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ABSTRACT

The National Science Foundation (NSF) Division of Science Resources Services designs and conducts surveys related to, and supports other data collection activities dealing with, science resources. The data from these surveys and data collection efforts are used by NSF and others to analyze various research and development (R&D) funding and scientific and technical labor market issues. This document, a guide to the recurring portions of these databases, provides information on survey scope, sample size, pertinent variables, and survey instrument (copy included where appropriate). Surveys described are presented in three sections. They are: (1) scientific and technical resources--experienced scientists and engineers, doctoral recipients, federally employed scientists and engineers, scientific and technical personnel employed at universities and colleges, recent science and engineering graduates, doctorate records file, survey of graduate science and engineering students and postdoctorates, and foreign scientists and engineers; (2) science and technology funding resources--federal funds for R&D; industrial R&D; federal support to universities, colleges, and selected nonprofit institutions; and scientific and engineering expenditures at universities and colleges; and (3) science and technology inputs and outputs--science indicators literature database and counts of patents applied for and granted in the United States. (JN)

A Guide to NSF

Science/Engineering Resources Data

NATIONAL SCIENCE FOUNDATION
Directorate for Scientific, Technological and International Affairs
Division of Science Resources Studies
Washington, D.C. 20550

1984

contents

NSF Science/Engineering (S/E) Resources Data

Survey name	Frequency	First year for which data are available	Most recent year for which data are available (as of early 1984)
Scientific and Technical Human Resources:			
Experienced Scientists and Engineers	Biennial	1972	1982
Doctorate Recipients	Biennial	1973	1981
Federally Employed Scientists and Engineers	Biennial since 1981; annual before	1954	1981
Scientific and Technical Personnel in Private Industry	Triennial	1977	1982
Scientific and Engineering Personnel Employed at Universities and Colleges	Annual since 1973, periodic before	1954	1983
Recent Science and Engineering Graduates	Periodic	1974	1982
Doctorate Records File	Annual	1957	1983
Survey of Graduate Science and Engineering Students and Postdoctorates	Annual	1972	1982
Foreign Scientists and Engineers	Annual	1966	1982
Science and Technology Funding Resources:			
Federal Funds for Research and Development	Annual	FY 1967	FY 1984
Industrial Research and Development	Annual	1953	1982
Federal Support to Universities, Colleges, and Selected Nonprofit Institutions	Annual since 1968	FY 1963	FY 1982
Scientific and Engineering Expenditures at Universities and Colleges	Annual since FY 1972, periodic before	FY 1954	FY 1982
Science and Technology Inputs and Outputs:			
Science Indicators Literature Data Base	Annual	1973	1982
Counts of Patents Applied For and Granted in the United States	Biennial	1963	1982

introduction

Among the many missions assigned to the National Science Foundation (NSF) by the Congress is the authority and responsibility to "...appraise the impact of research upon industrial development and upon the general welfare;...maintain a current register of scientific and technical personnel, and in other ways to provide a central clearinghouse for the collection, interpretation, and analysis of data on the availability of, and the current and projected need for, scientific and technological resources ... to initiate and maintain a program for the determination of the total amount of money for scientific research...." (PL81-507, Sec. 3.(a)).

In pursuit of these objectives, the Division of Science Resources Studies (SRS) designs and conducts surveys, and supports other data collection activities dealing with science resources. The data from these surveys and data collection efforts are used by NSF and others in analyses of various research and development (R&D) funding and scientific and technical labor market issues. This document is a guide to the recurring portions of these data bases including scope, size of sample, and pertinent variables.

The abstracts found in this guide provide a minimum introduction to these data resources. More complete descriptions can be found in the technical notes of publications cited for each data base. These notes provide technical detail and also contain copies of the current survey instruments employed.

Inquiries concerning the surveys should be addressed to:

Scientific and Technical Personnel:

Michael F. Crowley
Scientific and Technical Personnel Studies Section
Division of Science Resources Studies
(202) 634-4691

Research and Development:
Funds and Personnel:

Norman Friedman
R&D Economic Studies Section
Division of Science Resources Studies
(202) 634-4625

Science and Technology Inputs and Outputs:

Donald Buzzelli
Science Indicators Unit
Division of Science Resources Studies
(202) 634-4682

Where not otherwise stated, all requests for publications should be directed to:

Editorial and Inquiries Unit
Division of Science Resources Studies
National Science Foundation
1800 G Street, N.W., Rm. L-611
Washington, D.C. 20550

Other sources for publications are:

National Technical Information Service (NTIS)
Department of Commerce
Springfield, Virginia 22161

Superintendent of Documents
U.S. Government Printing Office (GPO)
Washington, D.C. 20402

scientific and technical human resources

xperienced scientists and engineers

urpose and background

The National Science Foundation (NSF) rsonnel Characteristics System is de- ned to measure the demographic, em- yment, educational, and geographic iracteristics of the nation's science and gineering personnel. The survey, Ex- ienced Scientists and Engineers, is the jor component of this system, and pro- es a longitudinal profile of those sci- ists and engineers who were in the labor ce at the time of a decennial census. llowing a decennial census, a new ıple is drawn.)

The initial survey in the series was done 1972; and repeated in 1974, 1976, and '8. In 1978, completed questionnaires 'e received from about 82 percent of se in the sample—approximately 41,000 pondents, representing an estimated ulation of about 970,000.

ollowing the 1980 decennial census, a new sample was drawn and a survey was conducted in 1982, with subsequent surveys planned for 1984, 1986, and 1988. The 1982 survey was mailed to approximately 140,000 individuals, and had a response rate of over 70 percent.

In these surveys, an individual is classified as a scientist or engineer if two of the following three criteria are met: (1) employed in a science or engineering field; (2) holding a degree in a science or engineering field; or (3) self-identification as a scientist or engineer based on an individuals total education and experience. Criteria used by NSF to define scientists and engineers are developed in consultation with appropriate professional societies.

references

The most recent NSF report based on the data cited above is

Characteristics of Experienced Scienti and Engineers: 1978 (Detailed Statistic Tables) (NSF 79-322), available from N and NTIS (PB 80-148091).

data access

Data in machine-readable form from t 1972, 1974, 1976, and 1978 surveys c be obtained, subject to reproduction os and official regulations (e.g., Privacy A of 1976), from:

Mr. Larry Carbaugh
Data User Service Division
Bureau of the Census
Room 3624, FOB #3
Department of Commerce
Washington, D.C. 20233
(202) 763-2400

The 1982 Postcensal tape will be availab from the source cited above in early 198

CERTIFIED

O.M.B. No. 99-S77003; Approval Expires December 31, 1978

FORM PMS-26F (10-26-77)

U.S. DEPARTMENT OF COMMERCE
BUREAU OF THE CENSUS

1978 NATIONAL SURVEY OF NATURAL AND SOCIAL SCIENTISTS AND ENGINEERS

NOTICE – Your report to the Census Bureau is confidential. It may be seen only by sworn Census employees and may be used only for statistical purposes.

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.

When 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.

PLEASE COMPLETE AND RETURN TO

Bureau of the Census
1201 East Tenth Street
Jeffersonville, Indiana 47132

A. Do you currently live in the State (or foreign country) printed in the above mailing label?

1 ☐ Yes, same State (or foreign country)

2 ☐ No, different State (or foreign country) – *Please enter your current State (or foreign country) of residence* _____ 3 ☐☐

FROM THE DIRECTOR
BUREAU OF THE CENSUS

Recently we asked you to participate in a voluntary survey of scientists, engineers, and other highly qualified persons. Since we are unsure whether you received the questionnaire, we have sent this additional copy. This is the final survey in the series. We realize that completing the form takes time and effort. To minimize the cost to the Nation of gathering this important information, however, only a small sample of persons is being surveyed. Each individual's response is especially important if the results are to be truly representative of all groups and regions.

In correspondence from others, there are several questions which have been asked frequently. Since you may have some of these same questions, we should like to give you our answers:

What about persons who are retired or working in nonscientific or nonengineering jobs? In addition to scientists and engineers, the sample includes persons who have completed certain levels of education. Therefore, even if you are not now working or are working in a nonscientific or nonengineering job, your reply will be most useful in describing career patterns.

What about confidentiality? Your reply may be seen only by sworn Census employees. It may not be given to any other government agency or to anyone else. Furthermore, all census workers are subject to severe penalty if they violate their oath not to reveal any of this information. This information is being collected under the authority of the National Science Foundation Act of 1950, as amended. The findings will be released only in the form of statistical summaries from which it will be impossible to identify information about any particular person. Your response is entirely voluntary and failure to provide some or all of the requested information will not adversely affect you.

What is the purpose of the survey? The primary purpose of this survey is to obtain current information on the education and employment of persons trained in professional, scientific, technical, or related fields, for use in the planning and implementation of various government and private programs. There is no other source of this particular information for the specific occupations involved.

What about persons no longer residing in the United States? Even though you may be living outside the United States at present, please return your questionnaire, as information is also needed on highly qualified persons who leave the country.

Please take the time to complete this questionnaire and return it in the enclosed preaddressed envelope. You will save the Government the expense of a further inquiry by responding promptly. Thank you for your cooperation.

Sincerely,

Manuel D. Plotkin

MANUEL D. PLOTKIN

Enclosure

PART I – EDUCATION AND TRAINING

1. Since January 1972 have you attended any college, university, or other post high school institution?

1 [ ] Yes – *Continue with Question 2a*
2 [ ] No – *Skip to question 4*

2a. What is the highest degree you have RECEIVED since January 1972?

Mark only one box

1 [ ] Associate
2 [ ] Registered Nurse (R.N.)
3 [ ] Bachelor's
4 [ ] Master's
5 [ ] First Professional Non-Medical (J.D., LL.B., Th.B.)
6 [ ] First Professional Medical (D.D.M., D.D.S., D.O., D.V.M., M.D.)
7 [ ] Doctorate
8 [ ] Other – *Specify* _____
9 [ ] None – *Skip to question 4*

b. When was this degree awarded?

If you received more than one degree at the same level (e.g., two master's degrees), enter the year of award of the most recent one.

19 ____

3. What was the major field of study of the degree you described in question 2?

Enter code and description from Reference List A.

Code | Description from Reference List A

4 Aside from formal education, which of the following types of training did you receive in 1976 or 1977?

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

	a. 1976	b. 1977
(1) On-the-job training	1 [ ]	1 [ ]
(2) Military training applicable to civilian occupations	2 [ ]	2 [ ]
(3) Extension or correspondence courses	3 [ ]	3 [ ]
(4) Courses at employer's training facility	4 [ ]	4 [ ]
(5) Courses at adult education center	5 [ ]	5 [ ]
(6) Other training	6 [ ]	6 [ ]
(7) None	7 [ ]	7 [ ]

PART II – EMPLOYMENT STATUS

5a. What was your employment status during the week of February 12–18, 1978?

1 [ ] Employed full time (including self-employed full time) – *Skip to 6a*
2 [ ] Employed part time (including self-employed part time) – *Answer 5b*
3 [ ] Unemployed and seeking work – *Go to Part III*
4 [ ] Not employed and not seeking work – *Skip to 7*

b. If you worked part time, were you seeking full-time work?

1 [ ] Yes
2 [ ] No

6a. Were you working in a position related to science or engineering during the week of February 12–18, 1978?

1 [ ] Yes – *Go to Part III*
2 [ ] No – *Answer 6b*

b. What was the most important reason for taking this position?

Mark only one box

1 [ ] Preferred nonscience or nonengineering position
2 [ ] Promoted out of science or engineering position
3 [ ] Pay was better in nonscience or nonengineering position
4 [ ] Locational preference
5 [ ] Science or engineering position not available
6 [ ] Other – *Specify* _____

(Go to Part III)

7. If you were not employed and not seeking work during the week of February 12–18, 1978, what was your most important reason for not seeking work?

Mark only one box

1 [ ] On vacation or otherwise temporarily absent from a job for health or personal reasons
2 [ ] On layoff from a job
3 [ ] Retired
4 [ ] Student
5 [ ] Tending to family responsibilities
6 [ ] Could not find work or believed no jobs available in my particular field
7 [ ] Other – *Specify* _____

(Go to Part III)

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PART III – JOB ACTIVITIES

INSTRUCTIONS

a. Complete questions 8–15 for the job held during the week of February 12–18, 1978; or, if you did not hold a job during that week, complete these questions for your most recent job prior to that week.

b. If you held more than one job, please report only the job at which you worked the greatest number of hours.

Job held during the week of February 12–18, 1978, or most recent prior job.

8. Where did you work?

Write in city and State or foreign country of company, business, agency, or other employer.

City

State or foreign country

9. What kind of business was this?

Enter code and description from Reference List B.

Code | Description from Reference List B

10. What was your occupation?

Enter code and description from Reference List C.

Code | Description from Reference List C

11a. What percent of working time did you devote to each of the following activities?

Entries should sum to 100%.

PLEASE NOTE

Basic research is study directed toward gaining scientific knowledge primarily for its own sake.

Applied research is study directed toward gaining scientific knowledge in an effort to meet a recognized need.

Development is direction of the knowledge gained from research toward production of useful materials, devices, systems, and methods.

01	%	Management or administration of research and development
02	%	Management or administration of other than research and development
03	%	Teaching and training – preparing and teaching courses, guiding and counseling students or trainees
04	%	Basic research
05	%	Applied research
06	%	Development – product, process, and technical development
07	%	Report and technical writing, editing, information retrieval
08	%	Clinical diagnosis
09	%	Design of equipment, processes, models
10	%	Quality control, testing, evaluation, or inspection
11	%	Operations – production, maintenance, construction, installation
12	%	Distribution – sales, traffic, purchasing, customer and public relations
13	%	Statistical work – survey work, forecasting, statistical analysis
14	%	Consulting
15	%	Computer applications
16	%	Other activities – *Specify*

TOTAL=100%

b. Among all these activities, which was your primary and which was your major secondary work activity?

Fill in the appropriate code numbers (01–16) from question 11a.

Code (01–16 from Question 11a).

Primary work activity

Secondary work activity

12. Which category best describes the type of organization of your principal employment or postdoctoral appointment?

Mark only one box

- 01 ☐ Business or industry, including self-employed
- 02 ☐ Junior college, 2-year college, technical institute
- 03 ☐ Medical school
- 04 ☐ 4-year college or university, other than medical school
- 05 ☐ Elementary or secondary school system
- 06 ☐ Hospital or clinic
- 07 ☐ Non-profit organization, other than hospital, clinic, or educational institution
- 08 ☐ U.S. military service, active duty, or Commissioned Corps, e.g., USPHS, NOAA
- 09 ☐ U.S. Government, civilian employee
- 10 ☐ State government
- 11 ☐ Local or other government – *Specify*
- 12 ☐ International agency
- 13 ☐ Other – *Specify*

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PLEASE CONTINUE TO DESCRIBE THIS JOB ON PAGE 4

PART III – JOB ACTIVITIES – Continued

Job held during week of February 12–18, 1978, or most recent prior job

13. What was the basic salary associated with this position? (If not working during February 12–18, report ending salary of most recent prior job.)

If you were on a postdoctoral appointment, include stipend plus allowances. (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.)

a. $ _____ .00

b. 1 [ ] Per year
2 [ ] Per month
3 [ ] Per week

c. If academically employed, mark whether salary is for –
1 [ ] 9–10 months
2 [ ] 11–12 months

14. Between what dates did you hold this position?
Enter month and year

Consider a change in positions to have occurred if there were significant changes in your duties, level of responsibility, or occupation, even if you continued to work for the same employer.

a. Beginning month and year: _____

b. Ending month and year: _____ OR [ ] Present

15a. Was ANY of your work supported or sponsored by U.S. Government funds?

1 [ ] Yes – *Continue with 15b*
2 [ ] No } *Skip to 16a*
3 [ ] Don't know }

b. Which of the following agencies or departments were supporting the work?
Mark as many as apply

01 [ ] AID (Agency for International Development)
02 [ ] Department of Agriculture
03 [ ] Department of Commerce
04 [ ] Department of Defense
05 [ ] Department of Energy
Department of Health, Education, and Welfare
06 [ ] Alcohol and Drug Abuse Mental Health Administration
07 [ ] NIH (National Institutes of Health)
08 [ ] Office of Education
09 [ ] Other HEW – *Specify* _____
10 [ ] Department of Housing and Urban Development
11 [ ] Department of the Interior
12 [ ] Department of Justice
13 [ ] Department of Labor
14 [ ] Department of Transportation
15 [ ] EPA (Environmental Protection Agency)
16 [ ] NASA (National Aeronautics and Space Administration)
17 [ ] NSF (National Science Foundation)
18 [ ] Nuclear Regulatory Commission
19 [ ] Other agency or department – *Specify* _____
20 [ ] Don't know source agency or department

PART IV – OTHER INFORMATION

16a. At anytime during calendar year 1977 were you without a job AND actively seeking employment?

1 [ ] Yes – *Continue with 16b*
2 [ ] No – *Skip to question 17*

b. For how many weeks were you seeking employment?

1 [ ] 1 to 4 weeks
2 [ ] 5 to 10 weeks
3 [ ] 11 to 14 weeks
4 [ ] 15 to 26 weeks
5 [ ] 27 weeks or more

17. How many years of professional experience, including teaching, have you had? *Enter number of years*

_____ Years

18. Based on your total education and experience, what do you regard yourself as professionally?
Enter code and description from Reference List C.

Code | Description from Reference List C

19. 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

01 [ ] Health
02 [ ] Environment protection, pollution control
Education:
03 [ ] Teaching
04 [ ] Other
05 [ ] Space
06 [ ] National defense
07 [ ] Crime prevention and control
08 [ ] Food production and technology
09 [ ] Energy and fuel
10 [ ] Other mineral resources
11 [ ] Community development and services
12 [ ] Housing (planning, design, construction)
13 [ ] Other – *Specify* _____
14 [ ] Does not apply

20a. Are you physically handicapped?

1 [ ] Yes – *Continue with 20b*
2 [ ] No – *Skip to question 21*

b. What is the nature of your handicap(s)?
Mark as many as apply

1 [ ] Visual
2 [ ] Auditory
3 [ ] Orthopedic
4 [ ] Other – *Specify* _____

21. Is your ethnic heritage Hispanic? (Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture)

1 [ ] Yes
2 [ ] No

22. In the event that it is necessary to contact you to clarify some of the information you provided, may we contact you by telephone?

[ ] Yes – *Enter number(s) on which you can be reached* → Area code | Telephone number
Area code | Telephone number
[ ] No

23. Please print your name here

Date prepared

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REFERENCE LIST A – MAJOR FIELDS OF STUDY

This list is to be used in answering question 3 about the field in which you have obtained study or training. It is divided into two sections. Section I is a list of fields of academic study generally leading to bachelor's or higher degrees; Section II is a list of fields of study and training below those generally leading to a bachelor's degree.

Please scan the entire list, choose the appropriate answer for the question and then enter the code and description in the appropriate section of question 3. If none of the categories listed below adequately describes what you were studying or being trained in, use the "Other" category (code 600 or 625) and enter a brief description of what you were studying in the space provided on the questionnaire.

PLEASE DETACH BEFORE RETURNING YOUR COMPLETED QUESTIONNAIRE

Section I – FIELDS OF ACADEMIC STUDY LEADING TO BACHELOR'S OR HIGHER DEGREES

Code	Description
	Biological and Agricultural Sciences and Related Fields
501	Agriculture, business
502	Agriculture, general
503	Agronomy, field crops
504	Anatomy and histology
505	Animal physiology
506	Animal science
507	Bacteriology, virology, mycology, Parasitology
508	Biochemistry
509	Biology, general
510	Biophysics
511	Botany, general
512	Dairy science (dairy husbandry)
513	Entomology
514	Farm management
515	Fish and game or wildlife management
516	Food science (food technology and processing, dairy manufacturing and technology, food industry)
517	Forestry
518	Genetics
519	Horticulture
520	Immunology
521	Microbiology
522	Plant pathology
523	Plant physiology
524	Soil science (soil management, soil conservation)
525	Zoology, general
526	Biological and agricultural sciences, other fields
	Education
527	Biological sciences education
528	Mathematics education
529	Physical sciences education
530	Trade and industrial training
531	Education, other fields
	Engineering
532	Aerospace, aeronautical, astronautical, and related fields
533	Agricultural
534	Architectural
535	Chemical, petroleum refining
536	Civil, construction, transportation
537	Electrical, electronics
538	Engineering sciences, mechanics, physics
539	Engineering technology
540	Environmental, sanitary engineering
541	General or unified
542	Industrial
543	Mechanical
544	Metallurgical, materials, ceramics
545	Mining, mineral, geological
546	Naval architecture and marine engineering
547	Nuclear
548	Operations research, systems engineering
549	Petroleum
550	Engineering, other fields
	Health Fields
551	Medicine or premedicine, and clinical medical sciences
552	Nursing (4 year or longer program)
553	Pathology
554	Pharmacology
555	Pharmacy
556	Health professions, other fields (4 year or longer program)
	Mathematical Sciences
557	Mathematics
558	Statistics and actuarial sciences
559	Computer sciences and systems analysis
560	Operations research, management science
	Physical Sciences
560	Astronomy
561	Chemistry
562	Geography
563	Meteorology
564	Physics
565	Physical sciences, general
566	Geology and geophysics
567	Oceanography
568	Physical sciences, other fields
	Psychology
569	Clinical
570	Educational
571	General psychology
572	Psychology, other fields
	Social Sciences
573	Anthropology
574	Area studies, regional studies
575	Economics, agricultural
576	Economics, except agricultural
577	Foreign service programs
593	Geography
579	History
580	Industrial relations
581	International relations
582	Political science or government
583	Public administration
584	Social sciences, general
585	Social work, social administration, social welfare
586	Sociology
587	Social sciences, other fields
	Arts, Humanities, and Other Specialties
588	Arts, general
589	Business and commerce, including accounting, hotel and restaurant administration, and secretarial studies
590	English and journalism
591	Fine and applied arts, all fields
592	Foreign language and literature, all fields
593	Geography
594	Home economics, all fields
595	Law or prelaw
596	Library science
597	Military science, including merchant marine deck officer
598	Philosophy, all fields
599	Religion and theology, all fields
600	Other *(Describe briefly under the applicable item on the questionnaire.)*

Section II – FIELDS OF ACADEMIC STUDY AND OCCUPATIONAL TRAINING RELATED TO PROGRAMS BELOW THE BACCALAUREATE

Code	Description
	Data Processing-related fields of study or training
601	Computer programming
602	Computer operating
603	All other data processing fields of study or training
	Engineering-related fields of study or training
604	Drafting and design, all fields
605	Aeronautical technology
606	Architectural or building technology
607	Chemical technology
608	Civil technology
609	Electrical and electronics technology
610	Industrial technology
611	Mechanical technology
612	All other engineering-related fields of study or training
	Science-related fields of study or training
613	Agriculture
614	Forestry
615	Other science-related fields of study or training
	Other fields of study or training
616	Business and commerce-related fields of study or training
617	Craft (skilled) occupations-related fields of study or training (such as carpentry, bricklaying, tool and die making, etc.)
618	Educational-related fields of study or training
619	Home economics
620	Nursing and other health service-related fields of study or training
621	Operative occupations-related fields of study or training (such as machine operation, driving, inspecting, etc.)
622	Police technology or law enforcement
623	Sales and marketing-related fields of study or training
624	Service occupations-related fields of study or training (such as cook, beautician, firefighter, etc.)
625	All other fields of study or training *(Describe briefly under the applicable item on the questionnaire.)*

FORM PM5-26F (9-26-77)

REFERENCE LIST B – KINDS OF BUSINESSES

This list is to be used in answering question 9 about the kind 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
	Manufacturing
701	Aircraft, aircraft engines, aircraft parts
702	Chemicals and allied products
703	Electrical machinery, equipment and supplies for the generation, storage, transformation, transmission, and utilization of electrical energy
704	Electronic apparatus, radio, television and communication equipment and parts
705	Electronic computers, accounting, calculating and office machinery and equipment
706	Fabricated metal products (except ordnance, machinery and transportation equipment)
707	Machinery (except electrical) including engines and turbines, farming and construction machinery, mining, metalworking and other manufacturing and service industry machines
708	Motor vehicles and motor vehicle equipment including trucks, buses, automobiles, railroad engines and cars
709	Ordnance, including manufacture of arms, ammunition, tanks, and complete guided missiles, space vehicles and equipment
710	Petroleum refining and related industries
711	Primary metal industries, including smelting, refining, rolling, drawing, alloying, and manufacture of castings, forgings and other basic metal products
712	Professional and scientific equipment and supplies
713	Other manufacturing including printing and publishing
	Educational Institutions
714	College or university (offering at least a bachelor's degree)
715	Junior college or technical institute
716	Medical school
717	Other educational institutions
	Health Services
718	Hospital or clinic
719	Other medical and health services

Code	Description
	Other Kinds of Business
720	Agriculture, forestry, and fisheries
721	Business, personal, and professional services
722	Construction
723	Engineering or architectural services
724	Finance, insurance, or real estate
725	Mining and petroleum extraction
726	Private, nonprofit organizations other than educational institutions and hospitals
727	Professional and technical societies
728	Research institutions
729	Retail and wholesale trade
730	Transportation, communication, or other public utilities
731	Other *(Describe briefly under the applicable item on the questionnaire.)*
	Public Administration (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.)
732	Uniformed military service
733	Federal public administration
734	State public administration
735	Local public administration (city, county, etc.)
737	Regional government
736	Other government

REFERENCE LIST C – OCCUPATIONS

This list is to be used in answering questions 10 and 18 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
	Engineers, including college professors and instructors
401	Engineer, aeronautical and astronautical
402	Engineer, agricultural
403	Engineer, chemical
404	Engineer, civil and architectural
405	Engineer, electrical and electronic
406	Engineer, industrial
407	Engineer, mechanical
408	Engineer, metallurgical and materials
409	Engineer, mining, petroleum, and geological
410	Engineer, nuclear
411	Engineer, environmental and sanitary
412	Engineer, operations research/systems
413	Engineer, other fields *(Describe briefly under the applicable item on the questionnaire.)*
	Computer Specialist, including college professors and instructors
414	Computer programmer
415	Computer systems analyst
416	Computer scientist
417	Other computer specialist *(Describe briefly under the applicable item on the questionnaire.)*
	Mathematicians and Statisticians, including college professors and instructors
418	Actuary
419	Mathematician
420	Statistician
421	Operations research analyst
	Physical Scientists, including college professors and instructors
422	Chemist
423	Earth scientists including geologists, geophysicists, etc.
424	Physicist, astronomer
425	Atmospheric scientist, meteorologist
426	Oceanographer
427	Other physical scientist *(Describe)*
	Biological Scientists, including college professors and instructors
428	Agricultural scientists, including foresters and conservationists
429	Biological scientist
430	Biochemist
431	Biophysicist
432	Medical scientist, excluding persons who are primarily medical practitioners; see Health Occupations
433	Other biological scientist *(Describe)*
	Social scientists, including college professors and instructors
434	Economist
435	Psychologist
436	Sociologist or anthropologist
437	Other social scientist *(Describe briefly under the applicable item on the questionnaire.)*

Code	Description
	Health Occupations, including persons who are primarily practitioners. Persons engaged primarily in medical research, teaching, and similar activities use code 432, Medical scientist.
438	Physician or surgeon
439	Technician, dental
440	Technician, medical
441	Other health occupation *(Describe briefly under the applicable item on the questionnaire.)*
	Technicians and Technologists, except medical
442	Designer, electronic parts and machine tools
443	Designer, industrial
444	Designer, other
445	Draftsman
446	Surveyor
447	Technician, biological and agricultural
448	Technician, electrical and electronic
449	Technician, construction, highways, and architectural
450	Technician, mechanical
451	Technician, other engineering
452	Technician, physical science
453	Technician, other fields *(Describe briefly under the applicable item on the questionnaire.)*
	Teachers
454	Teacher, elementary school
455	Teacher, secondary school
456	Teacher, college and university, excluding engineering and science *(Engineering and science teachers see codes 401–437 above.)*
	Administrators, Managers, and Officials, excluding farm
476	Urban and regional planner
457	College president or dean
458	Administrator or manager, scientific and technical research and development
459	Administrator or manager, production and operations
460	Administrator, manager, or official, all other, excluding self-employed
461	Self-employed proprietor
	All Other Occupations
462	Accountant
463	Attorney or judge
464	Sales worker
465	Clerical worker (such as bookkeeper, secretary, etc.)
466	Clergy
467	Craft worker (such as baker, carpenter, electrician, mechanic, repair worker)
468	Farmer (owner, manager, tenant, or farm laborer)
469	Fire fighter or police
470	Laborer, except farm
471	Librarian
472	Merchant or shopkeeper, self-employed
473	Operative (such as assembler, factory worker, miner, welder, truck driver, etc.)
474	Postal worker
475	Other occupations, not specified above *(Describe briefly under the applicable item on the questionnaire.)*

FORM PMS-26P (6-26-77)

doctorate recipients

purpose and background

The primary objective of this continuing biennial survey is to estimate at the national level the supply and utilization of doctoral scientists and engineers. One use of these data is to refine the estimates of doctoral scientists and engineers derived from the Experienced Scientists and Engineers Sample Survey.

