14. Primary Work Activity: January 1974**—Management or administration was the primary work activity of about 20 percent or more of the employed persons in every field, except computer specialists. Between 25 and 45 percent of the employed engineers, and of the employed life, physical, and environmental scientists, were primarily active in research and development.

**15. Type of Employer: January 1974**—Almost three-fourths of the employed computer specialists and engineers, 55 percent of the employed physical scientists, and 42 percent of the employed environ-

mental scientists worked for private industry or business. The largest proportions in the remaining fields, however, worked for either private or government supported educational institutions. From about 15 percent to about 30 percent of the employed in each field worked for some level of government (excluding government supported educational institutions).

**16. Basic Annual Salary: January 1974**—Of persons reporting basic annual salary in 1974, from about 50 percent to almost 70 percent in each of the fields had salaries between \$15,000 and \$25,000, with the largest concentration being between \$15,000 and \$19,000. All fields except life scientists (\$17,596) had median salaries above \$18,000; environmental scientists had the highest median salary, \$19,927.

**17. Job Mobility: 1973 to 1974**—Among persons in each field who were employed in both January 1973 and January 1974, 80 percent or more were working at the same job at both times. Among those who changed jobs, 40 percent or more remained within the same occupation.

**18. Job Mobility: 1972 to 1974**—Of persons in each field employed in both 1972 and January 1974, only about 60 percent to 75 percent held the same job in both years.

**19. Professional Identification**—In general, three-fourths or more of the persons in each field identified themselves, based on their education and experience, as being in a corresponding profession (e.g., mathematician is a corresponding profession of mathematical specialists).

**20. Federal Support: January 1974**—Between 35 and 40 percent of the employed persons in nearly every field had at least some of their work supported or sponsored by U.S. Government funds.

**21. National Interest Topics**—Approximately three-fourths of the life scientists, environmental scientists, and psychologists reported that they devoted a significant portion of their professional time to one of eleven topics of critical national interest. In contrast, only about 25 percent of the computer specialists reported such involvement.

## SUMMARY OF RESULTS

### A. Sex, Age, and Field in 1972

**Sex.** There were relatively few women in most of the science and engineering fields. Except for psychologists and social scientists, about 85 percent or more of the persons in each of the fields were men (table 1). Engineers and environmental scientists were the most predominately male groups, as men made up approximately 99 percent and 97 percent, respectively, of these fields. The field with the largest proportion of

women was psychologists (28 percent), followed by social scientists (21 percent).

**Age.** The universe for this study includes persons who were at least 16 years old and in the experienced civilian labor force in 1970. Therefore, the age distribution of each field is skewed upward; e.g., there are relatively few persons under 25 years old (table 1). The age structures of the eight fields reveal that computer specialists were generally younger than persons in other fields, as would be expected since computer science is a relatively new field. Approximately half of the computer specialists were under 35 years of age, whereas the proportion under 35 for the other fields ranged from about 21 percent for environmental scientists to about 39 percent for mathematical specialists. In contrast, from about 12 to 18 percent of persons in fields other than computer specialist were 55 years old or older, but only about 3 percent of the computer specialists were in this age group.

Differences in the age structures for the various fields are also reflected in the median age for each group. The median age for all persons, including those out-of-scope and nonrespondents, was 41.2 years as of April 1974. The group with the lowest median age was computer specialists, 34.4 years; the highest median ages were for engineers, 43.0 years, and environmental scientists, 43.3 years. Of the remaining groups, only mathematical specialists (37.8 years) and persons out-of-scope (38.6 years) had median ages significantly under 40 years.

**Field of science or engineering in 1972.** The majority of persons in a 1972 field of science or engineering were in the same field in 1974 (table A). The highest levels of agreement between field in 1972 and field in 1974 were for persons who were engineers (89 percent), or environmental scientists and psychologists (both about 85 percent) in 1972. Among persons who were designated as computer specialists in 1972, only about 68

percent were in the same field in 1974; about 7 percent were designated as engineers and 23 percent were out-of-scope. Similarly, about 8 percent of the 1972 mathematical specialists had moved into the computer specialist field or the engineer field in 1974, and about the same proportion of the physical scientists were either engineers or life scientists. Moreover, some proportion of each 1972 field was not in any of the fields of science or engineering in 1974, ranging from about 5 percent for environmental scientists to 27 percent for social scientists.

The differences among the fields in the proportion changing fields between 1972 and 1974 may reflect variations in the degree of specialized training required for each field, as well as differences in the areas of common ground among fields. For instance, computer specialists and physical scientists show some propensity to enter the engineering field; some physical scientists also entered into the life sciences; and some mathematical specialists moved into the computer field. However, relatively few engineers changed fields, and only small proportions of persons in other science or engineering fields switched into mathematics, environmental science, psychology, or social science.

Further information on the composition of each 1974 field, in terms of the 1972 field of its members, is provided in table 1. Although, as mentioned above, a relatively substantial proportion of persons in some of the 1972 fields had moved into engineering in 1974, about 98 percent of the 1974 engineers had also been engineers in 1972. The overall size of the group and the fact that few 1972 engineers had changed fields caused the influx from other fields to have only a small effect on the group. On the other hand, whereas only small proportions of each 1972 field had moved into environmental science in 1974, the 1974 group was small enough that persons entering from other fields accounted for approximately 10 percent of the total in the field in 1974.

**Table A. PERCENT DISTRIBUTION—SCIENTISTS OR ENGINEERS IN 1972 WHO RESPONDED IN THE 1974 SURVEY, BY FIELD OF SCIENCE OR ENGINEERING IN 1974**

Field of science or engineering in 1972	Total respondents		Field of science or engineering in 1974								Not in a field of science or engineering in 1974
	Number	Percent	Computer specialists	Engineers	Mathematical specialists	Life scientists	Physical scientists	Environmental scientists	Psychologists	Social scientists	
Computer specialists.....	70,908	100.0	68.0	6.9	1.2	0.1	0.3	0.1	0.1	0.3	23.1
Engineers.....	757,586	100.0	0.6	88.7	0.1	0.1	0.6	0.1	(%)	0.1	9.7
Mathematical specialists.....	35,273	100.0	4.7	3.6	72.2	0.3	0.6	(%)	0.1	0.6	17.9
Life scientists.....	86,684	100.0	2	1.4	(%)	77.3	2.6	0.8	0.2	0.4	17.2
Physical scientists.....	140,685	100.0	0.3	4.7	0.1	4.6	80.3	0.9	0.1	0.1	9.0
Environmental scientists.....	30,391	100.0	0.2	2.4	0.2	2.3	3.3	86.2	-	0.4	4.9
Psychologists.....	40,065	100.0	0.2	0.3	(%)	0.4	-	-	85.1	1.1	12.8
Social scientists.....	66,068	100.0	0.2	1.2	0.3	0.5	(%)	0.2	0.5	69.7	27.3

- Represents zero.

Z Less than 0.05 percent.

Note: Detail may not add to total because of rounding.

Source: Table 1.

## B. Social Characteristics

**Race.** Whites accounted for 93 percent or more of the persons in each field; whites also made up 97 percent of the out-of-scope cases (table 2). Among the fields, the proportion of blacks ranged from under 1 percent for engineers and environmental scientists to nearly 4 percent for mathematical specialists. The largest proportions of Japanese, Chinese, and Koreans were found among the physical scientists and mathematical specialists (approximately 3 percent).

Throughout all the fields, as well as among the out-of-scope, the proportion of persons of "other races" was under 1 percent.

**Place of birth.** Physical scientists had the largest proportion of foreign born persons, about 14 percent (table 2). Except for this group, about 90 percent or more of the members of each field and of the out-of-scope were born in the United States. About 60 percent or more of the computer specialists, engineers, physical scientists, psychologists, social scientists, and out-of-scope persons were born in two regions of the United States, the Northeast and North Central; within these two regions, the majority were born in the Middle Atlantic and East North Central divisions. Persons in the remaining fields were more evenly distributed by place of birth, with environmental and life scientists, for example, having about a quarter of their members with birthplaces in the South.

**Place of residence.** The sample for the National Sample of Scientists and Engineers was originally selected from the 1970 Census of Population records of persons from across the United States, i.e., the 50 States and the District of Columbia; accordingly, all persons in the fields of science or engineering and the out-of-scope resided in the United States at the time of the Census. In the spring and summer of 1974, when the 1974 National Survey of Scientists and Engineers was conducted, from 97 percent to 99 percent of these persons were living in the United States (table 2).

Estimates from the March 1974 Current Population Survey<sup>3</sup> indicate that in March 1974, 24 percent of the total United States population 4 years old and over lived in the Northeast, 27 percent in the North Central, 32 percent in the South, and 18 percent in the West. In comparison, the 1974 National Survey of Scientists and Engineers showed that, for members of the groups<sup>4</sup>, the

<sup>3</sup>Current Population Reports, Population Characteristics, Mobility of the Population of the United States March 1970 to March 1974, Series P-20, No. 273.

<sup>4</sup>That is, the fields of science and engineering plus the out-of-scope.

South and the Northeast were the major residential regions, having either the largest or second largest proportion of persons for most groups. Especially noteworthy is that almost 45 percent of the environmental scientists resided in the South and about 32 percent in the West. Engineers were the most evenly distributed among the four regions, with approximately one-fourth residing in each. For three fields—computer specialists, physical scientists, and psychologists—the Middle Atlantic division led all other divisions as a place of residence in 1974; the leading division for environmental scientists was the West South Central, and for mathematical specialists and social scientists, the South Atlantic. (See table 2.)

**Selected Standard Metropolitan Statistical Areas: 1974.** From about 75 to 85 percent of the persons in nearly every field lived in metropolitan areas (table 2). In contrast, about 69 percent of all persons 18 years old and over lived in metropolitan areas in March 1974.<sup>5</sup> The one exception to the relatively high proportion of scientists and engineers residing in metropolitan areas was for life scientists, a group that includes agricultural scientists among others; only about 60 percent of the life scientists lived in metropolitan areas. Relatively large proportions in some of the groups lived in particular SMSA's. The Washington, D.C., SMSA, for example, with its concentration of government employment, had approximately 11 percent of the mathematical specialists, 14 percent of the social scientists, and 7 percent of the environmental scientists and computer specialists. The Houston, Texas, SMSA and the Denver, Colorado, SMSA were residence for between 7 and 8 percent, respectively, of the environmental scientists; and the New York City SMSA had 7 percent of the computer specialists, 6 percent of the social scientists, and 8 percent of the psychologists.

## C. Educational Characteristics

**Highest degree held.** Degree attainment varied considerably among the fields (table 3). The highest degree held by almost 70 percent of the computer specialists and engineers was at the bachelor's level, but among psychologists and social scientists the bachelor's was the highest degree for only 10 percent and 25 percent, respectively. For the remaining fields, from about 30 percent to slightly over 40 percent had a bachelor's degree as the highest degree held. The situation among fields was almost entirely reversed for the doctorate degree: psychologists had the largest proportion (58 percent) with a Ph.D; life scientists, physical scientists, and social scientists all had over 40 percent; and more

<sup>5</sup>Current Population Reports, Population Characteristics, Mobility of the Population of the United States March 1970 to March 1974, Series P-20, No. 273.

than one-third of mathematical specialists and one-fourth of environmental scientists had doctorates. Engineers and computer specialists, on the other hand, had fewer than 5 percent at the doctorate level. The proportions whose highest degree held was a master's degree were relatively more uniform, with all the fields within the range of approximately 20 to 35 percent.

The definitions of the various fields of science or engineering permitted only engineers and the out-of-scope to include persons with no degree. That fewer than 3 percent of the engineers and 4 percent of the out-of-scope actually fell into this category is partly a reflection of the strictness of the criteria used in delineating the core of the nation's scientific and technical manpower.

**Major field of study of highest degree held.** Not surprisingly, there is a strong positive relationship between field of science and engineering in 1974 and the major field of study for highest degree held. Except for computer specialists, about three-fourths or more of the persons in each group had majored in a corresponding academic discipline<sup>6</sup> (table B). For most of the fields, in fact, over 80 percent of the persons had majored in a corresponding field of study; psychologists had the highest proportion (92 percent). In contrast to these high concentrations, only about 10 percent of the computer specialists had majored in computer science and systems analysis, whereas 25 percent had majored in mathematical sciences, 17 percent in engineering, and 20 percent in business and commerce (table 3). One reason computer specialists may have obtained training in different areas is that computer related subjects have only recently been offered in the degree programs of most colleges and universities.

<sup>6</sup>See the table in appendix A for the list of corresponding major fields of study for each field of science or engineering.

**Table B. PERCENT DISTRIBUTION—SCIENTISTS OR ENGINEERS IN 1974 WITH A DEGREE, BY MAJOR FIELD OF STUDY FOR HIGHEST DEGREE HELD**

Field of science or engineering in 1974	Total with a degree		Major field of study for highest degree held		
	Number	Percent	Corresponding field of study <sup>1</sup>	Other field of study	Field of study not reported
Computer specialists.....	55,160	100.0	10.2	89.1	0.8
Engineers.....	667,466	100.0	86.4	12.6	1.0
Mathematical specialists.....	27,849	100.0	79.7	19.8	0.5
Life scientists.....	75,478	100.0	89.6	9.4	1.0
Physical scientists.....	120,994	100.0	82.9	16.4	0.8
Environmental scientists.....	29,470	100.0	76.7	22.1	1.2
Psychologists.....	34,901	100.0	92.1	7.3	0.6
Social scientists.....	47,937	100.0	80.5	18.9	0.6

<sup>1</sup>See table in appendix A for a listing of corresponding fields of study.

Note: Detail may not add to total because of rounding.

Source: Table 3.

Just as some fields of science and engineering in 1974 had a significant proportion of persons who were in different fields in 1972, so some fields also had relatively large proportions of persons who had majored in subjects only peripherally related to their 1974 field. Note, in this regard, that about 11 percent of the environmental scientists had majored either in engineering or physics/astronomy; computer specialists, as noted above, came from varied educational backgrounds; about 8 percent of the physical scientists had studied biological science; and 14 percent of the social scientists had majored in "all other fields" (see table 3).

**Supplemental training in 1973.** The 61 percent of computer specialists who reported that they received supplemental training in 1973 was the largest proportion among all fields and the out-of-scope cases (table 3). The proportions, in fact, for the other groups ranged rather uniformly from about 25 percent for social scientists to almost 40 percent for engineers and the out-of-scope. The relatively large proportion of computer specialists reporting supplemental training may be related to the small number who had majored in computer science and systems analysis for their highest degree. Also, it may reflect the need for these specialists to keep abreast of the rapid changes that continue to occur in data processing.

The kinds of supplemental training of those who reported receiving such training is the subject of table C. It is evident that most training is provided by employers since among most groups "on the job training" and "employer training programs" were the most common types of supplemental training.

**D. Employment Characteristics**

**Employment Status: January 1974 and January 1973.** In January 1974, over 90 percent of each field

**Table C. PERCENT DISTRIBUTION—SCIENTISTS OR ENGINEERS IN 1974 WITH SUPPLEMENTAL TRAINING IN 1973, BY TYPE OF SUPPLEMENTAL TRAINING**

Type of supplemental training <sup>1</sup>	Field of science or engineering in 1974								Not in a field of science or engineering in 1974
	Computer specialists	Engineers	Mathematical specialists	Life scientists	Physical scientists	Environmental scientists	Psychologists	Social scientists	
<b>TOTAL WITH SUPPLEMENTAL TRAINING</b>									
Number.....	33,564	266,165	8,206	26,991	37,211	10,240	12,289	11,709	57,588
Percent.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
On-the-job training.....	59.9	45.1	49.8	55.7	47.3	50.1	55.0	46.8	53.6
Military training applicable to civilian occupations....	1.3	2.6	1.1	2.2	0.9	1.7	1.6	3.8	2.7
Extension or correspondence courses.....	5.7	11.0	8.1	10.5	8.8	12.8	7.3	10.3	10.1
Employer training programs...	58.8	47.4	40.9	29.8	34.4	43.6	17.0	30.3	41.1
Adult education center.....	10.7	10.9	13.0	11.5	12.1	10.0	9.4	10.9	11.9
Other training.....	19.2	17.1	19.2	26.9	25.7	19.9	42.7	29.7	21.9

<sup>1</sup>Sum of individual categories may exceed 100.0 percent because persons may have received more than one type of training.

Source: Table 3.

**Table D. PERCENT DISTRIBUTION—EMPLOYED SCIENTISTS OR ENGINEERS BY FULL-TIME AND PART-TIME WORK STATUS, FOR JANUARY 1974 AND JANUARY 1973**

Work status in January 1974 and January 1973	Field of science or engineering in 1974								Not in a field of science or engineering in 1974
	Computer specialists	Engineers	Mathematical specialists	Life scientists	Physical scientists	Environmental scientists	Psychologists	Social scientists	
<b>TOTAL EMPLOYED IN JANUARY 1974</b>									
Number.....	53,054	647,566	25,837	69,979	112,069	27,929	32,827	43,643	139,067
Percent.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Full time.....	98.0	98.4	95.3	96.1	96.9	96.0	89.6	94.7	95.6
Part time.....	1.4	1.1	4.1	3.2	2.7	3.6	9.5	4.4	3.8
Full or part time not reported.....	0.6	0.5	0.7	0.7	0.4	0.4	0.9	0.9	0.6
<b>TOTAL EMPLOYED IN JANUARY 1973</b>									
Number.....	53,128	648,010	25,751	70,444	112,692	27,755	32,491	43,106	137,412
Percent.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Full time.....	95.6	95.4	91.4	90.9	93.0	90.1	86.2	90.0	92.5
Part time.....	1.2	1.0	5.0	4.8	3.2	3.7	8.1	4.2	3.2
Full or part time not reported.....	3.2	3.6	3.6	4.3	3.7	6.2	5.7	5.8	4.3

Note: Detail may not add to total because of rounding.

Source: Table 4.

was in the labor force, ranging from 92 percent for social scientists to 97 percent for computer specialists (table 4). The proportion employed in each group also fell within a comparatively narrow range, from a low of 91 percent for social scientists to a high of 96 percent for computer specialists. The unemployment rate (the number unemployed divided by the total in the labor force) was only about 1 percent for each field. The levels of employment and unemployment were generally the same in January 1973 as in 1974. Although there were small differences in the unemployment rates between the two years, the figures do not indicate any statistically significant differences except for a slight increase in the unemployment rate for physical scientists.

Among persons who were employed in January 1974, approximately 90 percent or more in each field were working full time (table D). Engineers and computer specialists had the highest proportion of full-time workers (98 percent). Psychologists, with about 10 percent working part time, was the only field that had more than 5 percent employed on a part-time basis. The pattern of full- and part-time employment in 1973 was similar to that in 1974. The main difference was the larger proportion of persons not reporting full- or part-time status.

Among those persons who reported that they were working part time in 1974, the majority in each field indicated that they preferred part-time work (table E). The range of those preferring part-time work went from a low of about 57 percent for environmental scientists to almost 85 percent for computer specialists. Psychologists and social scientists, the two groups with the highest proportion of women, also had large proportions of part-time workers who preferred part-time jobs (82 percent and 83 percent, respectively). Environmental scientists had the largest proportion who were seeking full-time work (34 percent), although from about 7 percent to 21 percent of the part-time workers in other fields were seeking full-time work. Life scientists had the largest proportion (15 percent) contending that they were working at part-time jobs because full-time work was not available. The pattern of reasons indicated for working part time in 1973 was similar but not quite parallel to 1974. However, the number of part-time workers in each year was too small to indicate any real differences between the two dates in the reasons for part-time employment.

Table F presents a distribution of persons not in the labor force by reason for nonparticipation. The largest proportion of nonparticipants in most fields were out of the labor force in January 1974 because of retirement; for engineers this was the reason indicated by over 80 percent of the persons. Among the generally younger computer specialists, however, only about 14 percent cited retirement as the reason for not being in the labor force. The range for the remaining groups was from 42 percent for mathematical specialists to 69 percent for environmental specialists. There was a relatively uniform

proportion who were not working because of school, ranging from 17 percent to slightly over 25 percent for most fields. However, engineers and social scientists had only about 7 and 13 percent, respectively, of those not in the labor force falling in the "student" category. The highest proportion of those not in the labor force because of family responsibilities was for computer specialists at about 55 percent; the lowest, barely 2 percent, was for engineers.

Since the National Sample of Scientists and Engineers includes only persons who were in selected occupational categories in 1970 and does not include any new entrants into these fields since 1970, retirement is expected to play a larger role as a reason for being outside the labor force as this group of persons ages. Thus, in the "not in the labor force" statistics for January 1973, smaller proportions in each field gave retirement as a reason for nonparticipation than in 1974. Also, in 1973 most fields had a larger proportion of nonworkers in the "student" category. (See table 4.)

**Employment in science or engineering: January 1973 and January 1974.** As explained in the section, Definitions and Explanations, occupation was not a prerequisite for classification in a field of science or engineering. It was possible, therefore, for persons in these fields to work in positions not related to science or engineering. Likewise, the out-of-scope could have worked in positions related to science or engineering.

Social scientists tended to work outside of science or engineering more so than persons in other fields (table 4). For all the groups except social scientists and persons out-of-scope, 90 percent or more of the employed reported that they were working in a position related to science and engineering in January 1974 and in January 1973. However, this was true for only about 85 percent of the social scientists and 63 percent of the out-of-scope.

About one-third of the social scientists who were working in a position not related to science or engineering in January 1974 indicated that this was their preference (table G). Of the small number of engineers reporting work in unrelated areas, about 40 percent were promoted out of engineering or scientific positions. This may reflect a tendency of engineers to become managers and administrators.

**Unemployment in 1973.** About 3 to 6 percent of the persons in each field of science and engineering in 1974 were unemployed at some time during the calendar year 1973; for the out-of-scope cases, the proportion was about 7 percent. For those who did experience unemployment, the duration was likely to be a month or more (table H). Within each group, approximately three-fourths or more of those who were unemployed during 1973 had looked for work for 4 weeks or more. In contrast, estimates from the Current Population

Survey indicate that only about half of all unemployed persons and all unemployed men in 1973 had been unemployed for 5 weeks or more.<sup>7</sup> The comparatively

lengthy duration of unemployment for scientists and engineers, which existed in spite of the generally low unemployment rates, may have been caused by a tight labor market, or much of this unemployment could have been voluntary, i.e., the unemployed could afford to be selective in the job opportunities they would accept.

<sup>7</sup>U.S. Department of Labor, Bureau of Labor Statistics, *Employment and Earnings*, Volume 20, No. 7, January 1974.

**Table E. PERCENT DISTRIBUTION—SCIENTISTS OR ENGINEERS IN 1974 EMPLOYED PART TIME IN JANUARY 1974, BY REASONS FOR PART-TIME WORK STATUS**

Reasons for part-time work status	Field of science or engineering in 1974								Not in a field of science or engineering
	Computer specialists	Engineers	Mathematical specialists	Life scientists	Physical scientists	Environmental scientists	Psychologists	Social scientists	
<b>TOTAL EMPLOYED PART TIME IN JANUARY 1974</b>									
Number.....	720	7,420	1,048	2,243	3,017	1,003	3,107	1,918	5,334
Percent.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Seeking full-time work.....	15.7	16.5	21.4	15.4	19.0	33.6	13.2	6.9	21.9
Prefer part-time work.....	84.3	71.9	70.8	67.9	63.6	57.4	82.2	82.6	73.3
Full-time work not available.	-	6.1	6.6	14.8	10.3	7.5	3.3	7.6	2.3
Not reported.....	-	5.5	1.2	1.9	7.1	1.5	1.2	2.8	2.5

- Represents zero.

Note: Detail may not add to total because of rounding.

Source: Table 4.