This survey is unique in that the sample is drawn from the Doctorate Records File (q.v.), a complete enumeration of doctorate-holders. During 1972 a roster was compiled of all known recipients of doctoral degrees for the years 1930-72, inclusive. The completed Comprehensive Roster of Doctoral Scientists and Engineers, encompassing this particular 42-year span, was used as the population for the initial survey conducted in 1973. Subsequent surveys were, and continue to be, conducted at 2-year intervals (e.g., 1979 and 1981). For each succeeding survey the 42-year population definition is maintained by adding the two most recent graduating classes and dropping the oldest two cohort-year groups. For example, the 1975 survey covered doctorate recipients in the period January 1, 1932 to June 30, 1974, while the 1977 survey spanned the 1934-76 population.

The first survey in 1973 was based on the Comprehensive Roster of approximately 272,000 doctorate-holders from which a stratified sample of approximately 59,000 was selected. Individuals included in the 1973 roster were stratified according to the following variables: (1) U.S. science and engineering (S/E) doctorate-holders; foreign S/E doctorate-holders; non-S/E doctorate-holders subsequently employed in S/E positions; (2) sex; (3) size of graduating institution according to the annual number of doctorates awarded; (4) field of doctorate; and (5) year of doctorate. The survey yielded 42,456 responses, or 72 percent of those contacted.

The stratification plans for the subsequent surveys were the same as for the 1973 survey except that in 1975 "size of graduating institution" was replaced by a different variable—"racial/ethnic identification." Note that these racial/ethnic data are only available beginning with the 1973 cohort group. The 1981 survey, the most recent for which data are presently available, used a stratified sample of 44,400 scientists and engineers of whom 31,400, or 71 percent, responded.

survey instrument

A copy of the 1981 questionnaire follows this text.

references

The most recent NSF report based on the data cited above is

Characteristics of Doctoral Scientists and Engineers in the United States: 1981 (Detailed Statistical Tables) (NSF 82-332), available from NSF and NTIS (PB 83-210708).

data access

Additional data in the form of lists, tabulations, and machine readable tapes are available subject to the limitations of the Privacy Act and costs. Information on the availability of data and costs may be obtained from:

Dr. Betty Maxfield
National Academy of Sciences
2101 Constitution Avenue, N.W.
Washington, D.C. 20418
(202) 334-3152

1983 SURVEY OF DOCTORATE RECIPIENTS

OMB No.

CONDUCTED BY THE NATIONAL RESEARCH COUNCIL WITH THE SUPPORT OF THE NATIONAL SCIENCE FOUNDATION, THE NATIONAL ENDOWMENT FOR THE HUMANITIES, THE NATIONAL INSTITUTES OF HEALTH, AND THE DEPARTMENT OF ENERGY

If your name or address is incorrect, please enter correct information below.

(10-11)

Listed below are responses that you provided to us in previous NRC doctoral surveys. Please check this information to determine if it accurately reports your status as of FEBRUARY 1983. If the data are correct, simply check the "no change" box. If the data are missing or no longer correct, please enter the correct information in the spaces provided.

Previous Survey Response	No Change	Changes as of February 1983
Date of Birth	☐	(12-16)
Institution/Year of Doctorate	☐	(17-24)
Citizenship	☐	(25)
Marital Status	☐	(26)
Academic Rank	☐	(27)
Tenure Status	☐	(28-31)

What is your racial background?

1 ☐ American Indian or Alaskan Native
2 ☐ Asian or Pacific Islander
3 ☐ Black
4 ☐ White
(32)

Is your ethnic heritage Hispanic?

A ☐ Yes
B ☐ No
(33)

If YES, is it:
1 ☐ Mexican-American
2 ☐ Puerto Rican
3 ☐ Other Hispanic (34)

1. What was your employment status (includes postdoctoral appointment*) during February 1983?

☐ Circle your selection and enter number from below (35)

1. Employed full-time (35 hours or more/week in one position) (Skip to Question #3)
2. Employed part-time
   If you were employed part-time, were you seeking full-time employment?
   A ☐ Yes
   B ☐ No (36)
3. Postdoctoral appointment*
   If you held a postdoctoral appointment, was it
   A ☐ Full-time (Skip to Question #3)
   B ☐ Part-time (37)
4. Unemployed and seeking employment
5. Not employed and not seeking employment
6. Retired and not employed

(Skip to Question #11)

7. Other, specify _____

*Temporary appointment in academia, industry or government, the primary purpose of which is to provide for continued education or experience in research.

2. If you were employed part-time during FEBRUARY 1983, what was the MOST important reason for being in part-time status?

☐ Enter number from below (38)

1. Part-time employment preferred
2. Full-time position not available
3. Constraints due to family or marital status
4. Other, specify _____

3. Please give the name of your principal employer (company, organization, postdoctoral institution, etc. or, if self employed, write "self") and actual place of employment during FEBRUARY 1983.

Name of Employer (39-46)

City State ZIP (47-55)

4. From the Employment Specialties List on page 4 select and enter both the number and title of the employment specialty most closely related to your principal employment or postdoctoral appointment during FEBRUARY 1983. Write in your specialty if it is not on the list.

Number _____ Title of Employment Specialty _____ (56-58)

5. Which category below best describes the type of your principal employment OR postdoctoral appointment during FEBRUARY 1983?

☐ Enter number from below (59-60)

1. Business or industry (including self-employed)
2. Junior college, 2-year college, technical institute
3. Medical school (including university affiliated hospital or medical center)
4. 4-year college
5. University, other than medical school
6. Elementary or secondary school system
7. Private foundation
8. Hospital or clinic
9. U.S. military service, active duty, or Commissioned Corps, e.g., USPHS, NOAA
10. U.S. government, civilian employee
11. State government
12. Local or other government, specify _____
13. Nonprofit organization, other than those listed above
14. Other, specify _____

6. What is your best estimate of the percentage of your professional work time that you devoted to each of the following activities during a typical week in your principal job? (Total should equal 100%)

	%		%
1.	____ Teaching (61)	11.	____ Operations—production, maintenance, construction, installation (10)
2.	____ Basic research (63)	12.	____ Quality control, testing, evaluation (12)
3.	____ Applied research (65)	13.	____ Sales, marketing, purchasing, estimating (14)
4.	____ Development of equipment, products, systems, data (67)	14.	____ Archival work (16)
5.	____ Design (69)	15.	____ Curatorial work (18)
6.	____ Writing, editing (71)	16.	____ Performing arts (20)
7.	____ Professional services to individuals (73)	17.	____ Other, specify _____ (22)
8.	____ Management of R&D (75)	TOTAL = 100%	
9.	____ Management of educational/other programs (77)		
10.	____ Consulting (79)		

a. What were your primary and secondary work activities? (Enter number 1-17 from question #6 above) ☐ Primary (24-25) ☐ Secondary (26-27)

7. What was the basic annual salary* associated with your principal professional employment during FEBRUARY 1983? If you were on a postdoctoral appointment (see question #1 for definition), what was your stipend plus allowances? $_____ per year (28-30)

Check whether salary was for ☐ 9-10 months or ☐ 11-12 months (31)

*Basic salary is your annual salary before deductions for income tax, social security, retirement, etc., but does not include bonuses, overtime, summer teaching, or other payment for professional work.

8. If you were employed during FEBRUARY 1983 in a specialty field other than your field of Ph.D., what was the MOST important reason for being in that position?

☐ Enter number from below (32)

1. Better pay
2. More attractive career options
3. Preferred specific geographic location
4. Constraints due to family or marital status
5. Position in Ph.D. field not available
6. Promoted into new field
7. Other, specify _____

9. If you were employed in a non-academic job in FEBRUARY 1983, what was the MOST important reason for your decision to enter this job?

☐ Enter number from below (33)

1. Better pay
2. More attractive career options
3. Preferred specific geographic location
4. Constraints due to family or marital status
5. Academic position not available
6. Other, specify _____

10. During 1982 was any of your work supported or sponsored by U.S. Government funds?

A ☐ Yes B ☐ No C ☐ Don't Know (34)

If YES, which Federal agencies or departments supported the work? Enter number(s) from the List of Federal Supporting Agencies on page 4.

_____ (35-46)

11. How many full-time equivalent years of professional work experience have you had? _____ Year(s) (47-48)

12. Following the receipt of your doctorate, did you leave the work force for any period of at least one year in duration?

A ☐ Yes
B ☐ No (49)

If YES, indicate the beginning and ending years of career disruptions:

____ to ____ (50-53)
____ to ____ (54-57)
____ to ____ (58-61)

13. Have you received any external research support (for at least three months) from any of the following non-government sources in the past two years?

A ☐ Yes B ☐ No If YES, specify below

1. ____ Industry
2. ____ Private Foundations
3. ____ Academe
4. ____ Other, specify ____ (63-66)

14. Please indicate the number of publications you have authored or co-authored in the following categories during the past two years.

	1981-82	
1. Books	____	(67-68)
2. Chapters in books	____	(69-70)
3. Monographs and Reports	____	(71-72)
4. Journal articles	____	(73-74)
5. Book reviews	____	(75-76)

6. If NONE, check box ☐ (77)

15. After receiving your doctorate, did you have to acquire formal training in any of the following areas in order to obtain your present position?

A ☐ Yes B ☐ No (10) If YES, specify below

1. ____ Foreign languages
2. ____ Computer science
3. ____ Management and administration
4. ____ Survey research and statistics
5. ____ Other, specify ____ (11-15)

16. Please specify the type and field of any degree(s) you have received after your initial doctorate.

____ (16-27)

If you devoted a proportion of your professional time which you considered significant to energy or fuel activities during a typical work week, please answer questions #17-20, otherwise skip to item #21.

17. What percent of your professional time did you devote to energy and fuel during a typical week? ____ (28-29)
percent

18. From the list below, give the corresponding number of the ONE energy source that involved the LARGEST proportion of your energy-related work during a typical week.

☐ Enter number from below (30)

1. Coal and coal products
2. Petroleum (including oil shale and tar sands) or natural gas
3. Fission
4. Fusion
5. Hydroenergy
6. Direct solar (including space and water heating, thermal, electric)
7. Indirect solar (winds, tides, biomass, etc.)
8. Geothermal
9. Other, specify ____

19. Please read the following list of energy-related activities and give the corresponding number(s) from the list below of the activity(ies) in which you were engaged during a typical week. Enter number(s) from below ____ (31-50)

1. Exploration
2. Extraction (gas, oil, mining)
3. Manufacture of energy-related components or products
4. Fuel processing (including refining and enriching)
5. Electric power generation
6. Transportation, transmission, distribution of fuel or energy
7. Energy storage
8. Energy utilization, management
9. Fuel reprocessing or disposal
10. Energy conservation
11. Environmental impact (health, economic, etc.)
12. Education, training
13. Other, specify ____

20. Please enter the number 1-13 from question #19 that BEST describes the activity in which you spent MOST of your energy-related time. ☐ (51-52)

21. Thank you for completing this questionnaire. Please return the completed form in the enclosed envelope to the National Research Council, JH630, 2101 Constitution Avenue, Washington, D.C. 20418.

EMPLOYMENT SPECIALTIES LIST

MATHEMATICAL SCIENCES

000 · Algebra
010 · Analysis & Functional Analysis
020 · Geometry
030 · Logic (see also 834)
040 · Number Theory
052 · Probability
055 · Math. Statistics (see also 544, 670, 725, 727)
060 · Topology
082 · Operations Research (see also 478)
085 · Applied Mathematics
089 · Combinatorics & Finite Mathematics
098 · Mathematics, General
099 · Mathematics, Other*

COMPUTER AND INFORMATION SCIENCES

071 · Theory
072 · Software Systems
073 · Hardware Systems
074 · Intelligent Systems
079 · Computer Sciences, Other* (see also 437, 476)
081 · Information Sci. & Systems*

PHYSICS & ASTRONOMY

101 · Astronomy
102 · Astrophysics
110 · Atomic & Molecular
120 · Electromagnetism
132 · Acoustics
134 · Fluids
135 · Plasma
136 · Optics
140 · Elementary Particles
150 · Nuclear Structure
157 · Polymer
160 · Solid State
198 · Physics, General
199 · Physics, Other*

CHEMISTRY

200 · Analytical
210 · Inorganic
215 · Synthetic Inorganic & Organometallic
220 · Organic
225 · Synthetic Organic & Natural Products
230 · Nuclear
240 · Physical
250 · Theoretical
255 · Structural
260 · Agricultural & Food
270 · Pharmaceutical
275 · Polymer
280 · Biochemistry (see also 540)
298 · Chemistry, General
299 · Chemistry, Other*

EARTH, ENVIRONMENTAL, AND MARINE SCIENCES

301 · Mineralogy, Petrology
305 · Geochemistry
310 · Stratigraphy, Sedimentation
320 · Paleontology
330 · Structural Geology
341 · Geophysics (Solid Earth)
350 · Geomorph. & Glacial Geology
391 · Applied Geol., Geol. Engr & Econ. Geol.
398 · Earth Sciences, General
399 · Earth Sciences, Other*
381 · Atmospheric Physics & Chemistry
382 · Atmospheric Dynamics
383 · Atmos. & Meteorol. Sci., Other*
388 · Environmental Sciences, General (see also 480, 528)
389 · Environmental Sciences, Other*
360 · Hydrology & Water Resources
370 · Oceanography
397 · Marine Sciences, Other*

ENGINEERING

400 · Aerospace, Aeronautical & Astronautical
410 · Agricultural
415 · Bioengineering & Biomedical
420 · Civil
430 · Chemical
435 · Ceramic
436 · Communications
437 · Computer
440 · Electrical
445 · Electronics
450 · Industrial & Manufacturing
455 · Nuclear
460 · Engineering Mechanics
465 · Engineering Physics
470 · Mechanical
475 · Metallurgical & Phys. Met. Engr
476 · Systems Design & Systems Science (see also 072, 073, 074)
478 · Operations Research (see also 082)
479 · Fuel Technology & Petroleum
480 · Sanitary & Environmental Health
485 · Naval Arch. & Marine Engr.
486 · Mining & Mineral
487 · Ocean
490 · Polymer
497 · Materials Science & Engineering
498 · Engineering, General
499 · Engineering, Other*

AGRICULTURAL SCIENCES

501 · Agricultural Economics
508 · Animal Breeding & Genetics
509 · Animal Nutrition
512 · Animal Sciences, Other*
500 · Agronomy
511 · Plant Path. (see also 553)
513 · Plant Breeding & Genetics
514 · Plant Sciences, Other*
503 · Food Science and/or Technology (see also 573)
505 · Forestry
506 · Horticulture
507 · Soil Sciences
515 · Fisheries Sciences
516 · Wildlife Management
518 · Agriculture, General
519 · Agriculture, Other*

MEDICAL SCIENCES

520 · Medicine & Surgery
522 · Public Health & Epidemiology
523 · Veterinary Medicine
524 · Hospital Administration
526 · Nursing
527 · Parasitology
528 · Environmental Health
530 · Audiology & Speech Pathology
534 · Human and Animal Pathology
536 · Pharmacology
537 · Pharmacy
538 · Medical Sciences, General
539 · Medical Sciences, Other*

BIOLOGICAL SCIENCES

540 · Biochemistry (see also 280)
542 · Biophysics
550 · Botany
551 · Bacteriology
552 · Plant Genetics
553 · Plant Path. (see also 511)
567 · Plant Physiology
563 · Human & Animal Genetics
566 · Human & Animal Physiology
569 · Zoology
544 · Biometrics & Biostatistics (see also 055, 670, 725, 727)
545 · Anatomy
546 · Cell Biology
547 · Embryology
548 · Immunology
549 · Endocrinology
560 · Ecology
571 · Entomology
572 · Molecular Biology
573 · Food Science and/or Technology (see also 503)
574 · Behavior/Ethnology
575 · Microbiology
576 · Nutrition & Dietetics
589 · Neurosciences
590 · Toxicology
598 · Biological Sciences, General
599 · Biological Sciences, Other*

PSYCHOLOGY

600 · Clinical
603 · Cognitive
610 · Counseling & Guidance
620 · Developmental & Gerontological
630 · Educational
635 · School
641 · Experimental
642 · Comparative
643 · Physiological
650 · Industrial/Organizational
660 · Personality
670 · Psychometrics (see also 055, 544, 725, 727)
675 · Quantitative
680 · Social
698 · Psychology, General
699 · Psychology, Other*

SOCIAL SCIENCES

700 · Anthropology
703 · Archeology
708 · Communications
709 · Linguistics
710 · Sociology
720 · Economics (see also 501)
725 · Econometrics (see also 055, 544, 670, 727)
727 · Social Statistics (see also 055, 544, 670, 725)
730 · Demography
740 · Geography
745 · Area Studies*
751 · Political Sci. & Government
752 · Public Administration
753 · Public Policy Studies
755 · International Relations
760 · Criminology & Criminal Justice
770 · Urban & Regional Planning
775 · History & Philosophy of Sci.
798 · Social Sciences, General
799 · Social Sciences, Other*

HUMANITIES

804 · History, American
805 · History, European
806 · History, Other*
811 · American Literature
813 · English Language
814 · English Literature
827 · Classics
831 · Speech & Debate
836 · Comparative Literature
839 · Letters, Other*
821 · German
822 · Russian
823 · French
824 · Spanish & Portuguese
826 · Italian
829 · Other Languages*
802 · Art History & Criticism
808 · American Studies
809 · Theatre & Theatre Criticism
830 · Music
833 · Religious Studies (see also 881)
834 · Philosophy (see also 030)
891 · Library & Archival Sciences
878 · Humanities, General
879 · Humanities, Other*

EDUCATION AND PROFESSIONAL FIELDS

801 · Applied Art
881 · Theology (see also 833)
882 · Business & Management
883 · Home Economics
884 · Journalism
886 · Law, Jurisprudence
887 · Social Work
888 · Architec. & Environ. Design
896 · Professional Fields, General
897 · Professional Fields, Other*
938 · Education (other than teaching in a field listed above)

899 · OTHER FIELDS*

*Identify the specific field in the space on the questionnaire.

LIST OF FEDERAL SUPPORTING AGENCIES (For use with # 10)

1 Agency for International Development
2 Environmental Protection Agency
3 National Aeronautics & Space Administration
4 National Endowment for the Arts
5 National Endowment for the Humanities
6 National Science Foundation
7 Nuclear Regulatory Commission
8 Smithsonian Institution
9 Department of Agriculture
10 Department of Commerce
11 Department of Defense
12 Department of Energy
13 National Institutes of Health (DHHS)
14 Alcohol, Drug Abuse & Mental Health Administration (NIAA, NIDA, NIMH)
15 Other DHHS, specify
16 Department of Education (NIE, OE, NCES)
17 Department of Housing and Urban Development
18 Department of the Interior
19 Department of Justice
20 Department of Labor
21 Department of State
22 Department of Transportation
23 Other agency or department, specify
24 Don't know source agency

federally employed scientists and engineers

purpose and background

Data are collected and maintained concerning scientists and engineers employed by the U.S. Government. These data, when combined with other information resources, provide estimates of the number of science and engineering (S/E) personnel employed as well as the method of their utilization in the Federal Government (excluding uniformed military personnel).

The source of data on federally employed scientists and engineers is the U.S. Office of Personnel Management. As each person is employed, released, or has his/her status changed by an agency of the Federal Government, the employing office must notify the U.S. Office of Personnel Management via a Standard Form 50. Data on the form include sociodemographic, educational, occupational, and minority-status variables that provide the basis for this National Science Foundation (NSF) file and, more recently, for a set of computer-readable tapes.

Currently, only data for 1977-78 accessions and separations are available on computer-readable tape. Selected data are also available in NSF reports for over 25 years: Numbers employed by sex, intermittent since 1954; salary since 1964; major functions reported biennially for 1969 through 1975; educational levels for 1974; minority-group participation in the Federal work force as of 1977. A statistical report on the Federal work force is available for 1976-78. A similar report for 1979-81 will be available in late 1984.

references

The most recent NSF report based on the above data is

Federal Scientific and Technical Personnel, 1976, 1977, and 1978 (Detailed Statistical Tables) (NSF 81-309), available from NSF and NTIS (PB82-115395).

data access

The following tape files based on the Central Personnel Datafile (U.S. Civil Service Commission) are available.

A. Tape files of all in-house Federal civilian scientists and engineers employed full time in October 1977. Data on the tape files include: Agency, bureau; year of birth; State-city-county of employment; occupational specialty (series); pay plan; grade and step; salary; service computation date; sex; tenure (career, etc.); minority group designation; highest degree earned and year; field of highest degree; and functional class.

B. Tape files of all new hires (and rehires) of full-time Federal civilian scientists and engineers in calendar 1977 and 1978. Data include: Age interval; occupational series; grade; salary; sex; minority group designation; highest degree earned and year; and field of highest degree.

C. A tape file of all separations of full-time Federal civilian scientists and engineers in calendar 1977 and 1978. Data include: Age interval; occupational series; grade; salary; sex; minority-group designation; highest degree earned and year; and field of highest degree.

D. A tape file of all white-collar workers, including scientists, engineers, and technicians, as of October 1981. Data include age, occupational series, grade, salary, sex, minority-group designation, highest degree earned and year, field of highest degree, functional classification, and management/supervisory status. The tape will be available for use by mid-1984.

These tapes are available subject to restrictions (e.g., Privacy Act of 1976) and reproduction cost from:

Mr. Joseph Gannon
Division of Science Resources Studies
National Science Foundation
1800 G Street, N.W., Rm. L-611
Washington, D.C. 20550
(202) 634-4655

scientific and technical personnel in private industry

purpose and background

This series of surveys is supported as part of a National Science Foundation (NSF) effort to compile national estimates of employment by detailed industry and occupation from the Occupational Employment Statistics Survey of the Bureau of Labor Statistics (BLS), Department of Labor. Similar, but not strictly comparable, time-series data are available from NSF for the 1950-70 period and for 1975. Data for the 1950-70 series were collected by BLS from intermittent direct surveys of samples of establishments between 1950 and 1970 with interpolations for intervening years. The 1975 estimates were made by the Bureau of the Census from a sample of 24,000 establishments and included data on energy personnel.

Six surveys were conducted from 1977 through 1982. Manufacturing establishments were sampled in 1977 and 1980; the number of responding firms were 83,000 and 116,000, respectively. The surveys of nonmanufacturing establishments in mining, construction, financial, and service industries obtained responses from 217,000 firms in 1978 and 240,000 firms in 1981. There were approximately 240,000 respondents to the 1979 and 1982 surveys of nonmanufacturing establishments in trade and regulated industries. Manufacturing firms are found in Standard Industrial Classification (SIC) codes 20-39; nonmanufacturing firms, in SIC codes 10-17, 60-67, 70, 72-73, 75-76, 78-81, 83-84, 86, 89; and trade and regulated firms, in SIC codes 41-42, 44-59.

references

The most recent NSF reports based on the data cited above are

Science Resources Studies Highlights, "Technical Employment Growth Accelerates in Selected Nonmanufacturing Industries" (NSF 83-321), available from NSF.

Science Resources Studies Highlights, "Manufacturing Employment Becoming Increasingly More Technological" (NSF 83-303), available from NSF.

Changing Employment Patterns of Scientists, Engineers, and Technicians in Manufacturing Industries: 1977-80 (NSF 82-331), available from NSF and NTIS (PB 81-187924).

Scientists, Engineers, and Technicians in Private Industry: 1980 (NSF 81-329), available from NSF.

Scientists, Engineers, and Technicians in Private Industry: 1978-80 (NSF 80-320), available from NSF and NTIS (PB 81-187403).

data access

Data tapes for the Survey of Scientific and Technical Personnel in Industry are available for the years 1977 through 1982.

Tapes may be obtained from:

Mr. Brian MacDonald
Department of Labor
Bureau of Labor Statistics
G.A.O Building
441 G Street, N.W.
Washington, D.C. 20212
(202) 523-1636

Cost of tape: Actual copying cost (approximately $50.00)

scientific and engineering personnel employed at universities and colleges

purpose and background

The purpose of this survey is to provide quantitative information on professional science and engineering (S/E) personnel employed by universities and colleges.

The survey was conducted periodically between 1954 and 1973; since 1973 it has been conducted annually. All U.S. universities and colleges which employ scientists or engineers are surveyed, as are approximately 19 academically administered federally funded research and development centers (FFRDC's).

The data variables collected over the years have primarily consisted of headcounts by highest earned degree, of full- and part-time scientists and engineers by S/E field and sex, with some measure of the extent of research and development (R&D) involvement.

Prior to January 1979, data were collected for both full- and part-time personnel by the function (teaching, research, or other) in which they were primarily employed, for each specific field of science or engineering. Headcounts for both full- and part-time personnel were also collected by highest earned degree and function of primary employment. Additional questionnaire items requested headcounts of scientists and engineers with doctoral degrees by broad S/E area and employment status; headcounts for full-time personnel by detailed field and sex; and headcounts for technicians by broad area and primary function. Full-time-equivalent (FTE) counts were collected only for all-field totals prior to 1979 and were available by employment status and primary function.

Over time the scope of the survey has varied because of concern about response burden. Data on the distribution of personnel according to degree level and function of primary employment have not been collected since 1978. The items on primary function by field were converted to an FTE concept on a permanent basis on the shortened questionnaire used in 1979. All items on distributions of personnel by degree level or by sex were omitted from the shortened 1979 form but were returned to the full-scale survey form in 1980. The items on function of primary employment and the item on technicians last appeared on the 1978 survey form.

In addition to the reduced number of data items on the 1979 questionnaire, the scope of the survey was further restricted in that only doctorate-granting institutions and FFRDC's were surveyed. Prospective data users must therefore exercise care and judgment in interpreting and utilizing the 1979 data; data aggregates, for example, should not be treated as national totals. Data elements for the 1980, 1981, 1982, and 1983 surveys are identical.

references

The most recent NSF reports based on the data cited above are

Academic Science/Engineering: Scientists and Engineers, January 1982 (Detailed Statistical Tables) (NSF 83-311), available from NSF and NTIS (PB 83-241927).

Science Resources Studies Highlights, "Academic Employment of Scientists and Engineers Continued to Grow in 1982 But Slower Than in Other Economic Sectors" (NSF 83-317), available from NSF.

Academic Science: 1972-81. R&D Funds, Scientists and Engineers, *Graduate Enrollment and Support* (NSF-81-326), available from NSF and NTIS (PB 82-242439).

data access

Data for 1976 through 1983 are currently available on a single multiyear tape. Data for 1973, 1974, and 1975 are also available on separate tapes. The survey populations for these years are as follows:

January 1973—2,198 Academic Institutions; 21 FFRDC's
January 1974—2,198 Academic Institutions; 21 FFRDC's
January 1975—2,197 Academic Institutions; 21 FFRDC's
January 1976—2,177 Academic Institutions; 21 FFRDC's
January 1977—2,162 Academic Institutions; 21 FFRDC's
January 1978—2,161 Academic Institutions; 21 FFRDC's
January 1979— 318 Doctorate Institutions; 19 FFRDC's
January 1980—2,220 Academic Institutions; 19 FFRDC's
January 1981—2,217 Academic Institutions; 19 FFRDC's
January 1982—2,200 Academic Institutions; 19 FFRDC's
January 1983—2,205 Academic Institutions; 19 FFRDC's

For further information regarding data tape availability or contents, please contact:

Ms. Catherine Joseph
Abt Associates
NSF Surveys
55 Wheeler Street
Cambridge, Massachusetts 02143
(617) 492-7100

The cost of the multiyear tape is $325 for the period 1976-83; the 1983 single-year tape is $200; and the 1973, 1974, and 1975 tapes are $100 each. A *Data User Guide* has been developed for 1973-83 tape users that documents the compatible code structure utilized in NSF's Integrated Data Base—a 4-survey system of academic institutions' personnel and financial resources devoted to S/E activities, of which this survey is a part. This guide is available at no charge from:

Mr. J. G. Huckenpahler
Division of Science Resources Studies
National Science Foundation
1800 G Street, N.W., Rm. L-602
Washington, D.C. 20550
(202) 634-4673

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NSF FORM 724A (11-82)

OMB No. 3145-0074
Exp. Date: 12/31/83

NATIONAL SCIENCE FOUNDATION
Washington, D.C. 20550

SURVEY OF SCIENTIFIC AND ENGINEERING PERSONNEL EMPLOYED AT UNIVERSITIES AND COLLEGES, JANUARY 1983

Organizations are requested to complete and return this form to:

NATIONAL SCIENCE FOUNDATION
1800 G Street, N.W., Room L-602
Washington, D.C. 20550—Attn: UNISG

This information is solicited under the authority of Section 3 (a) (6) of the National Science Foundation Act of 1950, as amended (42 U.S. Code 1862 (a) (6)). Your response is entirely voluntary and your failure to provide some or all of the information will in no way adversely affect your institution.

Please correct if name or address has changed.

This survey requests scientific and engineering (S/E) employment data according to institutional recordkeeping conventions. **The completed 1983 questionnaire should be returned by March 15, 1983.** Your prompt cooperation will be appreciated. If you determine, however, that you cannot respond by March 15, please notify NSF and request an extension of time.

Please read the enclosed instructions before completing this form. If you have any questions, contact Ms. Judith Coakley or Ms. Esther Gist (202-634-4673). Please complete all columns; estimates by academic officials will be better than NSF estimates.

All entries should be in whole numbers; please do not enter decimals or fractions, except in item 3, columns 2 and 3, where two decimal places are optional.

SURVEY POPULATION

Include data for ALL ORGANIZATIONAL UNITS OF YOUR INSTITUTION THAT EMPLOY SCIENTISTS AND ENGINEERS, such as regional campuses, computer centers, medical schools, agricultural experiment stations, and associated research units. Also include any hospital or clinic owned, operated, or controlled by your university and integrated operationally with the clinical programs of your medical schools.

Federally Funded Research and Development Centers (FFRDC's)

Separate forms have been mailed directly to all FFRDC's administered by academic institutions. A list of these centers appears on page 3 of the Instructions and Definitions.

INSTITUTIONAL CLASSIFICATION

Highest degree granted in the sciences or engineering during 1982-83	Check one	One example of a science or engineering field in which highest degree was awarded	Check primary administrative control of your institution	
Doctor's degree, e.g., Ph.D., D. Eng., or D.E.S.	☐		Federal	☐
First-professional degree, e.g., M.D., D.D.S., D.V.M., etc.	☐		State	☐
Master's degree	☐			
Bachelor's degree	☐		Local	☐
Associate or other 2-year award	☐			
No degrees granted in the sciences or engineering	☐		Private	☐

Item 1.	Total number of scientists and engineers by highest earned degree and employment status: January 1983			
HIGHEST EARNED DEGREE		HEADCOUNTS		
		TOTAL (1)	FULL TIME (2)	PART TIME (3)
a. Doctor's degree, e.g., Ph. D., D. Eng., or D.E.S.	2210			
b. First-professional degree, e.g., M.D., D.D.S., D.V.M., etc.	2220			
c. Master's degree	2230			
d. Bachelor's degree or the equivalent	2240			
e. Total (sum of a through d)	2200			

NOTE: To ensure proper data comparability between item 1, line 2200, and items 2 and 3:

a) Line 2200, column 1 should equal item 3, line 2700, column 1;
b) Line 2200, column 2 should equal item 2, line 2600, column 1;
c) Line 2200, column 3 should equal item 2, line 2600, column 2.

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Item 2.	Total number of scientists and engineers by discipline, sex, and employment status: January 1983						
	S/E DISCIPLINES[1]	HEADCOUNTS					
		TOTAL		MEN		WOMEN	
		Full time	Part time	Full time	Part time	Full time	Part time
		(1)	(2)	(3)	(4)	(5)	(6)
	a. Engineers (total) 2610						
	(1) Aeronautical and astronautical engineers .. 2611						
	(2) Chemical engineers 2612						
	(3) Civil engineers 2613						
	(4) Electrical engineers 2614						
	(5) Mechanical engineers 2615						
	(6) Other engineers 2616						
	b. Physical scientists (total) 2620						
	(1) Astronomers 2621						
	(2) Chemists 2622						
	(3) Physicists 2623						
	(4) Other physical scientists . 2624						
	c. Environ. scientists (total) 2630						
	(1) Atmospheric scientists ... 2631						
	(2) Earth scientists 2632						
	(3) Oceanographers 2633						
	(4) Other environ. sci. 2634						
	d. Mathematical and computer scientists (total) 2640						
	(1) Mathematicians (exclude computer scientists) 2641						
	(2) Computer scientists (exclude programmers) .. 2642						
	e. Life scientists (total) 2650						
	(1) Agricultural scientists 2651						
	(2) Biological scientists 2652						
	(3) Medical scientists (see instructions, p. 4) 2653						
	(4) Other life scientists 2654						
	f. Psychologists (total) 2660						
	g. Social scientists (total) (exclude historians) 2670						
	(1) Economists 2671						
	(2) Political scientists 2672						
	(3) Sociologists 2673						
	(4) Other social scientists 2674						
	h. Total (sum of a thru g) 2600						

PLEASE EXCLUDE from your response any employees in the fields of education, law, humanities, music, the arts, physical education, library science, and all other nonscience fields.

[1]See enclosed Crosswalk between NSF's S/E disciplines and the codes in the NCES Classification of Instructional Programs.

Item 3.	Total number of scientists and engineers by discipline, estimated full-time equivalents, and R&D activity: January 1983				
	S/E Disciplines	Total headcounts[1]	Estimated full-time-equivalents (FTE's)		
			Total FTE's[2]	FTE's devoted to separately budgeted R&D[3]	
				Number	Percent (optional)[4]
	a. Engineers (total) 2710				%
	(1) Aeronautical and astronautical engineers 2711				%
	(2) Chemical engineers 2712				%
	(3) Civil engineers 2713				%
	(4) Electrical engineers 2714				%
	(5) Mechanical engineers 2715				%
	(6) Other engineers 2716				%
	b. Physical scientists (total) 2620				%
	(1) Astronomers 2621				%
	(2) Chemists 2722				%
	(3) Physicists 2723				%
	(4) Other physical scientists 2724				%
	c. Environmental scientists (total) 2730				%
	(1) Atmospheric scientists 2731				%
	(2) Earth scientists 2732				%
	(3) Oceanographers 2733				%
	(4) Other environmental scientists 2734				%
	d. Mathematical and computer scientists (total) 2740				%
	(1) Mathematicians (exclude computer scientists) 2741				%
	(2) Computer scientists (exclude programmers) 2742				%
	e. Life scientists (total) 2750				%
	(1) Agricultural scientists 2751				%
	(2) Biological scientists 2752				%
	(3) Medical scientists (see instructions, p. 4) 2753				%
	(4) Other life scientists 2754				%
	f. Psychologists (total) 2760				%
	g. Social scientists (total) (exclude historians) 2770				%
	(1) Economists 2771				%
	(2) Political scientists 2772				%
	(3) Sociologists 2773				%
	(4) Other social scientists 2774				%
	h. Total (sum of a thru g) 2700				%

[1]Line 2700, column 1, should equal item 1, line 2200, column 1.

[2]Include all activities, e.g., teaching, separately budgeted R&D, etc., of all individuals reported in column 1.

[3]See section B in Instructions for definition of "separately budgeted R&D expenditures."

[4]Column 4 has been provided for the convenience of those institutions that estimate the number (column 3) of FTE's devoted to separately budgeted R&D activities by use of a percentage (column 4) in each discipline.

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CHECK LIST

( ) 1. Are all entries rounded to whole numbers? Please do not enter fractions or decimals, except in columns 2 and 3 where two decimal places are optional.

( ) 2. Do the data add to subtotals?

( ) 3. Are all columns completed? YOUR estimates will be better than OURS. An explanation of estimates may be noted on a separate sheet or in the REMARKS.

( ) 4. Are all branches and components such as medical school, computer center, agricultural experiment station, and associated research units included?

( ) 5. Have you INCLUDED all postdoctorates?

( ) 6. Have you EXCLUDED graduate students?

1982-83 DATA CHECK

(For your convenience)

Please compare your January 1982 survey response with your survey response for January 1983, particularly for the totals. Please explain below or on a separate sheet any significant changes. Where possible, indicate any required adjustments in data reported in previous years.

	1982	1983
Total full-time scientists and engineers	Line 2600, column 1.	Line 2600, column 1.
Total part-time scientists and engineers	Line 2600, column 2.	Line 2600, column 2.
Total FTE's	Line 2700, column 2.	Line 2700, column 2.
Total FTE's in R&D	Line 2700, column 3.	Line 2700, column 3.

CONFIDENTIALITY

The National Science Foundation recognizes that its ability to gather much of the enclosed information would be severely impaired if it could not be held in confidence. Please indicate below the number of any items that you would not supply unless assured that the source is held confidential. The Foundation will hold in confidence such information to the extent permitted by law.

ITEM:

REMARKS

What methods and source records were used for estimating separately budgeted R&D effort?

Please indicate problems encountered in estimating R&D-related activity.

Please circle the month that your institutional data represent to reflect academic year 1982-83 employment.

1 2 3 4 5 6 7 8 9 10 11 12

Are there any significant changes in data reported in previous years?

How many person-hours were required to complete this form? ☐

PLEASE TYPE OR PRINT NAME OF PERSON SUBMITTING THIS FORM	TITLE	AREA CODE	EXCH	NO.	EXT.
NAME OF PERSON WHO PREPARED THIS SUBMISSION (If different from above)	TITLE	AREA CODE	EXCH	NO.	EXT.

NAME OF INSTITUTION	DATE	ADDRESS (number, street, city, State, ZIP code)

NSF FORM 724B (11-82)

OMB No. 3145-0074
Exp. Date: 12/31/83

NATIONAL SCIENCE FOUNDATION
Washington, D.C. 20550

SURVEY OF SCIENTIFIC AND ENGINEERING PERSONNEL EMPLOYED AT UNIVERSITIES AND COLLEGES, JANUARY 1983
INSTRUCTIONS AND DEFINITIONS

Introduction

This information is solicited under the authority of the National Science Foundation Act of 1950, as amended in P.L. 507 (42 U.S.C. 1862) (Section 3(a) (6)], and Executive Order 10521 (March 17, 1954). All information you provide will be used for statistical purposes only. Your response is entirely voluntary and your failure to provide some or all of the information will in no way adversely affect your institution.

The National Science Foundation requests your cooperation in completing the attached questionnaire covering the characteristics of personnel in your institution as they relate to the sciences and engineering. This form requests employment data in 1982-83 according to institutional recordkeeping coventions. The questionnaire should be completed and returned to NSF by March 15, 1983. If you determine, however, that you will not be able to respond by that date, please notify NSF and request an extension of time.

Where data you report in the current survey differ significantly from those reported in the previous survey, please indicate the reasons for the difference, such as "opening of new medical school," etc., at the end of the questionnaire in the "Remarks" section, or on a separate sheet of paper.

The survey procedures are outlined in flow chart format. **(See pp. 5-8.)**

If you have any questions regarding information requested on this form, write or telephone Ms. Judith Coakley or Ms. Esther Gist at the Universities and Nonprofit Institutions Studies Group, Division of Science Resources Studies, National Science Foundation, 1800 G Street, N.W., Room L-602, Washington, D.C. 20550 (Telephone: (202) 634-4673.) Additional forms, as well as copies of previous responses, may be obtained by writing to the above address.

Survey Instructions

1. Survey Population

This survey, conducted annually, covers professional employment at all academic institutions with a science or engineering (S/E) program. The institutional response to this survey should reflect personnel activity in all branches and other units of the parent institution, including regional campuses, computer centers, medical schools, agricultural experiment stations, and associated research units. If any data for any of these campuses are not included in your response to NSF, please indicate this under "Remarks" when submitting your questionnaire.

Federally funded research and development centers (FFRDC's) are to report their data separately from the administering university; see the listing of FFRDC's administered by academic institutions (p. 3.)

2. Survey Time Period

The January date referenced in this questionnaire reflects the midpoint of the 1982-83 academic year rather than the actual reporting date of data to be compiled for NSF. Data reported on this survey are to reflect a "snapshot" of S/E personnel employed at a fixed time during the 1982-83 academic year. For institutions reporting on the basis of central record systems, data should reflect the date when your files are "frozen" for annual personnel reports. Many institutions, especially those with State affiliation, use their central records compiled in the preceding fall of each year to report to NSF. You may want to report as of the payroll period closest to October 1, 1982, which is the basis for the Equal Employment Opportunity Commission's survey of higher education staff (EEO-6, Form 221). Please indicate the reporting month used by your institution in the space provided in the "Remarks" section.

3. Professional Employment

The term "professional," for purposes of this survey, refers to all persons paid a salary or stipend by the responding institution who work at a level at which the knowledge acquired by academic training equal to a bachelor's degree in science or engineering is essential in the performance of duties. Many institutions with central reporting systems use headcounts of exempt employees, i.e., those employees who are in the exempt category of the Fair Labor Standards Act as amended. Exempt employees are not eligible for overtime payment. Others use EEO-6 concepts.

Include: S/E personnel with faculty status, postdoctorates,[1] and other professional employees such as systems analysts in computer centers.

Exclude: (1) Personnel on sabbatical or other leave status even if these personnel continue to be paid by your institution; (2) personnel employed in branches of your institution located in foreign countries; (3) unpaid voluntary staff; (4) persons "unpaid" by the university but paid by the medical school; (5) student health service personnel; (6) those agricultural extension personnel primarily involved in home economics and 4-H youth programs; (7) administrative officers above the level of department chairpersons with titles such as president, academic dean, dean of faculty, provost, chancellor, etc., even though they may devote part of their time to teaching and/or research; (8) all graduate students.

[1]Some institutions without comprehensive central records on the number of postdoctorates base their response to this survey on data gathered in the office of the graduate dean as part of NSF's Survey of Graduate Science and Engineering Students and Postdoctorates.

4. Assignment of Scientists and Engineers to NSF Disciplines

Determination of whether professional employees should be reported in the NSF personnel survey as "scientists and engineers" and their associated disciplines is done by most respondents on the basis of departmental structures. After particular departments are selected for inclusion in the NSF personnel survey, respondents usually classify headcounts of all professional employees into various S/E disciplines according to their primary or home department of assignment. Where individual assignments are split into two departments on a 50-percent basis, classification into a single NSF discipline should be made according to institutional conventions.

See the classification of Disciplines of Employment in the Sciences and Engineering, for the broad and detailed S/E disciplines of employment corresponding to those shown on the questionnaire, with illustrative categories of each discipline (pages 3 and 4.) Also, for those that use the NCES instructional program categories, see the enclosed "Crosswalk" between NSF's S/E fields and the codes in the NCES Classifications of Instructional Programs (NCES 81-323). Please note that education, law, humanities, music, the arts, physical education, and library science are not considered S/E disciplines for the purpose of this survey. This discipline-oriented taxonomy is used by institutions that compile their own departmental groupings for this NSF survey. While most respondents report S/E headcounts based on departmental structures, NSF recognizes that because of the multidisciplinary nature of many academic activities, degree specialties and departmental assignments may differ (e.g., a Ph.D. in mechanical engineering may be assigned to the department of orthopedics.) To promote ease of reporting and consistency of data among institutions, it is suggested that where these differences are not significant, all professionals in the department be assigned to a single discipline. In other instances, where sizable differences occur, institutional respondents may choose to report professionals employed in a single department into two or more disciplines. For example, an institution may have a single department of electrical engineering and computer science and report individuals into two separate disciplines on the NSF personnel survey according to their degree specialties.

It is important that respondents include in the survey scientists and engineers who are appointed to organizational units that are not part of any academic department. For example, scientists and engineers employed at a computer center that is not affiliated with a particular academic department should be included in the survey. In a similar manner an economist in a nonscience department should be reported. The most prevalent reporting practice for these nonacademic units is to assign groups of individuals to NSF disciplines according to their degree specialties, especially when multidisciplinary activities are prominent.

5. Medical and Clinical Disciplines

For purposes of this survey, all M.D.'s, D.D.S.'s, etc., with faculty or academic appointments are to be reported, including postdoctorates. NSF considers faculty status given to physicians, dentists, public health specialists, pharmacists, etc., to be an indicator of significant involvement in teaching, clinical investigation, or other R&D activities.

Exclude: (1) All medical practitioners, such as nurse anesthetists, occupational therapists, physical therapists, interns; (2) scientists or engineers whose primary employment is at independent hospitals even though they may perform some teaching or research functions for your institution through cooperative agreements; (3) unpaid voluntary staff at medical or dental schools; and (4) medical residents unless research training under the supervision of a senior mentor is the prime purpose of the appointment.

6. Questionnaire Item 1, Highest Earned Degree and Headcounts

a. Highest earned degree information is most commonly available in personnel, payroll, or budget files. Most academic institutions have a computerized system for updating highest earned degree data for professionals. If these files at your institution do not contain degree data, however, these data may be estimated using departmental records.

For purposes of this survey, earned degrees are classified in four categories:

(1) Under "Doctorate Degree" include earned degrees carrying the title of Doctor, e.g., Ph.D., D. Eng., D.E.S., etc; include individuals holding both the Ph.D. degree and any other doctorate degree.

(2) Under "First-Professional Degree" include individuals whose highest earned degrees, e.g., M.D., D.D.S., D.V.M., etc., are first-professional medical degrees that represent the completion of the academic requirements based on programs that require at least 2 academic years of previous college work for entrance and require a total of at least 6 academic years of college work for completion. Specifically include in line 2h first-professional degrees in Medicine (M.D.), Dentistry (D.D.S. or D.M.D.), Veterinary Medicine (D.V.M.), Podiatric Medicine (D.P.M.) and Osteopathic Medicine (D.O.). Individuals holding both the Ph.D. degree and a first-professional degree such as the M.D., should be included in line 2a as mentioned in (1) above.

(3) Under "Master's Degree" include earned degrees carrying the title of Master that are above the bachelor's degree and are other-than-doctorate or first-professional degrees reported in lines 2a and 2b.

(4) Under "Bachelor's degree or the equivalent" include all individuals who have successfully completed a baccalaureate program of studies, usually requiring at least 4 years (or equivalent) of full-time college level study. For the purpose of this survey, 5-year bachelor's degree holders may be included in this category, as well as those who are considered to have the equivalent in experience, even if they have not earned such as degree.

b. *Headcounts*

(1) *Full-time* employees are those individuals available for full-time assignments at the date used for reporting in this survey, or those who are designated as "full time" in an official contract, appointment, or agreement. Determination of "full-time" designation should be based on institutional recordkeeping conventions and standards. Avoid double counting; if, for example, individuals are full-time employees but their assignments involve more than one department or campus, they should be counted as one full-time employee according to their primary or home department of assignment (or campus).

(2) *Part-time* employees are those individuals who work for a length of time in a day, week, etc., defined by your institution as part-time employment.

7. Questionnaire Item 2, Sex of Full- and Part-time Scientists and Engineers

Item 2 collects data on the sex of full- and part-time scientists and engineers, characteristics which are usually available in central records. Computer programs used to respond to other requests for employment data on women may often be modified to provide specialized information on scientists and engineers.

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8. *Questionnaire Item 3, Full-Time-Equivalents (FTE's)*

a. The FTE reporting concept should reflect the actual utilization of S/E professionals in various disciplines and their involvement in separately budgeted R&D activities. While headcounts are usually reported on the basis of primory department of assignment, FTE reporting in various NSF disciplines should reflect multiple appointments. **For example, an individual with a 60-percent appointment in electrical engineering and a 40-percent appointment in computer science would be reported in FTE's in two NSF disciplines according to the 60-40 percent split in departmental assignments.** Accordingly, the FTE concept converts the number of persons with part-time or split appointments among various disciplines or activities to an equivalent number of full-time persons, in accordance with institutionally agreed upon conventions. The number of FTE's reported in column 2 of item 3 should be equal to or greater than the number of full-time employees in any given field, using decimals (proportion of 1.00) for part-time employees. Therefore, the number of FTE's would be equal to or less than the total headcount in any field, and equal to or greater than the number of full-time employees.

The procedures used to compile FTE data vary from institution to institution, depending largely on the records available. Generally, there are two categories of records available to institutions—budgeting information describing the allocation of personnel resources and/or data reflecting actual rather than planned utilization of the resources.

In converting S/E headcounts into FTE's, the following method is suggested:

(1) Categorize headcounts of all exempt employees in S/E departments, medical schools, agricultural experiment stations, research institutes, and other institutional organizational units into one of the NSF disciplines according to primary assignment;

(2) Within each discipline, differentiate employees as being either full time or part time (according to institutional practices);

(3) Calculate the full-time equivalents of full-time S/E personnel. Use budgetary or resource utilization records to report S/E employees with split appointments between departments and/or institutional units, and distribute these data according to appropriate NSF disciplines.

(4) Calculate the full-time equivalents of part-time S/E personnel and merge them into appropriate NSF disciplines.

b. *Full-Time-Equivalents in Research and Development (R&D)*

For purposes of this survey, report only the full-time-equivalent involvement of persons engaged in *separately budgeted* reseorch and development.

R&D activities are systematic, intensive studies directed toward fuller knowledge of the subject studied. R&D is the same as "organized research" as defined in OMB Circular A-21 revised, July 23, 1982. It includes all R&D activities of an institution that are *seporately budgeted and accounted for*. R&D includes both "sponsored research" activities (sponsored by Federal or non-Federal agencies and organizations) and "university research" (separately budgeted under an internal application of institutional funds).

Exclude: Time spent by professional employees on departmental research that is not separately budgeted, training grants, public service grants, demonstration projects, etc.

Estimating the division of time allocated or spent by individuals in separately budgeted R&D programs is difficult for many institutions. Again, procedures used to supply these data vary among institutions and the extent to which central reporting is feasible depends, by and large, on the degree to which budget/personnel/financial records are mechanized and linked. Among the procedures used by various institutions are the following:

(1) Using some generally held criteria at the institutional or departmental levels (i.e., three-fourths for instruction, one-fourth for research);

(2) Estimating separately budgeted R&D involvement or assignment obtained from payroll records, personnel records, or from employee contracts (i.e., salaries paid from separately budgeted R&D funds may be compared with total academic salaries of individuals);

(3) Asking research administrators, department chairpersons, or heads of other organizational units to furnish estimates of separately budgeted R&D involvement.

(4) Using faculty activity analyses in institutions where these are regularly conducted, and differentiating separately budgeted R&D activity from departmental research activity.

Federally Funded Research and Development Centers (FFRDC's)

For purposes of this survey, FFRDC's are defined as R&D organizations exclusively or substantially financed by the Federal Government and administered on a contractual basis by educational institutions or other organizations. The following is a current list of FFRDC's administered by universities and colleges:

Ames Laboratory
Argonne National Laboratory
Brookhaven National Laboratory
Center for Naval Analyses
Cerro Tololo Inter-American Observatory
E. O. Lawrence Berkeley Laboratory
E. O. Lawrence Livermore Laboratory
Fermi National Accelerator Laboratory
Jet Propulsion Laboratory
Kitt Peak National Observatory
Lincoln Laboratory
Los Alamos Scientific Laboratory
National Astronomy and Ionosphere Center
National Center for Atmospheric Research
National Radio Astronomy Observatory
Oak Ridge Institute of Nuclear Studies
Plasma Physics Laboratory
Sacramento Peak Observatory
Stanford Linear Accelerator Center

Classification of disciplines of Employment in the Sciences and Engineering. Illustrative subfields include:

ENGINEERING

Aeronautical & Astronomical: aerodynamics, aerospace, space technology.

Chemical: ceramic, petroleum, petroleum refining process.

Civil: architectural, hydraulic, hydrologic, marine, sanitary and environmental, structural, transportation.

Electrical: communication, electronic, power.

Mechanical: engineering mechanics.

Other Engineering: agricultural, industrial and management, metallurgical and materials, mining, nuclear, ocean engineering systems, textile, welding.

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PHYSICAL SCIENCES

Astronomy: laboratory astrophysics, optical astronomy, radio astronomy, theoretical astrophysics, X-ray, gamma-ray, neutrino astronomy.

Chemistry: analytical, inorganic, organo-metallic, organic, pharmaceutical, physical, polymer science (exclude biochemistry).

Physics: acoustics, atomic and molecular, condensed matter, elementary particles, nuclear structure, optics, plasma.

Other Physical Sciences: used for multidisciplinary fields within physical sciences.

ENVIRONMENTAL SCIENCES (TERRESTRIAL AND EXTRATERRESTRIAL)

Atmospheric Sciences: aeronomy, solar, weather modification, extraterrestrial atmospheres, meteorology.

Earth Sciences: engineering geophysics, general geology, geodesy and gravity, geomagnetism, hydrology, inorganic geochemistry, isotopic geochemistry, organic geochemistry, lab geophysics, paleomagnetism, paleontology, physical geography and cartography, seismology.

Oceanography: biological oceanography, chemical oceanography, geological oceanography, physical oceanography, marine geophysics.

Other Environmental Sciences: used for multidisciplinary fields within environmental sciences.

MATHEMATICAL AND COMPUTER SCIENCES

Mathematics: algebra, analysis, applied mathematics, foundations and logic, geometry, numerical analysis, statistics, topology.

Computer Sciences: computer programming,[2] computer and information sciences (general), design, development, and application of computer capabilities to data storage and manipulation, information sciences and systems, systems analysis.

LIFE SCIENCES

Agricultural Sciences: agronomy, animal science, dairy science, food science and technology, forestry, horticulture, poultry science.

[2]Personnel employed as computer programmers should not be reported as professionals.

Biological Sciences: anatomy, bacteriology, biochemistry, biogeography, biophysics, ecology, embryology, entomology, evolutionary biology, genetics, immunology, microbiology, nutrition and metabolism, parasitology, pathology, pharmacology, physical anthropology, physiology, plant sciences, radiobiology, systematics, zoology, veterinary biology.

Medical Sciences: internal medicine, neurology, ophthalmology, preventive medicine and public health, psychiatry, radiology, surgery, veterinary medicine,[3] dentistry, pharmacy, podiatry, anesthesiology, chemotherapy, dermatology, geriatrics, nuclear medicine, obstetrics, gynecology, oncology, pediatrics, physical medicine and rehabilitation.

Other Life Sciences: all other health-related disciplines.[4]

PSYCHOLOGY

Psychology: animal behavior, clinical psychology, comparative psychology, counseling, and guidance, development and personality, educational, personnel, vocational psychology and testing, experimental psychology, ethology, industrial and engineering psychology, social psychology.

SOCIAL SCIENCES

Economics: econometrics and economics statistics, history of economic thought, international economics, industrial, labor and agricultural economics, macroeconomics, microeconomics, public finance and fiscal policy, theory, economic systems and development.

Political Science: regional studies, comparative government, history of political ideas, international relations and law, national, political and legal systems, political theory, public administration.

Sociology: comparative and historical, complex organizations, culture and social structure, demography, group interactions, social problems and social welfare, sociology theory.

Other Social Sciences: cultural anthropology, criminology, history of science, linguistics, socioeconomic geography, urban studies.

[3]Institutions with schools of veterinary medicine should distribute professionals among the appropriate disciplines (agricultural, biological, and medical) rather than report all personnel as medical scientists.

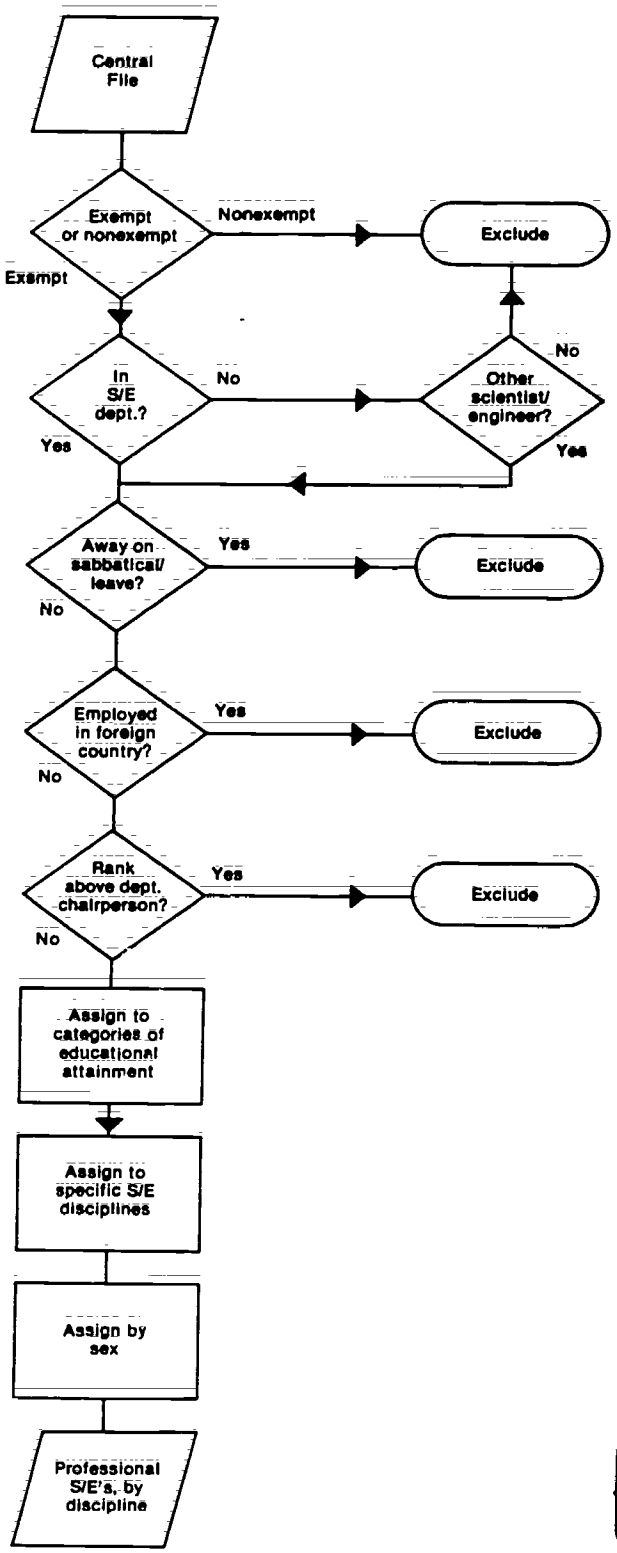
[4]*Exclude* personnel primarily involved in direct patient care.

NOTE: See enclosed NSF Crosswalk between NSF field of S/E codes and the NCES Classification of Instructional Programs.