**Table F. PERCENT DISTRIBUTION—SCIENTISTS OR ENGINEERS IN 1974 NOT IN THE LABOR FORCE IN JANUARY 1974, BY REASONS FOR NONPARTICIPATION**

Reasons for nonparticipation in the labor force	Field of science or engineering in 1974								Not in a field of science or engineering in 1974
	Computer specialists	Engineers	Mathematical specialists	Life scientists	Physical scientists	Environmental scientists	Psychologists	Social scientists	
<b>TOTAL NOT IN LABOR FORCE</b>									
Number.....	1,573	32,693	1,766	4,781	7,496	1,242	1,720	3,856	7,231
Percent.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Retired.....	13.5	83.0	41.9	49.4	60.2	69.2	47.7	45.3	43.4
Student.....	21.9	7.3	26.7	18.1	20.7	17.1	20.4	12.8	22.9
Family responsibility.....	54.5	2.2	24.4	24.8	12.8	6.7	14.5	32.8	23.7
Other or not reported.....	10.1	7.5	7.0	7.6	6.3	6.8	17.5	9.1	9.9

Note: Detail may not add to total because of rounding.

Source: Table 4.

**Table G. PERCENT DISTRIBUTION—EMPLOYED SCIENTISTS OR ENGINEERS WORKING IN POSITIONS NOT RELATED TO SCIENCE OR ENGINEERING, BY REASONS: JANUARY 1974**

Reasons for being in a position not related to science or engineering	Field of science or engineering in 1974								Not in a field of science or engineering
	Computer specialists	Engineers	Mathematical specialists	Life scientists	Physical scientists	Environmental scientists	Psychologists	Social scientists	
<b>TOTAL NOT IN SCIENCE OR ENGINEERING</b>									
Number.....	987	19,211	1,734	3,032	1,559	627	2,517	6,135	49,476
Percent.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Preferred nonscience or non-engineering.....	33.6	15.7	21.3	19.6	21.9	19.5	34.4	34.8	31.8
Promoted out of science or engineering.....	8.1	42.2	33.1	32.9	23.0	18.7	11.8	8.8	20.0
Pay better in nonscience or nonengineering.....	9.8	6.9	9.7	4.9	9.1	37.6	6.4	5.2	8.7
Locational preference.....	-	3.1	6.8	8.2	2.3	1.9	8.3	5.1	5.7
Science or engineering position not available.....	13.6	12.2	13.0	5.4	28.4	18.3	6.7	3.0	6.3
Other reason or reason not reported.....	34.9	20.0	16.1	28.9	15.3	3.8	32.4	43.0	27.4

- Represents zero.

Note: Detail may not add to total because of rounding.

Source: Table 4.

**Table H. PERCENT DISTRIBUTION—SCIENTISTS OR ENGINEERS IN 1974 REPORTING UNEMPLOYMENT DURING 1973, BY DURATION OF UNEMPLOYMENT**

Duration of unemployment	Field of science or engineering in 1974								Not in a field of science or engineering in 1974
	Computer specialists	Engineers	Mathematical specialists	Life scientists	Physical scientists	Environmental scientists	Psychologists	Social scientists	
<b>TOTAL UNEMPLOYED DURING 1973</b>									
Number.....	1,909	24,664	886	2,940	4,932	1,585	1,767	2,300	9,992
Percent.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1 week.....	2.8	6.0	3.6	6.7	6.2	1.6	2.3	1.0	3.7
2 weeks.....	5.6	8.8	1.8	2.1	5.0	8.5	3.2	5.8	4.7
3 weeks.....	9.9	5.2	1.5	9.0	7.6	4.2	0.8	11.3	8.2
4 weeks or more.....	76.5	77.1	86.9	81.4	75.7	82.6	90.6	79.8	81.5
Duration not reported.....	5.2	2.9	6.3	0.9	5.6	3.1	3.1	2.0	1.9

Note: Detail may not add to total because of rounding.

Source: Table 4.

### E. Job-Related Characteristics

**Occupation in 1974.** There was a strong relationship between field of science or engineering and occupation in 1974, although the strength of the relationship varied according to field (table 1). Computer specialists had the highest level of agreement between field and occupation<sup>8</sup>; about 98 percent of those employed in January 1974 reported working as computer specialists. Physical scientists, social scientists, and mathematical specialists, of whom about three-fourths were employed in a corresponding occupation, had the lowest rates. For the remaining fields, the percentage working in the same occupation was from approximately 84 percent to 91 percent.

Relatively large proportions of persons in most fields were employed as managers and administrators in 1974 (table 5). All fields except three—computer specialists, environmental scientists, and psychologists—had between 12 and 17 percent reporting employment in managerial or administrative positions. The small proportion of computer specialists, about 1 percent, who were managers and administrators may reflect the relatively youthful age structure of this field.

The occupational structure in 1974 of the out-of-scope persons reveals, as expected, a more varied pattern of occupational participation than is found among the fields (table 5). The out-of-scope had the highest proportion of managers and administrators and of persons in "other occupations."

Table 5 also provides more detailed information on the subcategories of occupations held by the various fields. The three major occupation categories for engineers in 1974 were electrical and electronic (21 percent), mechanical (18 percent), and civil and architectural (13 percent). Among employed mathematical specialists, nearly half were working as mathematicians and about one-fourth as statisticians. Agricultural scientists (31 percent) and biological scientists (27 percent) were the major occupations for employed life scientists; chemists made up 51 percent of the employed physical scientists. Approximately three-fourths of the employed environmental scientists were earth scientists. Economists constituted the largest subcategory among social scientists, 31 percent; other social scientists (e.g., political scientists, urban and regional planners, etc.) had the second largest representation, 26 percent; employment as sociologists and anthropologists was reported for only about 20 percent of the group.

**Industry of employment: 1974.** Employed computer specialists, engineers, and physical scientists were concentrated in manufacturing industries in 1974 (table

5). The proportions were about 45 percent for computer specialists, 51 percent for engineers, and 42 percent for physical scientists. Within specific manufacturing industries, electronic machinery and computing equipment manufacturers employed the largest proportions of computer specialists (26 percent) and engineers (12 percent). The production of chemicals and allied products was most important for physical scientists (24 percent). For all other fields, except environmental scientists, the largest proportions of persons were employed in educational institutions, primarily colleges or universities. Environmental scientists were more uniformly distributed by industry, with about 28 percent in mining or petroleum extraction and 21 percent in educational institutions. There were other important industries of employment for most fields, such as agriculture, forestry, and fisheries for life scientists; health services for psychologists; public administration for social scientists; and services (except education and health) for the other fields.

Probably the most diffuse industry structure was that for the out-of-scope cases. The major employers for this group were manufacturing (34 percent), educational institutions (12 percent), and services, except health and education (12 percent).

**Primary work activity: 1974.** Research and development were the primary work activities of a large proportion of the employed persons in four fields: engineers (33 percent); life scientists (28 percent); physical scientists (44 percent); and environmental scientists (27 percent). (See table 5.) For engineers the development or design aspect was obviously more important, but in the other three groups basic or applied research was the primary activity. All of the groups except computer specialists had nearly 20 percent or more of their employed members primarily involved in management or administration (a fact that agrees well with the relatively large proportions in these fields who reported their occupation in 1974 as administrators or managers). Engineers (31 percent) and the out-of-scope (40 percent) had particularly large proportions who were primarily involved in management or administration.

Unsurprisingly, nearly two-thirds of employed computer specialists were primarily active in computer applications. Teaching was the primary activity of over one-third of the employed mathematical specialists and social scientists and of more than one-fourth of the employed psychologists. In addition, clinical diagnosis was the major activity for about one-third of the employed psychologists, and statistical work was the primary activity of about 13 percent of the employed mathematical specialists.

**Type of employer.** The classification "type of employer" refers to the nature of the ownership of the employing organization. It differs, therefore, from the "industry of employment" classification, which refers to the nature of the activity of the employing organization. (See section on definitions.)

<sup>8</sup> See the table in appendix A for the list of corresponding occupations (i.e., those in agreement) for each field of science or engineering.

Table I. PERCENT DISTRIBUTION—EMPLOYED SCIENTISTS OR ENGINEERS BY OCCUPATION:  
JANUARY 1974

Field of science or engineering in 1974	Total employed in January 1974		Occupation in 1974		
	Number	Percent	Corresponding occupation <sup>1</sup>	Other occupation	Occupation not reported
Computer specialists.....	53,054	100.0	97.7	1.4	0.9
Engineers.....	647,566	100.0	84.6	14.7	0.7
Mathematical specialists.....	25,837	100.0	77.0	22.2	0.8
Life scientists.....	69,979	100.0	83.1	15.8	1.1
Physical scientists.....	112,069	100.0	73.6	25.6	0.7
Environmental scientists.....	27,929	100.0	90.7	8.8	0.5
Psychologists.....	32,827	100.0	83.8	14.7	1.5
Social scientists.....	43,643	100.0	75.4	22.9	1.7

<sup>1</sup> See table in appendix A for a listing of corresponding occupations.

Note: Detail may not add to total because of rounding.

Source: Table 5.

Almost three-fourths of the computer specialists and the engineers were employed by private industry or business in January 1974; in contrast, only about 11 percent of the psychologists and 17 percent of the social scientists were employed in the private business sector (table 5). In addition to employing large proportions of computer specialists and engineers, industry or business was also the major employer of physical scientists (55 percent), environmental scientists (42 percent), and the out-of-scope (63 percent). Educational institutions were the major employers for mathematical specialists (46 percent), life scientists (42 percent), psychologists (52 percent), and social scientists (47 percent); however, these institutions employed only 6 percent of the computer specialists and 3 percent of the engineers. Federal government employment ranged from about 5 percent for psychologists and the out-of-scope to nearly 20 percent for life scientists and environmental scientists. Employment in "other government", i.e., State, local, or international organizations, was relatively more uniform, ranging between 8 and 15 percent for most groups, with only physical scientists at 6 percent being outside the range. Approximately 30 percent of life scientists and environmental scientists worked in government (i.e., Federal or other government), as did about 25 percent of the social scientists. Relatively small portions of each field were self-employed, except for environmental scientists (7 percent) and psychologists (5 percent). In addition, about 11 percent of the psychologists and 7 percent of the social scientists were employed by nonprofit organizations.

**Basic annual salary.** As described on the 1974 survey questionnaire, basic annual salary "refers to salary before deductions for income tax, social security, retirement, etc., but does not include bonuses, overtime, summer teaching, or other payment for secondary jobs." The data on basic annual salary in this report relate to the job held by employed persons in January 1974.

The largest proportions of persons who reported salary in each group had basic annual salaries between \$15,000 and \$19,999 (table J). The highest concentrations in this interval were for computer specialists (45 percent) and engineers (38 percent). For the remaining fields, about 30 to 34 percent of the persons had basic salaries in this range. The second largest concentration for each group, except life scientists and out-of-scope cases, fell in the salary range of \$20,000 to \$24,999; about 20 to 25 percent of each group had salaries in this range. For life scientists and the out-of-scope cases, there were slightly larger proportions with salaries between \$10,000 and \$14,999 than between \$20,000 and \$24,999. Computer specialists had the smallest proportions with salaries at either extreme of the distribution, with only about 2 percent with salaries under \$10,000 and about 10 percent with salaries of \$25,000 or more. The proportion earning less than \$10,000 was also about 2 percent for engineers, but ranged from about 5 percent to 9 percent for the other groups. At the other end of the distribution, less than

20 percent of the engineers and life scientists had salaries of \$25,000 or more, whereas almost 30 percent of the social scientists had salaries in this range.

Except for life scientists (whose median salary was \$17,596) the median basic annual salaries for the employed members of all other groups were over \$18,000 (table J.) In fact, 5 of the 8 fields—engineers, mathematical specialists, physical scientists, environmental scientists, and social scientists—had median incomes above \$19,000, with the highest median salary being \$19,927 for environmental scientists. As noted above, environmental scientists and engineers were older, on the average, than persons in other fields and, thus, would most likely have had more time in the labor force and higher salaries. However, the figures do not indicate any consistent relationship between the median salary and the median age or the degree level for the fields. Also, it should be noted that between 5 and 9 percent of the persons in each field did not report basic annual salary.

**Job mobility: 1973 to 1974.** Among most fields, at least 90 percent of the persons were employed in both January 1973 and January 1974 (table 5). Of those who were employed at both dates, 80 percent or more of each field were working at the same job (table K). Computer specialists, who were on the average younger than persons in other fields, were the most likely to have changed jobs (19 percent did so), whereas mathematical specialists, life scientists, and physical scientists were the least likely (only about 14 percent changed jobs). Among all groups, the out-of-scope had the largest proportion of job changers (27 percent), a fact to be

expected since out-of-scope persons were in a field of science or engineering in 1972 but were not so classified in 1974.

Persons who changed jobs between January 1973 and January 1974 were likely to remain within the same occupation group (table L). About 40 percent or more of the job changers in each field reported work in the same occupation for both jobs. Although there seemed to be differences among the fields in the proportions changing occupations, the large number of not reported cases makes most comparisons unreliable. However, it does appear, as expected, that the out-of-scope group had the highest proportion of persons who left their former occupation group when changing jobs.

**Job mobility: 1972 to 1974.** Among persons in each field (excluding the out-of-scope) who were employed both in 1972 and in January 1974, from about 25 percent to nearly 40 percent held different jobs at the two times (table K). The job mobility rates for most groups were between 24 and 30 percent; only computer specialists (38 percent) and the out-of-scope (45 percent) had higher mobility rates.

**Professional identification.** Professional identification in 1974 was strongly related to field of science or engineering. In general, three-fourths or more of the persons in each field identified themselves, in terms of education and experience, as being in a profession that agreed with their 1974 field of science or engineering<sup>9</sup>

<sup>9</sup>See the table in appendix A for the list of corresponding professions (i.e., those in agreement) for each field of science or engineering.

**Table J. PERCENT DISTRIBUTION—EMPLOYED SCIENTISTS OR ENGINEERS REPORTING BASIC ANNUAL SALARY, BY BASIC ANNUAL SALARY: 1974**

Basic annual salary <sup>1</sup>	Field of science or engineering in 1974								Not in a field of science or engineering in 1974
	Computer specialists	Engineers	Mathematical specialists	Life scientists	Physical scientists	Environmental scientists	Psychologists	Social scientists	
<b>TOTAL REPORTING BASIC ANNUAL SALARY</b>									
Number.....	49,514	595,734	24,611	66,319	105,069	25,445	30,699	40,738	126,052
Percent.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Less than \$8,000.....	1.1	1.3	4.3	4.5	3.9	3.1	5.9	3.1	4.9
\$8,000 to \$9,999.....	0.6	0.7	1.0	2.7	2.7	2.7	2.4	3.0	4.1
\$10,000 to \$14,999.....	18.1	14.2	17.0	24.7	16.9	13.9	16.2	14.9	22.2
\$15,000 to \$19,999.....	45.4	38.0	30.9	33.6	30.7	30.7	32.5	29.5	29.3
\$20,000 to \$24,999.....	24.3	27.2	25.6	19.1	23.4	26.8	21.5	21.2	18.8
\$25,000 to \$29,999.....	6.8	11.2	12.8	8.6	12.7	12.9	11.0	13.9	8.3
\$30,000 to \$39,999.....	3.0	5.7	7.0	5.1	8.0	7.9	8.4	10.3	7.5
\$40,000 to \$49,999.....	0.5	0.9	1.1	1.0	1.1	1.1	1.1	2.7	2.3
\$50,000 or more.....	0.2	0.9	0.3	0.8	0.8	0.8	1.1	1.3	2.7
<b>Median salary (dollars).....</b>	<b>18,383</b>	<b>19,391</b>	<b>19,466</b>	<b>17,596</b>	<b>19,358</b>	<b>19,927</b>	<b>18,879</b>	<b>19,883</b>	<b>18,165</b>

<sup>1</sup>Refers to job held in January 1974.

Note: Detail may not add to total because of rounding.

Source: Table 5.

**Table K. PERCENT DISTRIBUTION—SCIENTISTS OR ENGINEERS IN 1974 BY JOB MOBILITY:  
1973 TO 1974 AND 1972 TO 1974**

Job mobility	Field of science or engineering in 1974								Not in a field of science or engineering in 1974
	Computer specialists	Engineers	Mathematical specialists	Life scientists	Physical scientists	Environmental scientists	Psychologists	Social scientists	
<b>TOTAL EMPLOYED IN JANUARY 1973 AND IN JANUARY 1974</b>									
Number.....	51,920	635,789	25,233	68,607	110,181	27,100	31,683	41,882	133,056
Percent.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Job change between 1973 and 1974.....	19.1	16.2	13.5	14.3	13.8	15.1	16.6	17.3	27.0
Same job in 1973 and 1974....	80.9	83.8	86.5	85.7	86.2	84.9	83.4	82.7	73.0
<b>TOTAL EMPLOYED IN 1972 AND IN JANUARY 1974</b>									
Number.....	51,557	629,035	24,895	67,468	108,732	26,760	31,215	41,671	131,248
Percent.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Job change between 1972 and 1974.....	37.8	29.4	25.5	24.0	23.8	26.0	27.9	29.8	45.1
Same job in 1972 and 1974....	56.2	63.4	69.7	69.0	70.1	65.1	66.0	63.3	48.1
Not reported.....	6.0	7.2	4.8	6.9	6.1	8.9	6.1	6.9	6.8

Note: Detail may not add to total because of rounding.

Source: Table 5.

**Table L. PERCENT DISTRIBUTION—SCIENTISTS OR ENGINEERS IN 1974 WHO CHANGED JOBS BETWEEN JANUARY 1973 AND JANUARY 1974, BY OCCUPATIONAL MOBILITY**

Occupational mobility	Field of science or engineering in 1974								Not in a field of science or engineering in 1974
	Computer specialists	Engineers	Mathematical specialists	Life scientists	Physical scientists	Environmental scientists	Psychologists	Social scientists	
<b>TOTAL WITH JOB CHANGE</b>									
Number.....	9,915	103,179	3,412	9,797	15,215	4,095	5,274	7,227	35,977
Percent.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Changed occupation.....	29.4	23.3	35.7	25.4	29.7	13.4	15.5	22.6	54.1
Did not change occupation....	52.5	53.9	42.3	45.6	51.7	58.3	61.5	53.3	29.1
Not reported.....	18.2	22.9	22.0	29.1	18.6	28.3	23.0	24.1	16.8

Note: Detail may not add to total because of rounding.

Source: Table 5.

(table M). The proportions with corresponding professional identification ranged from a high of about 95 percent for computer specialists to a low of about 73 percent for physical scientists. Also, a relatively large proportion of most groups identified as administrators and managers (table 5). This proportion was 10 percent or more for engineers, mathematical specialists, life scientists, physical scientists, and social scientists. Over 40 percent of the out-of-scope cases identified as managers and administrators.

**Federal support.** Only about one-fourth of the employed computer specialists and out-of-scope persons worked at jobs which received Federal support in 1974 (table 5). For most other groups, this proportion ranged from about 35 to 40 percent; however, about half the life scientists had work supported by the Federal Government.

The Department of Defense was the most important source of Federal support among computer specialists, engineers, mathematical specialists, and physical scientists. For life scientists, including agricultural scientists, the Department of Agriculture was the greatest source of support; and the Department of Health, Education, and Welfare provided the largest amount of support for psychologists and social scientists. Environmental scientists were equally supported by three government organizations: the National Science Foundation, the Department of the Interior, and the Department of Defense. The 21 percent of engineers supported by the Department of Defense and the 21 percent of life scientists supported by the Department of Agriculture were the largest proportions in any one field to be supported by any one agency.

Some fields received substantial support from departments other than the primary source cited above. A relatively large proportion of life scientists (15 percent) and physical scientists (7 percent) were supported by the Department of Health, Education, and Welfare. The Atomic Energy Commission also provided support to 7 percent of the physical scientists. The National Aeronautics and Space Administration (NASA) was a large supporter of engineers, 7 percent; and the National Science Foundation supported about 6 percent of the mathematical specialists and physical scientists.

**National interest topics.** There was considerable diversity among fields according to the topics of critical national interest on which their members spent the most time (table 5). Approximately three-fourths of the life scientists, environmental scientists, and psychologists reported that they devoted a significant proportion of their time to one of the topics; whereas only about one-fourth of the computer specialists reported such involvement.

Education was the most significant topic for many fields; especially mathematical specialists (32 percent), psychologists (37 percent) and social scientists (27 percent). Work related to energy and fuel was reported by about 37 percent of environmental scientists and 13 percent of the engineers; and environmental protection was most important for 14 percent of the engineers, 21 percent of the life scientists, 14 percent of the physical scientists, and 15 percent of the environmental scientists. Psychologists and life scientists had the highest proportions, 30 percent and 19 percent, respectively, engaged in work related to health. Also, a high proportion (15 percent) of the life scientists were involved in food production and technology.

**Table M. PERCENT DISTRIBUTION—SCIENTISTS OR ENGINEERS IN 1974, BY PROFESSIONAL IDENTIFICATION IN 1974**

Field of science or engineering in 1974	Total persons in field		Professional identification in 1974		
	Number	Percent	Corresponding professional identification <sup>1</sup>	Other professional identification	Professional identification not reported
Computer specialists.....	55,160	100.0	95.0	1.9	3.0
Engineers.....	687,715	100.0	82.7	12.6	4.7
Mathematical specialists .....	27,849	100.0	77.5	18.3	4.2
Life scientists.....	75,478	100.0	83.6	12.5	3.9
Physical scientists.....	120,994	100.0	72.8	22.8	4.4
Environmental scientists.....	29,470	100.0	88.4	7.9	3.7
Psychologists.....	34,901	100.0	85.4	10.9	3.7
Social scientists.....	47,937	100.0	77.3	17.9	4.8

<sup>1</sup>See table in appendix A for a listing of corresponding professions.

Note: Detail may not add to total because of rounding.

Source: Table 5.

## THE SAMPLE

The 1974 National Survey of Scientists and Engineers was the second survey based on the 1970 population of scientists and engineers to be conducted by the Bureau of the Census for the National Science Foundation. The first survey, the 1972 Professional, Technical, and Scientific Manpower Survey<sup>10</sup>, was conducted among a nationwide sample of approximately 150,000 persons who were recorded in the 1970 Census of Population as being in the experienced civilian labor force in one of 65 engineering, scientific, or related occupations. Also, the survey included a small sample of persons who had completed four or more years of college but were not in any of the specified occupations. Based on responses in the 1972 survey and on criteria established by the National Science Foundation, approximately 50,000 persons from the 1972 survey sample (excluding the small sample of college graduates) were chosen as the sample for the series of longitudinal surveys known as the National Sample of Scientists and Engineers.<sup>11</sup> The 1974 National Survey of Scientists and Engineers was the first survey in this longitudinal series.

Questionnaires for the 1974 survey were mailed in February 1974. The final result of all data collection activities, which extended to August 1974, was that completed questionnaires were obtained for 88.2 percent of the sample, approximately 44,000 persons. The 11.8 percent for whom completed questionnaires were not received include persons who refused to participate, the deceased, and persons who returned questionnaires with insufficient information to permit processing.<sup>12</sup>

For each sample case for which a completed questionnaire was obtained, the information from the 1974 survey was matched with 1972 survey data and 1970 census data for the same person. Weights applied to sample cases in the 1972 survey were then used to weight the resultant matched data file up to universe totals. The use of the 1972 survey weights means that no adjustment for nonresponse was made to 1974 survey results.

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<sup>10</sup> For a description of the 1972 survey and related matters, see U.S. Bureau of the Census, *Characteristics of Persons in Engineering and Scientific Occupations: 1972*, Technical Paper No. 33, U.S. Government Printing Office, Washington, D.C., 1974.

<sup>11</sup> For a description of the selection process, see appendix D.

<sup>12</sup> For an analysis of response, see appendix E.

Respondents to the 1974 National Survey of Scientists and Engineers were classified, again based on criteria of the National Science Foundation, into one of the fields of science and engineering or the category "not in a field of science and engineering in 1974". Except for table 1, the tables of this report deal exclusively with the characteristics of members of the universe represented by these respondents. Table 1, in addition, presents information based on the earlier 1972 study and on the 1970 census for members of the universe represented by nonrespondents in the 1974 survey.

## THE QUESTIONNAIRE

Each panel member in the 1974 National Survey of Scientists and Engineers was asked to complete by self-enumeration a four page questionnaire (reproduced in appendix A). A cover letter was printed on page one of the questionnaire, and a set of reference lists (also reproduced in appendix A) was attached to the questionnaire. The reference lists were used by respondents to self-code answers to inquiries on major field of study (Question 2, part b5 of the questionnaire), kind of business (Question 11), occupation (Question 12), and professional identification (Question 20).

## DEFINITIONS AND EXPLANATIONS

The definitions for many of the characteristics shown in this report are self-explanatory or can best be understood by reference to the appropriate questionnaire items (see appendix B) or the reference lists in appendix A. An explanation of the other subjects is provided below.

**Fields of science and engineering.** Science or engineering fields are categories established by the survey sponsor, the National Science Foundation, to identify persons who could be classified as engineers or scientists under most definitions. In general, to be classified into one of the fields, a person had to have at least two of the following three characteristics: (1) employment in the field; (2) attainment of a specified educational level in an academic discipline related to the field; or (3) self-identification, based upon total education and experience, as being in the field. More detailed information on the criteria for membership in a scientific and technical field is given in appendix C.

The fields of science and engineering for which data are presented in this report and the detailed fields they comprise are as follows:

- Computer specialists
- Engineers
- Mathematical specialists
  - Mathematicians
  - Statisticians
- Life scientists
  - Agricultural scientists
  - Biologists
  - Medical scientists
- Physical scientists
  - Chemists
  - Physicists and astronomers
  - Other physical scientists
- Environmental scientists
  - Earth scientists
  - Atmospheric scientists
  - Oceanographers
- Psychologists
- Social scientists
  - Economists
  - Sociologists and anthropologists
  - Other social scientists

**Race.** The data on race are based on responses in the 1970 Census of Population. The "other races" category includes all races not included in the specific categories listed.

**Age in 1974.** The reference period for age in 1974 was April 1974. The median age is that age that divides the distribution into two equal parts, one-half being older than the median age and one-half younger. Median ages were derived from an estimation process that distributed the subject populations into the five-year age groups given in table 1.

**Place of birth.** Data on place of birth are based on responses in the 1970 Census of Population.

**Divisions of the United States.** The divisions of the United States shown in table 2 comprise the following states:

- New England:** Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont
- Middle Atlantic:** New York, New Jersey, Pennsylvania
- East North Central:** Illinois, Indiana, Michigan, Ohio, Wisconsin
- West North Central:** Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, South Dakota
- South Atlantic:** Delaware, District of Columbia, Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, West Virginia

**East South Central:** Alabama, Kentucky, Mississippi, Tennessee

**West South Central:** Arkansas, Louisiana, Oklahoma, Texas

**Mountain:** Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, Wyoming

**Pacific:** Alaska, California, Hawaii, Oregon, Washington

Outlying areas of the United States include Puerto Rico, Guam, Virgin Islands, American Samoa, Canal Zone, and Trust Territory of the Pacific Islands.

**Standard Metropolitan Statistical Areas (SMSA).** In general, a standard metropolitan statistical area is a county or group of contiguous counties which contains at least one city of 50,000 inhabitants or more, or twin cities with a combined population of at least 50,000. The data in this report are restricted to SMSA boundaries as defined for the 1970 Census of Population. For more information, see 1970 Census of Population, Volume 1, Characteristics of the Population, Part 1, United States Summary.

**Highest degree held.** Highest degree held in 1974 refers to the highest academic degree awarded or assumed to have been awarded to the respondent in 1973 or earlier. Data on the highest degree held were derived as follows. First, question 2 of the 1974 questionnaire was reviewed to determine the highest degree worked for by the respondent since 1971. This degree was accepted as the highest degree received since 1971 if the respondent reported that it had been awarded in 1972 or 1973, or if he failed to indicate when it had been awarded, but did report the completion of at least a certain number of years of postsecondary education in question 1. The required years for each degree are specified in the following chart:

<u>Degree</u>	<u>Minimum years of postsecondary education</u>
No degree	0
Other	0
AA	2
RN	3
BA	4
MA	5
LLB	7
MD	8
Ph.D	7

Second, the highest degree received since 1971 was designated as the highest degree held by the respondent in 1974 if it was at the same or at a higher academic

level than the highest degree reported in the 1972 survey. Otherwise, the highest degree reported in 1972 was designated as the highest degree held in 1974.

The "other degree" classification includes persons whose highest academic degree was one of the following: RN, LLB, MD, and academic degrees other than those shown.

Except for engineers, the criteria for inclusion in a scientific or engineering field required that a person possess an academic degree at the bachelor's level or higher. In table 2, therefore, only engineers and persons "not in a field of science or engineering" can have an "associate degree" or "no degree".

**Major field of study for highest degree held.** The data on major field of study refer to the major subject associated with the highest degree held in 1974 as determined by the method described above. For persons whose highest degree held in 1974 was received after 1971, the data are derived from question 2, part b5 of the 1974 questionnaire. For persons whose highest degree was awarded in 1971 or earlier, the data on major subject are based on the 1972 survey.

**Employment status.** Employed persons are those who reported working, either full time or part time, during the reference week (January 20-26, 1974 or January 21-27, 1973); those who had a job but were not working because of vacation, temporary illness, or personal reasons; and persons on a postdoctoral appointment. If a person did not report whether he was working, but the dates of his most recent job included January of 1974 (or 1973), he was also considered as employed. The unemployed are persons who were not working but were looking for work or on temporary layoff from a job. All other persons were classified as not in the labor force or employment status not reported.

The statistics on employment status in January 1973 are not strictly comparable with those for January 1974. The editing rules for the 1974 National Survey of Scientists and Engineers rejected the questionnaire of any person who failed to report employment status in 1974, but did permit the respondent to leave status in 1973 unreported. Therefore, the data on employment status in 1973 have the category "employment status not reported," which is not found in the data on status in 1974.

**Unemployment in 1973.** The data on unemployment in 1973 relate to the incidence of unemployment during the entire calendar year, rather than just during the reference week.

**Type of employer.** The data on type of employer in 1974 are based on responses to question 11, industry or kind of business, and question 15, class of worker. If a respondent reported the industry, "educational institution" or "military" in question 11, he was classified in

this category regardless of his class of worker. Otherwise, the person was classified according to the response in the class of worker item. The category "other government" includes "State government", "local government", and "employee of international organization"; "self-employed" includes "own business-not incorporated" and "working without pay..."; and "industry or business" includes "employee of private company..." and "own business-incorporated".

**Basic annual salary rate.** The statistics on salary refer to the basic annual salary associated with the job held in January 1974. The figures relate to salary before deductions for income tax, social security, retirement, etc., but do not include bonuses, overtime pay, or earnings from secondary jobs. For employees of educational institutions whose salary was for 9 or 10 months, the salary rate was adjusted to a 12-month basis. Median salaries were derived by an estimation process that distributed the subject populations into \$1,000 intervals.

**Job mobility: 1973, 1974.** Persons who reported being employed in January 1973 and in January 1974 in the 1974 survey, were classified as "with a job change" if they reported different jobs in Part III of the questionnaire. Then, the occupation of the 1974 job was compared with the occupation of the 1973 job, and persons were classified as with same or different occupations or as "not reported".

**Job mobility: 1972, 1974.** The data on job mobility between 1972 and 1974 were derived from answers on the 1974 questionnaire and on the 1972 questionnaire. Persons were classified as with a "Job change since 1972" if they were employed in both 1972 and 1974 and reported that the beginning date of their current job was in 1973 or 1974. Persons were classified as "No job change since 1972" if the beginning date of this job was in 1972 or earlier and as "Not reported" if they did not report the beginning date of the job.

## WEIGHTING AND ESTIMATING PROCEDURES

**Estimation Procedure.** As mentioned earlier, the estimates for this report were prepared by a ratio estimation procedure, using the weights derived for the 1972 survey. Therefore, no adjustment was made for nonresponse in the 1974 survey. The weighting procedure for the 1972 survey involved first, the preparation of preliminary estimates by weighting the results for each sample person by the reciprocal of the probability of selection. As a second step, these weights were adjusted by applying a factor for each age, sex, and race cell within each of the sample's occupational categories from the 1970 census. Within each of the cells, the factor was computed as the ratio of the 1970 census count to the preliminary estimate. The final weight was the factor multiplied by the original weight of each person. To the extent the correlation between

the data being tabulated and the estimated count of persons in the cells are positively correlated, the ratio estimate procedure will improve the reliability of the estimate.

**Reliability of the Estimates.** The sample used for this survey is only one of a large number of possible samples that could have been selected using the same sample design, sample selection, and measurement procedures. Estimates derived from these samples would differ from each other. In addition, the estimates are subject to errors of response and of reporting, as occur in all survey work. The standard error of a survey estimate is primarily a measure of the variation among the estimates from all possible samples and is, therefore, a measure of the precision with which an estimate from a particular sample approximates the average result of all possible samples. As calculated for this report, the standard error also partially measures the effect of certain nonsampling errors but does not measure any systematic biases in the data. The estimate and its associated standard error may be used to construct a confidence interval, that is, an interval having a prescribed probability that it would include the average result of all possible samples. The chances are about two out of three (about 68 percent) that the survey estimate will differ from the average result of all possible samples by less than one standard error (plus or minus). Similarly, the chances are about 19 out of 20 that the difference would be less than twice the standard error and 99 out of 100 that it would be less than 2½ times the standard error.

A number of approximations and generalizations have been used to produce the standard errors, and hence the standard errors presented in the following tables should be regarded as approximations rather than precise measurements of the standard error in question. (See tables N.1–N.7).

There are two standard error tables shown for each group: The a table should be used for estimating standard errors on absolute numbers (total number of persons in a group, having a certain characteristic); the b table is used to obtain the standard error on a percentage.

The standard errors for estimating numbers or percents not shown in either set of tables may be approximated by linear interpolation. For example, of the 55,160 persons in the computer specialist field of science or engineering in 1974, 26.9 percent have the Master's degree as the highest degree held in 1974. The standard error of this percent as computed from table N.1b is 1.1 percent. Based on these data, we may conclude that the expected proportion of computer specialists with the Master's degree as the highest degree held in 1974 lies within the interval 24.7 percent to 29.1 percent with 95 percent confidence.

The figures in these tables are not directly applicable to standard errors of differences between two sample estimates. The standard error of the estimated difference between two figures may be approximated by the square root of the sum of the squares of the standard error of each estimate. This approximation will yield an exact result when the two characteristics are uncorrelated. If the two characteristics are positively correlated, the approximation will overestimate the standard error of the difference. For a difference between two sample estimates, one of which represents a subclass of the other, the table can be used with the difference considered as the sample estimate.

For example, of the 55,160 computer specialists in 1974, 4.7 percent have the Ph.D as the highest degree held in 1974. The standard error of this percent as computed from table N.1 b is 0.5 percent. The standard error of the difference between the above percentages (i.e., 26.9 - 4.7 = 22.2 percent) is then approximately

$$\sqrt{(1.1)^2 + (0.5)^2} = 1.2 \text{ percent}$$

Based on these data, we may conclude with 95 percent confidence that the average estimate of the difference of the percentages derived from all possible samples lies within the interval 19.8 percent to 24.6 percent.

## Standard Errors of Totals and Percentages for Computer Specialists, Psychologists, Physical Scientists

### Table N.1a. Standard Errors of Totals

Size of estimate	Estimated standard error
50.....	40
200.....	90
500.....	140
1,000.....	200
3,000.....	340
5,000.....	430
10,000.....	590
15,000.....	690
25,000.....	810
40,000.....	840
60,000.....	600
75,000.....	340
100,000.....	210
121,000.....	170

### Table N.1b. Standard Errors of Percentages

Base of percent	Estimated percent					
	2 or 98	5 or 95	10 or 90	20 or 80	25 or 75	50
50.....	12.7	19.8	27.3	36.4	39.4	45.5
200.....	6.3	9.9	13.6	18.2	19.7	22.7
500.....	4.0	6.2	8.6	11.5	12.4	14.3
1,000.....	2.8	4.4	6.1	8.1	8.8	10.1
3,000.....	1.6	2.5	3.5	4.7	5.0	5.8
5,000.....	1.2	1.9	2.7	3.6	3.9	4.5
10,000.....	0.9	1.4	1.9	2.5	2.7	3.2
15,000.....	0.7	1.1	1.5	2.1	2.2	2.6
25,000.....	0.5	0.8	1.2	1.6	1.7	2.0
40,000.....	0.4	0.7	0.9	1.2	1.3	1.6
60,000.....	0.3	0.5	0.7	1.0	1.1	1.3
75,000.....	0.3	0.5	0.7	0.9	1.0	1.1
100,000.....	0.2	0.4	0.6	0.8	0.8	1.0
121,000.....	0.2	0.4	0.5	0.7	0.8	0.9

## Standard Errors of Totals and Percentages for Engineers

### Table N.2a. Standard Errors of Totals

Size of estimate	Estimated standard error
500.....	140
1,000.....	200
5,000.....	450
10,000.....	630
20,000.....	890
40,000.....	1,240
75,000.....	1,650
150,000.....	2,180
200,000.....	2,710
300,000.....	2,630
400,000.....	2,620
500,000.....	2,390
690,000.....	2,100

### Table N.2b. Standard Errors of Percentages

Base of percent	Estimated percent					
	2 or 98	5 or 95	10 or 90	20 or 80	25 or 75	50
500.....	4.0	6.2	8.5	11.4	12.3	14.2
1,000.....	2.8	4.4	6.0	8.0	8.7	10.1
5,000.....	1.2	1.9	2.7	3.6	3.9	4.5
10,000.....	0.8	1.3	1.9	2.5	2.7	3.1
20,000.....	0.6	0.9	1.3	1.8	1.9	2.2
40,000.....	0.4	0.6	0.9	1.2	1.3	1.5
75,000.....	0.3	0.5	0.7	0.9	1.0	1.1
150,000.....	0.2	0.3	0.4	0.6	0.7	0.8
200,000.....	0.2	0.3	0.4	0.5	0.6	0.7
300,000.....	0.1	0.2	0.3	0.4	0.5	0.5
400,000.....	0.1	0.2	0.3	0.4	0.4	0.5
500,000.....	0.1	0.1	0.2	0.3	0.3	0.4
690,000.....	0.1	0.1	0.2	0.3	0.3	0.3

## Standard Errors of Totals and Percentages for Mathematical Specialists

**Table N.3a. Standard Errors of Totals**

Size of estimate	Estimated standard error
50.....	30
200.....	70
500.....	110
1,000.....	160
3,000.....	270
5,000.....	340
10,000.....	440
15,000.....	500
25,000.....	500
40,000.....	370

**Table N.3b. Standard Errors of Percentages**

Base of percent	Estimated percent					
	2 or 98	5 or 95	10 or 90	20 or 80	25 or 75	50
50.....	10.2	15.9	21.9	29.2	31.6	36.5
200.....	5.1	7.9	10.9	14.6	15.8	18.2
500.....	3.2	5.0	6.9	9.2	10.0	11.5
1,000.....	2.2	3.5	4.9	6.5	7.0	8.1
3,000.....	1.3	2.0	2.8	3.7	4.0	4.7
5,000.....	1.0	1.5	2.1	2.9	3.1	3.6
10,000.....	0.7	1.1	1.5	2.0	2.2	2.5
15,000.....	0.5	0.9	1.2	1.6	1.8	2.1
25,000.....	0.4	0.7	0.9	1.3	1.4	1.6
40,000.....	0.3	0.5	0.7	1.0	1.1	1.2

## Standard Errors of Totals and Percentages for Life Scientists

### Table N.4a. Standard Errors of Totals

Size of estimate	Estimated standard error
50.....	40
200.....	90
500.....	140
1,000.....	210
3,000.....	350
5,000.....	450
10,000.....	621
15,000.....	605
25,000.....	863
40,000.....	915
60,000.....	739
75,500.....	640

### Table N.4b. Standard Errors of Percentages

Base of percent	Estimated percent					
	2 or 98	5 or 95	10 or 90	20 or 80	25 or 75	50
50.....	13.2	20.5	28.3	37.7	40.8	47.2
200.....	6.6	10.2	14.1	16.8	20.4	23.6
500.....	4.1	6.5	8.9	9.1	12.9	14.9
1,000.....	2.9	4.6	6.3	8.4	9.1	10.5
3,000.....	1.7	2.6	3.6	4.8	5.2	6.0
5,000.....	1.3	2.0	2.8	3.7	4.0	4.7
10,000.....	0.9	1.4	2.0	2.6	2.8	3.3
15,000.....	0.7	1.1	1.6	2.1	2.3	2.7
25,000.....	0.5	0.9	1.2	1.6	1.8	2.1
40,000.....	0.4	0.7	1.0	1.3	1.8	1.6
60,000.....	0.3	0.5	0.8	1.0	1.1	1.3
75,500.....	0.3	0.5	0.7	0.9	1.0	1.2

## Standard Errors of Totals and Percentages for Environmental Scientists

### Table N.5a. Standard Errors of Totals

Size of estimate	Estimated standard error
50.....	40
200.....	80
500.....	130
1,000.....	190
1,500.....	230
2,500.....	300
5,000.....	400
10,000.....	520
15,000.....	580
20,000.....	590
30,000.....	440
36,000.....	360

### Table N.5b. Standard Errors of Percentages

Base of percent	Estimated percent					
	2 or 98	5 or 95	10 or 90	20 or 80	25 or 75	50
50.....	12.3	19.1	26.4	35.2	38.1	44.0
200.....	6.1	9.5	13.2	17.6	19.0	22.0
500.....	3.8	6.0	8.3	11.1	12.0	13.9
1,000.....	2.7	4.2	5.9	7.8	8.5	9.8
1,500.....	2.2	3.5	4.8	6.4	6.9	8.0
2,500.....	1.7	2.7	3.7	4.9	5.3	6.2
5,000.....	1.2	1.9	2.6	3.5	3.8	4.4
10,000.....	0.8	1.3	1.8	2.4	2.6	3.1
15,000.....	0.7	1.1	1.5	2.0	2.2	2.5
20,000.....	0.6	0.9	1.3	1.7	1.9	2.2
30,000.....	0.5	0.7	1.0	1.4	1.5	1.7
36,000.....	0.4	0.7	0.9	1.3	1.4	1.6

## Standard Errors of Totals and Percentages for Social Scientists

### Table N.6a. Standard Errors of Totals

Size of estimate	Estimated standard error
50.....	30
200.....	100
500.....	160
1,000.....	230
3,000.....	410
5,000.....	510
10,000.....	700
15,000.....	830
25,000.....	990
40,000.....	1,080
60,000.....	970
82,800.....	710

### Table N.6b. Standard Errors of Percentages

Base of percent	Estimated percent					
	2 or 98	5 or 95	10 or 90	20 or 80	25 or 75	50
50.....	14.9	23.1	31.9	42.5	46.0	53.2
200.....	7.4	11.5	15.9	21.2	23.0	26.6
500.....	4.7	7.3	10.0	13.4	14.5	16.8
1,000.....	3.3	5.1	7.1	9.5	10.3	11.9
3,000.....	1.9	2.9	4.1	5.4	5.9	6.8
5,000.....	1.4	2.3	3.1	4.2	4.6	5.3
10,000.....	1.0	1.6	2.2	3.0	3.2	3.7
15,000.....	0.8	1.3	1.8	2.4	2.6	3.0
25,000.....	0.6	1.0	1.4	1.9	2.0	2.3
40,000.....	0.5	0.8	1.1	1.5	1.6	1.8
60,000.....	0.4	0.6	0.9	1.2	1.3	1.5
82,800.....	0.3	0.5	0.7	1.0	1.1	1.3

## Standard Errors of Totals and Percentages for Persons Not in a Field of Science or Engineering in 1974

### Table N.7a. Standard Errors of Totals

Size of estimate	Estimated standard error
50.....	30
200.....	110
500.....	170
1,000.....	240
3,000.....	420
5,000.....	540
10,000.....	750
20,000.....	1,020
40,000.....	1,320
60,000.....	1,460
90,000.....	1,390
120,000.....	1,160
148,200.....	980

### Table N.7b. Standard Errors of Percentages

Base of percent	Estimated percent					
	2 or 98	5 or 95	10 or 90	20 or 80	25 or 75	50
50.....	15.3	23.9	32.9	43.9	47.5	54.9
200.....	7.6	11.9	16.4	21.9	23.7	27.4
500.....	4.8	7.5	10.4	13.9	15.0	17.3
1,000.....	3.4	5.3	7.3	9.8	10.6	12.2
3,000.....	1.9	3.0	4.2	5.6	6.1	7.0
5,000.....	1.5	2.3	3.2	4.3	4.7	5.4
10,000.....	1.0	1.6	2.3	3.1	3.3	3.8
20,000.....	0.7	1.1	1.6	2.1	2.3	2.7
40,000.....	0.5	0.8	1.1	1.5	1.6	1.9
60,000.....	0.4	0.6	0.9	1.2	1.3	1.5
90,000.....	0.3	0.5	0.7	1.0	1.1	1.2
120,000.....	0.3	0.4	0.6	0.8	0.9	1.1
148,200.....	0.2	0.4	0.6	0.8	0.8	1.0

**Table 1. FIELD OF SCIENCE OR ENGINEERING IN 1974, BY FIELD OF SCIENCE OR ENGINEERING IN 1972, BY SEX, AND BY AGE IN 1974, FOR ALL PERSONS**

Sex, age in 1974, and field in 1972	Total	Field of science or engineering in 1974								Not in field of science or engi- neering in 1974	Did not report in 1974
		Computer spe- cialists	Engineers	Mathe- matical spe- cialists	Life scientists	Physical scientists	Environ- mental scientists	Psychol- ogists	Social scientists		
<b>NUMBER</b>											
Total.....	1,400,143	55,160	687,715	27,849	75,478	120,994	29,470	34,901	47,937	148,157	172,481
Male.....	1,321,495	48,410	684,350	23,805	65,498	111,924	28,578	25,108	37,864	136,167	159,793
Female.....	78,648	6,750	3,366	4,044	9,980	9,071	893	9,794	10,073	11,990	12,688
Under 25 years.....	4,088	15	1,399	87	251	319	15	49	62	951	940
25 to 29 years.....	147,837	9,506	62,081	3,516	7,125	11,149	2,267	4,779	5,464	18,257	23,693
30 to 34 years.....	249,539	18,496	99,974	7,143	13,565	22,189	3,896	7,094	10,009	29,846	37,327
35 to 39 years.....	226,718	10,851	107,337	4,861	13,150	21,462	4,213	5,299	7,210	22,793	29,542
40 to 44 years.....	209,345	8,426	105,077	3,839	11,872	16,933	5,681	4,925	6,024	22,009	24,559
45 to 49 years.....	195,853	4,538	106,969	3,305	10,023	15,507	4,857	4,788	4,952	19,339	21,575
50 to 54 years.....	155,783	1,966	88,693	1,513	7,656	13,809	4,168	3,747	5,668	14,457	14,106
55 to 59 years.....	98,181	945	53,545	1,530	5,669	9,274	2,107	1,854	3,453	10,505	9,299
60 to 64 years.....	64,450	254	35,102	1,225	3,543	5,815	1,619	1,213	2,510	6,938	6,231
65 years and over.....	48,349	165	27,538	832	2,623	4,537	648	1,150	2,586	3,061	5,209
Median age.....	41.2	34.4	43.0	37.8	41.0	41.1	43.3	39.7	40.5	40.0	38.6
<b>Field of Science or Engineering in 1972</b>											
Computer specialists.....	83,820	48,251	4,916	852	50	192	39	55	185	16,368	12,910
Engineers.....	860,938	4,544	672,154	1,092	650	4,297	1,075	40	437	73,297	103,352
Mathematical specialists.....	40,950	1,651	1,256	25,464	110	218	12	32	229	6,300	5,677
Life scientists.....	97,930	17	1,220	37	67,041	2,214	718	173	324	14,940	11,248
Physical scientists.....	156,845	416	6,546	120	6,441	113,040	1,259	146	124	12,593	16,160
Environmental scientists.....	33,451	52	744	63	700	1,006	-	-	132	1,488	3,058
Psychologists.....	46,944	97	108	14	164	-	-	34,103	433	5,147	6,879
Social scientists.....	79,266	130	770	208	321	27	161	353	46,072	18,026	13,196
<b>PERCENT DISTRIBUTION</b>											
Total.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Male.....	94.4	87.8	99.5	85.5	86.8	92.5	97.0	71.9	79.0	91.9	92.6
Female.....	5.6	12.2	0.5	14.5	13.2	7.5	3.0	28.1	21.0	8.1	7.4
Under 25 years.....	0.3	(2)	0.2	0.3	0.3	0.3	0.1	0.1	0.1	0.6	0.5
25 to 29 years.....	10.6	17.2	9.0	12.6	9.4	9.2	7.7	13.7	11.4	12.3	13.7
30 to 34 years.....	17.8	33.5	14.5	25.6	18.0	18.3	13.2	20.3	20.9	20.1	21.6
35 to 39 years.....	16.2	19.7	15.6	17.5	17.4	17.7	14.3	15.2	15.0	15.4	17.1
40 to 44 years.....	15.0	15.3	15.3	13.8	15.7	14.0	19.3	14.1	12.6	14.9	14.2
45 to 49 years.....	14.0	8.2	15.6	11.9	13.3	12.8	16.5	13.7	10.3	13.1	12.5
50 to 54 years.....	11.1	3.6	12.9	5.4	10.1	11.4	14.1	10.7	11.8	9.8	8.2
55 to 59 years.....	7.0	1.7	7.8	5.5	7.5	7.7	7.1	5.3	7.2	7.1	5.4
60 to 64 years.....	4.6	0.5	5.1	4.4	4.7	4.8	5.5	3.5	5.2	4.7	3.6
65 years and over.....	3.5	0.3	4.0	3.0	3.5	3.7	2.2	3.3	5.4	2.1	3.0
<b>Field of Science or Engineering in 1972</b>											
Total.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Computer specialists.....	6.0	87.5	0.7	3.1	0.1	0.2	0.1	0.2	0.4	11.0	7.5
Engineers.....	61.5	8.2	97.7	3.9	0.9	3.6	3.6	0.1	0.9	49.5	59.9
Mathematical specialists.....	2.9	3.0	0.2	91.4	0.1	0.2	(2)	0.1	0.5	4.3	3.3
Life scientists.....	7.0	(2)	0.2	0.1	88.8	1.8	2.4	0.5	0.7	10.1	6.5
Physical scientists.....	11.2	0.8	1.0	0.4	8.5	93.4	4.3	0.4	0.3	8.5	9.4
Environmental scientists.....	2.4	0.1	0.1	0.2	0.9	0.8	88.9	-	0.3	1.0	1.8
Psychologists.....	3.4	0.2	(2)	0.1	0.2	-	-	97.7	0.9	3.5	4.0
Social scientists.....	5.7	0.2	0.1	0.7	0.4	(2)	0.5	1.0	96.1	12.2	7.7

-Entry represents zero.