30

Flow Charts

Institutions that automate NSF survey data or plan to—or even engage in manual data processing—may be assisted by these charts.



STEP 1:

Retrieve, sort, and select information from central records of institution.

Central File: Contains centralized records for all paid employees. (Note: Some affiliated entities such as medical schools may have their own central files. See below.) Examples: Personnel, payroll, or general financial records.

Select personnel exempt from Fair Labor Standards Act. (See section 3 in Instructions.)

Select scientists and engineers (include postdoctorates) by "home" department. Exception: if "home" department is not science or engineering, and person holds joint appointment in S/E department.

See section 3 in Instructions.

See section 3 in Instructions.

See section 3 in Instructions.

See section 6 in Instructions.

Assign to appropriate disciplines.

See section 7 in Instructions.

At this point you have extracted file containing all professional scientists and engineers covered by central records (but may be limited to those assigned to academic S/E departments in the institution proper).

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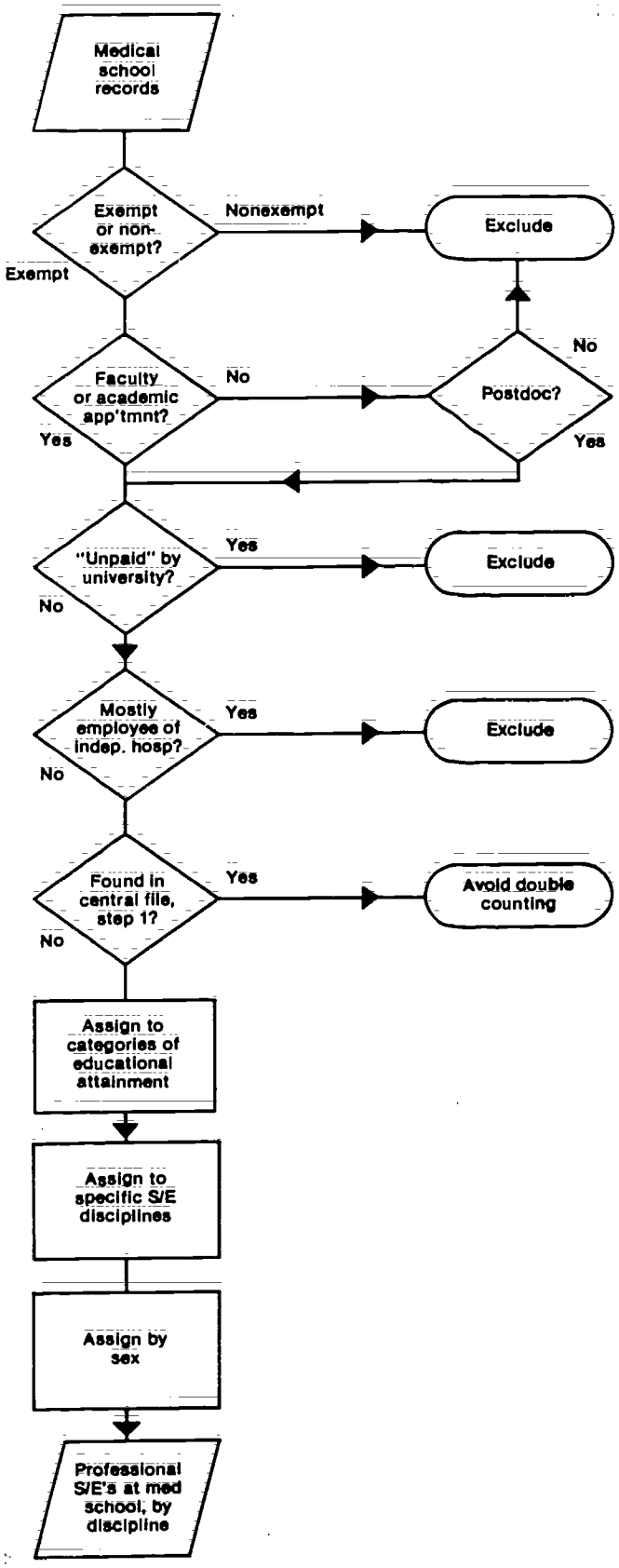
STEP 2:

Collect information for medical school (if any) if not covered by central file of institution.



Refer to discussion of medical schools (section 5 in Instructions).

Select personnel exempt from Fair Labor Standards Act. (See section 3 in Instructions.)

Do not include medical school personnel unless they have faculty or academic appointments. Exceptions: postdoctorates. (See section 5 in Instructions.)

Exclude personnel "unpaid" by the university even if paid by the medical school. Exclude voluntary staff.

Scientists whose primary employment is at independent hospitals are to be excluded even if they perform teaching/research for your institution through cooperative agreements.

Some individuals may be included in both the institution's central records and the medical school records. Count such persons only once, but keep track of split assignments for FTE figures, below.

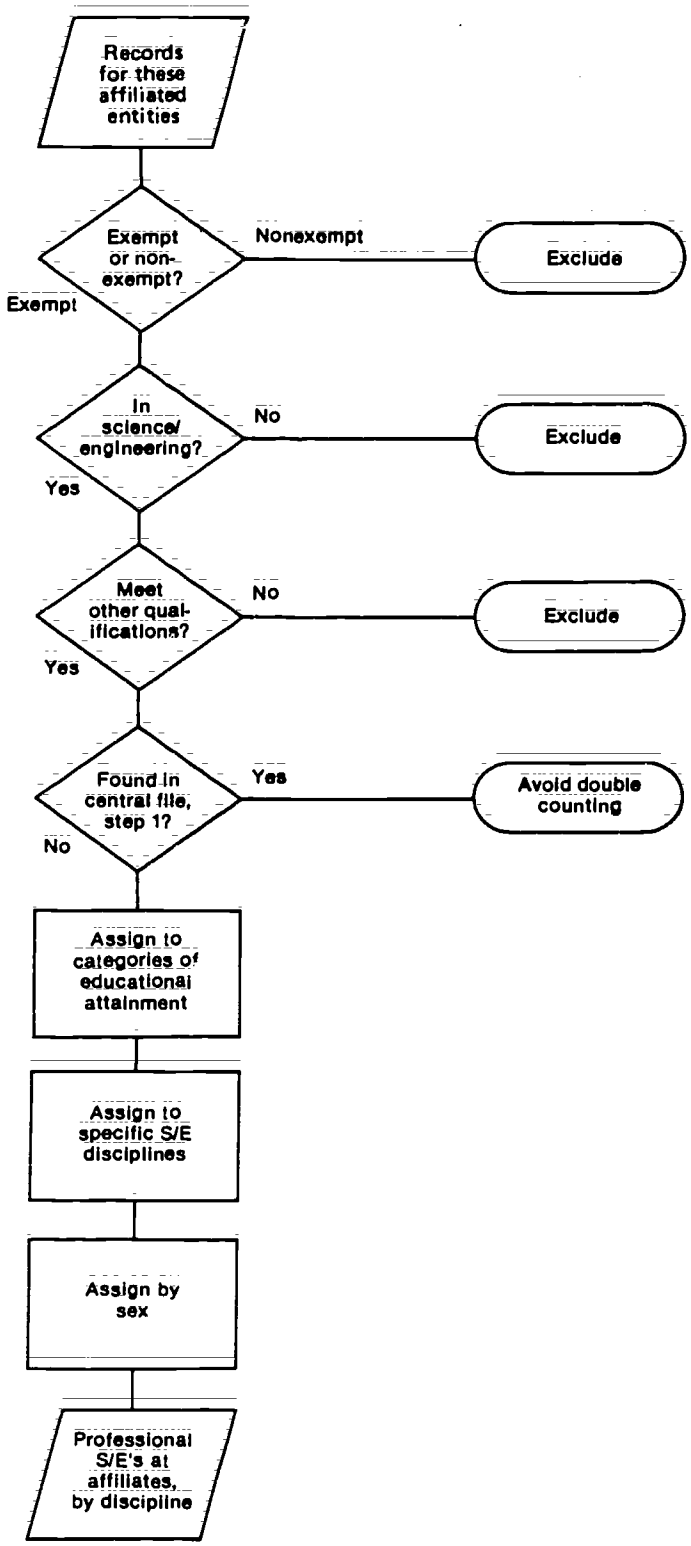
(See section 6 in Instructions.

Assign to appropriate disciplines.

See section 7 in Instructions.

STEP 3:

Collect information on any remaining affiliated entities not covered by files already processed. Such entities might include a regional campus, a computer center, an agricultural experiment station or an associated research unit (except for FFRDC's), etc. Also check for postdoctorates not included in central files (see footnote to section 3 in Instructions.)



{ See section 1 in Instructions.

{ Select personnel exempt from Fair Labor Standards Act. (See section 3 in Instructions.)

{ See discussions in sections 3 and 4 in Instructions.

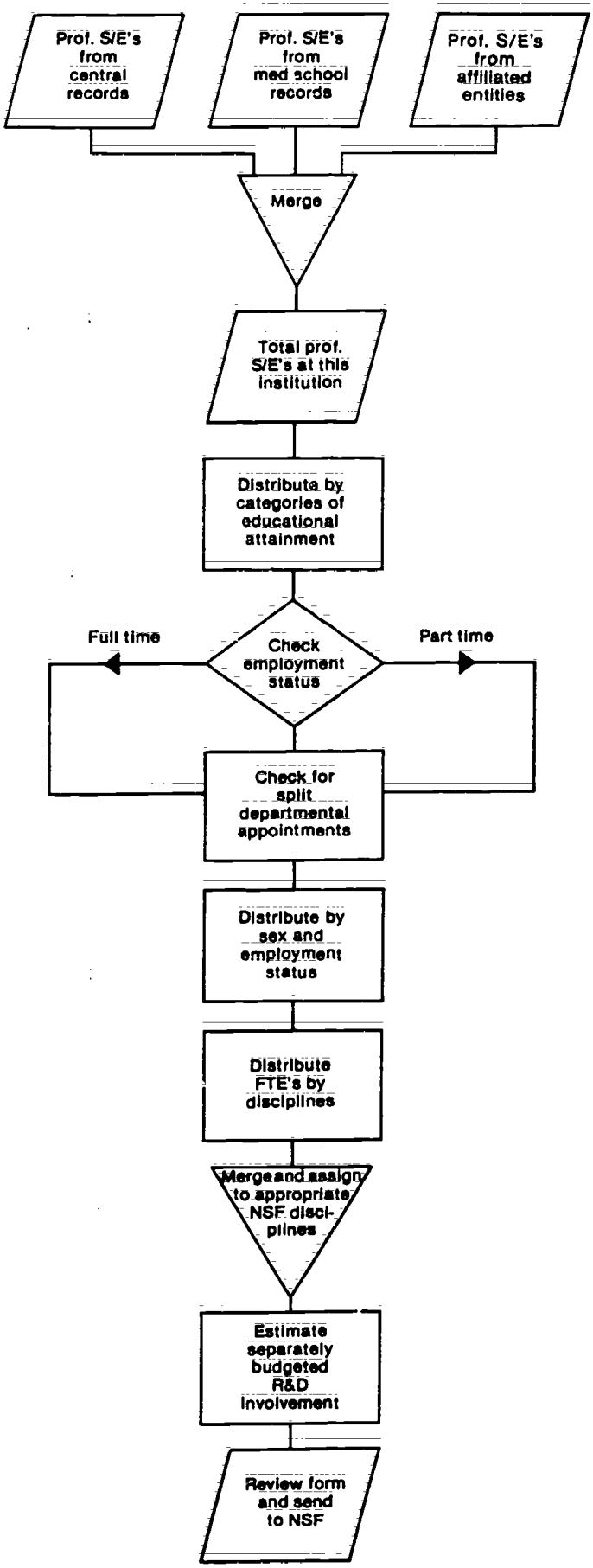
{ Note exclusions listed in section 3 in Instructions (e.g., exclude personnel away on sabbatical and voluntary staff.)

{ Some individuals may be included in both the institution's central records and the affiliated entity's files (e.g., a person teaching at both the main and a regional campus). Only count such persons once, but keep track of split assignments for FTE figures. below.

{ See section 6 in Instructions.

{ Assign to appropriate disciplines.

{ See section 7 in Instructions.



STEP 4:

Merge all extracted information, compute full-time-equivalents in each discipline for both full-time and part-time personnel, and determine extent of separately budgeted R&D involvement.

If duplicate entries have not already been eliminated, it may be convenient to do so at this stage.

Data required for item 1 have now been collected.

Use institutional definition for "part-time" employees. (See also discussion of "full time" in section 6 in Instructions.)

FULL TIME: Check for personnel assignments which are split across several disciplines. (See section 8 in Instructions.)

PART TIME: Use institutional conventions or practices to convert numbers of part-time personnel to the equivalent number of full-time individuals in each discipline. (See section 8 in Instructions.)

Data required for item 2 have now been collected.

For all personnel, determine the proportion of time spent in separately budgeted R&D programs. Use institution's conventions or data from faculty activity analyses, salaries paid from research funds, etc. (See section 8 in Instructions.)

Data required for item 3 have now been collected.

recent science and engineering graduates

purpose and background

The purpose of this periodic survey is to compile national statistics describing the employment and educational characteristics of baccalaureate- and master's-degree level scientists and engineers graduating *after* the decennial censuses in 1970 and 1980. As indicated above, the Survey of Experienced Scientists and Engineers biennially collects data about the "stock" of people who were *already at work in 1970* or 1980. These data, however, would become increasingly inaccurate with passing time unless the "new entrants" into the Nation's science and engineering (S/E) population were added to reflect the "birth" process in that stock. Thus, the Survey of Recent Science and Engineering Graduates is part of a continuing effort to trace the changing nature of "new entrants" to the S/E labor force as well as to provide the means by which current national estimates of this population can be made.

Recent doctorate recipients, who are excluded from this survey, are covered by other surveys. See the sections entitled (a) "Doctorate Records File" and (b) "Doctorate Recipients" for the sources of these data.

The initial effort in this series, the 1974 survey, used a sample of entering classes for 1967-69, the presumed source population for 1971-73 baccalaureates. Low response rates required a change in methodology. Subsequent surveys utilized samples drawn from lists of graduates furnished by participating institutions. Under this procedure a sample survey of recent bachelor's- and master's-degree recipients in science and engineering has been conducted periodically since 1976. The 1982 study surveyed the graduating classes of 1980 and 1981.

1982 survey sample

Approximately 27,000 persons who earned bachelor's or master's degrees between July 1979 and June 1981 were surveyed. Samples stratified by discipline were drawn from each of the two years consisting of 9,000 bachelor's-degree recipients and 4,500 master's-degree recipients, for a total of 27,000 individuals. Their names were drawn from lists received from 295 universities and colleges. Among the data collected were: Age, citizenship, sex, ethnicity, education, employment, work activity—including relationship to Federal research and development (R&D) efforts, and salary.

survey instrument

A copy of the 1982 questionnaire is reproduced on the following pages.

references

Characteristics of Recent Science/Engineering Graduates: 1980 (Detailed Statistical Tables) (NSF 82-313), available from NSF and NTIS (PB 82-262478).

Science Resources Studies Highlights, "Employment of Recent Science and Engineering (S/E) Graduates in S/E Fields Increased" (NSF 82-320), available from NSF.

Employment Attributes of Recent Science/Engineering Graduates (NSF 80-325), available from NSF, GPO, and NTIS (PB 81-188088).

INSTITUTE FOR SURVEY RESEARCH
TEMPLE UNIVERSITY
-Of The Commonwealth System Of Higher Education-
PHILADELPHIA, PENNSYLVANIA 19122

STUDY #518-305-01
FALL/WINTER 1982

OMB No.: 3145-0032
Expires: December 1983

1982 SURVEY OF SCIENCE AND ENGINEERING GRADUATES

NATIONAL SCIENCE FOUNDATION
AND
U.S. DEPARTMENT OF ENERGY

This information is solicited under the authority of the National Science Foundation Act of 1950, as amended. All information you provide will be treated as confidential and will be used for statistical purposes only. Information will be released only in the form of statistical summaries from which it will be impossible to identify any particular person. Your response is entirely voluntary and failure to provide some or all of the requested information will not in any way adversely affect you.

NAME: _____

ADDRESS: _____

_____

TELEPHONE: ( ) _____

DEGREE AND EMPLOYMENT SPECIALTY LIST

Agriculture

803 Agricultural economics
013 Agronomy
014 Animal, dairy, poultry, sciences
015 Farm and range management
016 Fish, game and wildlife management
017 Food sciences
018 Forestry and related sciences
019 Horticulture
020 Natural resources management
021 Soil science
090 Agricultural sciences, other

Biological Sciences

211 Anatomy, histology
213 Biochemistry
214 Biophysics
215 Botany
221 Cell and molecular biology
216 Entomology
226 Embryology
217 Genetics
218 Immunology
219 Marine biology
220 Microbiology, bacteriology
227 Neurosciences
222 Nutrition
228 Parasitology
223 Pathology, human, animal, plant
224 Physiology, human, animal, plant
229 Radiobiology
230 Toxicology
225 Zoology
290 Biological sciences, other

Education

413 Biological sciences education
414 Engineering education
417 Mathematics education
421 Physical sciences education
425 Social science education
490 Education, other

Engineering

511 Aerospace, aeronautical, astronautical
512 Agricultural
513 Architectural
514 Bioengineering and biomedical engineering
515 Chemical
516 Civil, construction, and transportation
723 Computer
517 Electrical, electronic, and communication
529 Engineering science
519 Environmental and sanitary
520 Geological
521 Industrial
530 Materials
522 Mechanical
523 Metallurgical
524 Mining and mineral
525 Naval architecture and marine
526 Nuclear
531 Ocean
527 Petroleum
751 Operations research/management sciences
590 Engineering, other

Mathematical Sciences

711 Actuarial science
723 Computer sciences
750 Mathematics
751 Operations research/management sciences
713 Statistics
723 Computer and information sciences
780 Mathematics, other

Physical Sciences

720 Astronomy
721 Atmoapheric sciences and meteorology
213 Biochemistry
722 Chemistry
741 Earth sciences and geology
733 Metallurgy
742 Oceanography
731 Physics
790 Physical sciences, other

Social Sciences

811 Anthropology
812 Criminology
813 Economics (except agricultural)
814 Geography
118 Linguistics
817 Political science and government
818 Psychology (except clinical)
821 Sociology
822 Urban studies
890 Other social sciences

Health Sciences

611 Clinical psychology
612 Dentistry
614 Hospital and health care administration
615 Medicine or pre-medicine
616 Nursing
617 Pharmacology
618 Pharmacy
690 Other health areas

Arts, Humanities and Other Specialties

910 Area and ethnic studies
911 Architecture and environmental design
110 Arts and letters, general
310 Business and commerce
115 English and journalism
114 Fine and applied arts
116 Foreign language and literature, all fields
815 History
912 Home economics, all fields
913 Law and prelaw
915 Military science, including merchant marine deck officer
816 Philosophy
819 Religion and theology
820 Social work
999 Other specialties

37

INSTRUCTIONS FOR COMPLETING THIS QUESTIONNAIRE

In constructing this questionnaire we have tried to provide response categories for most answers. If the response categories are not adequate for you to answer a question correctly, please write your answer in the question box. If you are not certain of the correct response, please give us your best estimate or guess.

There are basically two types of questions: the closed-end questions, where response categories have been provided and you are asked to mark a box; and open-end questions, where you are asked to fill in the information sought. In addition, in some of the questions you are asked to fill in "code numbers" either from the list on page 2 or from a preceding question.

An example of each type, with sample answers, is shown below.

1. Do you subscribe to any periodical journals or magazines?

   1. [X] Yes *(GO TO QUESTION 2)*
   2. [ ] NO *(SKIP TO QUESTION 4)*

2. Which of the following journals or magazines do you receive? *(MARK AS MANY AS APPLY)*

   01. [X] Newsweek
   02. [ ] Time
   03. [ ] Life
   04. [X] Science
   05. [X] Scientific American
   06. [X] Other, *Specify:* Smithsonian

3. Which of the journals marked in question 2 most relates to the kind of work you do? *(ENTER THE APPROPRIATE CODE NUMBER FROM QUESTION 2)*

   [0] [4]

4. What professional society or association do you belong to?

   National Association of Mechanical Engineers

Please answer all the questions that apply to you and follow directions which may ask you to skip certain questions. In the absence of instructions, always go to the next question. Even if you feel only part of the questionnaire applies to you, or there are some questions you cannot answer, please return the entire questionnaire.

We appreciate your participation and thank you for completing this questionnaire.

PART I. DEMOGRAPHIC CHARACTERISTICS

1. In what month and year were you born? (11-18)

(MONTH) (YEAR)

2. Are you: (12)

1. ☐ Male 2. ☐ Female

3. Are you: (13)

1. ☐ U.S. citizen *(GO TO QUESTION 4)*
2. ☐ Non-U.S. citizen, immigrant (permanent resident)
3. ☐ Non-U.S. citizen, nonimmigrant (temporary resident)

3a. If non-U.S. citizen, of which country are you a citizen?

(COUNTRY)

4. Are you: (14)

1. ☐ American Indian or Alaskan Native
2. ☐ Asian or Pacific Islander
3. ☐ Black
4. ☐ White
5. ☐ Other, *please specify:*

5. Are you of Spanish/Hispanic origin or descent? (17)

1. ☐ Yes → 2. ☐ Mexican-American, 3. ☐ Puerto Rican, 4. ☐ Other Hispanic
5. ☐ No

6. As of May 9, 1982, were you: (18)

1. ☐ Married 2. ☐ Widowed
3. ☐ Separated 4. ☐ Divorced
5. ☐ Never married

7. As of May 9, 1982, did you have any children living with you? (19)

1. ☐ Yes → 2. ☐ Under 6 years of age, 3. ☐ 6-17 years of age
4. ☐ No

8. Are you physically handicapped? (20)

1. ☐ Yes *(GO TO QUESTION 9)*
2. ☐ No *(SKIP TO QUESTION 10)*

9. What is the nature of your handicap(s)? *(MARK AS MANY AS APPLY)* (21)

1. ☐ Visual 2. ☐ Ambulatory
4. ☐ Auditory 8. ☐ Other, *specify:*

10. Are you a student, currently attending a college or university? (23)

1. ☐ Yes → 2. ☐ Student, full-time, 3. ☐ Student, part-time
4. ☐ No

In the next section (Question 11) beginning with the most recent and working back, list on the appropriate line each institution beyond the high school level from which you have obtained or are obtaining formal training leading to an academic degree.

Designate degrees by abbreviations, for example, AA, BA, MA, MS, Ph.D., LLB, MD, etc. Use a separate line for each degree granted or worked for, or for any change in major field of specialized study. Refer to the list on page 2 for the code number and the description of major fields. Do NOT include correspondence courses, on-the-job training, apprenticeship, or training at an employer's training school.

If you need more space, attach a separate sheet of paper and give the same type of information for each additional school listed.

39

PART II. EDUCATION AND TRAINING

(11a.) College, university or other post high school institution	(b.) Type of degree worked for, if any (BA, MA, etc.)	(c.) Year degree awarded	(d.) Major field *(ENTER CODE AND DESCRIPTION FROM LIST ON PAGE 2)*
MOST RECENT: 24 *(NAME)* *(CITY)* *(STATE OR FOREIGN COUNTRY)*	28 *(DEGREE)* OR ☐ None	30 *19*____ OR ☐ None	32 *(CODE)* *(DESCRIPTION)*
SECOND TO LAST: 35 *(NAME)* *(CITY)* *(STATE OR FOREIGN COUNTRY)*	39 *(DEGREE)* OR ☐ None	41 *19*____ OR ☐ None	43 *(CODE)* *(DESCRIPTION)*
THIRD TO LAST: 46 *(NAME)* *(CITY)* *(STATE OR FOREIGN COUNTRY)*	50 *(DEGREE)* OR ☐ None	52 *19*____ OR ☐ None	54 *(CODE)* *(DESCRIPTION)*
FOURTH TO LAST: 57 *(NAME)* *(CITY)* *(STATE OR FOREIGN COUNTRY)*	61 *(DEGREE)* OR ☐ None	63 *19*____ OR ☐ None	65 *(CODE)* *(DESCRIPTION)*
FIFTH TO LAST: 68 *(NAME)* *(CITY)* *(STATE OR FOREIGN COUNTRY)*	72 *(DEGREE)* OR ☐ None	74 *19*____ OR ☐ None	76 *(CODE)* *(DESCRIPTION)*

PART III. EMPLOYMENT STATUS

12. During the week of May 9, 1982, were you: 2/8

1. ☐ Working full-time (35 hours or more at least in one position) *(SKIP TO QUESTION 16)*
2. ☐ Working part-time *(GO TO QUESTION 13)*
3. ☐ Not working, but seeking work *(SKIP TO PART IV ON PAGE 7)*
4. ☐ Not working and not seeking work *(SKIP TO QUESTION 14)*

13. Were you seeking full-time work? 9

1. ☐ Yes
2. ☐ No

(SKIP TO QUESTION 16)

14. Did you look for work at any time during the three weeks prior to the week of May 9, 1982; that is, between April 18 and May 8, 1982? 10

1. ☐ Yes 2. ☐ No

15. What was the main reason you were not working or not seeking work during the week of May 9, 1982? 11

(MARK ONLY ONE BOX)

1. ☐ On layoff from a job
2. ☐ On vacation or otherwise temporarily absent from a job for health or personal reasons

(GO TO QUESTION 16)

3. ☐ Retired
4. ☐ Student
5. ☐ Family responsibilities
6. ☐ Chronic illness or permanent disability
7. ☐ Could not find work or believed no jobs available in my particular field
8. ☐ Did not want to work
9. ☐ New job to begin within 30 days
10. ☐ Waiting for school to begin
11. ☐ Other, *please specify:*

(SKIP TO PART IV ON PAGE 7)

16. During the week of May 9, 1982, were you working at (or on layoff or temporarily absent from) a position related to the natural sciences, social sciences, or engineering? 13

1. ☐ Yes *(SKIP TO PART IV ON PAGE 7)*
2. ☐ No *(GO TO QUESTION 17)*

17. What was the most important reason for taking that position? 14

(MARK ONLY ONE BOX)

1. ☐ Preferred nonscience or nonengineering position
2. ☐ Promoted out of science or engineering position
3. ☐ Pay was better in nonscience or nonengineering position
4. ☐ Locational preference
5. ☐ Science or engineering position not available
6. ☐ Other reason, *please specify:*

41

PART IV. EMPLOYMENT PROFILE

☐ *If you have never been employed, nor self-employed, please mark this box and SKIP TO QUESTION 39. Otherwise, CONTINUE with the instructions below.*

In this part of the questionnaire, we are asking questions about the job you held during the week of May 9, 1982, or your most recent job before May 9. Please include any employment, including a military service job, not only a scientific or technical job. If you had more than one regular job during the week of May 9, record the one which you consider your principal employment.

16

18. For whom did you work? What is the name of the company, business or the government agency you worked for?

_____

Check here if self-employed ☐

19

19. Where were you employed, that is, in what city, county and state?

_____ *(CITY OR TOWN)* _____ *(COUNTY)* _____ *(STATE OR FOREIGN COUNTRY)*

25

20. Which of the categories below best describes the type of organization of your principal employment or post-doctoral appointment? *(MARK ONLY ONE BOX)*

- 01 ☐ Self-employed
- 02 ☐ Business or industry
- 03 ☐ Junior college, 2-year college, technical institute
- 04 ☐ Medical school
- 05 ☐ 4-year college or university, other than medical school
- 06 ☐ Elementary or secondary school system
- 07 ☐ Hospital or clinic
- 08 ☐ Nonprofit organization, other than hospital, clinic or educational institution
- 09 ☐ U.S. military service, active duty, or Commissioned Corps, such as USPHS, NOAA, etc.
- 10 ☐ U.S. Government, civilian employee
- 11 ☐ State government
- 12 ☐ Local or other government *(SPECIFY)*: _____
- 13 ☐ International agency
- 14 ☐ Other *(SPECIFY)*: _____

27

21. If you had more than one job during the week of May 9, 1982, enter the category from the above list that is most appropriate for your second job.
(ENTER THE APPROPRIATE CODE NUMBER, 01-14, FROM Q. 20 ABOVE)

☐☐ ☐ Did not have a second job the week of May 9, 1982

22. From the activities listed below, select your primary and secondary work activities for your principal job as reported in question 18, in terms of time devoted for a typical week. 29

(ENTER THE APPROPRIATE CODE NUMBER 01-16 FOR EACH)

☐☐ Primary activity ☐☐ Secondary activity

01 Management or administration of research or development
02 Management or administration of other than research and development
03 Teaching and training - preparing and teaching courses, guiding and counseling students or trainees
04 Basic research - that is, study directed toward gaining scientific knowledge primarily for its own sake
05 Applied research - that is, study directed toward gaining scientific knowledge in an effort to meet a recognized need
06 Development - product, process, and technical development. That is, direction of knowledge gained from research toward production of useful materials, devices, systems and methods
07 Report and technical writing, editing, information retrieval
08 Clinical diagnosis
09 Design of equipment, processes, models
10 Quality control, testing, evaluation, or inspection
11 Operations - production, maintenance, construction, installation
12 Distribution - sales, traffic, purchasing, customer and public relations
13 Statistical work - survey work, forecasting, statiatical analysis
14 Consulting
15 Computer applications
16 Other activities *(SPECIFY)*: _____

23. During a typical week in your principal job reported in question 18, what percent of working time do you devote to each of the following activities? 33

(ENTRIES SHOULD TOTAL 100%)

_____% Management & administration

_____% Basic research

_____% Applied research

_____% Development

_____% Teaching

_____% Operations, production

_____% Other

100.0 % TOTAL

24. From the Degree and Employment Specialty List on page 2, select and enter the number and title of the specialty most closely related to your principal employment (reported in question 18) during the week of May 9, 1982. 54

(PLEASE WRITE IN YOUR SPECIALTY IF IT IS NOT ON THE LIST)

Number: ☐☐☐

Title : _____

57

(25.) For your principal job reported in question 18, what is the basic annual salary you currently earn? *(Do not include bonuses, overtime, summer teaching or other payments for secondary jobs)*

$_____.00 per year

☐ Not currently employed at that job.

62

(26.) If academically employed in your principal job, is your salary for:

☐ 9-10 months, OR ☐ 11-12 months?

63

(27.) What was your total professional income in 1981 including basic annual salary, bonuses, overtime, summer teaching, consulting fees, etc.?

$_____.00 per year

☐ None

68

(28.) What was your basic annual salary in 1981 from the principal job you held longest, excluding bonuses, overtime, summer teaching, consulting fees, etc.?

$_____.00 per year

☐ None

73

(29.) During the week of May 9, 1982, was any of your work at your principal job supported by U.S. Government funds?

1. ☐ Yes → *(GO TO QUESTION 30)*
2. ☐ No
3. ☐ Don't know → *(SKIP TO Q. 31)*

3/8

(30.) Which of the following agencies or departments were supporting your work? *(MARK AS MANY AS APPLY)*

1. ☐ AID--Agency for International Development
2. ☐ Department of Agriculture
3. ☐ Department of Commerce
4. ☐ Department of Defense
5. ☐ Department of Energy
6. ☐ Department of Education (NIE, OE, NCES)
7. ☐ Department of Health and Human Services (DHHS old HEW)
8. ☐ Department of Housing and Urban Development (HUD)
9. ☐ Department of the Interior
10. ☐ Department of Justice
11. ☐ Department of Labor (DOL)
12. ☐ Department of Transportation
13. ☐ EPA--Environmental Protection Agency
14. ☐ NASA--National Aeronautics and Space Administration
15. ☐ NSF--National Science Foundation
16. ☐ Nuclear Regulatory Commission
17. ☐ Other, *specify:* _____
18. ☐ Don't know source agency

26

(31.) The following list contains selected areas of national interest. Indicate the one area to which you devote(d) the most professional time during a typical week at the job reported in question 18.

1. ☐ Energy and fuel *(GO TO Q. 32)*
2. ☐ Health
3. ☐ Environment
4. ☐ Education
   - ☐ Teaching
   - ☐ Other education
5. ☐ National defense
6. ☐ Crime prevention and control
7. ☐ Food production and technology
8. ☐ Other mineral resources
9. ☐ Community development and service
10. ☐ Housing (planning, design, construction)
11. ☐ None of the above

(SKIP TO QUESTION 36)

28

(32.) What is your best estimate of the percent of your professional time that you devote(d) to energy and fuel during a typical week?

1. ☐ 100 percent
2. ☐ 75 to 99 percent
3. ☐ 50 to 74 percent
4. ☐ 25 to 49 percent
5. ☐ 24 percent or less

29

(33.) From the list below, indicate the one energy source that involves(d) the largest proportion of your energy-related work during a typical week.

1. ☐ Coal and coal products
2. ☐ Petroleum (including oil shale and tar sands) or natural gas
3. ☐ Fission
4. ☐ Fusion
5. ☐ Hydroenergy
6. ☐ Direct solar (including space and water heating, thermal, electric)
7. ☐ Indirect solar (winds, tides, biomass, etc.)
8. ☐ Geothermal
9. ☐ Other, *specify:* _____

31

(34.) From the list of energy-related activities below indicate the item(s) that best describe the activity(ies) in which you were engaged during a typical week.
(MARK AS MANY AS APPLY)

1. ☐ Exploration
2. ☐ Extraction (gas, oil, mining)
3. ☐ Manufacture of energy-related components or products
4. ☐ Fuel processing (including refining and enriching)
5. ☐ Electric power generation
6. ☐ Transportation, transmission, distribution of fuel or energy
7. ☐ Energy storage
8. ☐ Energy utilization, management
9. ☐ Fuel reprocessing or disposal
10. ☐ Energy conservation
11. ☐ Environmental impact (health, economic, etc.)
12. ☐ Education, training
13. ☐ Other, *specify:* _____

44

(35.) From the list in question 34, enter the number of the activity that best describes the one in which you spend(t) most of your energy-related time.
(ENTER THE APPROPRIATE CODE NUMBER 01-13, FROM Q. 34)

☐☐

PART V. OTHER INFORMATION

46

(36.) During calendar year 1981, how many weeks:

a) did you work, including paid vacation, paid sick leave, and military service? _____

b) were you without a job, but looking for work; or on layoff from a job? _____

c) were you not working, not seeking work, and not on layoff from a job? _____

TOTAL = 52 weeks

52

(37.) How many years of professional work experience, including teaching, do you have?

_____ Year(s) or ☐ None

54

(38.) Since age 22, have you had any periods of at least one year's duration when you were neither employed, nor looking for work, nor attending school full-time?
(DO NOT INCLUDE TIME IN ARMED FORCES)

1. ☐ Yes, a total of _____ year(s).
2. ☐ No

56

(39.) Using the list on page 2, complete the following statement:

"Based on my total education and experience, I regard myself professionally as a (an).....

_____"

CODE: ☐☐☐

59

(40.) Are you currently a member of a national professional society or association?

1. ☐ Yes → 2. ☐ No

Specify organization(s): _____

_____

_____

_____

60

(41.) Are you currently professionally licensed, certified, or registered? For example, do you have a teaching certificate, a medical license or a professional society certification, etc.?

1. ☐ Yes → 2. ☐ No

Specify title(s): _____

_____

_____

(42.) So that we can contact you in the event it is necessary to clarify some of the information you provide, please give the telephone number on which you can be reached.

_____ _____
(AREA CODE) *(NUMBER)*

If there is an alternate number on which you can be reached, enter it also.

_____ _____
(AREA CODE) *(NUMBER)*

61

(43.) Date completed:

_____ _____ _____
(MONTH) *(DAY)* *(YEAR)*

THANK YOU FOR COMPLETING THIS QUESTIONNAIRE. PLEASE RETURN THE COMPLETED FORM IN THE ENCLOSED POSTAGE-PAID ENVELOPE TO:

INSTITUTE FOR SURVEY RESEARCH
TEMPLE UNIVERSITY - 083-046
1601 N. BROAD STREET
PHILADELPHIA, PA 19122

doctorate records file

survey of earned doctorates awarded in the united states

purpose and background

The Doctorate Records File is a virtually complete listing of the 725,000 recipients of earned doctorates awarded by U.S. universities since 1920. The file includes research doctorates in all fields, but excludes professional (clinical) degrees such as M.D., D.D.S., or D.V.M.

The record for each doctorate recipient includes basic information of interest to policy analysts, planners, and others in the Federal Government, the general educational community, and employers. The major data categories are sociodemographic characteristics, education, and postgraduation plans. Sociodemographic characteristics include items such as date and place of birth, sex, marital status, citizenship, racial or ethnic group, cation of parents, and number of dependents. Educational information includes State and date of high school graduation, colleges attended with dates, fields of study and degrees, title of dissertation and field, and kind and sources of support during graduate study. Postgraduation plans include information on further education or employment. Many items of information, however, are available only since 1957 or, for racial or ethnic data, since 1973.

The Doctorate Records File is compiled from an annual survey (Survey of Earned Doctorates Awarded in the United States) conducted by the National Academy of Sciences under Federal sponsorship of the National Science Foundation (NSF) and other Federal agencies. The questionnaire is distributed with the cooperation of deans of graduate schools. Each survey requests information from all new recipients of the Ph. D. or equivalent degree (e.g., Ed.D.). The response rate to the questionnaire has been approximately 95 percent. Nonrespondents are individually represented in the Doctorate Records File by skeleton entries obtainable from commencement programs, graduation lists, and other similar public records. It is important to note that file entries for all early Ph. D.'s (1920-57 inclusive) were developed from commencement programs and similar sources rather than from questionnaire responses of individuals.

survey instrument

A copy of the 1983 survey instrument is reproduced on the following pages.

references

The most recent NSF reports based on the data cited above are

Science and Engineering Doctorates: 1960-82 (NSF 83-309), available from NSF and NTIS (PB 83-225599).

Science Resources Studies Highlights, "1982 Doctorate Production Was Stable in Science and Engineering Fields, But Down in Science and Mathematics Education" (NSF 83-330), available from NSF.

Science Resources Studies Highlights, "Science/Engineering Doctorate Production Increases in 1981; More New Doctorates Seek Nonacademic Positions" (NSF 82-323), available from NSF.

Foreign Participation in U.S. Science and Engineering Higher Education and Labor Markets (NSF 81-316), available from NSF and NTIS (PB 82-262452).

Summary data from each survey since 1967 are also available in a series of annual publications issued by the National Academy of Sciences (NAS), *Summary Report—Doctorate Recipients from U.S. Universities.*

data access

Additional data in the form of lists, tabulations, and computer tapes are available subject to the limitations of the Privacy Act. Information on the availability of data and costs may be obtained from:

Mr. Peter D. Syverson
National Academy of Sciences
2101 Constitution Ave., N.W.
Washington, D.C. 20418
(202) 334-3161

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Form Approved
OMB No. 3145-0019
Approval Expires 1/85

SURVEY OF EARNED DOCTORATES
AWARDED IN
THE UNITED STATES, 1982-83

Conducted by
The Commission on Human Resources of
the National Research Council
in Cooperation with
The American Council of Learned Societies,
The Social Science Research Council,
The Council of Graduate Schools in the United States,
and Other Graduate Deans

Supported by
The National Science Foundation,
The Department of Education,
The National Endowment for the Humanities, and
The National Institutes of Health

To the Doctoral Candidate:

This is a brief description of the Survey of Earned Doctorates indicating how the resulting data are used and how the individual confidentiality of data is protected. The basic purpose of this survey is to gather objective data about doctoral graduates; data that are important in improving graduate education both at your home institution and at a national level. Often, decisions by federal, state, and private agencies to develop new programs or support present ones are based in part on the data developed by this survey. We ask your cooperation with the project.

The information requested on the accompanying questionnaire is largely self-explanatory. Please complete it, detach it along the perforated line, and return it to your Graduate Dean. On the back of this sheet is a Specialties List with code numbers and titles for classifying your fields of specialization. This will be useful in connection with several items on the questionnaire. If none of the detailed fields listed seems to be appropriate, note the "General" and "Other" categories.

What is the Survey of Earned Doctorates?

The survey form is distributed annually with the cooperation of the Graduate Deans and filled out by all graduates who have completed requirements for their doctoral degrees. Research doctorates in all fields are included, but professional degrees such as the MD, DDS, and DVM are not included because information about recipients of those degrees is compiled elsewhere. The cumulative file goes back to 1920 and is called the Doctorate Records File.

The use of the doctoral data has been increasing, partly because of the implications for graduate education stemming from the change in the growth pattern of the number of persons receiving doctorates (562 in 1920; 3,278 in 1940; 9,735 in 1960; 29,497 in 1970; peaking at 33,727 in 1973; and now at 31,319 in 1981). This survey attempts to supply some of the information as of the time the doctorate is received.

What uses are made of the Survey data?

The data collected by this survey questionnaire become part of the Doctorate Records File maintained by the Commission on Human Resources of the National Research Council. In addition, all data collected will be provided to the National Science Foundation, the National Endowment for the Humanities, the National Institutes of Health, and the Department of Education. The Survey data are collected with the intention that they will be put to use, but only under carefully defined conditions. Such data as the number of degrees awarded in each field of specialization, the educational preparation of degree recipients, their sources of financial support, the length of time required to attain the degree, and postdoctoral employment plans of doctorate recipients are of great interest to graduate schools, employers, the scholarly community, and the nation generally. The Doctorate Records File is used for a limited number of carefully defined follow-up research studies. Each year a sample of doctorate recipients is selected for inclusion in a longitudinal research file maintained for the National Science Foundation, the National Institutes of Health, and the National Endowment for the Humanities. It is anticipated that in the future, as in the past, participation in the follow-up studies will be voluntary.

Statistical summaries from the Doctorate Records File are used by educational institutions, professional societies, and government agencies. Some specific examples are:

- An extensive statistical summary of the data is published and distributed to all graduate schools about every five years.[1] These reports have been widely used by graduate schools and states to evaluate their progress in providing doctoral education. The data may also be useful to graduate students as an aid in selecting a graduate department.
- Annual reports containing statistical summaries based on the most recent year's Survey are distributed to graduate schools, government agencies, and any others on request.[2]

The confidentiality of Survey data is carefully protected.

This information is solicited under the authority of the National Science Foundation Act of 1950, as amended in P.L. 507 (42 U.S.C. 186) Section 3(a)(6); and Executive Order 10521 (March 17, 1954). Within the extent provided by law, all information you provide will be treated as confidential, will be safeguarded in accordance with the provisions of the Privacy Act of 1974, and will be used for statistical purposes only. Information will be released only in the form of statistical summaries or in a form which does not identify information about any particular person. There are only two exceptions to this policy: (1) information (name, year, and field of degree) is released to institutions from which you received degrees and to other organizations as part of the address search procedure for follow-up research studies; and (2) information from your form will be made available to the institution where you receive your doctorate degree and to the National Science Foundation, the National Endowment for the Humanities, the National Institutes of Health, and the Department of Education. Your response is entirely voluntary and your failure to provide some or all of the information will in no way affect you.

(1) National Academy of Sciences, *A Century of Doctorates — Data Analyses of Growth and Change*, Washington, D.C. 1978.
(2) National Academy of Sciences, *Summary Report 1981; Doctorate Recipients from United States Universities*, Washington, D.C. 1982.

SPECIALTIES LIST

Instructions: The following field listing is to be used in responding to items 12, 13, 20b, and 21c. If a field marked with an asterisk (*) is chosen in item 12 or 13, please write in your field of specialization in the space provided.

AGRICULTURE

000 Agricultural Economics

005 Animal Breeding & Genetics
010 Animal Nutrition
019 Animal Sciences, Other*

020 Agronomy
025 Plant Breeding & Genetics
030 Plant Path. (See also 120)
039 Plant Sciences, Other*

040 Food Sciences
045 Soil Sciences
050 Horticulture Science
055 Fisheries Sciences
060 Wildlife Management
065 Forestry Science

098 Agriculture, General
099 Agriculture, Other*

BIOLOGICAL SCIENCES

100 Biochemistry
105 Biophysics

110 Bacteriology
115 Plant Genetics
120 Plant Path. (See also 030)
125 Plant Physiology
129 Botany, Other*

130 Anatomy
133 Biometrics & Biostatistics
136 Cell Biology
139 Ecology
142 Embryology
145 Endocrinology
148 Entomology
151 Immunology
154 Molecular Biology
157 Microbiology
160 Neurosciences
163 Nutritional Sciences
169 Toxicology

170 Human & Animal Genetics
175 Human & Animal Pathology
180 Human & Animal Pharmacology
185 Human & Animal Physiology
189 Zoology, Other*

198 Biological Sciences, General
199 Biological Sciences, Other*

HEALTH SCIENCES

200 Audiology & Speech Pathology
210 Environmental Health
220 Epidemiology
230 Nursing
240 Pharmacy
250 Veterinary Medicine
298 Health Sciences, General
299 Health Sciences, Other*

ENGINEERING

300 Aerospace, Aeronautical & Astronautical
303 Agricultural
306 Bioengineering & Biomedical
309 Ceramic
312 Chemical
315 Civil
318 Communications
321 Computer
324 Electrical, Electronics
327 Engineering Mechanics
330 Engineering Physics
333 Engineering Science
336 Environmental Health Engin.
339 Industrial
342 Materials Science
345 Mechanical
348 Metallurgical
351 Mining & Mineral
354 Naval Arch. & Marine Engin.
357 Nuclear
360 Ocean
363 Operations Research (See also 465, 930)
366 Petroleum
369 Polymer
372 Systems
398 Engineering, General
399 Engineering, Other*

COMPUTER AND INFORMATION SCIENCES

400 Computer Sciences*
410 Information Sci. & Systems*

MATHEMATICS

420 Applied Mathematics
425 Algebra
430 Analysis & Functional Anal.
435 Geometry
440 Logic (See also 785)
445 Number Theory
450 Probability & Math. Statistics (See also 690)
455 Topology
460 Computing Theory & Practice
465 Operations Research (See also 363, 930)
498 Mathematics, General
499 Mathematics, Other*

PHYSICAL SCIENCES

Astronomy

500 Astronomy
505 Astrophysics

Atmospheric & Meteorological Sciences

510 Atmospheric Physics & Chem.
512 Atmospheric Dynamics
514 Meteorology
518 Atmos. & Meteorol. Sci., Gen.
519 Atmos. & Meteorol. Sci., Other*

Chemistry

520 Analytical
522 Inorganic
524 Nuclear
526 Organic
528 Pharmaceutical
530 Physical
532 Polymer
534 Theoretical
538 Chemistry, General
539 Chemistry, Other*

Geological Sciences

540 Geology
542 Geochemistry
544 Geophysics & Seismology
546 Paleontology
548 Mineralogy, Petrology
550 Stratigraphy, Sedimentation
552 Geomorphology & Glacial Geology
554 Applied Geology
558 Geological Sciences, General
559 Geological Sciences, Other*

Physics

560 Acoustics
561 Atomic & Molecular
562 Electron
564 Elementary Particle
566 Fluids
568 Nuclear
569 Optics
570 Plasma
572 Polymer
574 Solid State
578 Physics, General
579 Physics, Other*

Other Physical Sciences

580 Environmental Sciences
585 Hydrology & Water Resources
590 Oceanography
595 Marine Sciences
599 Physical Sciences, Other*

PSYCHOLOGY

600 Clinical
603 Cognitive
606 Comparative
609 Counseling
612 Developmental
615 Experimental
618 Educational
621 Industrial & Organizational (See also 935)
624 Personality
627 Physiological
630 Psychometrics
633 Quantitative
636 School (See also 825)
639 Social
648 Psychology, General
649 Psychology, Other*

SOCIAL SCIENCES

650 Anthropology
652 Area Studies
658 Criminology
662 Demography
666 Economics
668 Econometrics
670 Geography
674 International Relations
678 Political Sci. & Government
682 Public Policy Studies
686 Sociology
690 Statistics (See also 450)
694 Urban Studies
698 Social Sciences, General
699 Social Sciences, Other*

HUMANITIES

History

700 History, American
705 History, European
710 History of Science
718 History, General
719 History, Other*

Letters

720 Classics
723 Comparative Literature
726 English Language
729 Linguistics
732 Literature, American
733 Literature, English
736 Speech & Debate
738 Letters, General
739 Letters, Other*

Foreign Languages and Literature

740 French
743 German
746 Italian
749 Spanish
752 Russian
755 Slavic (other than Russian)
758 Chinese
762 Japanese
765 Hebrew
768 Arabic
769 Other Languages*

Other Humanities

770 American Studies
773 Archeology
776 Art History & Criticism
780 Music
785 Philosophy (See also 440)
790 Religion (See also 984)
795 Theatre
798 Humanities, General
799 Humanities, Other*

EDUCATION

800 Curriculum & Instruction
805 Educ. Admin. & Superv.
810 Educational Media
815 Educ. Stat. & Research
820 Educ. Testing, Eval. & Meas.
825 School Psych. (See also 636)
830 Social Foundations
835 Special Education
840 Student Counseling & Personnel Services
845 Higher Education

Teacher Education

850 Pre-elementary
852 Elementary
854 Junior High
856 Secondary
858 Adult & Continuing

Teaching Fields

860 Agricultural Educ.
861 Art Educ.
862 Business Educ.
864 English Educ.
866 Foreign Languages Educ.
868 Health Educ.
870 Home Economics Educ.
872 Industrial Arts Educ.
874 Mathematics Educ.
876 Music Educ.
878 Nursing Educ.
880 Physical Educ.
882 Reading Educ.
884 Science Educ.
885 Social Science Educ.
886 Speech Educ.
888 Trade & Industrial Educ.
889 Teacher & Educ. Specific Subject Areas, Other*

898 Education, General
899 Education, Other*

PROFESSIONAL FIELDS

Business & Management

900 Accounting
905 Banking & Finance
910 Business Admin. & Management
915 Business Economics
920 Marketing Mngmnt. & Research
925 Business Statistics
930 Operations Research (See also 363, 465)
935 Organiz. Beh. (See also 621)
938 Business & Mngmnt., General
939 Business & Mngmnt., Other*

Communications

940 Communications Research
945 Journalism
950 Radio & Television
958 Communications, General
959 Communications, Other*

Other Professional Fields

960 Architec. & Environ. Design
964 Home Economics
968 Law
972 Library & Archival Science
976 Public Administration
980 Social Work
984 Theology (See also 790)
988 Professional Fields, General
989 Professional Fields, Other*

999 OTHER FIELDS*

SURVEY OF EARNED DOCTORATES, 1982-83

OMB No. 3145-0019
Approval Expires 1/85

This form is to be returned to the GRADUATE DEAN, for forwarding to: Commission on Human Resources
National Research Council
2101 Constitution Avenue, Washington, D. C. 20418

Please print or type.

1. Name in full: (Last Name) (First Name) (Middle Name) (9-30)

Cross Reference: Maiden name or former name legally changed

2. Permanent address through which you could always be reached: (Care of, if applicable)

(Number) (Street) (City)

(State) (Zip Code) (Or Country if not U.S.)

3. U.S. Social Security Number: — — — – — — – — — — (33-41)

4. Date of birth: (10-14) (Month) (Day) (Year) Place of birth: (15-16) (State) (Or Country if not U.S.)

5. Sex: 1 ☐ Male 2 ☐ Female (17)

6. Marital status: 1 ☐ Married 2 ☐ Not married (including widowed, divorced) (18)

7. Citizenship: 0 ☐ U.S. native 2 ☐ Non-U.S., Immigrant (Permanent Resident)
1 ☐ U.S. naturalized 3 ☐ Non-U.S., Non-Immigrant (Temporary Resident) (19)
If Non-U.S., indicate country of present citizenship (20-21)

8. What is your racial background? (Check only one) 0 ☐ American Indian or Alaskan Native 2 ☐ Black
1 ☐ Asian or Pacific Islander 3 ☐ White (22)

9a. Is your ethnic heritage Hispanic? ☐ Yes ☐ No (23)

9b. If yes, is it: 0 ☐ Mexican American 1 ☐ Puerto Rican 2 ☐ Other Hispanic (24)

10. Number of dependents: ..... Do not include yourself. (Dependent = someone receiving at least one half of his or her support from you) (25)

EDUCATION

11. Location of high school last attended: (State) (or country if not U.S.) (26-27)

Year of graduation from high school: (28-29)

12. List in the table below all collegiate and graduate institutions you have attended including 2-year colleges. List chronologically, and include your doctoral institution as the last entry.

Institution Name	Location	Years Attended From	Years Attended To	Major Field Use Specialties List Name	Major Field Use Specialties List Number	Degree (if any) Title of Degree	Degree (if any) Granted Mo.	Degree (if any) Granted Yr.

13. Enter below the title of your doctoral dissertation and the most appropriate classification number and field. If a project report or a musical or literary composition (not a dissertation) is a degree requirement, please check box. ☐ (12)

Title

Classify using Specialties List

Number Name of field

14. Name the department (or interdisciplinary committee, center, institute, etc.) and school or college of the university which supervised your doctoral program: (Department/Institute/Committee/Program) (School)

15. Name of your adviser for dissertation, project report or music/literary composition: (Last Name) (First Name) (Middle Initial)

continued on next page

16. Please enter a "1" beside your primary source of support during graduate study. Enter a "2" beside your secondary source of support during graduate study. Check (✓) all other sources from which support was received.

a — NSF Fellowship
b — NSF Traineeship
c — NIH Fellowship
d — NIH Traineeship
e — NDEA Fellowship
f — Title IX Graduate & Professional Opportunities Pgm. Fellowship
g — Other HEW
h — AEC/ERDA/DOE Fellowship
i — GI Bill
k — Other Federal support (specify) .....
l — Woodrow Wilson Fellowship
m — Other U.S. national (non-federal) fellowship (specify) .....
n — University Fellowship
o — Teaching Assistantship
p — Research Assistantship
q — Educational fund of industrial or business firm
r — Other institutional funds (specify) .....
s — Own earnings
t — Spouse's earnings
u — Family contributions
v — Loans (NDSL, direct)
w — Other loans
x — Other (specify) ..... (26-49)

17a. Please check the category which most fully describes your status during the year immediately preceding the doctorate.

0 ☐ Full-time employed (Go to Item "17b")
1 ☐ Held fellowship
2 ☐ Held assistantship
3 ☐ Part-time employed
4 ☐ Not employed
5 ☐ Other (specify) .....

17b. If full-time employed, what type of position did you hold?

6 ☐ College or university, faculty
7 ☐ College or university, non-faculty
8 ☐ Elem. or sec. school, teaching
9 ☐ Elem. or sec. school, non-teaching
(11) ☐ Industry or business
(12) ☐ Other (specify) ..... (50)

POSTGRADUATION PLANS

18. What is the status of your current postgraduate plans?

0 ☐ Am returning to, or continuing in, predoctoral employment
1 ☐ Have signed contract or made definite commitment
2 ☐ Am negotiating with one or more specific organizations
3 ☐ Am seeking position but have no specific prospects
4 ☐ Other (specify) ..... (51)

19. What best describes your immediate postgraduate plans?

0 ☐ Postdoctoral fellowship
1 ☐ Postdoctoral research associateship
2 ☐ Traineeship
3 ☐ Other study (specify) .....
} Go to Item "20"

4 ☐ Employment (other than 0, 1, 2, 3)
5 ☐ Military service
6 ☐ Other (specify) ..... (52)
} Go to Item "21"

20. If you plan to have a postdoctoral fellowship, associateship, traineeship, or otherwise undertake further study

A. What was the most important reason for taking a postdoctoral appointment? (Check only one.)

0 ☐ To obtain additional research experience in my doctoral field
1 ☐ To work with a particular scientist or research group
2 ☐ To switch into a different field of research
3 ☐ Could not obtain the desired type of employment position
4 ☐ Other reason (specify) ..... (53)

B. What will be the field of your postdoctoral study?
Please enter number from Specialties List ..... (54-56)

C. What will be the primary source of research support?

0 ☐ U.S. Government
1 ☐ College or university
2 ☐ Private foundation
3 ☐ Nonprofit, other than private foundation
4 ☐ Other (specify) .....
6 ☐ Unknown (57)

Go to Item "22"

21. If you plan to be employed, enter military service, or other—

A. What will be the type of employer?

a ☐ 4-year college or university other than medical school
b ☐ Foreign university
c ☐ Medical school
d ☐ Jr. or community college
e ☐ Elem. or sec. school
f ☐ Foreign government
g ☐ U.S. Federal government
h ☐ U.S. state government
i ☐ U.S. local government
j ☐ Nonprofit organization
k ☐ Industry or business
l ☐ Self-employed
m ☐ Other (specify) ..... (58)

B. Indicate what your *primary* work activity will be with "1" in appropriate box; *secondary* work activity (if any) with "2" in appropriate box.

0 ☐ Research and development
1 ☐ Teaching
2 ☐ Administration
3 ☐ Professional services to individuals
5 ☐ Other (specify) ..... (59-60)

C. In what field will you be working?
Please enter number from Specialties List ..... (61-63)

D. Did you seriously consider undertaking postdoctoral study?
Yes ___ No ___ (64)

If yes, why did you decide against the postdoctoral?

0 ☐ No postdoctoral appointment available
1 ☐ Felt that I would derive little or no benefit from a postdoctoral appointment
2 ☐ Postdoctoral available but stipend inadequate
3 ☐ Had more attractive employment opportunity
4 ☐ Other (specify) ..... (65)

Go to Item "22"

22. What is the name and address of the organization with which you will be associated?

(Name of Organization) .....

(Street) ..... (City, State) ..... (Or Country if not U.S.) (66-71)

BACKGROUND INFORMATION

23. Please indicate, by circling the highest grade attained, the education of

your father:	none	1 2 3 4 5 6 7 8 Elementary school	9 10 11 12 High school	1 2 3 4 College	MA, MD PhD Graduate	Postdoctoral (72)
your mother	none 0	1 2 3 4 5 6 7 8 1 2 3	9 10 11 12 4 5	1 2 3 4 6 7	MA, MD PhD 8 9	Postdoctoral (11) (73)

Signature ..... Date ..... (74-76)

If you would like to receive a summary of the results of this survey, please check box. ☐ (79)

51

survey of graduate science and engineering students and postdoctorates (gssp)

purpose and background

The survey is designed to obtain data on the characteristics of graduate science and engineering (S/E) enrollment at the department level including: Enrollment status (full or part time); level of study (first year or beyond); types and sources of major support of full-time students; number of women studying full time and the primary sources of their support and level of study; number of women studying part time; the total number of foreign graduate students; and the support, citizenship, and sex of postdoctoral appointees.