% Less than 0.05 percent.

Note: Detail may not add to total because of rounding.

Table 2. SELECTED SOCIAL CHARACTERISTICS BY FIELD OF SCIENCE OR ENGINEERING: 1974

Selected social characteristics	Field of science or engineering in 1974										Not in field of science or engineering in 1974							
	Computer specialists		Engineers		Mathematical specialists		Life scientists		Physical scientists		Environmental scientists		Psychologists		Social scientists			
	Number	Per- cent	Number	Per- cent	Number	Per- cent	Number	Per- cent	Number	Per- cent	Number	Per- cent	Number	Per- cent	Number	Per- cent		
RACE																		
All races.....	55,160	100.0	687,715	100.0	27,849	100.0	75,478	100.0	120,994	100.0	29,470	100.0	34,901	100.0	47,937	100.0	148,157	100.0
White.....	53,248	96.5	664,526	96.6	25,923	93.1	72,076	95.5	113,845	94.1	28,919	98.1	34,065	97.6	46,221	96.4	143,241	96.7
Negro.....	844	1.5	4,491	0.7	1,031	3.7	1,179	1.6	2,205	1.8	47	0.2	636	1.8	674	1.4	2,402	1.6
Japanese, Chinese, or Korean.....	704	1.3	15,004	2.2	730	2.6	1,765	2.3	3,907	3.2	408	1.4	96	0.3	877	1.8	1,950	1.3
Other races.....	363	0.7	3,693	0.5	165	0.6	458	0.6	1,038	0.9	97	0.3	104	0.3	165	0.3	563	0.4
PLACE OF BIRTH																		
Total.....	55,160	100.0	687,715	100.0	27,849	100.0	75,478	100.0	120,994	100.0	29,470	100.0	34,901	100.0	47,937	100.0	148,157	100.0
United States.....																		
Northeast.....	51,510	93.4	616,565	89.7	24,442	87.8	68,555	90.8	101,927	84.2	27,021	91.7	32,422	92.9	42,740	89.2	138,557	93.5
New England.....	19,709	35.7	201,548	29.3	8,343	30.0	16,309	21.6	36,851	30.5	5,674	19.3	12,027	34.5	15,500	32.3	47,266	31.9
New York.....	3,904	7.1	49,020	7.1	1,894	6.8	4,330	5.7	7,658	6.3	1,535	5.2	2,007	5.8	3,327	6.9	10,099	6.8
Middle Atlantic.....	15,805	28.7	152,528	22.2	6,449	23.2	11,979	15.9	29,193	24.1	4,139	14.0	10,020	28.7	12,173	25.4	37,167	25.1
North Central.....	15,226	27.6	209,367	30.4	7,381	26.3	23,022	30.5	34,993	28.9	8,641	29.3	10,518	30.1	14,405	30.0	47,077	31.8
East North Central.....	9,969	18.1	139,463	20.2	4,588	16.5	13,534	17.9	22,565	18.6	5,131	17.4	7,059	20.2	8,988	18.7	32,291	21.8
West North Central.....	5,257	9.5	69,904	10.2	2,793	10.0	9,488	12.6	12,428	10.3	3,510	11.9	3,459	9.9	5,417	11.3	14,786	10.0
South.....	11,769	21.3	134,282	19.5	6,007	21.6	18,177	24.1	19,111	15.8	7,732	26.2	6,055	17.3	8,224	17.2	29,190	19.7
South Atlantic.....	5,127	9.3	50,945	7.4	2,878	10.3	7,388	9.8	7,931	6.6	3,039	10.3	2,788	8.0	4,352	9.1	12,803	8.6
East South Central.....	2,408	4.4	32,632	4.7	1,140	4.1	5,012	6.6	4,573	3.8	1,039	3.5	964	2.8	1,476	3.1	6,489	4.4
West South Central.....	4,234	7.7	50,705	7.4	1,989	7.1	5,777	7.7	6,507	5.5	1,125	3.8	2,303	6.6	2,396	5.0	9,898	6.7
West.....	4,806	8.7	71,390	10.4	2,712	9.7	11,048	14.6	10,972	9.1	4,974	16.9	3,822	11.0	4,611	9.6	15,024	10.1
Mountain.....	1,301	2.4	27,311	4.0	978	3.5	4,024	5.3	3,816	3.2	1,944	6.6	1,467	4.2	1,299	2.7	4,802	3.2
Pacific.....	3,505	6.4	44,079	6.4	1,734	6.2	7,024	9.3	7,156	5.9	3,030	10.3	2,355	6.7	3,312	6.9	10,222	6.9
Outlying areas of the United States	67	0.1	695	0.1	-	-	51	0.1	77	0.1	-	-	27	0.1	115	0.2	205	0.1
Foreign.....	2,984	5.4	61,802	9.0	2,980	10.7	5,739	7.6	17,300	14.3	1,973	6.7	1,892	5.4	4,410	9.2	7,622	5.1
Not reported.....	599	1.1	8,633	1.3	427	1.5	1,153	1.5	1,684	1.4	476	1.6	560	1.6	673	1.4	1,774	1.2
RESIDENCE IN 1974																		
Total.....	55,160	100.0	687,715	100.0	27,849	100.0	75,478	100.0	120,994	100.0	29,470	100.0	34,901	100.0	47,937	100.0	148,157	100.0
United States.....																		
Northeast.....	54,620	99.0	683,716	99.4	27,603	99.1	74,707	99.0	119,906	99.1	28,747	97.5	34,673	99.3	47,255	98.6	147,075	99.3
New England.....	17,382	31.5	184,442	26.8	6,821	24.5	13,767	18.2	37,846	31.3	3,003	10.2	11,211	32.1	13,114	27.4	42,923	29.0
New York.....	4,390	8.0	54,190	7.9	1,748	6.3	4,248	5.6	9,047	7.5	1,125	3.8	2,987	8.6	3,215	6.7	10,735	7.2
Middle Atlantic.....	12,992	23.6	130,252	18.9	5,073	18.2	9,519	12.6	28,799	23.8	1,878	6.4	8,224	23.6	9,899	20.7	32,188	21.7
North Central.....	12,112	22.0	165,518	24.1	6,366	22.9	18,925	25.1	30,295	25.0	3,311	11.2	9,077	26.0	10,276	21.4	40,147	27.1
East North Central.....	8,901	16.1	124,972	18.2	4,641	16.7	11,862	15.7	23,735	19.6	2,133	7.2	6,356	18.2	7,287	15.2	28,745	19.4
West North Central.....	3,211	5.8	40,546	5.9	1,725	6.2	7,063	9.4	6,560	5.4	1,178	4.0	2,721	7.8	2,989	6.2	11,402	7.7
South.....	14,460	26.2	175,952	25.6	9,416	33.8	23,758	31.5	30,209	25.0	13,108	44.5	7,443	21.3	15,041	31.4	36,198	24.4
South Atlantic.....	8,726	15.8	88,277	12.8	6,576	23.6	12,418	16.5	18,616	15.4	4,143	14.1	4,845	12.4	11,528	24.0	20,769	14.0
East South Central.....	1,549	2.8	29,107	4.2	848	3.0	4,989	6.6	4,313	3.6	652	2.2	1,061	3.0	1,727	3.6	4,854	3.3
West South Central.....	4,185	7.6	58,568	8.5	1,992	7.2	6,351	8.4	7,280	6.0	8,313	28.2	2,037	5.8	1,786	3.7	10,575	7.1
West.....	10,665	19.3	157,805	22.9	5,001	18.0	18,237	24.2	21,556	17.8	9,325	31.6	6,942	19.9	8,263	18.4	27,806	18.8
Mountain.....	1,958	3.5	31,378	4.6	1,444	5.2	4,999	6.6	5,584	4.6	4,572	15.5	1,605	4.6	2,262	4.7	6,103	4.1
Pacific.....	8,707	15.8	126,427	18.4	3,557	12.8	13,258	17.6	15,972	13.2	4,753	16.1	5,337	15.3	6,561	13.7	21,703	14.6
Outlying areas of the United States	37	0.1	489	0.1	-	-	49	0.1	50	(2)	-	-	13	(2)	-	-	79	0.1
Foreign.....	502	0.9	3,486	0.5	246	0.9	722	1.0	1,038	0.9	723	2.5	215	0.6	682	1.4	1,003	0.7
Not reported.....	-	-	25	(2)	-	-	-	-	-	-	-	-	-	-	-	-	-	-

See footnotes at end of table.

Table 2. SELECTED SOCIAL CHARACTERISTICS BY FIELD OF SCIENCE OR ENGINEERING: 1974—Continued

Selected social characteristics	Field of science or engineering in 1974												Not in field of science or engineering in 1974					
	Computer specialists		Engineers		Mathematical specialists		Life scientists		Physical scientists		Environmental scientists		Psychologists		Social scientists			
	Number	Per-cent	Number	Per-cent	Number	Per-cent	Number	Per-cent	Number	Per-cent	Number	Per-cent	Number	Per-cent	Number	Per-cent		
SELECTED SMSA's IN 1974																		
Total.....	55,160	100.0	687,715	100.0	27,849	100.0	75,478	100.0	120,994	100.0	29,470	100.0	34,901	100.0	47,937	100.0	148,157	100.0
Metropolitan areas.....	47,464	86.0	563,265	81.9	20,921	75.1	44,067	58.4	95,699	79.1	22,474	76.3	27,972	80.1	37,293	77.8	118,437	79.9
Anaheim-Santa Ana-Garden Grove, Calif..	830	1.5	13,946	2.0	355	1.3	522	0.7	1,370	1.1	335	1.1	560	1.6	340	0.7	2,104	1.4
Los Angeles-Long Beach, Calif.....	2,839	5.1	36,645	5.3	584	2.1	1,418	1.9	3,521	2.9	1,098	3.7	1,327	3.8	1,236	2.6	6,433	4.3
San Francisco-Oakland, Calif.....	1,168	2.1	13,631	2.0	451	1.6	2,113	2.8	3,631	3.0	653	2.2	714	2.0	1,387	2.9	3,270	2.2
San Jose, Calif.....	974	1.8	12,047	1.8	350	1.3	629	0.8	1,256	1.0	325	1.1	371	1.1	193	0.4	1,782	1.2
Denver, Colo.....	737	1.3	8,576	1.2	179	0.6	512	0.7	1,190	1.0	1,952	6.6	372	1.1	365	0.8	1,844	1.2
Washington, D.C.-Md.-Va.....	3,594	6.5	21,036	3.1	3,038	10.9	2,884	3.8	5,535	4.6	1,929	6.5	1,574	4.5	6,512	13.6	4,867	3.3
Chicago, Ill.....	2,601	4.7	23,219	3.4	992	3.6	2,176	2.9	4,671	3.9	276	0.9	1,518	4.3	1,222	2.5	6,585	4.4
Baltimore, Md.....	727	1.3	7,693	1.1	588	2.1	543	0.7	1,781	1.5	105	0.4	297	0.9	603	1.3	1,805	1.2
Boston, Mass.....	1,661	3.0	15,950	2.3	487	1.7	987	1.3	3,512	2.9	381	1.3	1,038	3.0	967	2.0	3,165	2.1
Detroit, Mich.....	1,136	2.1	10,388	1.5	248	0.9	793	1.1	1,711	1.4	101	0.3	416	1.2	424	0.9	3,794	2.6
Minneapolis-St. Paul, Minn.....	1,103	2.0	8,958	1.3	348	1.2	309	0.4	1,183	1.0	60	0.2	384	1.1	297	0.6	2,283	1.5
St. Louis, Mo.-Ill.....	679	1.2	11,183	1.6	378	1.4	810	1.1	2,895	2.4	23	0.1	295	0.8	357	0.7	1,740	1.2
Newark, N.J.....	1,019	1.8	6,730	1.0	124	0.4	461	0.6	1,806	1.5	12	(Z)	170	0.5	100	0.2	2,461	1.7
Paterson-Clifton-Passaic, N.J.....	603	1.1	24,853	3.6	1,345	4.8	2,497	3.3	5,254	4.3	484	1.6	2,894	8.3	3,074	6.4	9,109	6.1
New York, N.Y.....	4,029	7.3	7,795	1.1	104	0.4	479	0.6	1,409	1.2	24	0.1	391	1.1	238	0.5	2,071	1.4
Cleveland, Ohio.....	679	1.2	21,848	3.2	669	2.4	1,131	1.5	4,636	3.8	120	0.4	1,329	4.0	1,329	2.8	4,702	3.2
Philadelphia, Pa.-N.J.....	1,665	3.0	12,197	1.8	237	0.9	258	0.3	1,677	1.4	294	1.0	520	1.5	545	1.1	7,714	5.2
Pittsburgh, Pa.....	646	1.2	7,293	1.1	329	1.2	318	0.4	843	0.7	978	3.3	338	1.0	183	0.4	2,208	1.5
Dallas, Tex.....	876	1.6	13,994	2.0	329	1.2	419	0.6	1,616	1.3	2,354	8.0	331	0.9	230	0.5	2,424	1.6
Houston, Tex.....	1,017	1.8	12,310	1.8	184	0.7	641	0.8	790	0.7	120	0.4	214	0.6	461	1.0	1,696	1.1
Seattle-Everett, Wash.....	690	1.3	256,992	37.4	9,104	32.7	23,683	31.4	43,466	35.9	10,753	36.5	12,239	35.1	6,725	34.9	50,046	33.8
Other metropolitan areas.....	18,191	33.0	119,813	17.4	6,682	24.0	30,640	40.6	24,183	20.0	6,273	21.3	6,688	19.2	9,962	20.8	28,413	19.2
Nonmetropolitan areas.....	7,123	12.9	119,813	17.4	6,682	24.0	30,640	40.6	24,183	20.0	6,273	21.3	6,688	19.2	9,962	20.8	28,413	19.2
Outlying areas of the United States or foreign.....	539	1.0	3,975	0.6	246	0.9	771	1.0	1,088	0.9	723	2.5	228	0.7	682	1.4	1,082	0.7
Not reported.....	34	0.1	661	0.1	-	-	-	-	25	(Z)	-	-	13	(Z)	-	-	225	0.2

- Entry represents zero.  
 Z Less than 0.05 percent.  
 Note: Detail may not add to total because of rounding.

Table 3. SELECTED EDUCATIONAL CHARACTERISTICS BY FIELD OF SCIENCE OR ENGINEERING: 1974

Selected educational characteristics	Field of science or engineering in 1974										Not in field of science or engineering in 1974							
	Computer specialists		Engineers		Mathematical specialists		Life scientists		Physical scientists		Environmental scientists		Psychologists		Social scientists			
	Number	Per-cent	Number	Per-cent	Number	Per-cent	Number	Per-cent	Number	Per-cent	Number	Per-cent	Number	Per-cent	Number	Per-cent		
<b>HIGHEST DEGREE HELD</b>																		
Total.....	55,160	100.0	687,715	100.0	27,849	100.0	75,478	100.0	120,994	100.0	29,470	100.0	34,901	100.0	47,937	100.0	148,157	100.0
With a degree.....	55,160	100.0	687,466	97.1	27,849	100.0	75,478	100.0	120,994	100.0	29,470	100.0	34,901	100.0	47,937	100.0	143,082	96.6
Associate.....	-	-	12,537	1.8	-	-	-	-	-	-	-	-	-	-	-	-	3,725	2.5
Bachelor's.....	37,590	68.1	476,692	69.3	8,350	30.0	25,507	33.8	43,818	36.2	12,914	43.8	3,404	9.8	11,975	25.0	88,227	59.5
Master's.....	14,813	26.9	145,272	21.1	9,337	33.5	16,804	22.3	22,340	18.5	8,437	28.6	11,049	31.7	14,244	29.7	37,810	25.5
Doctorate.....	2,604	4.7	31,859	4.6	10,016	36.0	31,750	42.1	54,661	45.2	8,056	27.3	20,394	58.4	21,481	44.8	10,706	7.2
Other degrees.....	152	0.3	1,106	0.2	147	0.5	1,417	1.9	175	0.1	63	0.2	54	0.2	238	0.5	2,614	1.8
No degree.....	-	-	20,249	2.9	-	-	-	-	-	-	-	-	-	-	-	-	5,075	3.4
<b>MAJOR FIELD OF STUDY FOR HIGHEST DEGREE HELD</b>																		
Total.....	55,160	100.0	687,466	100.0	27,849	100.0	75,478	100.0	120,994	100.0	29,470	100.0	34,901	100.0	47,937	100.0	143,082	100.0
Computer science and systems analysis.....	5,602	10.2	1,111	0.2	123	0.4	12	(Z)	73	0.1	13	(Z)	22	0.1	13	(Z)	1,282	0.9
Engineering.....	9,272	16.8	576,619	86.4	483	1.7	521	0.7	3,604	3.0	1,533	5.2	15	(Z)	206	0.4	45,664	31.9
Mathematical sciences.....	13,956	25.3	6,767	1.0	22,186	79.7	291	0.4	726	0.6	556	1.9	31	0.1	201	0.4	8,226	5.7
Agricultural sciences.....	191	0.3	1,707	0.3	354	1.3	26,436	35.0	834	0.7	785	2.7	12	(Z)	195	0.4	5,104	3.6
Biological sciences.....	593	1.1	1,405	0.2	196	0.7	37,223	49.3	254	0.2	254	0.9	175	0.5	26	0.1	6,725	4.7
Medical sciences.....	429	0.8	792	0.1	152	0.5	3,955	5.2	682	0.6	358	1.2	51	0.1	74	0.2	3,259	2.3
Chemistry.....	697	1.3	7,978	1.2	80	0.3	1,029	1.4	70,708	58.4	264	0.9	25	0.1	25	0.1	6,533	4.6
Physics and astronomy.....	2,352	4.3	14,510	2.2	406	1.5	508	0.7	29,539	24.4	1,700	5.8	14	(Z)	42	0.1	4,964	3.5
Earth, space, and marine sciences.....	543	1.0	2,157	0.3	31	0.1	129	0.2	652	0.5	22,602	76.7	-	-	17	(Z)	1,599	1.1
Psychology.....	1,140	2.1	948	0.1	217	0.8	576	0.8	85	0.1	25	0.1	32,151	92.1	955	2.0	6,108	4.3
Economics.....	1,926	3.5	1,580	0.2	895	3.0	171	0.2	42	(Z)	105	0.4	-	-	17,454	36.4	6,507	4.5
Sociology and anthropology.....	450	0.8	208	(Z)	267	1.0	158	0.2	46	(Z)	-	-	38	0.1	10,762	22.5	2,241	1.6
Other social sciences.....	1,251	2.3	2,110	0.3	132	0.5	186	0.2	339	0.3	712	2.4	224	0.6	10,374	21.6	6,803	4.8
Business and commerce.....	10,935	19.8	17,303	2.6	804	2.9	97	0.1	499	0.4	62	0.2	91	0.3	726	1.5	14,993	10.5
All other fields.....	5,396	9.8	25,764	3.9	1,445	5.2	3,398	4.5	2,160	1.8	467	1.6	1,868	5.4	6,593	13.8	20,334	14.2
Field not reported.....	427	0.8	6,507	1.0	148	0.5	788	1.0	926	0.8	354	1.2	209	0.6	287	0.6	2,741	1.9
<b>SUPPLEMENTAL TRAINING<sup>1</sup></b>																		
Total.....	55,160	100.0	687,715	100.0	27,849	100.0	75,478	100.0	120,994	100.0	29,470	100.0	34,901	100.0	47,937	100.0	148,157	100.0
With supplemental training in 1973.....	33,564	60.8	266,165	38.7	8,206	29.5	26,991	35.8	37,211	30.8	10,240	34.7	12,289	35.2	11,709	24.4	57,588	38.9
On-the-job training.....	20,106	36.5	120,123	17.5	4,089	14.7	15,034	19.9	17,607	14.6	5,129	17.4	6,769	19.4	5,475	11.4	30,867	20.8
Military training applicable to civilian occupations.....	443	0.8	6,899	1.0	88	0.3	588	0.8	351	0.3	178	0.6	194	0.6	444	0.9	1,575	1.1
Extension or correspondence courses.....	1,927	3.5	29,403	4.3	692	2.5	2,845	3.8	3,262	2.7	1,310	4.4	892	2.6	1,202	2.5	5,842	3.9
Employer training programs.....	19,758	35.8	126,267	18.4	3,353	12.0	8,039	10.7	12,818	10.6	4,463	15.1	2,083	6.0	3,548	7.4	23,668	16.0
Adult education center.....	3,602	6.5	28,985	4.2	1,068	3.8	3,098	4.1	4,512	3.7	1,021	3.5	1,160	3.3	1,272	2.7	6,829	4.6
Other training.....	6,442	11.7	45,426	6.6	1,575	5.7	7,262	9.6	9,564	7.9	2,035	6.9	5,242	15.0	3,474	7.2	12,639	8.5
No supplemental training in 1973.....	13,817	25.0	302,541	44.0	15,125	54.3	35,905	47.6	63,335	52.3	13,732	46.6	16,635	47.7	27,691	57.8	63,648	43.0
Not reported.....	7,779	14.1	119,009	17.3	4,518	16.2	12,582	16.7	20,448	16.9	5,497	18.7	5,977	17.1	8,537	17.8	26,921	18.2

<sup>1</sup> Entry represents zero.