Thus, the Survey of Graduate Science and Engineering Students and Postdoctorates (GSSP) compiles a factual base for assessing the relationship between financial support patterns and resulting shifts in graduate enrollment and postdoctorates. It provides the only nationally representative data bank on major sources of support of full-time graduate S/E students and their characteristics. Data for the doctorate- and master's-granting institutions are collected on NSF Form 812.

Since 1972 the National Science Foundaton (NSF), in cooperation with the National Institutes of Health (NIH), has conducted the GSSP survey annually to collect data from institutions of higher education, including their medical school affiliates. Originally limited to institutions which grant a doctoral degree in at least one S/E field, the survey was expanded in 1976 to include master's-granting institutions as well.

Between 1965 and 1971, data on the support of graduate S/E students and postdoctorates were collected through institutional applications for NSF traineeships. The NSF-NIH survey, originally called the Survey of Graduate Science Student Support and Postdoctorals, was designed in 1972 to continue the collection of similar data from an expanded universe of graduate departments in all S/E doctorate-granting institutions. Since 1972 the survey universe has been expanded: First, through the addition of all medical schools with graduate programs; second, with the inclusion of all S/E departments in institutions that grant a master's as the highest degree in the sciences and engineering; and third, with the annual addition of newly formed institutions and departments within the scope of the survey. The expansion of coverage to master's-granting institutions was initiated as a parallel survey utilizing an abbreviated form in 1976. For comparison purposes, selected 1975 data variables were collected for these institutions at the same time. The expanded population of doctorate- and master's-granting institutions has been surveyed in parallel since 1977.

For 1978, as part of an NSF experiment with biennial reductions in survey scope to reduce respondent burden, the population was restricted to doctorate-granting institutions and an abbreviated survey instrument was employed. The full population was restored for the succeeding surveys, with a revised full-scale survey form.

The data variables collected over the years have consisted primarily of headcounts of full-time graduate students, with information on sources and mechanisms of their major support (e.g., fellowships, traineeships, research assistantships, or teaching assistantships), sex, level of study (first year or beyond), and citizenship. For graduate students enrolled part time, summary data on sex and racial/ethnic background have been available since 1980. Counts of postdoctorates and nonfaculty research staff have also included source and mechanism of support, sex, and citizenship information.

Beginning in 1982, four items on the characteristics of S/E faculty were added to the survey form on an optional basis: Number of full-time faculty by rank and tenure status; number that were appointed during the preceding year by tenure status; number that departed during the preceding year by reason for departure and tenure status; and number of non-faculty doctoral research staff by number of years since doctorate. Response to these items was light and the results were tabulated by using a separate data file rather than incorporating them in the multiyear tape.

For purposes of an overview, it is useful to think of the questionnaires used over the years as falling into four basic groupings:

- the doctorate-level GSSP prior to 1978;
- the master's-level survey for 1975-77;
- the abbreviated survey of doctorate-granting institutions in 1978; and
- the combined (master's plus doctorate) survey conducted since 1979.
- the addition of faculty characteristics data beginning in 1982 on an optional basis and incorporated in the questionnaire in succeeding years.

Prospective data users must exercise particular care in generating and interpreting any aggregates over all institutions, since some data variables were not collected for all portions of the population in the time series.

references

The most recent NSF reports based on the data cited above are

Academic Science/Engineering: Graduate Enrollment and Support, Fall 1981 (Detailed Statistical Tables) (NSF 83-305),

available from NSF and NTIS (PB 83-226100).

Science Resources Studies Highlights, "Graduate Science/Engineering Enrollment Rose 2% in 1981, Mostly in 'High-Tech' Fields" (NSF 83-310), available from NSF.

data access

Data for the years 1975 through 1982 are currently available on a single multiyear tape. Data for 1972, 1973, and 1974 are available on separate tapes. The data records are sequenced in ascending order by school identification number, departmental identification number, year, and record type. The departmental populations for these years are as follows:

Fall 1972—4,593 Departments in Doctorate-Granting Institutions
Fall 1973—6,571 Departments in Doctorate-Granting Institutions
Fall 1974—7,498 Departments in Doctorate-Granting Institutions; 49 Departments in Master's-Granting Institutions
Fall 1975—7,659 Departments in Doctorate-Granting Institutions; 1,263 Departments in Master's-Granting Institutions
Fall 1976—7,759 Departments in Doctorate-Granting Institutions; 1,299 Departments in Master's-Granting Institutions
Fall 1977—7,988 Departments in Doctorate-Granting Institutions; 1,469 Departments in Master's-Granting Institutions
Fall 1978—8,202 Departments in Doctorate-Granting Institutions; 15 Departments in Master's-Granting Institutions
Fall 1979—8,341 Departments in Doctorate-Granting Institutions; 1,442 Departments in Master's-Granting Institutions
Fall 1980—8,529 Departments in Doctorate-Granting Institutions; 1,396 Departments in Master's-Granting Institutions
Fall 1981—8,448 Departments in Doctorate-Granting Institutions; 1,421 Departments in Master's-Granting Institutions
Fall 1982—8,346 Departments in Doctorate-Granting Institutions; 1,430 Departments in Master's-Granting Institutions

For further information regarding data tape availability or contents, please contact:

Ms. Catherine Joseph
Abt Associates
NSF Surveys
55 Wheeler Street
Cambridge, Massachusetts 02138
(617) 492-7100

The cost of the multiyear tape is $325 for the period 1975-82; the 1982 single-year tape is $200; and the 1972, 1973, and 1974 tapes are $100 each. A *Data User Guide* has been developed for 1972-82 tape users that documents the compatible code structure utilized in NSF's Integrated Data Base—a 4-survey system of academic institutions' personnel and financial resources devoted to S/E activities, of which this survey is a part. A copy of this guide may be obtained at no charge from:

Mr. J. G. Huckenpahler
Division of Science Resources Studies
National Science Foundation
1800 G Street, N.W., Rm. L-602
Washington, D.C. 20550
(202) 634-4673

NSF Form 812. Nov 82

NATIONAL SCIENCE FOUNDATION and NATIONAL INSTITUTES OF HEALTH

Survey of Graduate Science and Engineering (S/E) Students and Postdoctorates, Fall 1982

Form Approved
OMB No. 3145-0062
Appr. Exp. 12/31/83

DEPARTMENTAL DATA SHEET

Before filling out, please read the instructions. Upon completion, return form to your survey coordinator.

1. Name and address of institution: _____

2. Name of science or engineering department (or unit) covered by this data sheet: _____

3. Person in department (or unit) preparing this form:

Name: _____

Title: _____ Phone. ( )

4. Highest degree offered by department in fall 1982 (CHECK ONE ONLY) Doctorate ..... [1] Master's ..... [2] No graduate degree offered ..... [3]

(LEAVE BLANK)
Response code .....
Institution and department code

If your department does not enroll graduate students, please move to item 8 below. For identification of S/E fields classification, see enclosed NSF/NCES "Crosswalk." If data are unavailable or unknown, write "unavailable" or unknown" in the blank. "N/A" means "not applicable" on this form.

5. Number of FULL-TIME GRADUATE S/E STUDENTS enrolled for advanced degrees (master's and doctorate) in fall 1982		STUDENTS RECEIVING FINANCIAL ASSISTANCE								SELF-SUPPORTED STUDENTS (including loans and family sources)	TOTAL FOR ALL SOURCES (Sum of [A] thru [I])
		FEDERAL SOURCES (excluding loans)					NON-FEDERAL SOURCES				
MECHANISMS OF SUPPORT		Department of Defense [A]	HHS: National Institutes of Health [B]	HHS: Other HHS [C]	National Science Foundation [D]	Other Federal sources [E]	Institutional support[1] [F]	Foreign sources [G]	Other U.S. sources[2] [H]	[I]	[J]
Graduate Fellowships	[1]										
Graduate Traineeships	[2]										
Graduate Research Assistantships	[3]										
Graduate Teaching Assistantships	[4]										
Other Types of Support	[5]										
FULL-TIME TOTAL	[6]										
For each total on line [6] how many are WOMEN?	[7]										

FIRST-YEAR STUDENTS	[8]	Of the full-time graduate students on line [6], column [J], how many are FIRST-YEAR students?
FIRST-YEAR WOMEN STUDENTS	[9]	Of the full-time FIRST-YEAR graduate students on line [9], how many are WOMEN?

[1] Include support from this university and State and local governments.

[2] Include support from nonprofit institutions, industry, and all other U.S. sources.

6 NUMBER OF PART-TIME GRADUATE STUDENTS, FALL 1981		
PART-TIME TOTAL	(1)	
Of the part-time total on line (1), how many are WOMEN?	(2)	

Check List

- ☐ 1. Do all entries reflect headcounts and **NOT** FTE's?
- ☐ 2. Do the data in items 5, 7, and 8 add to totals?
- ☐ 3. Have you **included** all self-supported full-time graduate S/E students in item 5, column I? Note that self-supported students should also be included in the total (column J).
- ☐ 4. Have you **excluded** M.D., D.D.S., and D.V.M. candidates, interns, and residents (except those enrolled in joint programs with the Ph.D.) from items 5, 6, and 7?
- ☐ 5. Does item 5, line 6, column J equal item 7, line 1, column H?
- ☐ 6. Does item 6, line 1 equal item 7, line 2, column H?

7. RACIAL/ ETHNIC BACKGROUND	Of the graduate student totals in items 5 and 6, how many belong to the following racial/ethnic categories?		U.S. CITIZENS ONLY: Black non-Hispanic (A)	Amer. Indian/ Alaskan Native (B)	Asian/ Pacific Islander (C)	Hispanic (D)	White non-Hispanic (E)	Other or unknown (F)	FOREIGN (G)	TOTAL (sum of (A) thru (G)) (H)
	Full time (column G should equal item 5, line 6, col. J)	(1)								
	Part time (column G should equal item 6, line 1)	(2)								

Is Racial/Ethnic Background data available at department level?

If not, where available?

8. Number of POSTDOCTORATES and NON-FACULTY DOCTORAL RESEARCH STAFF (Include those affiliated with this department as well as those employed in associated academic research units. Exclude clinical fellows and residents not involved in research.)		POSTDOCTORATES: SOURCE OF SUPPORT: Federal: Fellowships (A)	Federal: Traineeships (B)	Federal: Research grants (C)	Non-Federal (D)	TOTAL for all sources (A) thru (D) (E)	Of the total in (E), how many are FOREIGN? (F)	OTHER NON-FACULTY DOCTORAL RESEARCH STAFF (G)	TOTAL (Sum of (E) and (G)) (H)
TOTAL	(1)								
Of the total on line (1), how many are WOMEN?	(2)								
Optional: Of the total on line (1) how many also hold the M.D., D.D.S., or D.V.M. degree?	(3)								

Approximately how many personhours were required to complete this form? ☐

Please provide comments to explain any variances from prior year's data:

NOTE: This information is solicited under the authority of the National Science Foundation Act of 1950, as amended. All information you provide will be used for statistical purposes only. Your response is entirely voluntary and your failure to provide some or all of the information will in no way adversely affect your institution.

Form Approved
OMB No. 3145-0062
Appr. exp. 12/31/83

OPTIONAL

SURVEY OF GRADUATE SCIENCE AND ENGINEERING STUDENTS AND POSTDOCTORATES, FALL 1982

INSTRUCTIONS

Please complete items 9, 10, and 11 with regard to FULL-TIME SCIENCE/ENGINEERING (S/E) FACULTY only. Include all full-time S/E faculty in your department regardless of whether they instruct graduate or undergraduate students. Please complete item 12 for FULL-TIME S/E NONFACULTY research doctorates only.

9) *RANK AND TENURE STATUS OF FULL-TIME S/E FACULTY.* What academic ranks are held by the full-time S/E faculty of this department? What is their tenure status?

Full-time S/E faculty. Persons with regular full-time appointments. Include all ranks from instructor to professor. Include full-time members of your department who are on sabbatical leave away from your institution. Persons with joint appointments who work part of their time in another department should be treated as follows: Those working more than one-half their time in this department should be included here; those working less than one-half time in this department should be included in the other department; if they work exactly half time in each, please consult with the chairperson of the other department as to which one will include the appointee. Please DO NOT include the following as full-time faculty: Visiting professors, post-doctorates, research associates, graduate assistants, or others who are not regular FULL-TIME S/E FACULTY in this department.

9. Rank and tenure status of full-time S/E faculty, fall 1982	Academic rank	Total (A)	Tenured (B)	Non-tenured (C)	Of those in column (C) how many are in tenure track? (D)
	(1) Professor				
	(2) Associate professor				
	(3) Assistant professor				
	(4) Other ranks				
☐ Check here if this department has no full-time S/E faculty.	(5) Non-ranked				
	(6) Total full-time S/E faculty				

10) *APPOINTMENTS.* How many full-time S/E faculty did your department appoint for service to begin during the academic year 1981/82? How many of these new appointees held full-time faculty or staff appointments in another academic institution immediately prior to their joining your department? What tenure status were they given in your department at the time of their appointments? Note that line (2), columns (B) & (C) refer to the status of these individuals at your institution.

D. Full-time S/E faculty appointments during academic year 1981/82		Appointments	Total full-time S/E faculty appointed (A)	Tenure status as of date of appointment: Tenured (B)	Tenure status as of date of appointment: Non-tenured (C)
	(1)	Total appointments			
	(2)	Of those in line (1) above, how many joined your department from full-time faculty or staff positions in another academic institution? (Do not report transfers within your institution).			

11) *DEPARTURES.* How many members of this department who held full-time S/E faculty appointments in September 1981 left the department between September 1, 1981, and August 31, 1982, for one of the reasons listed below? *Please enter the number for each of the following categories.* (*Count each person only once; in case of multiple reasons, choose the one in your opinion that was most important.*)

11. Full-time S/E faculty departing during academic year 1981/82		Reason for leaving	Total full-time S/E faculty leaving (A)	Tenure status of full-time S/E faculty leaving	
				Tenured (B)	Nontenured (C)
	(1)	Retirement, illness, or death			
	(2)	Voluntary resignation for another academic position			
	(3)	Voluntary resignation for a position in business or industry			
	( )	Voluntary resignation for other reasons			
	( )	Failure to receive tenure			
	( )	Involuntary resignation for other reasons			
	( )	Total departures			

12) *NONFACULTY S/E DOCTORAL RESEARCH STAFF.* How many full-time, nonfaculty S/E research doctorates are employed in this department? Please enter the number of people in each category shown. Only persons holding full-time appointments are to be included.

Full-time nonfaculty S/E research doctorate. Persons employed full time by the department in fall 1982 in a professional capacity specifically for research activities, who hold doctorates on the date this survey form is filled out, who do not have a faculty appointment, and who are not postdoctorates.

12. Full-time nonfaculty S/E doctoral research staff, fall 1982	TOTAL (see item 8, column (G), line 1) (A)	Number receiving doctorates before fall 1975 (B)	Number receiving doctorates in fall 1975 or later (C)

Department name _____

Institution name _____

INSTRUCTIONS FOR SURVEY OF GRADUATE SCIENCE AND ENGINEERING STUDENTS AND POSTDOCTORATES, FALL 1982

General Definitions

A *graduate science/engineering* (S/E) student is defined as a student enrolled for credit in an advanced-degree program leading to either a master's or Ph.D. degree in fall 1982. M.D., D.V.M., or D.D.S. candidates, interns, and residents should not be reported *unless* they are concurrently working for a master's or Ph.D. in a science or engineering field or are enrolled in a joint M.D./Ph.D. program. Individuals who already hold an M.D., D.V.M., or D.D.S., master's or Ph.D. degree but who are working on *another master's or Ph.D. degree are to be counted as graduate students, either full or part time. Do not* report such individuals as postdoctorates in item 8.

Graduate S/E students performing thesis or dissertation research away from the campus at Government and contractor-owned facilities in the United States are to be included as long as they are enrolled for credit in an advanced-degree program. Students enrolled at a branch or extension center in a foreign country are to be *excluded*.

A *graduate S/E student, whether full- or part-time, should be reported in only one department.* If any students are in interdisciplinary programs, please be sure that they are counted only once by their "home" department. If a graduate student is enrolled in an inter-institutional program, please report the student only if the degree will be granted by your institution. Please report in terms of headcounts, *not* in full-time-equivalent (FTE) terms. If data are unavailable or unknown, write "unavailable" or "unknown" in the blank. "N/A" means "not applicable" on this form.

Item Instructions and Definitions

HIGHEST DEGREE OFFERED, item 4: Check the item which refers to the *highest* degree program offered by this science/engineering department in fall 1982. If your department does not offer a graduate degree, but is a department of clinical medicine with or without postdoctorates, check (3).

FULL-TIME GRADUATE STUDENTS, item 5: A full-time graduate student is defined as a student enrolled for credit in an advanced-degree program (not a regular staff member or a postdoctorate) who is engaged full time in training activities in his/her field of science/engineering; these activities may embrace any appropriate combination of study, teaching, and research, depending on your *institution's own policy*. If your department has no full-time graduate students, write "None" in item 5 and move to item 6.

MECHANISMS OF SUPPORT, item 5, lines [1]-[5]: Report each full-time graduate S/E student only once according to the source of the largest amount of support received in the fall of 1982. Students receiving *equal* amounts of support from two or more sources should be reported only once, under one of the sources. Students who receive *fellowships* or *traineeships* should be reported on line [1] or [2] respectively, if either of these mechanisms constitute the largest source of his/her support. The Federal Interagency Committee on Education (FICE) differentiates between the two *fellowship and traineeship* stipends as follows: 1) A fellowship is an award made directly to or on behalf of a student selected in a national competition, to enable him to pursue post-baccalaureate training, and 2) a traineeship is an educational award to a student selected by his university. Except for the student selection process, the terms and conditions of the two types of awards are generally identical. A student receiving his/her main support from an assistantship should be classified as a research assistant on line [3] or as a teaching assistant on line [4], depending on how he/she spends the majority of his/her time; e.g., a graduate assistant devoting most of his/her time to teaching should be classified as a graduate teaching assistant. All other full-time graduate students should be reported on line [5].

STUDENTS RECEIVING FINANCIAL ASSISTANCE, item 5, columns (A) through (H): Report the number of full-time graduate S/E students in the appropriate column according to the source of the largest portion of their support. To determine the source, consider only tuition and other academic expenses. If a graduate student receives equal support from more than one source, report student under only one source.

FEDERAL SOURCES, columns (A) through (E): Report the number of full-time graduate S/E students in the appropriate column where they receive the largest portion of their support. Full-time graduate S/E students receiving the largest portion of their support from Federal Government *loans* should be reported as *self-supported*, column (H).

Department of Defense (DOD), column (A): Report full-time graduate S/E students receiving support from the Department of the Army, Navy, or Air Force. Students receiving their main support from the Veterans Administration under the G.I. Bill should be reported under column (E) "Other Federal Sources"; if this form of support does not constitute his/her *main* source, the student should be counted in the appropriate column representing that source.

Department of Health and Human Services (HHS), columns (B) and (C): Report full-time graduate students receiving support from the institutes or divisions of the **National Institutes of Health (NIH)** under column (B); support from all other components of HHS should be reported under column (C), as indicated below:

National Institutes of Health, report in column (B):
- Division of Research Resources
- National Cancer Institute
- National Eye Institute
- National Heart, Lung, and Blood Institute
- National Institute on Aging
- National Institute of Allergy and Infectious Diseases
- National Institute of Arthritis, Diabetes, and Digestive and Kidney Diseases
- National Institute of Child Health and Human Development
- National Institute of Dental Research
- National Institute of Environmental Health Sciences
- National Institute of General Medical Sciences
- National Institute of Neurological and Communicative Disorders and Stroke
- National Library of Medicine

Other HHS, report in column (C):
- Alcohol, Drug Abuse, and Mental Health Administration (including National Institute of Mental Health)
- Center for Disease Control
- Food and Drug Administration
- Health Resources Administration
- Health Services Administration
- Office of Human Development

Other Federal sources, column (E): Report the number of full-time graduate S/E students receiving support from all other Federal agencies, including the Department of Education.

NON-FEDERAL SOURCES, columns (F) through (H):

Institutional support, column (F): Report full-time graduate S/E students receiving support from your own institution and State and local governments. Students supported by funds given to a university by the Federal Government, such as training grant funds, should be reported under the appropriate Federal agency and NOT reported as *institutional* support.

Foreign sources, column (G): Include support from any non-U.S. source.

Other U.S. sources, column (H): Include support from nonprofit institutions, private industry, and all other U.S. sources.

SELF-SUPPORTED STUDENTS, column (I): Include full-time graduate S/E students whose main source of support is derived from loans from any source and from personal or family financial contributions. Full-time graduate S/E students receiving the largest portion of their support from Federal loans or tuition waivers should be reported here. Note that these students should be included in the total, column (J) Foreign *self-supported* students are to be reported here, also.

Women, line (7): Report all women S/E students by their source of main support. Please note that in each column, data on line (7) should not exceed the total on line (6).

NOTE: Foreign students are now to be reported in item 7, column G.

First-year students, lines (8) and (9): A first-year student is defined as one who will have completed less than a full year of graduate study as of the beginning of the fall term in 1982 in the S/E program in which he/she is enrolled for a degree. All other graduate S/E students should be considered beyond their first year.

PART-TIME GRADUATE S/E STUDENTS, item 6: A part-time graduate student is defined as a student who is enrolled in an advanced-degree program who is NOT pursuing graduate work full time as defined in item 5. Report the *total* number of part-time graduate students on line (1); if a department has no part-time graduate students, enter "None" and move to item 7.

RACIAL/ETHNIC BACKGROUND, item 7. Racial/ethnic designations as used in this survey do not denote scientific definitions of anthropological origins; a graduate student may thus be included in the group to which he/she appears to belong, identifies with, or is regarded in the community as belonging. No person should be counted in more than one racial/ethnic group; however, and only those with U.S. citizenship should be reported in columns (A) through (F).

On line 1, report the total number of full-time S/E graduate students under the appropriate racial/ethnic category. The total for each line should equal the sum of columns (A) through (G). The total for full-time enrollment shown in item 7 should match the total shown in item 5; similarly, the part-time total shown in item 7 should equal the total in item 6.

The following racial/ethnic designations are those defined by the Office of Civil Rights:

U.S. CITIZENS: columns (A) through (E):

Black, non-Hispanic, column (A): Report persons having origins in any of the black racial groups (except those of Hispanic origin).

American Indian or Alaskan Native, column (B): Report persons having origins in any of the original peoples of North America.

Asian or Pacific Islander, column (C): Report persons having origins in any of the original peoples of the Far East, Southeast Asia, or the Pacific Islands. These areas include China, Japan, Korea, the Philippine Islands, and Samoa.

Hispanic, column (D): Report persons of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race.

White, non-Hispanic, column (E): Report persons having origins in any of the original peoples of Europe, North Africa, the Middle East or the Indian subcontinent, except those of Hispanic origin.

OTHER AND UNKNOWN, column (F): If department records are not complete as to racial/ethnic origin of some graduate students, please report in column (F) those students with U.S. citizenship whose origins are not listed in item 7, as well as those whose origins are unknown.

FOREIGN, column (G): Please report all foreign students, whether nonresident alien or holding a permanent visa, in column (G). A foreign graduate student is defined as an individual who has not attained U.S. citizenship. Do not include native residents of a U.S. possession, such as American Samoa. Applicants for U.S. citizenship are to be considered as foreign until the date their citizenship becomes effective.

POSTDOCTORATES AND NONFACULTY DOCTORAL RESEARCH STAFF, item 8: Include as **postdoctorates** those individuals with science or engineering Ph.D.'s, M.D.'s, D.D.S.'s, or D.V.M.'s (including foreign degrees that are equivalent to U.S. doctorates) who devote their primary effort to research activities or study in the department under temporary appointments carrying no academic rank. Such appointments are generally for a specific time period. They may contribute to the academic program through seminars, lectures, or working with graduate students. Their postdoctoral activities provide additional training for them. **Exclude** clinical fellows and those with appointments in residency training programs in medical and health professions, unless research training under the supervision of a senior mentor is the primary purpose of the appointment.

On line (1), under columns (A) and (B), enter the number of fellows and trainees receiving support under Federal fellowships and/or training grants. Under column (C) enter the number of postdoctorates who are receiving federally supported research grants. Those remaining postdoctoral appointees receiving non-Federal support should be entered under column (D). Of the *total* in column (E), enter in column (F) the number of postdoctorates who are foreign.

Under **other nonfaculty doctoral research staff,** column (G), report all doctoral scientists and engineers who are principally involved in research activities but who are considered *neither* postdoctoral appointees nor members of the *regular* faculty. In column (H), report the total of columns (E) and (G).

On line 2, report the number of women in each category. On line 3 (optional) report those postdoctorates and nonfaculty doctoral research staff who hold first professional medical degrees (M.D., D.D.S., D.V.M., etc.). Please note that in each column, data on lines 2 and 3 should not exceed the total on line 1.

foreign scientists and engineers

purpose and background

In addition to the new "entrants" to these fields from training programs discussed earlier, immigration provides a major source of science and engineering (S/E) population. For this reason, the National Science Foundation (NSF) obtains yearly data from the U.S. Immigration and Naturalization Service on foreign individuals entering the country.

Data are obtained from the U.S. Immigration and Naturalization Service of the Department of Justice on all nontourist/nonstudent, foreign-born scientists, engineers, and physicians entering the United States in each year according to their visa status, i.e., permanent or temporary residents. These data are in two files: (a) Immigrant Professional, Technical, and Kindred Workers with permanent resident visa status and (b) Nonimmigrant Scientists and Engineers, Physicians and Surgeons with temporary resident visa status. Annual data are available for fiscal years (FYs) 1965 through 1978.

Data for FY 1978 are available in machine readable form. Data for FY 1966 through 1973 are available in hard copy format. Cross tabulations of the above noted variables may be obtained for 1966-78 on the same basis as magnetic tapes.

references

The most recent NSF report based on the data cited above is

Scientists and Engineers From Abroad: 1976-78 (Detailed Statistical Tables) (NSF 80-324), available from NSF and NTIS (PB81-188070).

data access

The following tape files based on data from the U.S. Immigration and Naturalization Service are available from NSF.

A. All Immigrant Scientists, Engineers, Physicians, and Surgeons, fiscal year (FY) 1978. The tape file includes: Occupational specialty; country of birth; country of last permanent residence; age; sex; change from the nonimmigrant status by year of entry and former nonimmigrant category; State of intended residence; status as professor or instructor; and type of immigrant visa.

B. Selected Nonimmigrant Scientists, Engineers, Physicians, and Surgeons grouped by like characteristics, FY 1978. This tape file includes: Occupational specialty; country of birth; country of last permanent residence; status as professor or instructor; half-year of entry; and nonimmigrant category. The nonimmigrant categories are H-1, temporary workers of distinguished merit and ability; H-2, temporary workers performing services unavailable in the United States; H-3 industrial trainees; J-1 exchange visitors; and L-1, intracompany transfers.

These tapes are available, subject to reproduction cost and official regulations (e.g., Privacy Act of 1976), from:

Mr. Joseph Gannon
Division of Science Resources Studies
National Science Foundation
1800 G Street, N.W., Rm. L-611
Washington, D.C. 20550
(202) 634-4655

Data for FY 1979 through 1981 are not available. Tape data for FY 1982 are expected to be available by spring 1984.

science and technology funding resources

federal funds for research and development

purpose and background

The Federal Funds survey—an annual series that began with fiscal year (FY) 1952 and has continued without interruption since that time—provides comprehensive statistical information on the size and scope of Federal funding for research and development and the types of institutions and purposes to which such funds are directed. Data are collected from all Federal agencies that provide funds for research and development. Each agency provides data for three years: actual funding for the prior fiscal year and estimates for the current and next fiscal year. These estimates are based on funding levels contained in the Federal budget document. Most data are collected in obligations, although limited portions of the survey ask for funding in outlay terms. The research and development (R&D) data are classified by character of work, type of performer, field of science, geographic (State) distribution and R&D plant; research data are classified by field of science.

Historical tabulations are available for the period 1967-83. These tabulations are classified similarly to those that cover only the most recent 3-year period.

survey instrument

A copy of the FY 1983 survey covering the years 1982, 1983, and 1984 is reproduced on the following pages.

references

The most recent National Science Foundation (NSF) reports based on the survey data are

Federal Funds for Research and Development, Fiscal Years 1981, 1982, and 1983, Volume XXXI (Final Report) (NSF 83-320), available from NSF, GPO, and NTIS.

Federal Funds for Research and Development, Fiscal Years 1982, 1983, and 1984, Volume XXXII (Detailed Statistical Tables) (NSF 83-319), available from NSF and NTIS.

Federal Funds for Research and Development, Detailed Historical Tables, 1955-84, available from NSF.

Federal Obligations for Research to Universities and Colleges by Agency and Detailed Field of Science, 1967-84, available from NSF.

Federal Obligations for Research by Agency and Detailed Field of Science, 1967-84, available from NSF.

data access

Federal Funds survey data from FY 1967-84 are available in hard copy from the Government Studies Group, Division of Science Resources Studies, NSF. They are also available in machine readable form from:

Moshman Associates, Inc.
6400 Goldsboro Road
Washington, D.C. 20034
(301) 229-3000

Federal Funds survey data prior to FY 1967 are available on request from the Government Studies Group, Division of Science Resources Studies, NSF. A complete survey instrument (questionnaire) can also be obtained from this Group. **Prior-year data as reported in earlier Federal Funds reports do not reflect subsequent reclassification changes and should not be used.** For all data needed prior to 1967, contact:

Mr. Gerard R. Glaser, Jr.
Division of Science Resources Studies
National Science Foundation
1800 G Street, N.W., Rm. L-602
Washington, D.C. 20550
(202) 634-4636

INSTRUCTIONS FOR

ANNUAL SURVEY of FEDERAL FUNDS for RESEARCH and DEVELOPMENT

VOLUME XXXII
Fiscal Years 1982, 1983, 1984

Conducted by the
NATIONAL SCIENCE FOUNDATION

NSF FORM 818

CONTENTS

ANNUAL SURVEY OF
Federal Funds for Research and Development
Fiscal Years 1982, 1983, and 1984

INTRODUCTION

This annual survey is conducted to measure Federal support of, and participation in, national scientific activities in terms of obligations and outlays. The survey results will be published in the *Federal Funds for Research and Development, Volume XXXII* final report.

In this survey, data are to be provided for fiscal years 1982, 1983, and 1984 covering funding support in the areas of research, development, and R&D plant. The scope of the survey remains identical with the scope of last year's survey.

Reports from Federal agencies should originate from all organizational subdivisions supporting research, development, or R&D plant.

Please read the instructions carefully before filling in the tables.

SUBMISSION DUE DATE

Due date for submission of responses for the survey is March 1, 1983.

Two **typed** sets of completed tables and narrative statements (the **original** and **one copy**, each with the agency **code number** on each table) from the survey should be sent to:

Division of Science Resources Studies
National Science Foundation
Washington, D.C. 20550

or

Government Stop 19
Attention: Government Studies Group

Members of the Foundation staff are ready to assist in clarifying the instructions and to discuss any problems that may arise in their application. Additional copies of the instructions and tables are available upon request. All inquiries should be made to:

Ms. Eleanor Stoddard, Study Director

or

Mr. Gerard Glaser, Associate Study Director
Government Studies Group
Phone: (202) 634-4636

Comments and recommendations for formulating and refining future questionnaires are solicited.

Be sure to include the names of the individuals in your office with whom survey matters may be discussed.

GENERAL CONCEPTS AND DEFINITIONS

The following general concepts and definitions are applicable throughout the survey:

1. An **agency** is an organization of the Federal Government whose principal executive officer reports to the President. The Library of Congress, however, whose chief officer reports to the Congress, is also included in the survey. **Subdivision** refers to any organizational unit of a reporting agency, such as a bureau, division, office, or service.

2. **Obligations** and **outlays** reported should be consistent with figures shown for fiscal years 1982, 1983, and 1984 appearing in *The Budget of the United States Government, Fiscal Year 1984*.

Obligations and outlays cover all transactions that occurred in fiscal year 1982, and those estimated for 1983 and 1984. The data should include all Federal funds available to

an agency that the agency received or expects to receive, from direct appropriations, trust funds, and special account receipts, corporate income, or other sources, including funds appropriated to the President.

The amounts shown for each year should reflect obligations or outlays for that year regardless of when the funds were originally authorized or received, and regardless of whether or not they were appropriated, received, or identified in the agency's budget specifically for research, development, or R&D plant.

Each agency should include in the reporting of obligations or outlays the amounts transferred to other agencies for support of research and development. The receiving agencies are *not* to report funds transferred to them. Similarly, a subdivision of an agency that transfers funds to another subdivision within that agency reports such obligations or outlays as its own.

Obligations and outlays for work performed for an agency in foreign countries should include all funds available to the agency for this purpose, including funds separately appropriated for special foreign currency programs.

3. A **performer** is either an intramural group or organization carrying out an operational function or an extramural organization or person receiving support or providing services under a contract or grant.

a. **Intramural performers** are the agencies of the Federal Government. Their work is carried on directly by agency personnel. Obligations reported under this category are for activities performed or to be performed by the reporting agency itself, or they represent funds that the agency transfers to another Federal agency for performance of work as long as the ultimate performer is that agency or any Federal agency. If the ultimate performer is *not* a Federal agency, the funds so transferred are to be reported by the transferring agency under the appropriate *extramural* performer category (industrial firms, universities and colleges, or other nonprofit institutions).

Note that intramural activities cover costs associated with the planning and administration of intramural and extramural programs by Federal personnel as well as actual intramural R&D performance. Intramural activities also include the costs of supplies and equipment, essentially of an "off-the-shelf" nature, that are procured for use in intramural research and development. For example, the purchase from an extramural source of an operational launch vehicle (i.e., one that has gone beyond the development or prototype stage) that is used for intramural performance of research and development should be reported as a part of the cost of intramural research and development.

b. **Extramural performers** are organizations outside the Federal sector that perform with Federal funds under contract or grant. Only those costs associated with actual R&D performance should be reported, but these would include costs of materials and supplies to carry out R&D activities. Note, however, that the costs of "off-the-shelf" supplies and equipment procured from extramural suppliers that are required to support intramural research and development should be considered as part of the costs of intramural performance and not as part of the costs of extramural performance.

Extramural performers are identified as follows:

(1) **Industrial firms:** Those organizations that may legally distribute net earnings to individuals or to other organizations.

(2) **Universities and colleges:** Institutions engaged primarily in providing resident and/or accredited instruction for at least a 2-year program above the secondary school level. Included are colleges of liberal arts; schools of arts and sciences; professional schools, as in engineering and medicine, including affiliated hospitals and associated research institutes; and agricultural experiment stations.

(3) **Other nonprofit institutions:** Private organizations other than educational institutions no part of whose net earnings inure to the benefit of a private stockholder or individual, and other private organizations organized for the exclusive purpose of turning over their entire net earnings to such nonprofit organizations.

(4) **Federally funded research and development centers (FFRDC's):** Research-and-development-performing organizations exclusively or substantially financed by the Federal Government either to meet a particular R&D objective or, in some instances, to provide major facilities at universities for research and associated training purposes. Each center is administered by an industrial firm, a university, or another nonprofit institution. (See p. 41 for list.)

In general, all of the following criteria are met by an organization before it is included in the federally funded research and development center category:

(a) Its primary activities include one or more of the following: Basic research, applied research, development, or management of research and development (specifically excluded are organizations engaged primarily in routine quality control and testing, routine service activities, production, mapping and surveys, and information dissemination);

(b) It is a separate operational unit within the parent organization or is organized as a separately incorporated organization;

(c) It performs actual research and development or R&D management either upon direct request of the Federal Government or under a broad charter from the Federal Government, and in either case under the direct monitorship of the Federal Government;

(d) It receives its major financial support (70% or more) from the Federal Government, usually from one agency;

(e) It has, or is expected to have, a long-term relationship with its sponsoring agency (about 5 years or more), as evidenced by specific obligations assumed by it and the agency;

(f) Most or all of its facilities are owned by or funded under contract with the Federal Government; and

(g) It has an average annual budget (operating and capital equipment) of at least $500,000.

(5) **State and local governments:** State and local government agencies, excluding State or local universities and colleges, agricultural experiment stations, medical schools, and affiliated hospitals. (Federal R&D funds obligated directly to such State and local institutions should be included under the universities-and-colleges category in this report.) Research and development activities under the State-and-local category are performed either by the State or local agencies themselves or by other organizations under grants or contracts from such agencies. Regardless of the ultimate performer, Federal R&D funds directed to State and local governments are to be reported under this sector and no other.

(6) **Foreign performers:** Foreign citizens, foreign organizations, or foreign governments, as well as international organizations, such as NATO, UNESCO, WHO, performing work abroad financed by the Federal Government. Excluded are U.S. agencies, organizations, or citizens performing research and development abroad for the Federal Government; the survey does not seek information on "off-shore" payments. An exception is made in the case of U.S. citizens performing research or development abroad under special foreign currency funds; these activities are included under foreign performers. Foreign scientists performing in the United States are excluded, however.

(7) **Private individuals:** In the case of an R&D grant or contract awarded directly to a private individual, place obligations incurred under "industrial firms."

Instructions for Reporting Obligations and Outlays for Research, Development and R&D Plant, Fiscal Years 1982, 1983, and 1984

There are no changes in this year's instructions. No new questions have been added. The scope of the survey remains identical with the scope of last year's survey, as follows:

- Obligations and outlays, in summary form, for research and development and R&D plant.
- Obligations for total research, basic research, and applied research, by field of science.
- Obligations for total research, basic research, and applied research performed at universities and colleges, by field of science.
- Obligations for total research, basic research, applied research, and development, by performer.
- Obligations for total research and development and basic research, by foreign country.
- Obligations for R&D plant by performer of the research and development supported.
- Obligations for research and development and R&D plant, by State and performer or performer supported.

DEFINITIONS

1. **Research, development, and R&D plant** include all direct, indirect, incidental, or related costs resulting from, or necessary to, performance of research and development, and costs of R&D plant as defined below, regardless of whether the research and development are performed by a Federal agency (intramurally) or performed by private individuals and organizations under grant or contract (extramurally). Research and development exclude routine product testing, quality control, mapping and surveys, collection of general-purpose statistics, experimental production, and the training of scientific personnel.

a. **Research** is systematic study directed toward fuller scientific knowledge or understanding of the subject studied. Research is classified as either basic or applied according to the objectives of the sponsoring agency:

In **basic research** the objective of the sponsoring agency is to gain fuller knowledge or understanding of the fundamental aspects of phenomena and of observable facts without specific applications toward processes or products in mind.

In **applied research** the objective of the sponsoring agency is to gain knowledge or understanding necessary for determining the means by which a recognized and specific need may be met.

b. **Development** is systematic use of the knowledge or understanding gained from research, directed toward the production of useful materials, devices, systems, or methods, including design and development of prototypes and processes. It excludes quality control, routine product testing, and production.

c. **Demonstration** activities that are part of research or development (i.e., that are intended to prove or to test whether a technology or method does, in fact, work) should be included. Demonstrations intended primarily to make information available about new technologies or methods should not be included.

d. **R&D plant** (R&D facilities and fixed equipment, such as reactors, wind tunnels, and radio telescopes) includes acquisition of, construction of, major repairs to, or alterations in structures, works, equipment, facilities, or land for use in R&D activities at Federal or non-Federal installations. *Excluded from the R&D plant category are expendable equipment and office furniture and equipment.* Obligations for *foreign* R&D plant are limited to Federal funds for facilities located abroad and used in support of foreign research and development.

2. **Fields of science** in this survey are divided into eight broad field categories, each consisting of a number of detailed fields. The broad fields are life sciences, psychology, physical sciences, environmental sciences, mathematics and computer sciences, engineering, social sciences, and other sciences not elsewhere classified. The following listing presents the fields grouped under each of the broad fields together with *illustrative* disciplines. (Additional information concerning fields of science is provided on page 8 under Reporting Guidelines for tables III, IV, and V.)

a. **Life sciences** consist of five detailed fields: biological (excluding environmental), environmental biology, agricultural, medical, and life sciences not elsewhere classified. The illustrative disciplines provided below under each of these detailed fields are intended to be guidelines, not sharp definitions; they represent examples of disciplines generally classified under each detailed field. A discipline under one detailed field may be classified under another detailed field when the major emphasis is elsewhere. Research in biochemistry could be reported as biological, agricultural, or medical, depending on the orientation of the project. Human biochemistry would be classified under biological, but animal biochemistry or plant biochemistry would be under agricultural. In no case should the research be reported under more than one field. No double counting is intended or allowed.

Biological (excluding environmental):	anatomy; biochemistry; biology; biometry and biostatistics; biophysics; botany; cell biology; entomology and parasitology; genetics; microbiology; neuroscience (biological); nutrition; physiology; zoology; other biological, n.e.c.[1]
Environmental biology:	ecosystem sciences; evolutionary biology; limnology; physiological ecology; population biology; population and biotic community ecology; systematics; other environmental biology, n.e.c.[1]
Agricultural:	agronomy; animal sciences; food science and technology; fish and wildlife; forestry; horticulture; plant sciences; soils and soil science; phytopathology; phytoproduction; agriculture, general; other agriculture, n.e.c.[1]
Medical:	internal medicine; neurology; obstetrics and gynecology; ophthalmology; otolaryngology; pediatrics; preventive medicine; pathology; pharmacology; psychiatry; radiology; surgery; dentistry; pharmacy; veterinary medicine; other medical, n.e.c.[1]

Life sciences, n.e.c.[1]

b. **Psychology** deals with behavior, mental processes, and individual and group characteristics and abilities. Psychology is divided into three categories: biological aspects, social aspects, and psychological sciences not elsewhere classified. Examples of the disciplines under each of these fields are as follows:

Biological aspects:	experimental psychology; animal behavior; clinical psychology; comparative psychology; ethology
Social aspects:	social psychology; educational, personnel, vocational psychology, and testing; industrial and engineering psychology; development and personality

Psychological sciences, n.e.c.[1]

c. **Physical sciences** are concerned with understanding of the material universe and its phenomena. They comprise the fields of astronomy, chemistry, physics, and physical sciences not elsewhere classified. Examples of disciplines under each of these fields are as follows:

Astronomy:	laboratory astrophysics; optical astronomy; radio astronomy; theoretical astrophysics; X-ray, Gamma-ray, neutrino astronomy
Chemistry:	inorganic; organo-metallic; organic; physical
Physics:	acoustics; atomic and molecular; condensed matter; elementary particle; nuclear structure; optics; plasma

Physical sciences, n.e.c.[1]

d. **Environmental sciences** (terrestrial and extraterrestrial) are concerned with the gross nonbiological properties (with one exception) of the areas of the solar system that directly or indirectly affect man's survival and welfare; they comprise the fields of atmospheric sciences, geological sciences, oceanography, and environmental sciences not elsewhere classified. The one exception is that obligations for studies pertaining to life in the sea or other bodies of water are to be reported as support of oceanography and *not* biology. Examples of disciplines under each of these fields are as follows:

Atmospheric sciences:	aeronomy; solar; weather modification; extraterrestrial atmospheres; meteorology
Geological sciences:	engineering geophysics; general geology; geodesy and gravity; geomagnetism; hydrology; inorganic geochemistry; isotopic geochemistry; organic geochemistry; laboratory geophysics; paleomagnetism; paleontology; physical geography and cartography; seismology; soil sciences
Oceanography:	biological oceanography; chemical oceanography; physical oceanography; marine geophysics

Environmental sciences, n.e.c.[1]

e. **Mathematics and computer sciences** employ logical reasoning with the aid of symbols and are concerned with the development of methods of operation employing such symbols, and in the case of computer sciences, with the application of such methods to automated information systems. Examples of disciplines under these fields are as follows:

Mathematics:	algebra; analysis; applied mathematics; foundations and logic; geometry; numerical analysis; statistics; topology
Computer sciences:	programming languages; computer and information sciences (general); design, development, and application of computer capabilities to data storage and manipulation; information sciences and systems; systems analysis

Mathematics and computer sciences, n.e.c.[1]

f. **Engineering** is concerned with studies directed toward developing engineering principles or toward making specific principles usable in engineering practice. Engineering is divided into eight fields: aeronautical, astronautical, chemical, civil, electrical, mechanical, metallurgy and materials, and engineering not elsewhere classified. Examples of disciplines under each of these fields are as follows:

Aeronautical:	aerodynamics
Astronautical:	aerospace; space technology
Chemical:	petroleum; petroleum refining; process
Civil:	architectural; hydraulic; hydrologic; marine; sanitary and environmental; structural; transportation
Electrical:	communication; electronic; power
Mechanical:	engineering mechanics
Metallurgy and materials:	ceramic; mining; textile; welding
Engineering, n.e.c.[1]	agricultural; industrial and management; nuclear; ocean engineering; systems

g. **Social sciences** are directed toward an understanding of the behavior of social institutions and groups and of individuals as members of a group. Social sciences include anthropology, economics, political science, sociology, and social sciences not elsewhere classified. Examples of disciplines under the fields of social science are as follows:

Anthropology:	archaeology; cultural and personality; social and ethnology; applied anthropology

Economics:	econometrics and economic statistics; history of economic thought; international economics; industrial, labor and agricultural economics; macroeconomics; microeconomics; public finance and fiscal policy; theory; economic systems and development
Political science:	area or regional studies; comparative government; history of political ideas; international relations and law; national political and legal systems; political theory; public administration
Sociology:	comparative and historical; complex organizations; culture and social structure; demography; group interactions; social problems and social welfare; sociological theory
Social sciences, n.e.c.[1]	linguistics; research in education; research in history; socioeconomic geography; research in law, e.g., attempts to assess impact on society of legal systems and practices

h. **Other sciences, n.e.c.**[1] To be used for multidisciplinary and interdisciplinary projects that cannot be classified within one of the broad fields of science above.

3. Performers are defined under General Concepts and Definitions (pp. 1, 2, and 3).

REPORTING GUIDELINES

Shuttle data: Agencies are requested to complete the data for the shuttle columns (shaded areas on tables) if these data are not already inserted. Shuttle data are the estimates provided by agencies for fiscal years 1982 and 1983 in last year's survey (*Federal Funds, XXXI*). They are included in the present survey for purposes of comparison. If there are important differences (increases or decreases) between the current report and last year's report for fiscal years 1982 and 1983 explain the reasons on the sheet attached for this purpose (page 49).

Cost coverage: Obligations and outlays reported should reflect full costs. In addition to costs of specific scientific projects, applicable overhead costs should also be included. **Thus, the amounts reported should include the costs of planning and administration of both intramural and extramural R&D programs, laboratory overhead, pay of military personnel, and departmental administration.**

Character of work: Classifying research and development on the basis of the character of the work, i.e., basic research, applied research, or development, may present problems. It may be necessary in some cases to employ a measure of judgment in distributing obligations among categories. In cases where an overlap exists, funds should be assigned to the category most appropriate to the principal type of work supported.

Intramural transfer of funds: A Federal agency that transfers funds to another Federal agency for the support of research and development should report such obligations or outlays as its own. The receiving agency is *not* to report, for purposes of this survey, on funds transferred to it from another agency. A subdivision of an agency that transfers funds to another subdivision within that agency should also report such obligations or outlays as its own.

To assure that no undue distortion of funds for intramural performance of research and development takes place, the agency transferring the funds should make a special effort, within practical limits, to determine whether the ultimate performer is intramural or extramural and report accordingly. The transfer of funds to another Federal agency should not be the sole basis for reporting that the R&D performance is intramural.

Tables

Table I is for reporting outlays only.

Table II is for reporting obligations only. Obligations shown in items 5 and 6 of table II should be identified by appropriation titles and program activities on pages 43 and 47 as part of the descriptive narrative.

Tables III, IV, and V are for the reporting of obligations for research by field of science.

Definitions and a guide relating to fields of science are provided on pages 5 through 7, although the examples provided for the disciplines are not intended as a complete enumeration.

[1] Not elsewhere classified: To be used for multidisciplinary projects within a broad field and for single-discipline projects for which a separate field has not been assigned.

Every effort should be made to allocate obligations to a specific discipline rather than to the "not elsewhere classified (n.e.c.)" category. If specific allocation is not feasible, however, obligations reported under the n.e.c. category should be identified in an explanatory note. In reporting obligations for activities concerned with interdisciplinary studies funds must not be double-counted.

Tables VI, VII, and VIII cover reporting of obligations by performer. Definitions of performers appear on pages 2 and 3. Item 2 is for identification of obligations for intramural personnel services and related allowances, as defined in OMB Circular A-34, Section 25.1A. Such obligations cover salaries for scientists and engineers and other intramural support personnel, including planning and administrative personnel.

Items 4, 6, and 8 are for identification of obligations to federally funded research and development centers (FFRDC's) appearing on Table IX and on the list of FFRDC's (pages 41 and 42). Each agency should report obligations to each FFRDC that it uses that appears on that list, even though the FFRDC may be sponsored by another agency. Obligations to FFRDC's administered by university consortia should be included in the amounts under item 6.

Agencies may not unilaterally delete organizations classified as FFRDC's from the list or add organizations thereto. Inquiries concerning additions or deletions to the list of FFRDC's should be directed to Dr. Charles E. Falk, Director, Division of Science Resources Studies, National Science Foundation. Additional information concerning FFRDC's is provided on pages 2 and 3, under General Concepts and Definitions, and in Reporting Guidelines for table IX.

Item 9 is for identification of obligations to State and local government agencies for R&D activities financed by the Federal Government.

Item 11 is for identification of obligations for R&D performance by foreign individuals or foreign organizations (including international organizations in foreign countries) that is financed by Federal agencies. Obligations made with funds separately appropriated for special foreign currency programs should be included in the totals for foreign obligations (item 11) and separately identified in item 12. These special foreign currencies are derived largely from funds provided under Public Law 480, 1954, as amended. Care should be taken to report foreign performance only once. For example, if a foreign performer is an educational institution, obligations to that institution should be reported only under foreign performance and not also under universities and colleges.

Table IX provides for reporting additional information on fiscal year 1982 R&D and R&D plant obligations to FFRDC's. This table requires the breakdown of obligations for research and development reported in items 4, 6, and 8 of table VI by each FFRDC listed. This table also requires the breakdown by individual FFRDC of obligations for R&D plant reported in items 3, 5, and 7 of table XI for FY 1982. Each agency should report obligations to each FFRDC it supports, even though the FFRDC is sponsored by another agency. Pages 41 and 42 provide a list of FFRDC's by sponsoring agency and administering organization.

Table X. Countries included in each geographic area are as follows:

Europe: All countries of continental Europe and the British Isles. Excluded are Greece and Turkey, which are classified under the Near East.

Near East: Greece, Iran, Iraq, Israel, Jordan, Lebanon, Saudi Arabia, Sudan, Turkey, and Egypt.

Asia: All countries of continental Asia and Japan, the Philippines, Sumatra, and Borneo. Excluded are Iran, Iraq, Israel, Jordan, Lebanon, and Saudi Arabia, which are included under the Near East.

Africa: All countries of continental Africa except Egypt and the Sudan, which are under the Near East.

Latin America: All countries of continental South America, Central America, the Caribbean, and Mexico.

Note that for table X, data for fiscal years 1983 and 1984 are not required.

Table XI provides for reporting obligations for R&D plant by the performer of research and development that the R&D plant supports regardless of the plant's ownership or location.

Under item 1 report obligations for R&D plant that are provided to support research and development performed intramurally.

Under item 2 report obligations for R&D plant that are provided to support research and development by industrial firms excluding FFRDC's.

Under item 3 report the amount obligated for R&D plant that is provided to support research and development performed by FFRDC's administered by industrial firms.

Under items 4 and 5 report obligations for R&D plant that are provided to support R&D performance by universities and colleges excluding FFRDC's and those that are provided to support university-administered FFRDC's.

Under items 6 and 7 report the same information for nonprofit performers.

Under item 8 report obligations for R&D plant that are provided to support research and development performed by State and local governments.

Under item 10 report obligations for R&D plant located abroad that are provided to support foreign research and development.

Note that the performer of research and development determines the classification of R&D plant obligations.

Tables A and B. Instructions for these tables are included as a separate attachment for the 10 agencies that are requested to provide data on geographic distribution, by State, of fiscal year 1982 obligations for research and development and R&D plant. These 10 agencies are the following: The Departments of Agriculture, Commerce, Defense, Energy, the Interior, Transportation, and Health and Human Services; the Environmental Protection Agency; the National Aeronautics and Space Administration; and the National Science Foundation.

Tables C, D, and E. Instructions for these tables are included as a separate attachment for the six agencies that are requested to report obligations for basic research, applied research, and total research performed at universities and colleges by field of science. These agencies are the Departments of Agriculture, Defense, Energy, and Health and Human Services; the National Aeronautics and Space Administration; and the National Science Foundation.

Narrative Statements

Sheets are provided for reporting a description of the content and objectives of the research, development, and R&D plant programs being supported in fiscal years 1982, 1983, and 1984.

Respondents are requested to identify R&D and R&D plant obligations by appropriation title and by program activity or subactivity within each appropriation, as shown in *The Budget, Fiscal Year 1984*.

For each program activity or subactivity the R&D and R&D plant obligations should be given for fiscal years 1982, 1983, and 1984.

In addition, brief descriptions should be provided of the research and development or R&D plant construction supported under each program activity or subactivity, including reasons for increases or decreases during the 3-year period.

Respondents are encouraged to confer with the staff of the National Science Foundation in the development of descriptive material on programs.

RELATIONSHIP TO OFFICE OF MANAGEMENT AND BUDGET ANALYSIS

In response to Office of Management and Budget (OMB) Circular No. A-11 (Section 44, Exhibit 44, revised July 1982), agencies provide OMB with data on their obligations and outlays for research and development by character of work and R&D plant. They also provide data on R&D obligations and outlays to universities and colleges. OMB publishes some of these data in the budget document, *Special Analyses, Budget of the United States Government*. This document includes a report on the R&D portion of the budget, but in its coverage of R&D data it does not provide as much detail on character of work or performers as *Federal Funds* and provides no information on fields of science or geographic distribution. Both the *Federal Funds* report and the OMB report, however, use the same general definitions and guidelines. Therefore, the

overall amounts reported for total research or development for distribution by character of work, and for R&D plant, both *Federal Funds* and OMB should be the same.

If there are differences between the R&D data submitted for the *Federal Funds* report and for the OMB report, each reporting agency or subdivision should provide an explanation on the attached sheets (pages 51 and 53) for differences in total R&D obligations, basic research obligations, and R&D obligations to universities and colleges.

RELATIONSHIP TO (CASE) SURVEY ON FEDERAL OBLIGATIONS TO INDIVIDUAL UNIVERSITIES AND COLLEGES FOR FY 1982

Certain agencies[2] have been requested to provide specific obligational data for fiscal year 1982 to NSF in response to the reporting system established in 1965 by the Committee on Academic Science and Engineering (CASE) of the Federal Council for Science and Technology; this survey is referred to in these instructions as the *Federal Support to Universities* (CASE) survey. The requested data cover obligations for research and development and R&D plant to universities and colleges and to FFRDC's administered by universities as well as data on other activities. In general the concepts and definitions used in the *Federal Support to Universities* (CASE) survey conform with the general guidelines in the annual *Federal Funds* survey. Thus, for agencies participating in both surveys, overall totals for research and development and R&D plant to universities and colleges and also to FFRDC's administered by universities should be substantially the same. Where differences appear in data reported for the two surveys, each reporting agency or subdivision should provide an explanation for the differences on the attached sheets (pages 55 and 57).

Different totals can sometimes result from the fact that for the *Federal Funds* survey and the *Federal Support to Universities* (CASE) survey reporting is accomplished in different ways. For the *Federal Funds* survey each agency includes in its reporting the amounts transferred to other agencies for furtherance of its own purposes; the receiving agencies do *not* report funds transferred to them. In the *Federal Support to Universities* (CASE) survey, however, the data are reported by the agencies in terms of individual performing institutions, and because of this requirement, only the agency that makes the final distribution of the funds can readily determine where the transferred or reimbursable funds are obligated. For this reason agencies reporting for the *Federal Support to Universities* (CASE) survey include funds received from other agencies and exclude funds transferred to other agencies, the reverse of the procedure for the *Federal Funds* survey.

[2] The Departments of Agriculture, Commerce, Defense, Education, Energy, Housing and Urban Development, the Interior, Health and Human Services, Labor, State (AID), and Transportation; the Environmental Protection Agency; the National Aeronautics and Space Administration; the National Science Foundation; and the Nuclear Regulatory Commission.

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Please indicate the individual in your organization to whom inquiries may be addressed concerning the response:

Name _____

Title _____

Office _____

Address _____

_____

Phone No. _____
(Outside line)

TABLE I

Outlays for research and development and R&D plant fiscal years 1982, 1983, and 1984

[Dollars in thousands]

Agency [ ] _____

Item	R&D AND R&D PLANT	FY 1982		FY 1983		FY 1984
		FF XXXI Estimate	FF XXXII Actual	FF XXXI Estimate	FF XXXII Estimate	FF XXXII Estimate
	Research & development[2]					
1	Total, research & development					
	R&D plant					
2	Total, R&D plant					
0	Total research & development and R&D plant					
3	R&D plant as % of item 0		%		%	%

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TABLE II
Summary of obligations for research and development and R&D plant fiscal years 1982, 1983, and 1984

[Dollars in thousands]

Agency [ ]

Item	CHARACTER OF WORK	FY 1982		FY 1983		FY 1984
		FF-XXXI Estimate	FF-XXXII Actual	FF-XXXI Estimate	FF-XXXII Estimate	FF-XXXII Estimate
1	Basic research					
	As % of item 5	%	%	%	%	%
2	Applied research					
	As % of item 5	%	%	%	%	%
3	Total research[1]					
	As % of item 5	%	%	%	%	%
4	Development					
	As % of item 5	%	%	%	%	%
5	Total research & development					
6	Total R&D plant					
	As % of item 0	%	%	%	%	%
0	Total research & development and R&D plant					

[1] Basic research plus applied research equals total research.