<sup>2</sup> Less than 0.05 percent.

<sup>3</sup> Sum of types of training may exceed total with training.

Note: Detail may not add to total because of rounding.

Table 4. SELECTED EMPLOYMENT STATUS CHARACTERISTICS BY FIELD OF SCIENCE OR ENGINEERING: 1974

Selected employment status characteristics	Field of science or engineering in 1974										Not in field of science or engineering in 1974							
	Computer specialists		Engineers		Mathematical specialists		Life scientists		Physical scientists		Environmental scientists		Psychologists		Social scientists			
	Number	Per-cent	Number	Per-cent	Number	Per-cent	Number	Per-cent	Number	Per-cent	Number	Per-cent	Number	Per-cent	Number	Per-cent		
<b>EMPLOYMENT STATUS IN JANUARY 1974</b>																		
Total.....	55,160	100.0	687,715	100.0	27,849	100.0	75,478	100.0	120,994	100.0	29,470	100.0	34,901	100.0	47,937	100.0	148,157	100.0
Labor force.....	53,587	97.1	655,022	95.2	26,083	93.7	70,697	93.7	113,488	93.8	28,228	95.8	33,181	95.1	44,081	92.0	140,926	95.1
Employed.....	53,054	96.2	647,566	94.2	25,837	92.8	69,979	92.8	112,069	92.6	27,929	94.8	32,827	94.1	43,643	91.0	139,067	93.9
Full time.....	51,995	94.3	636,852	92.6	24,620	88.4	67,276	89.1	108,560	89.7	26,814	91.0	31,077	89.9	41,317	86.2	132,960	89.7
Part time.....	720	1.3	7,420	1.1	1,048	3.8	2,243	3.0	3,017	2.5	1,003	3.4	3,107	8.9	1,918	4.0	5,334	3.6
Seeking full-time work.....	113	0.2	1,225	0.2	224	0.8	345	0.5	574	0.5	337	1.1	411	1.2	133	0.3	1,166	0.8
Prefer part-time work.....	607	1.1	5,333	0.8	742	2.7	1,918	2.0	1,918	1.6	576	2.0	2,555	7.3	1,585	3.3	3,911	2.6
Full-time work not available.....	-	-	452	0.1	69	0.2	332	0.4	312	0.3	75	0.3	103	0.3	146	0.3	122	0.1
Full or part time not reported.....	340	0.6	3,194	0.5	169	0.6	460	0.6	492	0.4	112	0.4	297	0.9	408	0.9	773	0.5
Unemployed.....	533	1.0	7,456	1.1	246	0.9	719	1.0	1,429	1.2	299	1.0	354	1.0	438	0.9	1,859	1.3
Not in labor force.....	1,573	2.9	32,693	4.8	1,766	6.3	4,781	6.3	7,496	6.2	1,242	4.2	1,720	4.9	3,856	8.0	7,231	4.9
Retired.....	213	0.4	2,714	0.4	2,363	3.1	4,510	3.7	860	2.9	820	2.8	850	2.3	1,746	3.6	3,138	2.1
Student.....	344	0.6	2,379	0.3	471	1.7	865	1.1	1,554	1.3	213	0.7	321	0.9	1,049	2.2	1,657	1.1
Family responsibilities.....	857	1.6	718	0.1	431	1.5	1,187	1.6	962	0.8	83	0.3	249	0.7	1,266	2.6	1,717	1.2
Other or not reported.....	159	0.3	2,455	0.4	124	0.4	365	0.5	471	0.4	85	0.3	301	0.9	349	0.7	718	0.5
<b>EMPLOYMENT STATUS IN JANUARY 1975</b>																		
Total.....	55,160	100.0	687,715	100.0	27,849	100.0	75,478	100.0	120,994	100.0	29,470	100.0	34,901	100.0	47,937	100.0	148,157	100.0
Labor force.....	53,372	96.8	653,682	95.1	26,021	93.4	71,010	94.1	113,524	93.8	28,011	95.0	32,716	93.7	43,648	91.1	139,333	94.0
Employed.....	53,128	96.3	648,010	94.2	25,821	92.5	70,444	93.3	112,692	93.1	27,755	94.2	32,491	93.1	43,006	89.9	137,412	92.7
Full time.....	50,800	92.1	618,069	89.9	23,546	84.5	64,033	84.5	104,856	86.7	25,015	84.9	28,003	80.2	38,778	80.9	127,144	85.8
Part time.....	646	1.2	6,812	1.0	1,279	4.6	3,996	5.3	3,640	3.0	1,028	3.5	2,633	7.5	1,823	3.8	4,334	2.9
Seeking full-time work.....	107	0.2	1,029	0.1	115	0.4	365	0.5	665	0.5	318	1.1	809	2.3	510	1.1	1,055	0.7
Prefer part-time work.....	539	1.0	4,792	0.7	951	3.4	2,822	3.7	2,162	1.8	657	2.2	2,223	6.4	1,410	2.9	2,986	2.0
Full-time work not available.....	-	-	365	0.1	114	0.4	170	0.2	574	0.5	27	0.1	60	0.2	108	0.2	228	0.2
Full or part time not reported.....	1,682	3.0	23,329	3.4	925	3.3	3,015	4.0	4,195	3.5	1,712	5.8	1,855	5.3	2,505	5.2	5,934	4.0
Unemployed.....	244	0.4	5,671	0.8	271	1.0	566	0.7	832	0.7	255	0.9	225	0.6	542	1.1	1,921	1.3
Not in labor force.....	1,171	2.1	23,559	3.4	1,558	5.6	3,405	4.5	5,332	4.4	997	3.4	1,430	4.1	3,259	6.8	6,386	4.3
Retired.....	104	0.2	19,014	2.8	437	1.6	1,405	1.9	2,639	2.2	468	1.6	398	1.1	1,138	2.4	1,992	1.3
Student.....	232	0.4	2,503	0.4	673	2.4	821	1.1	1,800	1.5	462	1.6	540	1.5	466	1.0	2,317	1.6
Family responsibilities.....	695	1.3	492	0.1	372	1.3	989	1.3	604	0.5	42	0.1	372	1.1	1,088	2.3	1,462	1.0
Other or not reported.....	141	0.3	1,549	0.2	75	0.3	189	0.3	291	0.2	25	0.1	119	0.3	567	1.2	615	0.4
Employment status not reported.....	617	1.1	10,475	1.5	270	1.0	1,064	1.4	2,138	1.8	463	1.6	753	2.2	1,030	2.1	2,439	1.6
<b>EMPLOYMENT IN SCIENCE OR ENGINEERING IN JANUARY 1974</b>																		
Total employed.....	53,054	100.0	647,566	100.0	25,837	100.0	69,979	100.0	112,069	100.0	27,929	100.0	32,827	100.0	43,643	100.0	139,067	100.0
In science or engineering.....	51,910	97.8	625,429	96.6	23,935	92.6	66,550	95.1	110,197	98.3	27,187	97.3	30,178	91.9	36,940	84.6	87,819	63.1
Not in science or engineering.....	987	1.9	19,211	3.0	1,734	6.7	3,032	4.3	1,559	1.4	627	2.2	2,517	7.7	6,135	14.1	49,476	35.6
Preferred non-science or non-engineering.....	332	0.6	3,018	0.5	370	1.4	595	0.9	341	0.3	122	0.4	866	2.6	2,137	4.9	15,729	11.3
Promoted out of science or engineering.....	80	0.2	8,102	1.3	370	1.4	997	1.4	359	0.3	117	0.4	297	0.9	542	1.2	9,899	7.1
Pay better in non-science or non-engineering.....	97	0.2	1,321	0.2	168	0.7	150	0.2	142	0.1	236	0.8	161	0.5	322	0.7	4,326	3.1
Locational preference.....	-	-	592	0.1	118	0.5	250	0.4	36	(Z)	12	(Z)	208	0.6	314	0.7	2,843	2.0
Science or engineering position not available.....	134	0.3	2,335	0.4	226	0.9	163	0.2	443	0.4	115	0.4	169	0.5	185	0.4	3,140	2.3
Other reason or reason not reported.....	344	0.6	3,842	0.6	279	1.1	876	1.3	238	0.2	24	0.1	132	0.4	636	1.5	13,537	9.7
Not reported.....	157	0.3	2,926	0.5	168	0.7	397	0.6	315	0.3	115	0.4	81	0.2	569	1.3	1,773	1.3

See footnotes at end of table.

Table 4. SELECTED EMPLOYMENT STATUS CHARACTERISTICS BY FIELD OF SCIENCE OR ENGINEERING: 1974—Continued

Selected employment status characteristics	Field of science or engineering in 1974												Not in field of science or engineering in 1974					
	Computer specialists		Engineers		Mathematical specialists		Life scientists		Physical scientists		Environmental scientists		Psychologists		Social scientists		Number	Per-cent
	Number	Per-cent	Number	Per-cent	Number	Per-cent	Number	Per-cent	Number	Per-cent	Number	Per-cent	Number	Per-cent				
<b>EMPLOYMENT IN SCIENCE OR ENGINEERING IN JANUARY 1973</b>																		
Total employed.....	53,128	100.0	648,010	100.0	25,751	100.0	70,444	100.0	112,692	100.0	27,755	100.0	32,491	100.0	43,106	100.0	137,412	100.0
In science or engineering.....	52,013	97.9	624,322	96.3	24,099	93.6	66,790	94.8	110,387	98.0	26,912	97.0	29,970	92.2	36,724	85.2	92,616	67.4
Not in science or engineering.....	832	1.6	16,734	2.6	1,405	5.5	2,700	3.8	1,317	1.2	400	1.4	2,121	6.5	5,310	12.3	37,764	27.5
Preferred nonscience or nonengineering.....	274	0.5	2,689	0.4	350	1.4	558	0.8	298	0.3	-	-	836	2.6	2,064	4.8	12,777	9.3
Promoted out of science or engineering.....	34	0.1	7,452	1.1	361	1.4	881	1.3	183	0.2	42	0.2	284	0.9	441	1.0	6,462	4.7
Pay better in nonscience or nonengineering.....	97	0.2	1,171	0.2	118	0.5	131	0.2	117	0.1	236	0.9	121	0.4	399	0.9	3,403	2.5
Locational preference.....	-	-	584	0.1	193	0.7	254	0.4	36	(Z)	-	-	64	0.2	171	0.4	2,270	1.7
Science or engineering position not available.....	117	0.2	1,812	0.3	44	0.2	72	0.1	261	0.2	92	0.3	70	0.2	126	0.3	2,331	1.7
Other reason or reason not reported.....	311	0.6	3,028	0.5	339	1.3	805	1.1	421	0.4	30	0.1	745	2.3	2,111	4.9	10,521	7.7
Not reported.....	284	0.5	6,954	1.1	246	1.0	954	1.4	987	0.9	443	1.6	400	1.2	1,072	2.5	7,031	5.1
<b>UNEMPLOYMENT IN 1973</b>																		
Total.....	55,160	100.0	687,715	100.0	27,849	100.0	75,478	100.0	120,994	100.0	29,470	100.0	34,901	100.0	47,937	100.0	148,157	100.0
Unemployed in 1973.....	1,909	3.5	24,664	3.6	886	3.2	2,940	3.9	4,932	4.1	1,585	5.4	1,767	5.1	2,300	4.8	9,992	6.7
1 week.....	54	0.1	1,492	0.2	32	0.1	196	0.3	308	0.3	25	0.1	41	0.1	24	(Z)	369	0.2
2 weeks.....	106	0.2	2,167	0.3	16	0.1	61	0.1	245	0.2	134	0.5	57	0.2	134	0.3	473	0.3
3 weeks.....	189	0.3	1,283	0.2	13	(Z)	264	0.3	373	0.3	67	0.2	14	(Z)	261	0.5	821	0.6
4 weeks or more.....	1,460	2.6	19,005	2.8	770	2.8	2,392	3.1	3,732	3.1	1,310	4.4	1,601	4.6	1,835	3.8	8,142	5.5
Duration not reported.....	100	0.2	716	0.1	56	0.2	26	(Z)	274	0.2	49	0.2	54	0.2	46	0.1	188	0.1
Not unemployed in 1973.....	51,589	93.5	634,391	92.2	25,997	93.3	69,269	91.8	111,139	91.9	26,874	91.2	31,874	91.3	43,157	90.0	133,793	90.3
Not reported.....	1,661	3.0	28,661	4.2	965	3.5	3,270	4.3	4,923	4.1	1,011	3.4	1,261	3.6	2,480	5.2	4,172	3.0

- Entry represents zero.  
 Z Less than 0.05 percent.  
 \*Includes persons not reporting reason for part-time work, not shown separately.  
 Note: Detail may not add to total because of rounding.

Table 5. SELECTED JOB-RELATED CHARACTERISTICS BY FIELD OF SCIENCE OR ENGINEERING: 1974

Selected job-related characteristics	Field of science or engineering in 1974												Not in field of science or engineering in 1974					
	Computer specialists		Engineers		Mathematical specialists		Life scientists		Physical scientists		Environmental scientists		Psychologists		Social scientists		Number	Per-cent
	Number	Per-cent	Number	Per-cent	Number	Per-cent	Number	Per-cent	Number	Per-cent	Number	Per-cent	Number	Per-cent	Number	Per-cent		
OCCUPATION IN 1974																		
Total employed in January 1974...	53,054	100.0	647,566	100.0	25,837	100.0	69,979	100.0	112,069	100.0	27,929	100.0	32,827	100.0	43,643	100.0	139,067	100.0
Computer specialists.....	51,818	97.7	2,553	0.4	496	1.9	75	0.1	245	0.2	36	0.1	87	0.3	68	0.2	9,974	7.2
Engineers, total.....	166	0.3	547,730	84.6	356	1.4	71	0.1	1,476	1.3	261	0.9	151	0.5	19	0.0	6,773	4.9
Aeronautical and astronautical.....	12	(Z)	25,149	3.9	129	0.5	13	(Z)	49	(Z)	-	-	-	-	-	-	299	0.2
Agricultural.....	-	-	3,437	0.5	-	-	12	(Z)	-	-	-	-	-	-	-	-	-	-
Chemical.....	-	-	35,510	5.5	-	-	13	(Z)	474	0.4	-	-	-	-	-	-	402	0.3
Civil and architectural.....	-	-	85,144	13.1	35	0.1	-	-	30	(Z)	35	0.1	-	-	-	-	604	0.4
Electrical and electronic.....	153	0.3	135,046	20.9	28	0.1	-	-	280	0.2	13	(Z)	-	-	-	-	1,591	1.1
Environmental and sanitary.....	-	-	11,909	1.8	-	-	46	0.1	149	0.1	26	0.1	-	-	19	(Z)	91	0.1
Industrial.....	-	-	27,881	4.3	-	-	-	-	-	-	-	-	-	-	-	-	1,053	0.8
Mechanical.....	-	-	116,969	18.1	-	-	-	-	41	(Z)	-	-	-	-	-	-	64	(Z)
Metallurgical and materials.....	-	-	16,310	2.5	-	-	-	-	78	0.1	-	-	-	-	-	-	109	0.1
Mining and petroleum.....	-	-	9,474	1.5	-	-	-	-	-	-	86	0.3	-	-	-	-	51	(Z)
Nuclear.....	-	-	5,848	0.9	-	-	-	-	94	0.1	-	-	-	-	-	-	280	0.2
Operations research/systems.....	-	-	12,288	1.9	67	0.3	-	-	49	(Z)	-	-	74	0.2	-	-	1,250	0.9
Other fields.....	72	0.1	62,745	9.7	96	0.4	-	-	232	0.2	115	0.4	65	0.2	-	-	1,234	0.9
Mathematicians.....	59	0.1	3,349	0.5	19,898	77.0	50	0.1	165	0.1	-	-	-	-	200	0.5	196	0.1
Statisticians and actuaries.....	-	-	62	(Z)	12,521	48.5	37	0.1	27	(Z)	-	-	-	-	-	-	58	0.2
Operations research analysts.....	13	(Z)	3,219	0.5	6,267	24.3	13	(Z)	32	(Z)	-	-	58	0.2	186	0.4	599	0.4
Life scientists, total.....	-	-	59	(Z)	1,110	4.3	58,150	83.1	105	0.1	12	(Z)	128	0.4	96	0.2	439	0.3
Agricultural scientists.....	-	-	11	(Z)	-	-	21,961	31.4	50	(Z)	-	-	-	-	33	0.1	179	0.1
Biological scientists.....	-	-	33	(Z)	-	-	18,753	26.8	154	0.1	-	-	-	-	-	-	87	0.1
Biochemists and biophysicists.....	-	-	-	-	-	-	1,367	2.0	8,451	7.5	-	-	-	-	-	-	104	0.1
Medical scientists.....	-	-	14	(Z)	-	-	9,590	13.7	145	0.1	12	(Z)	128	0.4	63	0.1	419	0.3
Other life scientists.....	-	-	880	0.1	12	(Z)	6,480	9.3	201	0.2	-	-	-	-	-	-	74	0.1
Physical scientists, total.....	-	-	374	0.1	12	(Z)	475	0.7	82,825	73.6	45	0.2	-	-	-	-	1,091	0.8
Chemists.....	-	-	189	(Z)	12	(Z)	117	0.2	56,967	50.8	12	(Z)	-	-	-	-	623	0.4
Physicists and astronomers.....	-	-	317	(Z)	-	-	-	-	19,972	17.8	-	-	-	-	-	-	146	0.1
Other physical scientists.....	-	-	89	(Z)	-	-	358	0.5	5,586	5.0	33	0.1	-	-	-	-	320	0.2
Environmental scientists, total.....	-	-	52	(Z)	-	-	72	0.1	320	0.3	25,329	90.7	-	-	35	0.1	424	0.3
Atmospheric scientists, meteorologists.....	-	-	37	(Z)	-	-	48	0.1	140	0.1	20,937	75.0	-	-	35	0.1	314	0.2
Oceanographers.....	-	-	-	-	-	-	12	(Z)	74	0.1	2,796	10.0	-	-	-	-	97	0.1
Psychologists.....	-	-	17	(Z)	68	0.3	13	(Z)	106	0.1	1,596	5.7	-	-	-	-	13	(Z)
Social scientists, total.....	-	-	17	(Z)	29	(Z)	28	(Z)	35	(Z)	-	-	27,494	83.8	12	(Z)	164	0.1
Economists.....	-	-	17	(Z)	-	-	16	(Z)	15	(Z)	-	-	129	0.4	32,912	75.4	235	0.2
Sociologists and anthropologists.....	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13,565	31.1	180	0.1
Health occupations.....	-	-	201	(Z)	-	-	106	0.3	37	(Z)	-	-	13	(Z)	7,950	18.2	55	(Z)
Technicians and technologists, except medical.....	-	-	2,809	0.4	-	-	382	0.5	147	0.1	13	(Z)	42	0.1	-	-	11,286	8.1
Teachers.....	31	0.1	888	0.1	345	1.3	1,073	1.5	585	0.5	125	0.4	1,021	3.1	1,309	3.0	10,242	7.4
Administrators and managers.....	419	0.8	77,216	11.9	4,254	16.5	8,347	11.9	16,102	14.4	1,859	6.7	2,795	8.5	7,501	17.2	55,899	40.2
Other occupations.....	72	0.1	7,363	1.1	204	0.8	330	0.5	589	0.5	115	0.4	251	0.8	691	1.6	35,868	25.8
Occupation not reported.....	476	0.9	4,401	0.7	204	0.8	792	1.1	831	0.7	132	0.5	502	1.5	756	1.7	35,766	0.6

See footnotes at end of table.

Table 5. SELECTED JOB-RELATED CHARACTERISTICS BY FIELD OF SCIENCE OR ENGINEERING: 1974—Continued

Selected job-related characteristics	Field of science or engineering in 1974												Not in field of science or engineering in 1974					
	Computer specialists		Engineers		Mathematical specialists		Life scientists		Physical scientists		Environmental scientists		Psychologists		Social scientists		Number	Per-cent
	Number	Per-cent	Number	Per-cent	Number	Per-cent	Number	Per-cent	Number	Per-cent	Number	Per-cent	Number	Per-cent	Number	Per-cent		
INDUSTRY IN 1974																		
Total employed in January 1974....	53,054	100.0	647,566	100.0	25,837	100.0	69,979	100.0	112,069	100.0	27,929	100.0	32,827	100.0	43,643	100.0	139,067	100.0
Agriculture, forestry, and fisheries....	231	0.4	2,102	0.3	263	1.0	17,388	24.8	710	0.6	544	1.9	58	0.2	669	1.5	2,580	1.9
Mining and petroleum extraction.....	343	0.6	9,653	1.5	39	0.2	130	0.2	465	0.4	7,727	27.7	-	-	182	0.4	967	0.7
Construction.....	124	0.2	26,178	4.0	52	0.2	73	0.1	169	0.2	181	0.6	119	0.4	183	0.4	4,783	3.4
Manufacturing.....	23,849	45.0	329,695	50.9	4,206	16.3	5,005	7.2	46,537	41.5	2,769	9.9	1,117	3.4	3,097	7.1	47,184	33.9
Primary metal industries.....	436	0.8	13,947	2.2	24	0.1	117	0.2	1,234	1.1	49	0.2	-	-	250	0.6	2,469	1.8
Fabricated metal industries.....	494	0.9	19,919	3.1	-	-	240	0.3	824	0.7	105	0.4	-	-	107	0.2	2,543	1.8
Machinery, except electrical and electronic.....	652	1.2	26,266	4.1	55	0.2	74	0.1	213	0.2	24	0.1	12	(Z)	191	0.4	3,348	2.4
Electrical machinery, equipment, and supplies.....	436	0.8	26,954	4.2	219	0.8	14	(Z)	901	0.8	51	0.2	221	0.7	65	0.1	3,269	2.4
Electronic machinery and computing equipment.....	13,781	26.0	75,543	11.7	1,052	4.1	71	0.1	3,914	3.5	78	0.3	87	0.3	249	0.6	10,994	7.9
Aircraft and parts.....	1,667	3.1	42,099	6.5	300	1.2	29	(Z)	847	0.8	24	0.1	107	0.3	344	0.8	2,822	2.0
Motor vehicles and motor vehicle equipment.....	784	1.5	20,215	3.1	343	1.3	15	(Z)	756	0.7	12	(Z)	13	(Z)	111	0.3	3,070	2.2
Ordnance.....	789	1.5	27,568	4.3	514	2.0	15	(Z)	1,529	1.4	-	-	25	0.1	207	0.5	1,922	1.4
Chemicals and allied products.....	1,380	2.6	32,438	5.0	876	3.4	2,306	3.3	27,017	24.1	230	0.8	290	0.9	192	0.4	6,505	4.7
Petroleum refining and related industries.....	1,353	2.6	15,661	2.4	98	0.4	25	(Z)	2,804	2.5	2,042	7.3	40	0.1	186	0.4	1,670	1.2
Other manufacturing.....	2,077	3.9	29,085	4.5	725	2.8	2,102	3.0	6,499	5.8	152	0.5	321	1.0	1,194	2.7	8,573	6.2
Transportation, communications, and other public utilities.....	2,861	5.4	33,200	5.1	516	2.0	109	0.2	1,280	1.1	324	1.2	146	0.4	679	1.6	6,419	4.6
Wholesale and retail trade.....	992	1.9	3,518	0.5	103	0.4	328	0.5	276	0.2	-	-	267	0.8	483	1.1	5,998	4.3
Finance, insurance, and real estate.....	3,757	7.1	2,597	0.4	148	0.6	259	0.4	148	0.1	180	0.6	273	0.8	1,629	3.7	7,021	5.0
Educational institutions.....	3,285	6.2	20,227	3.1	11,892	46.0	29,651	42.4	26,380	23.5	5,832	20.9	17,010	51.8	20,677	47.4	16,987	12.2
College or university.....	2,840	5.4	16,637	2.6	9,852	38.1	20,526	29.3	21,855	19.5	5,209	18.7	10,255	31.2	18,709	42.9	9,888	7.1
Other.....	445	0.8	3,589	0.6	2,040	7.9	9,126	13.0	4,525	4.0	623	2.2	6,754	20.6	1,971	4.5	7,099	5.1
Health services.....	831	1.6	1,811	0.3	391	1.5	3,675	5.3	2,629	2.3	12	(Z)	7,906	24.1	974	2.2	3,902	2.8
Services, except education or health.....	5,983	11.3	137,478	21.2	3,966	15.4	6,227	8.9	19,940	17.8	4,279	15.3	2,852	8.7	4,944	11.3	16,584	11.9
Engineering or architectural services	1,049	2.0	99,234	15.3	615	2.4	51	0.1	872	0.8	1,032	3.7	51	0.2	240	0.5	7,549	5.4
Research institutions.....	2,560	4.8	32,377	5.0	2,828	10.9	5,876	8.1	18,194	16.2	2,867	10.3	1,596	4.9	2,653	6.1	3,127	2.2
Other.....	2,374	4.5	5,967	0.9	523	2.0	500	0.7	874	0.8	380	1.4	1,205	3.7	2,051	4.7	5,908	4.2
Public administration.....	4,192	7.9	3,020	0.4	2,319	9.0	3,429	4.9	5,048	4.5	2,761	9.9	1,310	4.0	7,620	17.5	9,649	6.9
Federal.....	1,825	3.4	1,732	0.3	1,189	4.6	1,388	2.5	1,950	1.7	1,193	4.3	308	0.9	3,332	7.6	3,041	2.2
Other.....	2,367	4.5	23,698	3.7	1,128	4.4	1,691	2.4	3,098	2.8	1,568	5.6	1,002	3.1	4,288	9.8	6,608	4.8
Military.....	258	0.5	2,427	0.4	132	0.5	132	0.2	162	0.1	12	(Z)	29	0.1	16	(Z)	744	0.5
Other industries.....	5,898	11.1	37,694	5.8	1,494	5.8	2,913	4.2	7,248	6.5	3,105	11.1	1,030	3.1	1,753	4.0	14,880	10.7
Not reported.....	450	0.8	5,965	0.9	139	0.5	659	0.9	1,056	0.9	204	0.7	711	2.2	739	1.7	1,367	1.0
PRIMARY WORK ACTIVITY IN 1974																		
Total employed in January 1974....	53,054	100.0	647,566	100.0	25,837	100.0	69,979	100.0	112,069	100.0	27,929	100.0	32,827	100.0	43,643	100.0	139,067	100.0
Research and development, total.....	3,131	5.9	211,720	32.7	3,290	12.7	19,410	27.7	49,436	44.1	7,408	26.5	2,959	9.0	5,358	12.3	11,993	8.6
Basic research.....	245	0.5	3,880	0.6	1,655	6.4	10,266	14.7	18,820	16.8	2,808	10.1	1,394	4.2	2,138	4.9	1,870	1.3
Applied research.....	407	0.8	20,173	3.1	1,184	4.6	7,673	11.0	16,578	14.8	3,757	13.5	1,235	3.8	2,919	6.7	1,563	1.1
Development.....	1,870	3.5	84,077	13.0	306	1.2	1,342	1.9	13,439	12.0	652	2.3	239	0.7	285	0.7	3,074	2.2
Design.....	609	1.1	103,589	16.0	146	0.6	129	0.2	599	0.5	190	0.7	91	0.3	17	(Z)	5,486	3.9
Management or administration, total.....	6,665	12.6	197,743	30.5	4,734	18.3	18,109	25.9	25,285	22.6	6,535	23.4	5,944	18.1	11,457	26.3	56,090	40.3
Research and development.....	2,137	4.0	66,773	10.3	2,046	7.9	6,396	9.1	16,954	15.1	2,380	8.5	2,384	7.3	3,603	8.3	8,382	6.0
Other.....	4,527	8.5	130,970	20.2	2,688	10.4	11,713	16.7	8,331	7.4	4,155	14.9	3,560	10.8	7,854	18.0	47,708	34.3

See footnotes at end of table.

Table 5. SELECTED JOB-RELATED CHARACTERISTICS BY FIELD OF SCIENCE OR ENGINEERING: 1974—Continued

Selected job-related characteristics	Field of science or engineering in 1974										Not in field of science or engineering in 1974							
	Computer specialists		Engineers		Mathematical specialists		Life scientists		Physical scientists		Environmental scientists		Psychologists		Social scientists			
	Number	Per-cent	Number	Per-cent	Number	Per-cent	Number	Per-cent	Number	Per-cent	Number	Per-cent	Number	Per-cent	Number	Per-cent		
<b>PRIMARY WORK ACTIVITY IN 1974—Continued</b>																		
Teaching.....	1,729	3.3	14,356	2.2	9,498	36.8	16,929	24.2	14,793	13.2	3,465	12.4	8,878	27.0	14,996	34.4	11,576	8.3
Production and inspection.....	1,369	2.6	104,803	16.2	1,005	3.9	5,008	7.2	11,686	10.4	2,088	7.5	533	1.6	1,551	3.6	21,159	15.2
Quality control.....	216	0.4	26,146	4.0	278	1.1	986	1.4	8,908	7.9	387	1.4	13	0.0	213	0.5	3,427	2.5
Operations.....	598	1.1	64,477	10.0	554	2.1	3,724	5.3	2,209	2.0	1,639	5.9	309	0.9	994	2.3	8,281	6.0
Distribution-sales.....	555	1.0	14,180	2.2	173	0.7	287	0.4	570	0.5	81	0.3	211	0.6	344	0.8	9,451	6.8
Consulting.....	3,406	6.4	40,748	6.3	590	2.3	3,739	5.3	2,644	2.4	2,863	10.3	12,120	36.9	2,243	5.1	6,879	4.9
Clinical diagnosis.....	-	-	818	0.1	17	0.1	906	1.3	336	0.3	12	(Z)	10,618	32.3	1,155	2.6	1,723	1.2
Consulting.....	3,406	6.4	39,930	6.2	572	2.2	2,833	4.0	2,308	2.1	2,851	10.2	1,502	4.6	1,088	2.5	5,157	3.7
Report writing, statistical work, and computer applications.....	35,240	66.4	36,529	5.6	5,899	22.8	2,615	3.7	2,831	2.5	2,136	7.6	844	2.6	4,574	10.5	13,439	9.7
Report writing.....	689	1.3	17,218	2.7	483	1.9	1,559	2.2	1,607	1.4	1,137	4.1	596	1.8	2,373	5.4	2,231	1.6
Statistical work.....	209	0.4	6,993	1.1	3,440	13.3	1,775	1.1	356	0.3	481	1.7	209	0.6	1,966	4.5	1,897	1.4
Computer applications.....	34,342	64.7	12,318	1.9	1,976	7.6	281	0.4	867	0.8	519	1.9	40	0.1	235	0.5	9,311	6.7
Other activities.....	1,096	2.1	29,963	4.6	291	1.1	2,770	4.0	2,852	2.5	2,750	9.8	920	2.8	2,408	5.5	13,868	10.0
Not reported.....	419	0.8	11,705	1.8	530	2.1	1,400	2.0	2,543	2.3	685	2.5	628	1.9	1,056	2.4	4,063	2.9
<b>TYPE OF EMPLOYER IN 1974</b>																		
Total employed in January 1974...	53,054	100.0	647,566	100.0	25,837	100.0	69,979	100.0	112,069	100.0	27,929	100.0	32,827	100.0	43,643	100.0	139,067	100.0
Educational institution.....	3,285	6.2	20,227	3.1	11,892	46.0	29,651	42.4	26,380	23.5	5,832	20.9	17,010	51.8	20,677	47.4	16,987	12.2
Federal government.....	3,779	7.1	56,797	8.8	3,823	14.8	13,300	19.0	11,675	10.4	4,940	17.7	1,622	4.9	5,130	11.8	7,045	5.1
Other government.....	4,954	9.3	61,036	9.4	1,970	7.6	7,766	11.1	6,334	5.7	3,125	11.2	5,081	15.5	6,134	14.1	13,157	9.5
Nonprofit organization.....	1,814	3.4	13,424	2.1	696	2.7	2,799	4.0	4,989	4.5	502	1.8	3,704	11.3	3,101	7.1	4,659	3.4
Industry or business.....	38,378	72.3	477,608	73.8	7,138	27.6	15,415	22.0	61,187	54.6	11,603	41.5	3,500	10.7	7,272	16.7	88,055	63.3
Self-employed.....	447	0.8	13,684	2.1	64	0.2	379	0.5	618	0.6	1,839	6.6	1,722	5.2	740	1.7	6,214	4.5
Military.....	258	0.5	2,427	0.4	132	0.5	132	0.2	162	0.1	12	(Z)	29	0.1	16	(Z)	744	0.5
Not reported.....	139	0.3	2,362	0.4	122	0.5	535	0.8	724	0.6	75	0.3	160	0.5	573	1.3	2,206	1.6
<b>BASIC ANNUAL SALARY RATE<sup>2</sup></b>																		
Total employed in January 1974...	53,054	100.0	647,566	100.0	25,837	100.0	69,979	100.0	112,069	100.0	27,929	100.0	32,827	100.0	43,643	100.0	139,067	100.0
With salary reported.....	49,514	93.3	595,734	92.0	24,611	95.3	66,319	94.8	105,069	93.8	25,445	91.1	30,699	93.5	40,738	93.3	126,052	90.6
Less than \$9,000.....	529	1.0	7,909	1.2	1,054	4.1	3,007	4.3	4,122	3.7	782	2.8	1,800	5.5	1,262	2.9	6,171	4.4
\$9,000 to \$9,999.....	310	0.6	3,898	0.6	258	1.0	1,783	2.5	2,785	2.5	694	2.5	722	2.2	1,236	2.8	5,120	3.7
\$10,000 to \$14,999.....	8,958	16.9	84,775	13.1	4,189	16.2	16,390	23.4	17,708	15.8	3,549	12.7	4,961	15.1	6,087	13.9	27,941	20.1
\$15,000 to \$19,999.....	22,458	42.3	226,393	35.0	7,605	29.4	22,276	31.8	32,245	28.8	7,814	28.0	9,983	30.4	12,028	27.6	36,959	26.6
\$20,000 to \$24,999.....	12,046	22.7	161,810	25.0	6,290	24.3	12,638	18.1	24,602	22.0	6,812	24.4	6,605	20.1	8,624	19.8	23,724	17.1
\$25,000 to \$29,999.....	3,377	6.4	66,763	10.3	3,145	12.2	5,703	8.1	13,294	11.9	3,286	11.8	3,365	10.3	5,648	12.9	10,443	7.5
\$30,000 to \$39,999.....	1,494	2.8	33,682	5.2	1,726	6.7	3,376	4.8	8,404	7.5	2,021	7.2	2,566	7.8	4,203	9.6	9,492	6.8
\$40,000 or more.....	263	0.5	5,394	0.8	273	1.1	633	0.9	1,112	1.0	277	1.0	345	1.1	1,115	2.6	2,859	2.1
Median salary (dollars).....	81	0.2	5,098	0.8	72	0.3	512	0.7	795	0.7	211	0.8	352	1.1	534	1.2	3,943	2.8
Salary not reported.....	18,383	(X)	19,391	(X)	19,466	(X)	17,596	(X)	19,358	(X)	19,927	(X)	18,879	(X)	19,863	(X)	18,165	(X)
Salary not reported.....	3,539	6.7	51,832	8.0	1,226	4.7	3,659	5.2	7,001	6.2	2,484	8.9	2,128	6.5	2,905	6.7	13,014	9.4

See footnotes at end of table.

Table 5. SELECTED JOB-RELATED CHARACTERISTICS BY FIELD OF SCIENCE OR ENGINEERING: 1974—Continued

Selected job-related characteristics	Field of science or engineering in 1974										Not in field of science or engineering in 1974							
	Computer specialists		Engineers		Mathematical specialists		Life scientists		Physical scientists		Environmental scientists		Psychologists		Social scientists			
	Number	Per-cent	Number	Per-cent	Number	Per-cent	Number	Per-cent	Number	Per-cent	Number	Per-cent	Number	Per-cent	Number	Per-cent		
<b>JOB MOBILITY: 1973 TO 1974</b>																		
Total persons.....	55,160	100.0	687,715	100.0	27,849	100.0	75,478	100.0	120,994	100.0	29,470	100.0	34,901	100.0	47,937	100.0	148,157	100.0
Employed in January 1974.....	53,054	96.2	647,566	94.2	25,837	92.8	69,979	92.7	112,069	92.6	27,929	94.8	32,827	94.1	43,643	91.0	139,067	93.9
Employed in January 1973.....	51,920	94.1	635,789	92.4	25,233	90.6	68,607	90.9	110,181	91.1	27,100	92.0	31,683	90.8	41,882	87.4	133,056	89.8
Job change between 1973 and 1974.....	9,915	18.0	103,179	15.0	3,412	12.3	9,797	13.0	15,215	12.6	4,095	13.9	5,274	15.1	7,227	15.1	35,977	24.3
Different occupation.....	2,911	5.3	23,996	3.5	1,248	4.4	2,485	3.3	4,526	3.7	1,550	1.9	1,632	4.7	1,632	3.4	19,458	13.1
Same occupation.....	5,203	9.4	35,603	5.1	1,444	5.2	4,464	5.9	7,865	6.5	2,387	8.1	3,243	9.3	3,853	8.0	10,480	7.1
Not reported.....	1,802	3.3	23,881	3.4	750	2.7	2,848	3.8	2,854	2.3	1,157	3.9	1,212	3.5	1,742	3.6	6,039	4.1
Same job in 1973 and 1974.....	42,005	76.2	532,610	77.4	21,822	78.4	58,810	77.9	94,966	78.5	23,005	78.1	26,408	75.7	34,555	72.3	97,079	65.5
Not employed or employment status not reported in January 1973.....	1,134	2.1	11,777	1.7	604	2.2	1,372	1.8	1,888	1.6	829	2.8	1,145	3.3	1,761	3.7	6,010	4.1
Not employed in January 1974.....	2,106	3.8	40,149	5.8	2,012	7.2	5,499	7.3	8,925	7.4	1,541	5.2	2,074	5.9	4,294	9.0	9,091	6.1
<b>JOB MOBILITY: 1972 TO 1974</b>																		
Total persons.....	55,160	100.0	687,715	100.0	27,849	100.0	75,478	100.0	120,994	100.0	29,470	100.0	34,901	100.0	47,937	100.0	148,157	100.0
Employed in January 1974.....	53,054	96.2	647,566	94.2	25,837	92.8	69,979	92.7	112,069	92.6	27,929	94.8	32,827	94.1	43,643	91.0	139,067	93.9
Employed in 1972.....	51,557	93.5	629,035	91.5	24,895	89.4	67,468	89.4	108,732	90.8	26,760	90.8	31,215	89.4	41,671	86.9	131,248	88.6
Job change between 1972 and 1974.....	19,477	35.3	184,797	26.9	6,351	22.8	16,226	21.5	25,897	21.4	6,949	23.6	8,723	25.0	12,398	25.9	59,162	39.9
Same job in 1972 and 1974.....	28,994	52.6	398,832	58.0	17,350	62.3	46,578	61.7	76,249	63.0	17,418	59.1	20,599	59.0	26,379	55.0	63,135	42.6
Not reported.....	3,086	5.6	45,406	6.6	1,194	4.3	4,664	6.2	6,586	5.4	2,394	8.1	1,894	5.4	2,894	6.0	8,951	6.0
Not employed or employment status not reported in 1972.....	1,487	2.7	18,531	2.7	942	3.4	2,511	3.3	3,338	2.8	1,169	4.0	1,612	4.6	1,973	4.1	7,819	5.3
Not employed in January 1974.....	2,106	3.8	40,149	5.8	2,012	7.2	5,499	7.3	8,925	7.4	1,541	5.2	2,074	5.9	4,294	9.0	9,091	6.1
<b>PROFESSIONAL IDENTIFICATION IN 1974</b>																		
Total persons.....	55,160	100.0	687,715	100.0	27,849	100.0	75,478	100.0	120,994	100.0	29,470	100.0	34,901	100.0	47,937	100.0	148,157	100.0
Computer specialists.....	52,426	95.0	1,543	0.2	557	2.0	-	-	84	0.1	70	0.2	13	(Z)	26	0.1	10,101	6.8
Engineers.....	79	0.1	568,774	82.7	377	1.4	331	0.4	1,884	1.6	307	1.0	-	-	105	0.2	9,943	6.7
Mathematicians and statisticians.....	17	(Z)	3,080	0.4	21,587	77.5	43	0.1	99	0.1	12	(Z)	-	-	87	0.2	2,004	1.4
Life scientists.....	12	(Z)	103	(Z)	-	(Z)	63,107	83.6	9,437	7.8	85	0.3	307	0.9	96	0.2	2,275	1.5
Physical scientists.....	-	-	1,126	0.2	91	0.3	328	0.4	88,071	72.8	96	0.3	-	-	64	0.1	2,399	1.6
Environmental scientists.....	13	(Z)	102	(Z)	12	(Z)	114	0.2	185	0.2	26,047	88.4	-	-	13	(Z)	354	0.2
Psychologists.....	-	-	28	(Z)	-	-	38	0.1	-	-	-	-	29,791	85.4	104	0.2	400	0.3
Social scientists.....	-	-	26	(Z)	31	0.1	43	0.1	92	0.1	-	-	190	0.5	37,065	77.3	1,589	1.1
Administrators and managers.....	895	1.6	76,807	11.2	3,324	11.9	7,803	10.3	14,677	12.1	1,470	5.0	2,603	7.5	7,086	14.8	60,555	40.9
Other.....	44	0.1	3,876	0.6	698	2.5	732	1.0	1,117	0.9	284	1.0	682	2.0	998	2.1	52,978	35.8
Not reported.....	1,673	3.0	32,250	4.7	1,158	4.2	2,939	3.9	5,348	4.4	1,099	3.7	1,306	3.7	2,292	4.8	5,558	3.8
<b>FEDERAL SUPPORT IN 1974</b>																		
Total employed in January 1974.....	53,054	100.0	647,566	100.0	25,837	100.0	69,979	100.0	112,069	100.0	27,929	100.0	32,827	100.0	43,643	100.0	139,067	100.0
With Federal support.....	13,344	25.2	238,076	36.8	9,869	38.2	35,145	50.2	40,242	35.9	10,900	39.0	11,483	35.0	16,568	38.0	33,131	23.8
Department of Agriculture.....	112	0.2	5,671	0.9	533	2.1	14,601	20.9	2,021	1.8	834	3.0	107	0.3	2,266	5.2	2,240	1.6
Department of Commerce.....	176	0.3	4,117	0.6	507	2.0	846	1.2	1,170	1.0	1,569	5.6	-	-	653	1.5	671	0.5
Department of Defense.....	7,594	14.3	138,231	21.3	4,114	15.9	1,629	2.3	13,578	12.1	2,261	8.1	1,330	4.1	1,979	4.5	12,028	8.6

See footnotes at end of table.

Table 5. SELECTED JOB-RELATED CHARACTERISTICS BY FIELD OF SCIENCE OR ENGINEERING: 1974—Continued

Selected job-related characteristics	Field of science or engineering in 1974										Not in field of science or engineering in 1974							
	Computer specialists		Engineers		Mathematical specialists		Life scientists		Physical scientists		Environmental scientists		Psychologists		Social scientists			
	Number	Per-cent	Number	Per-cent	Number	Per-cent	Number	Per-cent	Number	Per-cent	Number	Per-cent	Number	Per-cent	Number	Per-cent		
FEDERAL SUPPORT IN JANUARY 1974—Continued																		
Department of Health, Education, and Welfare.....	1,025	1.9	4,838	0.7	1,127	4.4	10,221	14.6	8,116	7.2	274	1.0	5,769	17.6	4,184	9.6	6,159	4.4
Department of Housing and Urban Development.....	396	0.7	10,441	1.6	128	0.5	151	0.2	69	0.1	124	0.4	81	0.2	1,132	2.6	1,856	1.3
Department of the Interior.....	152	0.3	8,367	1.3	105	0.4	3,401	4.9	1,336	1.2	2,269	8.1	13	(Z)	606	1.4	1,431	1.0
Department of Justice.....	407	0.8	1,183	0.2	88	0.3	1,94	0.3	507	0.5	12	(Z)	622	1.9	789	1.8	1,045	0.8
Department of Labor.....	228	0.4	1,318	0.2	446	1.7	80	0.1	49	(Z)	-	-	372	0.8	1,818	4.2	1,259	0.9
Department of Transportation.....	574	1.1	31,357	4.8	453	1.8	241	0.3	869	0.8	507	1.8	347	1.1	504	1.2	2,645	1.9
Atomic Energy Commission.....	747	1.4	17,523	2.7	386	1.5	1,056	1.5	7,544	6.7	389	1.4	221	0.7	161	0.4	1,922	1.4
Environmental Protection Agency.....	196	0.4	11,327	1.7	229	0.9	1,200	1.7	2,101	1.9	415	1.5	13	(Z)	420	1.0	1,449	1.0
NASA.....	1,709	3.2	42,010	6.5	442	1.7	573	0.8	4,686	4.2	1,244	4.5	208	0.6	411	0.9	3,503	2.5
National Science Foundation.....	397	0.7	5,656	0.9	1,641	6.4	2,801	4.0	6,329	5.8	2,343	8.4	645	2.0	996	2.3	823	0.7
Other agency.....	946	1.8	9,514	1.5	275	1.1	1,555	2.2	1,624	1.4	640	2.3	1,136	3.5	2,181	5.0	2,429	1.7
Agency not known or not reported.....	976	1.8	6,988	1.1	679	2.6	1,437	2.1	1,136	1.0	414	1.5	1,979	8.1	1,979	4.5	3,086	2.2
No Federal support.....	36,064	68.0	372,126	57.5	13,730	53.1	30,047	42.9	65,087	58.1	15,660	56.1	17,406	53.0	23,335	53.5	97,031	69.8
Federal support not known or not reported.....	3,647	6.9	37,364	5.8	2,238	8.7	4,787	6.8	6,740	6.0	1,369	4.9	3,939	12.0	3,740	8.6	8,904	6.4
NATIONAL INTEREST TOPICS <sup>4</sup>																		
Total persons.....	55,160	100.0	687,715	100.0	27,849	100.0	75,478	100.0	120,994	100.0	29,470	100.0	34,901	100.0	47,937	100.0	148,157	100.0
Health.....	1,748	3.2	9,859	1.4	1,592	5.7	14,430	19.1	12,483	10.3	63	0.2	10,385	29.8	4,159	8.7	10,308	7.0
Education, total.....	4,089	7.4	20,742	3.0	8,790	31.6	13,610	18.0	15,663	12.9	3,172	10.8	12,994	37.2	13,024	27.2	14,461	9.8
Teaching.....	2,586	4.7	15,948	2.3	8,122	29.2	12,073	16.0	13,863	11.5	2,940	10.0	7,359	21.1	10,369	21.6	9,340	6.7
Other.....	1,503	2.7	4,794	0.7	668	2.4	1,537	2.0	1,800	1.5	232	0.8	5,635	16.1	2,655	5.5	4,521	3.1
Environmental protection, pollution control.....	503	0.9	94,342	13.7	647	2.3	16,093	21.3	16,553	13.7	4,474	15.2	402	1.2	2,197	4.6	11,293	7.6
Space.....	2,121	3.8	44,308	6.4	721	2.6	128	0.2	4,330	3.6	842	2.9	52	0.1	310	0.6	3,753	2.5
Crime prevention and control.....	758	1.4	2,361	0.3	137	0.5	44	0.1	858	0.7	36	0.1	880	2.5	1,322	2.8	1,723	1.2
Food production and technology.....	185	0.3	9,401	1.4	347	1.2	11,482	15.2	4,073	3.4	380	1.3	1,20	0.3	1,441	3.0	4,089	2.8
Energy and fuel.....	2,129	3.9	86,450	12.6	911	3.3	396	0.5	9,930	8.2	10,990	37.3	104	0.3	1,555	3.2	10,936	7.4
Other mineral resources.....	161	0.3	7,001	1.0	149	0.5	189	0.3	1,166	1.0	2,399	8.1	-	-	301	0.6	771	0.5
Community development and services.....	790	1.4	19,813	2.9	266	1.0	645	0.9	853	0.7	258	0.9	1,248	3.6	4,654	9.7	8,068	5.4
Housing.....	185	0.3	13,748	2.0	288	1.0	81	0.1	363	0.3	46	0.2	182	0.5	313	0.7	3,600	2.4
Not applicable.....	33,925	61.5	278,449	40.5	10,442	36.1	11,306	15.0	37,753	31.2	4,203	14.3	5,272	15.1	13,145	27.4	62,368	42.1
Not reported.....	8,566	15.5	101,241	14.7	3,960	14.2	7,073	9.4	16,970	14.0	2,605	8.8	3,263	9.3	5,516	11.5	16,788	11.3

- Entry represents zero. X Not applicable.  
 1College or university teachers of science or engineering are excluded from teachers and included with occupation corresponding to subject taught.  
 2Refers to salary for job held in January 1974.  
 3Sum of individual agencies' support may exceed total with Federal support.  
 4Areas of national concern in which persons devoted a significant proportion of professional time.  
 Note: Detail may not add to total because of rounding.

**APPENDIX A**  
**QUESTIONNAIRE AND REFERENCE LISTS**

FORM PMS-14A  
(10-23-73)U.S. DEPARTMENT OF COMMERCE  
SOCIAL AND ECONOMIC STATISTICS ADMIN.  
BUREAU OF THE CENSUS**NOTICE** - Your report to the Census Bureau is confidential by law (Title 13, U.S. Code). It may be seen only by sworn Census employees and may be used only for statistical purposes.

## 1974 NATIONAL SURVEY OF SCIENTISTS AND ENGINEERS

*Please read* instructions carefully before answering questions.

Answer as accurately as you can by printing your reply clearly or by entering an "X" in the box next to the appropriate reply.

If the instructions for a question direct you to enter a code and description from a list, please refer to the reference list attached to this questionnaire.

**A. Is the information shown in the mailing label above correct?** YES NO - Please enter the correct information

Name

Number and street

City or town

State (if USA)

010

ZIP code

Foreign country

**B. Is this mailing address the same address as your place of residence?** SAME DIFFERENT - Please enter your city and State or foreign country of residence.

City or town

State (if USA)

011

ZIP code

Foreign country

Dear Friend:

Let us express our appreciation for your cooperation in the 1972 Professional, Technical, and Scientific Manpower Survey which we conducted under the sponsorship of the National Science Foundation. Reports including statistical summaries based on this survey are now being used in analysis and planning by Federal and State manpower agencies, private businesses, nonprofit research organizations, industrial and trade associations, and university scholars.

As you are very likely aware, there have been significant changes in the past few years in the patterns of both public and private expenditures related to science and technology. It is important to know how these changes affect highly trained persons. The sample of persons canvassed in the 1972 survey is unique in its coverage of scientific and technical manpower and, for this reason, the National Science Foundation has asked the Bureau to again survey this panel to obtain current employment information and related data. For the survey to be successful and yield truly representative information, it is important that each person fill out and return his questionnaire.

Please complete the questions which follow on pages 2 through 4 and return your questionnaire in the enclosed preaddressed envelope. For most persons only a portion of the questions are applicable and need to be completed. For some questions you are instructed to enter a code and description from Reference List A, B, or C. These lists are attached to the questionnaire.

Please be assured that the information you provide is confidential by law and may be seen only by sworn Census employees; it cannot be used for anything but statistical purposes and cannot be given to any other Government agency, private concern, or individual except in the form of statistical summaries from which it is impossible to identify information about any particular person.

Your participation in this voluntary survey will be appreciated.

Thank you for your cooperation.

Sincerely,



VINCENT P. BARABBA  
Director  
Bureau of the Census

Enclosure

PART I - EDUCATION AND TRAINING

1. EDUCATIONAL ATTAINMENT

How many years of education or formal training BEYOND HIGH SCHOOL have you COMPLETED? (Include college, junior college, graduate school, law school, business college, technical institute, etc., but do not include work taken through correspondence courses, on-the-job training, apprenticeship, or at employer's training facility. For any education received in foreign or ungraded schools, mark the equivalent number of years in the regular American school system.)

012 0 years 5 years
1 year 6 years
2 years 7 years
3 years 8 years
4 years or more

2. EDUCATION SINCE 1971

a. Since 1971, have you attended any college, university, or other post-high school institution?

013 1 Yes - Continue with 2b
2 No - SKIP to question 3

b. List below each institution from which you have obtained or are currently obtaining formal training beyond the high school level and give the other information requested. Begin with the most recent and work back through 1972. Use a separate column for each degree granted or worked for. Designate degrees by abbreviation (e.g., A.A., B.A., M.A., Ph.D., LL.B., M.D., etc.). Do not include work taken through correspondence courses, on-the-job training, apprenticeship, or at employer's training facility.

Table with 3 columns: MOST RECENT, SECOND-TO-LAST, THIRD-TO-LAST. Rows include Name, City, State or foreign country, Year attendance ended, Type of degree worked for, Year degree awarded, Major field of study.

3. OTHER TRAINING SINCE 1971

Aside from formal education, which of the following types of training did you receive in 1972 or 1973?

(Mark the appropriate year for each type of training you have received.)

- 1. On-the-job training
2. Military training applicable to civilian occupations
3. Extension or correspondence courses
4. Courses at employers training facility
5. Courses at adult education center
6. Other training
7. None

PART II - WORK STATUS

(Complete questions 4 through 9 for column (A) and then for column (B))

Table with 2 columns: (A) Work status during the last full week in January 1974, (B) Work status during the last full week in January 1973. Rows include working status, part-time seeking full-time, position related to science or engineering, reason for position, and principal reason for not working.

**PART III - JOB ACTIVITIES**

**INSTRUCTIONS FOR COMPLETING QUESTIONS 10-18**

- a. Complete column (A) for questions 10 through 18 for the job held during the last full week of January 1974 or for your most recent prior job held.  
 b. Column (B) should be completed if the job you had during the last full week of January 1973 differed from the job described in column (A). If the job was the same, mark (X) the "Same job as column (A)" box at the top of column (B). **NOTE:** Consider a change in jobs to have occurred if there were significant changes in duties, level of responsibility, or occupation even if you continued to work for the same employer.  
 c. If you held more than one job during the weeks mentioned above, please report **only** the job at which you worked the greatest number of hours.

	Job held during week of January 20-26, 1974 or most recent prior job (A)	Job held during week of January 21-27, 1973 (B)	SAME JOB AS COLUMN (A) <input checked="" type="checkbox"/> (043) <input type="checkbox"/>
<b>10. Where did you work?</b> <i>Location (city and State or foreign country) of company, business, agency, or other employer.</i>	(044) <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> City _____ (046) <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> State or foreign country _____	(045) <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> City _____ (047) <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> State or foreign country _____	
<b>11. What kind of business was this?</b> <i>Enter code and description from Reference List B. If the organization conducted activities at different locations (e.g., research at one location and manufacturing at another), enter the activity at the location where you worked.</i>	(048) Code _____ Description _____	(049) Code _____ Description _____	
<b>12. What was your occupation?</b> <i>Enter code and description from Reference List C.</i>	(050) Code _____ Description _____	(051) Code _____ Description _____	
<b>13. What work activities were related to this position?</b> <i>(Mark all activities in which you spent time)</i>	01 <input type="checkbox"/> Management or administration of research and development 02 <input type="checkbox"/> Management or administration of other than research and development 03 <input type="checkbox"/> Teaching and training - preparing and teaching courses, guiding and counseling students or trainees 04 <input type="checkbox"/> Basic research 05 <input type="checkbox"/> Applied research 06 <input type="checkbox"/> Development - product, process, and technical development 07 <input type="checkbox"/> Report and technical writing, editing, information retrieval 08 <input type="checkbox"/> Clinical diagnosis - diagnosis, treatment, etc. for patients or clients 09 <input type="checkbox"/> Design - of equipment, processes, models; drafting, drawing, blueprints 10 <input type="checkbox"/> Quality control, testing, evaluation, or inspection of equipment, materials, devices 11 <input type="checkbox"/> Operations - production, maintenance, construction, installation 12 <input type="checkbox"/> Distribution - sales, traffic, purchasing, customer and public relations 13 <input type="checkbox"/> Statistical work - designing and conducting sample and other surveys, forecasting, statistical analysis 14 <input type="checkbox"/> Consulting - on technical aspects of professional, scientific, and management fields or products 15 <input type="checkbox"/> Computer applications - programming, data systems analysis, development of programming techniques, controlling computer operations 16 <input type="checkbox"/> Other activities - Specify <b>7</b>	01 <input type="checkbox"/> Management or administration of research and development 02 <input type="checkbox"/> Management or administration of other than research and development 03 <input type="checkbox"/> Teaching and training - preparing and teaching courses, guiding and counseling students or trainees 04 <input type="checkbox"/> Basic research 05 <input type="checkbox"/> Applied research 06 <input type="checkbox"/> Development - product, process, and technical development 07 <input type="checkbox"/> Report and technical writing, editing, information retrieval 08 <input type="checkbox"/> Clinical diagnosis - diagnosis, treatment, etc. for patients or clients 09 <input type="checkbox"/> Design - of equipment, processes, models; drafting, drawing, blueprints 10 <input type="checkbox"/> Quality control, testing, evaluation, or inspection of equipment, materials, devices 11 <input type="checkbox"/> Operations - production, maintenance, construction, installation 12 <input type="checkbox"/> Distribution - sales, traffic, purchasing, customer and public relations 13 <input type="checkbox"/> Statistical work - designing and conducting sample and other surveys, forecasting, statistical analysis 14 <input type="checkbox"/> Consulting - on technical aspects of professional, scientific, and management fields or products 15 <input type="checkbox"/> Computer applications - programming, data systems analysis, development of programming techniques, controlling computer operations 16 <input type="checkbox"/> Other activities - Specify <b>7</b>	
<b>14. Among all the activities marked above (in question 13) which in terms of working hours spent was your primary and which was your major secondary activity?</b> <i>Fill in the appropriate code numbers from the activities in question 13.</i>	CODE (052) _____ Primary (054) _____ Secondary	CODE (053) _____ Primary (055) _____ Secondary	
<b>15. Were you primarily --</b>	(MARK ONLY ONE BOX) (056) 1 <input type="checkbox"/> Employee of private company, business, or individual for wages, salary, or commissions 2 <input type="checkbox"/> Employee of nonprofit organization (excluding government) 3 <input type="checkbox"/> Federal government employee 4 <input type="checkbox"/> State government employee 5 <input type="checkbox"/> Local government employee (city, county, etc.) 6 <input type="checkbox"/> Employee of international organization Self-employed in own business, profession, or farm 7 <input type="checkbox"/> Own business - not incorporated 8 <input type="checkbox"/> Own business - incorporated 9 <input type="checkbox"/> Working without pay in family business or farm	(MARK ONLY ONE BOX) (057) 1 <input type="checkbox"/> Employee of private company, business, or individual for wages, salary, or commissions 2 <input type="checkbox"/> Employee of nonprofit organization (excluding government) 3 <input type="checkbox"/> Federal government employee 4 <input type="checkbox"/> State government employee 5 <input type="checkbox"/> Local government employee (city, county, etc.) 6 <input type="checkbox"/> Employee of international organization Self-employed in own business, profession, or farm 7 <input type="checkbox"/> Own business - not incorporated 8 <input type="checkbox"/> Own business - incorporated 9 <input type="checkbox"/> Working without pay in family business or farm	

PART III - JOB ACTIVITIES - Continued					
	Job held during week of January 20-26, 1974, or most recent prior job		Job held during week of January 21-27, 1973		SAME JOB AS COLUMN (A) <input type="checkbox"/>
	(A)		(B)		
16. Between what dates did you hold this position? <i>Enter month and year</i>	From <b>(058)</b>	To <b>(059)</b>	From <b>(060)</b>	To <b>(061)</b>	
17. What was the basic salary associated with this position? If you were on a post-doctoral appointment, include stipend plus allowances. Indicate whether the figure entered is per year, per month, or per week. (Basic salary refers to salary before deductions for income tax, social security, retirement, etc., but does not include bonuses, overtime, summer teaching, or other payment for secondary jobs.)	<b>(062)</b> \$ _____ .00 <b>(064)</b> 1. Per year 2. Per month 3. Per week  If academically employed, mark whether salary is for - <b>(066)</b> 1. 9-10 months 2. 11-12 months	<b>(063)</b> \$ _____ .00 <b>(065)</b> 1. Per year 2. Per month 3. Per week  If academically employed, mark whether salary is for - <b>(067)</b> 1. 9-10 months 2. 11-12 months			
18a. Was ANY of your work supported or sponsored by U.S. Government funds?	<b>(068)</b> 1. Yes - Continue with 18b 2. No ..... } SKIP to 19a 3. Don't know }		<b>(069)</b> 1. Yes - Continue with 18b 2. No ..... } SKIP to 19a 3. Don't know }		
b. Which of the following agencies or departments were supporting the work?	<b>(070)</b> 1. Department of Housing and Urban Development 2. Department of the Interior 3. Department of Labor 4. Department of Defense 5. Department of Commerce 6. Department of Agriculture  <b>(072)</b> 7. Department of Transportation 8. Department of Justice 9. NIH (National Institutes of Health) 10. Health Services and Mental Health Administration  <b>(074)</b> 11. Office of Education 12. Other H.E.W. - Specify <input checked="" type="checkbox"/>  13. NASA (National Aeronautic and Space Administration)  <b>(076)</b> 14. NSF (National Science Foundation) 15. EPA (Environmental Protection Agency) 16. AEC (Atomic Energy Commission)  <b>(078)</b> 17. AID (Agency for International Development) 18. Other agency or department - Specify <input checked="" type="checkbox"/>  19. Don't know source agency		<b>(071)</b> 1. Department of Housing and Urban Development 2. Department of the Interior 3. Department of Labor 4. Department of Defense 5. Department of Commerce 6. Department of Agriculture  <b>(073)</b> 7. Department of Transportation 8. Department of Justice 9. NIH (National Institutes of Health) 10. Health Services and Mental Health Administration  <b>(075)</b> 11. Office of Education 12. Other H.E.W. - Specify <input checked="" type="checkbox"/>  13. NASA (National Aeronautic and Space Administration)  <b>(077)</b> 14. NSF (National Science Foundation) 15. EPA (Environmental Protection Agency) 16. AEC (Atomic Energy Commission)  <b>(079)</b> 17. AID (Agency for International Development) 18. Other agency or department - Specify <input checked="" type="checkbox"/>  19. Don't know source agency		
PART IV - OTHER INFORMATION					
19a. At anytime during calendar year 1973, were you without a job AND actively seeking employment?	<b>(080)</b> 1. Yes - Continue with 19b 2. No - SKIP to question 20				
b. For how many weeks were you seeking employment?	<b>(081)</b> 1. 1 week 2. 2 weeks 3. 3 weeks 4. 4 weeks or more				
20. Based on my total education and experience, I now regard myself professionally as a (an) --- <i>Enter code and description from Reference List C</i>	<b>(082)</b> Code [ ] [ ] [ ] [ ] Description _____				
21. Listed at the right, are selected topics of critical national interest. If you devote a significant proportion of your professional time to any of these problem areas, please mark the box for the one on which you spend the MOST time. Mark only one box.	<b>(083)</b> 01. Health Education: 02. Teaching 03. Other 04. Environment protection, pollution control 05. Space 06. Crime prevention and control 07. Food production and technology 08. Energy and fuel 09. Other mineral resources 10. Community development and services 11. Housing (planning, design, construction) 12. Does not apply				
22. In the event that it is necessary to contact you to clarify some of the information you provide, may we contact you by telephone? If "Yes," please enter the telephone number(s) on which you can be reached.	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		Area code	Telephone number	
23. Please enter the name of a person at an address other than yours through whom you can be reached	Name				
	Address (Number and street)				
	City	State or foreign country	ZIP code		
Print your name here				Date prepared	



### REFERENCE LIST B – KINDS OF BUSINESSES

This list is to be used in answering question 11 about the kind(s) of business or industry for which you worked. Please scan the entire list, choose the appropriate answer for the question and enter the code and description from this list. If none of the categories listed below adequately describes the kind of business for which you worked, use the "Other" category (code 731).

Code	Description	Code	Description
<b>Manufacturing</b>		<b>Other Kinds of Business</b>	
701	Aircraft, aircraft engines, parts	720	Agriculture, forestry, and fisheries
702	Chemicals and allied products	721	Business, personal, and repair services
703	Electrical machinery, equipment and supplies for the generation, storage, transformation, transmission, and utilization of electrical energy	722	Construction
704	Electronic apparatus, radio, television and communication equipment and parts	723	Engineering or architectural services
705	Electronic computers, accounting, calculating and office machinery and equipment	724	Finance, insurance, or real estate
706	Fabricated metal products (except ordnance, machinery and transportation equipment)	725	Mining and petroleum extraction
707	Machinery (except electrical) including engines and turbines, farming and construction machinery, mining, metalworking and other manufacturing and service industry machines	726	Private, nonprofit organizations other than educational institutions and hospitals
708	Motor vehicles and motor vehicle equipment including trucks, buses, automobiles, railroad engines and cars	727	Professional and technical societies
709	Ordnance, including manufacture of arms, ammunition, tanks, and complete guided missiles, space vehicles and equipment	728	Research institutions
710	Petroleum refining and related industries	729	Retail and wholesale trade
711	Primary metal industries, including smelting, refining, rolling, drawing, alloying, and manufacture of castings, forgings and other basic metal products	730	Transportation, communication, or other public utilities
712	Professional and scientific equipment and supplies	731	Other (Describe briefly under the applicable item on the questionnaire.)
713	Other manufacturing including printing and publishing		
<b>Educational Institutions</b>		<b>Public Administration</b> (Include only uniquely governmental activities, such as the U.S. Postal Service, U.S. Air Force, State court, Department of Motor Vehicles, city building inspection, or city public welfare. For example, if you work for the U.S. Postal Service use code 733, Federal public administration; on the other hand, if you work at a Veterans' Administration Hospital, use code 718, Hospital or clinic; if you work at a State university, use code 714, College or university; if you work for a county road building agency, use code 722, Construction; if you work in a Defense Department research laboratory, use code 728, Research institution.)	
714	College or university (offering at least a BA degree)	732	Uniformed military service
715	Junior college or technical institute	733	Federal public administration
716	Medical school	734	State public administration
717	Other educational institutions	735	Local public administration (city, county, etc.)
<b>Health Services</b>		736	Other government
718	Hospital or clinic		
719	Other medical and health services		

### REFERENCE LIST C – OCCUPATIONS

This list is to be used in answering questions 12 and 20 about your occupational classification. Please scan the entire list, choose the appropriate entry and enter the code and description from this list. If you cannot find exactly the right entry, please choose the one that comes nearest to it. If none of the entries is at all appropriate, use the "Other" category (code 475) and enter a brief description in the space provided on the questionnaire.

Code	Description	Code	Description
<b>Engineers, including college professors and instructors</b>		<b>Health Occupations, including persons who are primarily practitioners. Persons engaged primarily in medical research, teaching, and similar activities use code 432, Medical scientist.</b>	
401	Engineer, aeronautical and astronautical	438	Physician or surgeon
402	Engineer, agricultural	439	Technician, dental
403	Engineer, chemical	440	Technician, medical
404	Engineer, civil and architectural	441	Other health occupation (Describe briefly under the applicable item on the questionnaire.)
405	Engineer, electrical and electronic	<b>Technicians and Technologists, except medical</b>	
406	Engineer, industrial	442	Designer, electronic parts and machine tools
407	Engineer, mechanical	443	Designer, industrial
408	Engineer, metallurgical and materials	444	Designer, other
409	Engineer, mining and petroleum	445	Draftsman
410	Engineer, nuclear	446	Surveyor
411	Engineer, environmental and sanitary	447	Technician, biological and agricultural
412	Engineer, operations research systems	448	Technician, electrical and electronic
413	Engineer, other fields (Describe briefly under the applicable item on the questionnaire.)	449	Technician, construction, highways, and architectural
<b>Computer Specialist, including college professors and instructors</b>		450	Technician, mechanical
414	Computer programmer	451	Technician, other engineering
415	Computer systems analyst	452	Technician, physical science
416	Computer scientist	453	Technician, other fields (Describe briefly under the applicable item on the questionnaire.)
417	Other computer specialist (Describe briefly under the applicable item on the questionnaire.)	<b>Teachers</b>	
<b>Mathematicians and Statisticians, including college professors and instructors</b>		454	Teacher, elementary school
418	Actuary	455	Teacher, secondary school
419	Mathematician	456	Teacher, college and university, excluding engineering and science (Engineering and science teachers see codes 401-437 above.)
420	Statistician	<b>Administrators, Managers, and Officials, excluding farm</b>	
421	Operations research analyst	457	College president or dean
<b>Physical Scientists, including college professors and instructors</b>		458	Administrator or manager, scientific and technical research and development
422	Chemist	459	Administrator or manager, production and operations
423	Earth scientists including geologists, geophysicists, etc.	460	Administrator, manager, or official, all other, excluding self-employed
424	Physicist, astronomer	461	Self-employed proprietor
425	Atmospheric scientist, meteorologist	<b>All Other Occupations</b>	
426	Oceanographer	462	Accountant
427	Other physical scientist (Describe)	463	Attorney or judge
<b>Biological Scientists, including college professors and instructors</b>		464	Sales worker
428	Agricultural scientists, including foresters and conservationists	465	Clerical worker (such as bookkeeper, secretary, etc.)
429	Biological scientist	466	Clergy
430	Biochemist	467	Craft worker (such as baker, carpenter, electrician, mechanic, repair worker)
431	Biophysicist	468	Farmer (owner, manager, tenant, or farm laborer)
432	Medical scientist, excluding persons who are primarily medical practitioners; see Health Occupations	469	Fire fighter or police
433	Other biological scientist (Describe)	470	Laborer, except farm
<b>Social scientists, including college professors and instructors</b>		471	Librarian
434	Economist	472	Merchant or shopkeeper, self-employed
435	Psychologist	473	Operative (such as assembler, factory worker, miner, welder, truck driver, etc.)
436	Sociologist or anthropologist	474	Postal worker
437	Other social scientist (Describe briefly under the applicable item on the questionnaire.)	475	Other occupations, not specified above (Describe briefly under the applicable item on the questionnaire.)

**CORRESPONDING MAJOR FIELDS OF STUDY, OCCUPATIONS, AND PROFESSIONS, BY FIELD OF  
SCIENCE OR ENGINEERING IN 1974**

(Codes are from reference lists A and C of this appendix)

Fields of science or engineering in 1974	Corresponding major fields of study	Corresponding occupations and professions
Computer specialists.....	559	414-417
Engineers.....	532-550	401-413
Mathematical specialists.....	557,558	418-421
Life scientists.....	501-526, 551, 554-556	428-433
Physical scientists.....	560, 561, 565, 568	422, 424, 427
Environmental scientists.....	563, 566, 567	423, 425,426
Psychologists.....	569-572	435
Social scientists.....	573-577, 580-584, 586, 587, 593	434, 436,437

**APPENDIX B**  
**SOURCE OF DATA**

## SOURCE OF DATA

Table number	Characteristic	Item number on 1974 questionnaire <sup>1</sup>	Source code <sup>2</sup> on 1974 questionnaire
1	Sex	(From the 1972 survey response, if available; otherwise, from the 1970 Census response)	
1	Age in 1974*	(From 1970 census response, if available; otherwise, from the 1972 survey response)	
1	Field of science or engineering in 1972	(From the 1972 survey responses)	
2	Race*	(From the 1970 census response)	
2	Place of birth*	(From the 1970 census response)	
2	Place of residence in 1974	A or B, page 1	010, 011
2	Selected SMSA's of residence: 1974*	A or B, page 1	010, 011
3	Highest degree held*	1; 2(parts b2, b3, and b4); otherwise from 1972 survey response	012, 017-025
3	Major field of study for highest degree held*	2 (part b5); otherwise from 1972 survey response	026, 027, 028
3	Supplemental training in 1973	3	030
4	Employment status: January 1974*	Part II, column A; and Part III, column A: 16	031, 033, 035, 039, 041, 058, 059
4	Employment status: January 1973*	Part II, column B; and Part III, column B: 16	032, 034, 036, 040, 042, 060, 061
4	Employment in science or engineering: January 1974	Part II, column A: 6, 7	035, 037
4	Employment in science or engineering: January 1973	Part II, column B: 6, 7	036, 038
4	Unemployment in 1973*	Part IV, 19a, 19b	080, 081
5	Occupation in 1974	Part III, column A: 12	050
5	Industry in 1974	Part III, column A: 11	048

See footnotes at end of table.

## SOURCE OF DATA—CONTINUED

Table number	Characteristic	Item number on 1974 questionnaire <sup>1</sup>	Source code <sup>2</sup> on 1974 questionnaire
5	Primary work activity in 1974	Part III, column A: 13, 14	052
5	Type of employer: 1974*	Part III, column A: 11, 15	048, 056
5	Basic annual salary: 1974*	Part III, column A: 17	062, 064, 066
5	Job mobility: 1973-74*		
	a) Job change	a) Part III, columns A and B	a) 043
	b) Occupation change	b) 12	b) 050, 051
5	Job mobility: 1972 to 1974*	1972 survey response; and Part III, column A: 16	058
5	Professional identification in 1974	20	082
5	Federal Support: 1974	Part III, column A: 18a, 18b	068, 070, 072, 074, 076, 078
5	National interest topics	21	083

\*For more information, see appropriate subject in section of text on "Definitions and Explanations."

<sup>1</sup>The 1974 National Survey of Scientists and Engineers questionnaire is reprinted in appendix A.

<sup>2</sup>Source codes refer to sections of the 1974 questionnaire denominated by a 3-digit number inside a circle, e.g., (012) for the "Educational Attainment" section of page 2.

## **APPENDIX C**

### **CRITERIA FOR FIELDS OF SCIENCE OR ENGINEERING IN 1974**

## CRITERIA FOR MEMBERSHIP IN A FIELD OF SCIENCE OR ENGINEERING IN 1974

(Developed by the National Science Foundation)

Respondents in the 1974 National Survey of Scientists and Engineers were classified into a specific field of science and engineering in 1974 if they met, in relation to the specific field, any one of the criteria given below. Classification by these criteria proceeded such that all respondents were initially examined by the first criterion; those not placed into a field by the first criterion, were then examined by the second; those not categorized by the second, were examined by the third; and so on, until only those remained who met none of the criteria—these were classified as “not in a field of science or engineering in 1974.” The academic degree levels and major fields of study used in these criteria refer to the highest degree held. The coincident and related fields of study and the coincident and related occupations and professions are shown in the table in this appendix. Occupation of employment refers to the most recent job for which occupation was reported.

### THE CRITERIA

A member of a field of science or engineering in 1974 is an individual (1) who had earned a master's degree or higher<sup>1</sup> in a coincident field of study and who regarded himself, based on his total education and experience, as having a coincident profession; or (2) who had earned a Ph.D in any field of social or natural science,<sup>2</sup> and was employed in a coincident occupation; or (3) who had earned a bachelor's degree or higher in a coincident field of study, and was employed in a coincident occupation; or (4) who had earned a bachelor's degree or higher in any field of study, was employed in a coincident occupation, and regarded himself as having a coincident profession; or (5) whose highest degree<sup>3</sup> was in a coincident field of study<sup>4</sup>, and who was employed as a college president, college dean, or manager or administrator of research or development, production or operations<sup>5</sup> or (6) who had earned a bachelor's degree or higher in a coincident field of study,<sup>6</sup> was employed

in a related occupation, and regarded himself as having a coincident profession; or (7) who had earned a bachelor's degree in a coincident field of study since 1969 and who regarded himself as having a coincident profession; or (8) who had earned a bachelor's degree or higher in any field of science<sup>7</sup> and was employed as a college president, college dean, or administrator or manager of research or development, production or operations<sup>8</sup> and who regarded himself as having a coincident profession; or (9) whose highest degree<sup>9</sup> was in a related field of study and who was employed in a coincident occupation and who regarded himself professionally to be a college president, dean, or administrator or manager of research or development, production or operations.<sup>10</sup> The field “engineers” also includes any individual who failed to meet any of the above 9 criteria but who had completed a minimum of two years of a program of study leading to a bachelor's degree in engineering or a related field of study before 1968, and was employed as an engineer, and regarded himself professionally to be an engineer or a manager or administrator of research or development, production or operations;<sup>11</sup> or who earned an associate degree before 1968, and was employed as an engineer, and regarded himself professionally to be an engineer or a manager or administrator of research or development, production, or operations.<sup>12</sup>

Some respondents to the 1974 survey reported “operations research analyst”<sup>13</sup> as their occupation or profession. The National Science Foundation determined that certain of the above criteria should classify these persons as either “mathematicians” or “engineers”. Such an individual, therefore, is classified by criteria 3 or 7 as a “mathematician” if he, depending upon the criterion specified, was either employed as or regarded himself professionally as an “operations research analyst” and met the educational requirement of the specified criterion as it related to mathematicians. Likewise, the individual was classified by criteria 3, 4, or 7 as an “engineer” if, depending on the criterion specified, his occupation and/or profession was “operations research analyst” instead of “engineer”, and he met all the other requirements of the specified criterion as these related to engineers. In addition, an individual is classified as an engineer if he met none of the above criteria, but had earned a bachelor's degree in a field of study other than one coincident to a field of science or engineering, was employed as a college president, dean, manager or administrator of research or development, production or operations,<sup>14</sup> and regarded himself professionally as an “operations research analyst.”

<sup>1</sup>Engineers could meet this requirement with a bachelor's degree or higher.

<sup>2</sup>Codes 501-587 and 593 from list A of appendix A.

<sup>3</sup>At the bachelor's level or higher.

<sup>4</sup>Certain coincident fields of study are common to two fields of science or engineering. Therefore, persons meeting criterion 5 with field of study represented by codes 508 or 526 of list A of appendix were classified exclusively as “biologists”; those with codes 565 or 568, were classified exclusively as “other physical scientists”; and those with code 581, were classified exclusively as “economists”.

<sup>5</sup>Codes 457-459 of list C of appendix A.

<sup>6</sup>In addition to a coincident field of study, engineers could have earned a bachelor's degree or higher in codes 508, 529, 557, 559-561, 563-568 of list A of appendix A.

<sup>7</sup>For all fields except economists, codes 501-587 and 593 of list A of appendix A; for economists, codes 557, 558, 573-587, and 593 of list A of appendix A.

<sup>8</sup>Codes 457-459 of list C of appendix A.

<sup>9</sup>At the bachelor's level or higher.

<sup>10</sup>Codes 457-459 of list C of appendix A.

<sup>11</sup> and <sup>12</sup> Codes 458 and 459 of list C of appendix A.

<sup>13</sup>Code 421 of list C of appendix A.

<sup>14</sup>Codes 457-459 of list C of appendix A.

**COINCIDENT AND RELATED MAJOR FIELDS OF STUDY, OCCUPATIONS, AND PROFESSIONS, BY FIELD  
OF SCIENCE OR ENGINEERING IN 1974**

(Codes are from reference lists A and C of appendix A)

Field of science or engineering in 1974	Major field of study		Occupation and profession	
	Coincident	Related	Coincident	Related
Computer specialists	559	501-526, 532-558, 560-568	415-417	401-413, 415-417, 419-438
Engineers	532-550	508, 529, 557, 559-561, 563-568,	401-413	457-459
Mathematical specialists:				
Mathematicians	557	532-550, 558-568, 576	419	401-413, 415-417, 419-438
Statisticians	558	518, 532, 535-545, 548, 550, 557, 559-572, 575, 576, 586, 587	420	401-413, 415-417, 419-438
Life scientists:				
Agricultural scientists	501-503, 506, 512, 514- 517, 519, 523, 524, 526	504, 505, 507-511, 513, 518, 520-522, 525, 532- 568	428	401-413, 415-417, 419-433, 438
Biologists	504, 505, 507-511, 513, 518, 520-522, 525, 526, 554	501-503, 506, 512, 514- 517, 519, 523, 524, 532- 553, 555-568	429, 431, 433	401-413, 415-417, 419-433, 438
Medical scientists	555, 556	501, 526, 532-550, 557-573	432	401-413, 415-417, 419-438
Physical scientists:				
Chemists	508, 561	501-507, 509-526, 532- 560, 562-568	422, 430	401-413, 415-417, 419-433, 438
Physicists and astronomers	560, 564	508, 509, 535-541, 543- 546, 550, 557-559, 561- 563, 565-568	424	401-413, 415-417, 419-433, 438
Other physical scientists	565, 568	501-526, 532-564, 566, 567	427	401-413, 415-417, 419-433, 438
Environmental scientists:				
Earth scientists	565, 566, 568	501-526, 532-564, 567	423	401-413, 415-417, 419-433, 438
Atmospheric scientists	563	501-526, 532-562, 564- 568	425	401-413, 415-417, 419-433, 438
Oceanographers	567	501-526, 532-566, 568	426	401-413, 415-417, 419-433, 438
Psychologists	569-572	509, 551, 552, 556- 558, 573, 586	435	401-413, 415-417, 419-438
Social scientists:				
Economists	575, 576, 581	501, 557-559, 574, 577-580, 582, 583, 589 595	434	434-437
Sociologists and anthropologists	573, 586	569, 572, 574, 577, 579, 587, 593	436	401-413, 415-417, 419-438
Other social scientists	574, 577, 581-584, 587, 593	None	437	434-437

**APPENDIX D**  
**SAMPLE SELECTION**

The 156,116 sample cases for the 1972 Professional, Technical, and Scientific Manpower Survey were separated into two segments. The "target" segment consisted of 150,358 persons who were recorded by the 1970 Census of Population as being in one of 40 scientific, engineering, or related occupations in the 1970 experienced civilian labor force. The "residual" segment consisted of 5,758 persons who were recorded by the 1970 census as having four or more years of college and as being in the 1970 experienced civilian labor force in occupations other than the 40 target occupations.

The sample selection for the National Sample of Scientists and Engineers focused exclusively on the "target" segment. From this "target" segment, 115,557

persons responded in the 1972 survey. Based on criteria established by the survey sponsor, the National Science Foundation, these respondents were classified as "in-scope," that is, in one of the fields of science or engineering in 1972, or as "out-of-scope," that is, not in a field of science or engineering in 1972. The in-scope cases, numbering 50,093 persons, became the sample for the 1974 National Survey of Scientists and Engineers and all subsequent surveys in the National Sample of Scientists and Engineers.

The table in this appendix presents a distribution of the 1972 respondents from the 40 groups of census occupations in the "target" segment, according to their field of science or engineering in 1972.

## FIELD OF SCIENCE OR ENGINEERING IN

(Un-

Line number	1970 census occupation <sup>1</sup>	Total	Field of science or engineering in 1972								
			Computer specialists	Engi- neers	Mathematical specialists			Life scientists			
					Total	Mathe- mati- cians	Stat- isti- cians	Total	Agricul- tural scien- tists	Biolog- ical scien- tists	Medical scien- tists
1	Total target occupations.....	115,557	3,391	25,797	2,185	1,604	581	4,891	2,025	2,139	727
2	Operations and computer specialists....	14,820	2,809	780	189	163	26	32	9	17	6
3	Computer programmers.....	4,515	732	101	67	61	6	8	2	5	1
4	Computer systems analysts.....	4,596	1,453	185	59	50	9	11	4	5	2
5	Computer specialists, n.e.c.....	991	215	116	17	16	1	3	1	1	1
6	Operations and systems analysts.....	4,718	409	378	46	36	10	10	2	6	2
7	Engineers.....	39,572	202	22,036	89	72	17	67	29	31	7
8	Aeronautical and astronautical engi- neers.....	4,715	23	2,985	23	21	2	6	2	3	1
9	Chemical engineers.....	4,308	14	3,233	5	5	-	9	2	6	1
10	Civil engineers.....	4,872	7	2,905	4	3	1	8	6	1	1
11	Electrical and electronic engineers...	5,429	68	3,301	11	10	1	2	1	-	1
12	Industrial engineers.....	4,767	23	1,634	23	12	11	14	5	8	1
13	Mechanical engineers.....	4,761	13	2,824	5	5	-	3	1	2	-
14	Metallurgical and materials engineers.	1,231	1	824	-	-	-	7	3	3	1
15	Mining and petroleum engineers.....	1,193	-	803	-	-	-	3	1	1	1
16	Sales engineers.....	4,060	14	1,328	1	1	-	3	1	2	-
17	Engineers, n.e.c., and engineering teachers.....	4,236	39	2,199	17	15	2	12	7	5	-
18	Mathematical specialists.....	4,579	155	139	1,679	1,218	461	22	4	12	6
19	Actuaries and statisticians.....	2,052	16	62	405	34	371	13	4	6	3
20	Mathematicians.....	2,527	139	77	1,274	1,184	90	9	-	6	3
21	Life scientists.....	6,611	4	71	6	1	5	3,713	1,718	1,683	312
22	Agricultural scientists.....	1,358	-	33	3	-	3	606	517	86	3
23	Foresters and conservationists <sup>2</sup> .....	1,369	1	17	-	-	-	1,037	1,018	17	2
24	Biological scientists.....	3,884	3	21	3	1	2	2,070	183	1,580	307
25	Physical scientists.....	10,560	37	803	37	34	3	203	40	98	65
26	Chemists.....	4,883	9	334	7	5	2	138	28	67	43
27	Physicists.....	2,888	18	323	15	15	-	38	2	15	21
28	Other physical scientists.....	2,789	10	146	15	14	1	27	10	16	1
29	Social scientists.....	10,116	67	217	60	27	33	73	21	24	28
30	Economists.....	4,564	63	170	44	15	29	30	19	7	4
31	Psychologists.....	3,030	2	5	3	1	2	23	-	6	17
32	Other social scientists.....	2,522	2	42	13	11	2	20	2	11	7
33	Engineering and science technicians....	11,956	23	506	11	8	3	91	34	41	16
34	Agricultural, biological, and chemical technicians, ex. health....	2,105	2	34	2	2	-	50	19	23	8
35	Draftsmen.....	2,434	-	126	-	-	-	2	2	-	-
36	Electrical and electronic engineer- ing technicians.....	2,025	8	79	2	1	1	2	-	1	1
37	Industrial and mechanical engineer- ing technicians, and numerical control tool programmers.....	1,327	8	99	5	3	2	-	-	-	-
38	Surveyors.....	2,010	-	73	1	1	-	10	9	1	-
39	Mathematical technicians and engi- neering and science technicians, n.e.c.	2,055	5	95	1	1	-	27	4	16	7
40	Personnel and labor relations workers...	2,506	5	50	7	6	1	14	7	4	3
41	Health specialties teachers.....	1,055	-	5	-	-	-	220	5	22	193
42	Trade, industrial, and technical teachers.....	122	1	1	-	-	-	2	-	-	2
43	Miscellaneous teachers.....	659	1	18	3	3	-	6	1	2	3
44	Teachers, subject not specified.....	2,018	7	125	33	27	6	123	24	78	21
45	Technicians, n.e.c.....	1,234	3	17	1	1	-	5	2	2	1
46	Research workers, not specified.....	1,984	14	233	33	18	15	178	55	80	43
47	School administrators, college <sup>2</sup> .....	1,138	4	28	4	3	1	36	10	20	6
48	Managers and administrators, n.e.c. <sup>2</sup> ....	6,627	59	768	33	23	10	106	66	25	15

- Represents zero. n.e.c. Not elsewhere classified.

<sup>1</sup>For detailed information on the composition of the census occupational categories, see U.S. Bureau of the Census, *Characteristics* page 120) for categories with line numbers 33-48, and appendix E for categories with line numbers 2-32.<sup>2</sup>Excludes persons with fewer than four years of college.

## 1972, BY 1970 CENSUS OCCUPATION

weighted)

Field of science or engineering in 1972														Not in a field of science or engineering in 1972	Line number
Physical scientists				Environmental scientists				Psychologists	Social scientists						
Total	Chemists	Physicists and astronomers	Other physical scientists	Total	Atmospheric scientists	Earth scientists	Oceanographers		Total	Economists	Sociologists and anthropologists	Other social scientists			
6,248	3,644	2,128	476	2,095	150	1,898	47	2,488	2,998	1,216	696	1,086	65,464	1	
61	18	35	8	19	2	17	-	22	106	50	12	44	10,802	2	
15	3	9	3	6	1	5	-	9	5	4	-	1	3,572	3	
18	4	11	3	5	1	4	-	6	34	18	4	12	2,825	4	
7	1	6	-	5	-	5	-	-	4	1	1	2	624	5	
21	10	9	2	3	-	3	-	7	63	27	7	29	3,781	6	
410	270	126	14	71	6	65	-	21	69	31	8	30	16,607	7	
46	12	31	3	4	1	3	-	3	10	3	-	7	1,615	8	
192	173	16	3	4	2	2	-	2	3	2	1	-	846	9	
2	2	-	-	14	-	14	-	-	6	2	-	4	1,925	10	
36	7	27	2	2	1	1	-	-	4	2	-	2	2,005	11	
37	27	8	2	4	2	2	-	7	27	15	2	10	2,998	12	
6	-	6	-	1	-	1	-	1	3	1	1	1	1,905	13	
18	14	4	-	1	-	1	-	1	1	-	-	1	378	14	
6	3	3	-	33	-	33	-	-	1	-	1	-	347	15	
12	7	4	1	2	-	2	-	2	5	2	1	2	2,693	16	
55	25	27	3	6	-	6	-	4	9	4	2	3	1,895	17	
50	21	25	4	8	-	8	-	25	75	36	10	29	2,426	18	
14	9	3	2	1	-	1	-	15	56	27	7	22	1,470	19	
36	12	22	2	7	-	7	-	10	19	9	3	7	956	20	
291	91	7	193	53	5	44	4	48	46	19	10	17	2,379	21	
43	7	-	36	12	2	10	-	-	25	16	2	7	636	22	
14	2	-	12	9	-	8	1	-	3	1	-	2	288	23	
234	82	7	145	32	3	26	3	48	18	2	8	8	1,455	24	
4,634	2,707	1,753	174	1,815	123	1,660	32	8	25	5	8	12	2,998	25	
2,692	2,641	13	38	13	1	11	1	2	8	2	4	2	1,680	26	
1,822	37	1,709	76	27	2	23	2	6	8	2	4	2	631	27	
120	29	31	1,60	1,775	120	1,626	29	-	9	1	-	8	687	28	
54	29	9	16	10	-	10	-	2,108	2,111	924	541	646	5,416	29	
23	18	3	2	3	-	3	-	10	992	917	5	70	3,229	30	
7	2	-	5	-	-	-	-	2,082	117	-	17	100	791	31	
24	9	6	9	7	-	7	-	16	1,002	7	519	476	1,396	32	
211	188	13	10	15	1	14	-	5	11	2	5	4	11,083	33	
158	150	2	6	3	-	3	-	-	2	-	1	1	1,854	34	
2	-	-	2	3	-	3	-	2	-	-	-	-	2,299	35	
5	4	1	-	1	1	-	-	-	2	1	1	-	1,926	36	
6	5	1	-	-	-	-	-	-	2	1	-	1	1,207	37	
1	1	-	-	-	-	-	-	-	2	-	1	1	1,923	38	
39	28	9	2	8	-	8	-	3	3	-	2	1	1,874	39	
12	8	3	1	1	-	1	-	20	53	9	4	40	2,344	40	
19	9	3	7	1	-	1	-	28	11	1	2	8	771	41	
-	-	-	-	-	-	-	-	1	1	-	-	1	116	42	
8	2	-	6	13	2	11	-	1	49	1	2	46	560	43	
98	47	42	9	25	-	23	2	61	127	32	46	49	1,419	44	
8	6	2	-	2	1	1	-	1	3	-	1	2	1,194	45	
259	158	77	24	37	7	21	9	68	111	27	25	59	1,051	46	
16	9	4	3	5	-	5	-	35	53	17	6	30	957	47	
117	81	29	7	20	3	17	-	36	147	62	16	69	5,341	48	

of Persons in Engineering and Scientific Occupations: 1972, Technical Paper No. 33, 1974, appendix A (especially list A,

**APPENDIX E**  
**ANALYSIS OF RESPONSE**

## ANALYSIS OF RESPONSE

The table in this appendix presents response rates of various components of the sample for the 1974 National Survey of Scientists and Engineers. The characteristics presented here are based on the 1970 census or on the 1974 survey. Since the percentages in the table are based on a complete count of the sample cases, no reference to the standard error tables is necessary.

Men were more likely than women to respond in the 1974 survey. About 88 percent of the men in the survey panel responded, compared with about 85 percent of the women.

Response rates increased steadily by age from a rate of nearly 76 percent for panel members under 25 years old to almost 92 percent for the age group 55 to 59

years old. After peaking for the 55 to 59 years of age group, however, the response rate made slight declines in the groups above 60, dropping to around 90 percent for persons 65 years and over. Since nonrespondents include deceased persons, this slight decrease in rates is expected. Overall, except for the two youngest age groups, over 85 percent of each age category responded in the 1974 survey; even the youngest groups, however, had rates above 75 percent.

There were only slight differences in response rates for 1974 among the various fields of science or engineering in 1972. The highest response rate, 91 percent, was that for environmental scientists, one of the oldest groups on the average. The lowest response rate was approximately 86 percent for computer specialists, social scientists, and psychologists.

**PERCENT DISTRIBUTION—ANALYSIS OF RESPONSE IN THE 1974 NATIONAL SURVEY OF SCIENTISTS AND ENGINEERS, BY FIELD OF SCIENCE OR ENGINEERING IN 1972, AGE IN 1974, AND SEX**

Sex, age in 1974, and field of science or engineering in 1972	Total		Respondents	Nonrespondents
	Number	Percent		
Total.....	50,093	100.0	88.2	11.8
SEX				
Male.....	46,877	100.0	88.3	11.7
Female.....	3,216	100.0	85.4	14.6
AGE IN 1974				
Under 25 years.....	99	100.0	75.8	24.2
25 to 29 years.....	4,730	100.0	83.9	16.1
30 to 34 years.....	9,174	100.0	85.6	14.4
35 to 39 years.....	8,312	100.0	87.1	12.9
40 to 44 years.....	7,797	100.0	88.8	11.2
45 to 49 years.....	7,057	100.0	89.7	10.3
50 to 54 years.....	5,646	100.0	91.3	8.7
55 to 59 years.....	3,495	100.0	91.6	8.4
60 to 64 years.....	2,161	100.0	91.1	8.9
65 years and over.....	1,622	100.0	89.5	10.5
FIELD OF SCIENCE OR ENGINEERING IN 1972				
Computer specialists.....	3,391	100.0	85.6	14.4
Engineers.....	25,797	100.0	88.1	11.9
Mathematical specialists.....	2,185	100.0	88.4	11.6
Life scientists.....	4,891	100.0	89.7	10.3
Physical scientists.....	6,248	100.0	89.9	10.1
Environmental scientists.....	2,095	100.0	90.7	9.3
Psychologists.....	2,488	100.0	86.1	13.9
Social scientists.....	2,998	100.0	85.5	14.5

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