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TABLE III

Obligations for basic, applied, and total research by field of science and engineering, fiscal year 1982

(Dollars in thousands)

Agency

Code	FIELD OF SCIENCE AND ENGINEERING	Basic research		Applied research		Total research[1]	
		FF XXXI Estimate	FF XXXII Actual	FF XXXI Estimate	FF XXXII Actual	FF XXXI Estimate	FF XXXII Actual
100000	**Life sciences, total**						
103020	Biological (excl. envrmtl.)						
103040	Environmental biology						
103060	Agricultural						
106000	Medical						
109000	Life sciences, n.e.c.[2]						
200000	**Psychology, total**						
201000	Biological aspects						
202000	Social aspects						
209000	Psychological sci., n.e.c.						
300000	**Physical sciences, total**						
301000	Astronomy						
302000	Chemistry						
303000	Physics						
309000	Physical sciences, n.e.c.[2]						
400000	**Environmental sciences, total**						
401000	Atmospheric						
402000	Geological						
403000	Oceanography						
409000	Environmental sci., n.e.c.[2]						
500000	**Mathematics and computer sciences, total**						
501000	Mathematics						
502000	Computer sciences						
509000	Math. & compt. sci., n.e.c.[2]						
600000	**Engineering, total**						
601000	Aeronautical						
602000	Astronautical						
603000	Chemical						
604000	Civil						
605000	Electrical						
606000	Mechanical						
607000	Metallurgy and materials						
609000	Engineering, n.e.c.[2]						
700000	**Social sciences, total**						
701000	Anthropology						
702000	Economics						
705000	Political science						
706000	Sociology						
709000	Social sciences, n.e.c.[2]						
800000	**Other sciences, n.e.c.[2]**						
000000	**Total, all fields[3]**						

[1] Basic research plus applied research.
[2] Not elsewhere classified.
[3] Totals equal items 1, 2, and 3, for 1982 for basic research, applied research, and total research.

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TABLE IV

Obligations for basic, applied, and total research by field of science and engineering, fiscal year 1983

[Dollars in thousands]

Agency [ ]

Code	FIELD OF SCIENCE AND ENGINEERING	Basic research		Applied research		Total research[1]	
		FF XXXI Estimate	FF XXXII Estimate	FF XXXI Estimate	FF XXXII Estimate	FF XXXI Estimate	FF XXXII Estimate
100000	**Life sciences, total**						
103020	Biological (excl. envrmtl.)						
103040	Environmental biology						
103060	Agricultural						
106000	Medical						
109000	Life sciences, n.e.c.[2]						
200000	**Psychology, total**						
201000	Biological aspects						
202000	Social aspects						
209000	Psychological sci., n.e.c.						
300000	**Physical sciences, total**						
301000	Astronomy						
302000	Chemistry						
303000	Physics						
309000	Physical sciences, n.e.c.[2]						
400000	**Environmental sciences, total**						
401000	Atmospheric						
402000	Geological						
403000	Oceanography						
409000	Environmental sci., n.e.c.[2]						
500000	**Mathematics and computer sciences, total**						
501000	Mathematics						
502000	Computer sciences						
509000	Math. & compt. sci., n.e.c.[2]						
600000	**Engineering, total**						
601000	Aeronautical						
602000	Astronautical						
603000	Chemical						
604000	Civil						
605000	Electrical						
606000	Mechanical						
607000	Metallurgy and materials						
609000	Engineering, n.e.c.[2]						
700000	**Social sciences, total**						
701000	Anthropology						
702000	Economics						
705000	Political science						
706000	Sociology						
709000	Social sciences, n.e.c.[2]						
800000	**Other sciences, n.e.c.[2]**						
000000	**Total, all fields[3]**						

[1] Basic research plus applied research equals total research.
[2] Not elsewhere classified.
[3] Totals equal items 1, 2, and 3, respectively, in table 1, for 1983 for basic research, applied research, and total research.

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TABLE V

Obligations for basic, applied, and total research by field of science and engineering, fiscal year 1984

(Dollars in thousands)

Agency [ ]

Code	FIELD OF SCIENCE AND ENGINEERING	Basic research FF-XXXII Estimate	Applied research FF-XXXII Estimate	Total research[1] FF-XXXII Estimate
100000	**Life sciences, total**			
103020	Biological (excl. envrmtl.)			
103040	Environmental biology			
103060	Agricultural			
106000	Medical			
109000	Life sciences, n.e.c.[2]			
200000	**Psychology, total**			
201000	Biological aspects			
202000	Social aspects			
209000	Psychological sci., n.e.c.			
300000	**Physical sciences, total**			
301000	Astronomy			
302000	Chemistry			
303000	Physics			
309000	Physical sciences, n.e.c.[2]			
400000	**Environmental sciences, total**			
401000	Atmospheric			
402000	Geological			
403000	Oceanography			
409000	Environmental sci., n.e.c.[2]			
500000	**Mathematics and computer sciences, total**			
501000	Mathematics			
502000	Computer sciences			
509000	Math. & compt. sci., n.e.c.[2]			
600000	**Engineering, total**			
601000	Aeronautical			
602000	Astronautical			
603000	Chemical			
604000	Civil			
605000	Electrical			
606000	Mechanical			
607000	Metallurgy and materials			
609000	Engineering, n.e.c.[2]			
700000	**Social sciences, total**			
701000	Anthropology			
702000	Economics			
703000	Political science			
706000	Sociology			
709000	Social sciences, n.e.c.[2]			
800000	**Other sciences, n.e.c.[2]**			
000000	**Total, all fields[3]**			

[1] Basic research plus applied research equals total research.
[2] Not elsewhere classified.
[3] Totals equal items 1, 2, and 3, respectively, in table II for 1984 for basic research, applied research, and total research.

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TABLE VI

Obligations for research and development by performer and character of work
fiscal year 1982

[Dollars in thousands]

Agency [ ]

Item	PERFORMER	Basic research		Applied research		Development	
		FF XXXI Estimate	FF XXXII Actual	FF XXXI Estimate	FF XXXII Actual	FF XXXI Estimate	FF XXXII Actual
1	Federal intramural[1]						
	As % of total (item 00)	%	%	%	%	%	%
2	Personnel costs[2]	( )	( )	( )	( )	( )	( )
3	Industrial firms excluding FFRDC's[3]						
	As % of total (item 00)	%	%	%	%	%	%
4	FFRDC's[3] adm. by industrial firms						
	As % of total (item 00)	%	%	%	%	%	%
5	Universities and colleges, excluding FFRDC's[3]						
	As % of total (item 00)	%	%	%	%	%	%
6	FFRDC's[3] adm. by universities and colleges						
7	Nonprofit institutions excluding FFRDC's[3]						
8	FFRDC's[3] adm. by nonprofit institutions						
9	State and local governments						
10	Total, all domestic performers						
11	Foreign[4]						
12	Amount of item 11 supported by separate appropriations for "special foreign currency programs"	( )	( )	( )	( )	( )	( )
00	Total, all performers[5]						

For each total (basic research, applied research or development), there must be an entry for item 1 (Federal intramural). Even if all work is performed extramurally, the costs associated with the planning and administration of such programs by Federal personnel must be reported.
Amount of item 1 for personnel costs.
Federally funded research and development centers. (See p. 41 for list.)
See page 3 for definition of foreign performers.
Totals equal items 1, 2, and 4, respectively, in table II for 1982 for basic research, applied research, and development.

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TAB[illegible]

Obligations for research and development by performer and character of work
fiscal year 1983

[Dollars in thousands]

Agency [ ]

Item	PERFORMER	Basic research		Applied research		Development	
		FF XXXI Estimate	FF XXXII Estimate	FF XXXI Estimate	FF XXXII Estimate	FF XXXI Estimate	FF XXXII Estimate
1	Federal intramural[1]						
	As % of total (item 00)	%	%	%	%	%	%
2	Personnel costs[2]	( )	( )	( )	( )	( )	( )
3	Industrial firms, excluding FFRDC's[3]						
	As % of total (item 00)	%	%	%	%	%	%
4	FFRDC's[3] adm. by industrial firms						
	As % of total (item 00)	%	%	%	%	%	%
5	Universities and colleges, excluding FFRDC's[3]						
	As % of total (item 00)	%	%	%	%	%	%
6	FFRDC's[3] adm. by universities and colleges						
7	Nonprofit inst. excluding FFRDC's[3]						
8	FFRDC's[3] adm. by nonprofit institutions						
9	State and local governments						
10	Total, all domestic performers						
11	Foreign[4]						
12	Amount of item 11 supported by separate appropriations for "special foreign currency programs"	( )	( )	( )	( )	( )	( )
00	Total, all performers[5]						

For each total (basic research, applied research, or development), there must be an entry for item 1 (Federal intramural). Even if all work is performed extramurally, the costs associated with the planning and administration of such programs by Federal personnel must be reported.
Amount of item 1 for personnel costs.
Federally funded research and development centers. (See p. 41 for list.)
[illegible] page 4 for definition of foreign performers.
Totals equal items 1, 2, and 4, respectively, in table II for 1983 for basic research, applied research, and development.

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TABLE VIII

Obligations for research and development by performer and character of work
fiscal year 1984

(Dollars in thousands)

Agency _____

Item	PERFORMER	Basic research FF XXXII Estimate	Applied research FF XXXII Estimate	Development FF XXXII Estimate
1	Federal intramural[1]			
	As % of total (item 00)	%	%	%
2	Personnel costs[2]	( )	( )	( )
3	Industrial firms, excluding FFRDC's[3]			
	As % of total (item 00)	%	%	%
4	FFRDC's[3] adm. by industrial firms			
	As % of total (item 00)	%	%	%
5	Universities and colleges, excluding FFRDC's[3]			
	As % of total (item 00)	%	%	%
6	FFRDC's[3] adm. by universities and colleges			
7	Nonprofit inst. excluding FFRDC's[3]			
8	FFRDC's[3] adm. by nonprofit institutions			
9	State and local governments			
10	Total, all domestic performers			
11	Foreign[4]			
12	Amount of item 11 supported by separate appropriations for "special foreign currency programs"	( )	( )	( )
00	Total, all performers[5]			

[1] For each total (basic research, applied research or development), there must be an entry for item 1 (Federal intramural). Even if all work is performed extramurally, the costs associated with the planning and administration of such programs by Federal personnel must be reported.
[2] Amount of item 1 for personnel costs.
[3] Federally funded research and development centers. (See p. 41 for list.)
[4] See page 3 for definition of foreign performers.
[5] Totals equal items 1, 2, and 4, respectively, in table II for 1984 for basic research, applied research, and development.

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Table IX

Obligations for research and development and R&D plant at individual federally funded research and development centers fiscal year 1982

[Dollars in thousands]

Agency [ ]

Federally funded research and development centers (FFRDC's). (Report obligations for any FFRDC used by respondent agency.)	R&D obligations	R&D plant obligations
Administered by industrial firms:		
Bettis Atomic Power Laboratory (Westinghouse Electric Corp.), Pittsburgh, Pa.		
Frederick Cancer Research Facility (Litton Bionetics, Inc., Litton Industries), Frederick, Md.		
Hanford Engineering Development Laboratory (Westinghouse-Hanford Corp.), Richland, Wash.		
Oak Ridge National Laboratory (Union Carbide Corp.), Oak Ridge, Tenn.		
Idaho National Engineering Laboratory (EG&G Idaho, Inc.), Idaho Falls, Idaho		
Knolls Atomic Power Laboratory (General Electric Company), Schenectady, N.Y.		
Energy Technology Engineering Center (Rockwell International Corporation), Canoga Park, Calif.		
Sandia National Laboratories (Western Electric Co., Inc.-Sandia Corp.), Albuquerque, N.M.		
Savannah River Laboratory (E.I. du Pont de Nemours & Co., Inc.), Aiken, S.C.		
Total	1/	2/
Administered by universities and colleges:		
Ames Laboratory (Iowa State University of Science and Technology), Ames, Iowa		
Argonne National Laboratory (University of Chicago and Argonne Universities Assn), Argonne, Ill.		
Brookhaven National Laboratory (Associated Universities, Inc.), Upton, Long Island, N.Y.		
Center for Naval Analyses (University of Rochester), Arlington, Va.		
Cerro Tololo Inter-American Observatory (Association of Universities for Research in Astronomy, Inc.), La Serena, Chile		
E. O. Lawrence Berkeley Laboratory (University of California), Berkeley, Calif.		
E. O. Lawrence Livermore National Laboratory (University of California), Livermore, Calif.		
Fermilab (Universities Research Association, Inc.), Batavia, Ill.		
Jet Propulsion Laboratory (California Institute of Technology), Pasadena, Calif.		
Kitt Peak National Observatory (Associated Universities for Research in Astronomy, Inc.), Tucson, Ariz.		

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TABLE IX (cont.)

Obligations for research and development and R&D plant at individual federally funded research and development centers fiscal year 1982

[Dollars in thousands]

Agency [ ]

Federally funded research and development centers (FFRDC's). (Report obligations for any FFRDC used by respondent agency.)	R&D obligations	R&D plant obligations
Administered by universities and colleges (con.):		
Lincoln Laboratory (Massachusetts Institute of Technology), Lexington, Mass.		
Los Alamos National Laboratory (University of California), Los Alamos, N.M.		
National Astronomy and Ionosphere Center (Cornell University), Arecibo, P.R.		
National Center for Atmospheric Research (University Corporation for Atmospheric Research), Boulder, Colo.		
National Radio Astronomy Observatory (Associated Universities, Inc.), Green Bank, W.Va.		
Oak Ridge Institute of Nuclear Studies (Oak Ridge Associated Universities), Oak Ridge, Tenn.		
Plasma Physics Laboratory (Princeton University), Princeton, N.J.		
Sacramento Peak Observatory (Associated Universities for Research in Astronomy, Inc.), Sunspot, N.M.		
Stanford Linear Accelerator Center (Stanford University), Stanford, Calif.		
Total	3/	4/
Administered by other nonprofit institutions:		
Aerospace Corporation, El Segundo, Calif.		
Institute for Defense Analyses (IDA), Arlington, Va.		
C I Division (MITRE Corporation),* Bedford, Mass.		
Pacific Northwest Laboratory (Battelle Memorial Institute), Richland, Wash.		
Project Air Force (RAND Corporation),* Santa Monica, Calif.		
Solar Energy Research Institute (Midwest Research Institute), Golden, Colo.		
Total	7/	8/

1/ Totals equal combined obligations for basic research, applied research, and development, as reported in item 4 of table VI.
2/ Totals equal item 3 of table XI for 1982.
3/ Totals equal combined obligations for basic research, applied research, and development, as reported in item 6 of table VI.
4/ Totals equal item 5 of table XI for 1982.
* Only the C I Division of the MITRE Corporation should be reported as an FFRDC. All other agency support to MITRE should be reported under "other nonprofit institutions excluding FFRDC's."
* Only the Project Air Force portion of the RAND Corporation should be reported as an FFRDC. All other agency support to RAND should be reported under "other nonprofit institutions excluding FFRDC's."
7/ Totals equal combined obligations for basic research, applied research, and development, as reported in item 8 of table VI.
8/ Totals equal 7 of table XI for 1982.

Note: Each supporting agency should report obligations to each FFRDC it uses even though the FFRDC may be under the sponsorship of another agency. See pages 41 and 42 for list of FFRDC's shown by sponsoring agency and administering organization.

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Table X

Obligations for basic research and total research and development to foreign performers[1] by geographic area and country fiscal year 1982

(Dollars in thousands)

Agency

Code	GEOGRAPHIC AREA AND COUNTRY	Basic research only[2]	Total research and development[3]
010000	Europe, total		
010100	Austria		
010200	Belgium		
010300	Denmark		
010400	Finland		
010500	France		
010600	Iceland		
010700	Ireland		
010800	Italy		
010900	Netherlands		
011000	Norway		
011100	Poland		
011200	Portugal		
011300	Spain		
011400	Sweden		
011500	Switzerland		
011600	United Kingdom, total		
011610	England		
011620	Scotland		
011630	Bermuda		
011640	Other United Kingdom		
011700	West Germany		
011800	Yugoslavia		
011900	Other Europe		

[1] See page 3 for definition of a foreign performer.
[2] Total of columns equals basic research in item 11 in table VI.
[3] Total of columns equals the sum of basic research, applied research, and development in item 11 in table VI.

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Table X (cont.)

Obligations for basic research and total research and development to foreign performers[1] by geographic area and country fiscal year 1982

[Dollars in thousands]

Agency

Code	GEOGRAPHIC AREA AND COUNTRY	Basic research only[2]	Total research and development[3]
020000	Asia, total		
020100	Burma		
020200	Cambodia		
020300	Hong Kong		
020400	India		
020500	Indonesia		
020600	Japan		
020700	South Korea		
020800	Malaysia		
020900	Pakistan		
021000	Philippines		
021100	Taiwan		
021200	Thailand		
021400	Other Asia		
030000	Near East, total		
030100	Greece		
030200	Israel		
030300	Jordan		
030400	Lebanon		
030500	Syria		
030600	Turkey		
030700	Egypt		
030800	Other Near East		

[1]See page 3 definition of a foreign performer.
[2]Total of columns equals basic research in item 11 in table VI.
[3]Total of columns equals the sum of the basic research, applied research, and development in item 11 in table VI.

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Table X (cont.)

Obligations for basic research and total research and development to foreign performers[1] by geographic area and country fiscal year 1982

(Dollars in thousands)

Agency [ ]

Code	GEOGRAPHIC AREA AND COUNTRY	Basic research only[2]	Total research and development[3]
040000	Africa, total		
040100	Kenya		
040200	Liberia		
040300	Nigeria		
040400	Sudan		
040500	Uganda		
040600	Union of South Africa		
040700	Other Africa		
050000	Latin America, total		
050100	Argentina		
050200	Bolivia		
050300	Brazil		
050400	Chile		
050500	Colombia		
050600	Costa Rica		
050700	Ecuador		
050800	El Salvador		
050900	Mexico		
051000	Panama		
051100	Peru		
051200	Uruguay		
051300	Venezuela		
051400	Other Latin America		
060000	Australia		
070000	Canada		
080000	New Zealand		
090000	International organizations		
000000	Total, all areas and organizations		

See page 3 for definition of a foreign performer.
[2]Total of column equals basic research in item 11 in table VI.
[3]Total of column equals the sum of basic research, applied research, and development in item 11 in table VI.

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TABLE XI

Obligations for R&D plant by performer of research and development supported fiscal years 1982, 1983, and 1984

[Dollars in thousands]

Agency [ ]

Item	PERFORMER OF RESEARCH AND DEVELOPMENT SUPPORTED	FY 1982		FY 1983		FY 1984
		FF XXXI Estimate	FF XXXI Actual	FF XXXI Estimate	FF XXXII Estimate	FF XXXII Estimate
1	Federal intramural					
2	Industrial firms, exclu... FFRDC's[1]					
3	FFRDC's[1] adm. by industrial firms					
4	Universities and colleges, excluding FFRDC's[1]					
5	FFRDC's[1] administered by universities and colleges					
6	Nonprofit inst. excluding FFRDC's[1]					
7	FFRDC's[1] adm. by nonprofit institutions					
8	State and local governments					
9	Total, all domestic performers					
10	Foreign[2]					
00	Total, all performers[3]					

[1] Federally funded research and development centers.
[2] See pp. 3 and 5 for definition of foreign R&D plant.
[3] Equals item 6 in table II

FEDERALLY FUNDED RESEARCH AND DEVELOPMENT CENTERS

The following is a list of the centers to be used in providing information for tables VI, VII, VIII, IX, and XI. The list is arranged by sponsoring agency and administering organization. Respondents will report under the FFRDC category funds obligated to centers identified on this list.

Department of Defense

Office of the Secretary of Defense

Administered by other nonprofit institutions:

Institute for Defense Analyses (IDA), Arlington, Va.

Department of the Navy

Administered by universities and colleges:

Center for Naval Analyses (University of Rochester), Arlington, Va.

Department of the Air Force

Administered by universities and colleges:

Lincoln Laboratory (Massachusetts Institute of Technology), Lexington, Mass.

Administered by other nonprofit institutions:

Aerospace Corporation, El Segundo, Calif.
C³I Division (MITRE Corporation,[1] Bedford, Mass.
Project Air Force (RAND Corporation),[2] Santa Monica, Calif.

Department of Health and Human Services

National Institutes of Health

Administered by industrial firms:

Frederick Cancer Research Facility (Litton Bionetics, Inc.; Litton Industries) Frederick, Md.

Department of Energy

Administered by industrial firms:

Bettis Atomic Power Laboratory (Westinghouse-Electric Corp.), Pittsburgh Pa
Hanford Engineering Development Laboratory (Westinghouse-Hanford Corp.), Richland, Wash.
Idaho National Engineering Laboratory (EG&G Idaho, Inc.; Exxon Nuclear Idaho Co.; Argonne National Laboratory, West; Westinghouse Electric Corp.), Idaho Falls, Idaho
Knolls Atomic Power Laboratory (General Electric Company), Schenectady, N.Y.
Energy Technology Engineering Center (Rockwell International Corporation), Canoga Park, Calif.
Oak Ridge National Laboratory (Union Carbide Corp.), Oak Ridge, Tenn.
Sandia National Laboratories (Western Electric Co., Inc.—Sandia Corp.), Albuquerque, N.M.
Savannah River Laboratory (E.I. du Pont de Nemours & Co., Inc.), Aiken, S.C.

Department of Energy——con.

Administered by universities and colleges:

Ames Laboratory (Iowa State University of Science and Technology), Ames, Iowa
Argonne National Laboratory (University of Chicago and Argonne Universities Assn.), Argonne, Ill.
Brookhaven National Laboratory (Associated Universities, Inc.), Upton, Long Island, N.Y.
E. O. Lawrence Berkeley Laboratory (University of California), Berkeley, Calif.
E. O. Lawrence Livermore National Laboratory (University of California), Livermore, Calif.
Fermilab (Universities Research Association, Inc.), Batavia, Ill.
Los Alamos National Laboratory (University of California), Los Alamos, N.M.
Oak Ridge Institute of Nuclear Studies (Oak Ridge Associated Universities), Oak Ridge, Tenn.
Plasma Physics Laboratory (Princeton University), Princeton, New Jersey
Stanford Linear Accelerator Center (Stanford University), Stanford, Calif.

Administered by other nonprofit institutions:

Pacific Northwest Laboratory (Battelle Memorial Institute), Richland, Wash.
Solar Energy Research Institute (Midwest Research Institute), Golden, Colo.

National Aeronautics and Space Administration

Administered by universities and colleges:

Jet Propulsion Laboratory (California Institute of Technology), Pasadena, Calif.

National Science Foundation

Administered by universities and colleges:

Cerro Tololo Inter-American Observatory (Association of Universities for Research in Astronomy, Inc.), La Serena, Chile
Kitt Peak National Observatory (Association of Universities for Research in Astronomy, Inc.), Tucson, Ariz.
National Astronomy and Ionosphere Center (Cornell University), Arecibo, Puerto Rico
National Center for Atmospheric Research (University Corporation for Atmospheric Research), Boulder, Colo.
National Radio Astronomy Observatory (Associated Universities, Inc.), Green Bank, W.V.
Sacramento Peak Observatory (Association of Universities for Research in Astronomy, Inc.), Sunspot, N.M.

[1] Only the C3I Division of the MITRE Corporation should be reported as FFRDC. All other agency support to MITRE should be reported under "other nonprofit institutions excluding FFRDC's."
[2] Only the Project Air Force portion of the RAND Corporation should be reported as an FFRDC. All other agency support to RAND should be reported under "other nonprofit institutions excluding FFRDC's."

DESCRIPTION OF RESEARCH AND DEVELOPMENT PROGRAMS

Agency

Identify below the total R&D obligations shown in item 5 of table II by appropriation title and program activity or subactivity within each appropriation as given in the fiscal year 1984 budget.

For each activity or subactivity give the R&D obligations for fiscal years 1982, 1983, and 1984 and identify within parentheses the portion that is for *research* only, excluding development.

In addition, provide a brief description of the research and development supported under each activity or subactivity **including reasons for increases or decreases during the 3-year period.**

Use the three headings below in providing information. They may be rearranged on the pages to provide more space for completing the middle item.

Use additional sheets, as needed.

Appropriation title and program activity and subactivity	*Brief description of each activity or subactivity*	*R&D obligations for each activity or subactivity 1982, 1983 (est.), 1984 (est.)*

DESCRIPTION OF RESEARCH AND DEVELOPMENT PROGRAMS (cont.)

Agency

DESCRIPTION OF R&D PLANT PROGRAMS

Agency

Identify below the total R&D plant obligations shown in item 6 of tables II by appropriation title and program activity or subactivity within each account, as given in the fiscal 1984 budget.

For each activity or subactivity give the R&D plant obligations for fiscal years 1982, 1983, and 1984.

In addition, provide a brief description of the R&D plant supported in connection with each activity or subactivity, **including reasons for increases or decreases during the 3-year period.**

Use the three headings below in providing information. They may be rearranged on the page to provide more space for completing the middle item.

Use addition sheets, as needed.

Appropriation title and program activity and subactivity	*Brief description of each activity or subactivity*	*R&D obligations for each activity or subactivity 1982, 1983 (est.), 1984 (est.)*

SHUTTLE DESCRIPTIONS

Description of significant differences between data reported for Volume XXXI and Volume XXXII for fiscal years 1982 and 1983 (Shuttle columns)

Agency

(If more space is required, please use additional sheets of paper)

Table II: Explanation of significant differences in obligation levels for *character of work (basic research, applied research,* and *development)* and *R&D plant.*

FY 82

FY 83

Tables III and IV: Explanation of significant differences in obligation levels for *fields of science.*

FY 82

FY 83

Tables VI and VII: Explanation of significant differences in obligation levels for *performers.*

FY 82

FY 83

RECONCILIATION WITH THE OFFICE OF MANAGEMENT AND BUDGET SPECIAL ANALYSIS OF FEDERAL R&D PROGRAMS

Research and development reconciliation sheet for fiscal years 1982, 1983, and 1984

Relationship of data submitted for *Federal Funds XXXII* to data reported to the Office of Management and Budget for the special analysis of Federal research and development programs, *Budget of the United States Government, FY 1984*

Agency _____

Total research and development obligations

	1982	1983 (est.)	1984 (est.)
	(Dollars in thousands)		
Obligations for total research and development reported in *Federal Funds* table II, item 5	$		
Obligations for total research and development reported to OMB in response to Circular No. A-11 (Section 44, Exhibit 44, revised July 1982)	$		
Differences	$		

Explanation of any differences in research and development obligations between the two reports:

Total basic research obligations

	1982	1983 (est.)	1984 (est.)
	(Dollars in thousands)		
Obligations reported for basic research in *Federal Funds* Table II, item 1	$		
Obligations for basic research reported to OMB in response to Circular No. A-11 (Section 44, Exhibit 44, revised July 1982)	$		
Differences	$		

Explanation of any differences in basic research obligations between the two reports:

RECONCILIATION WITH THE OFFICE OF MANAGEMENT AND BUDGET SPECIAL ANALYSIS OF FEDERAL R&D PROGRAMS

Research and development reconciliation sheet for fiscal years 1982, 1983, and 1984

Relationship of data submitted for *Federal Funds XXXII* to data reported to the Office of Management and Budget for the special analysis of Federal research and development programs, *Budget of the United States Government, FY 1984*

Agency _____

Research and development obligations to universities and colleges

	1982	1983 (est.)	1984 (est.)
	(Dollars in thousands)		
Obligations reported in *Federal Funds* tables VI, VII, and VIII, item 5, universities and colleges, excluding FFRDC's (basic research plus applied research plus development)	$		
Obligations reported to OMB in response to Circular No. A-11 (Sec 44, Exhibit 44, revised July 1982)	$		
Differences	$		

Explanation of any differences in research and development obligations to universities and colleges between the two reports:

RECONCILIATION WITH THE FEDERAL SUPPORT TO UNIVERSITIES (CASE) SURVEY[1]

Research and development reconciliation sheet for FY 1982 obligations

Relationship of data submitted for *Federal Funds XXXII* to data reported to NSF for the survey of Federal obligations to universities and colleges, by individual institutions

Agency _____

_____

Research and development

(Dollars in thousands)

Amount reported in *Federal Funds* table VI, item 5, universities and colleges, excluding federally funded research and development centers (basic research plus applied research plus development) $ _____

Amount reported for research and development to universities and colleges (total for all institutions) in the *Federal Support to Universities* (CASE) survey. $ _____

Difference $ _____

Explanation of any differences in research and development amounts reported between these two surveys:

_____

Amount reported in *Federal Funds* table VI, item 6, federally funded research and development centers administered by universities and colleges (basic research plus applied research plus development) $ _____

Amount reported for research and development to federally funded research and development centers (total for all centers administered by universities and colleges) in the *Federal Support to Universities* (CASE) survey. $ _____

Difference $ _____

Explanation of any differences in research and development amounts reported between these two surveys:

_____

[1] To be completed by the following agencies and their subdivisions: The Departments of Agriculture, Commerce, Defense, Education, Energy, Housing and Urban Development, the Interior, Health and Human Services, Labor, State (AID), and Transportation; the Environmental Protection Agency; the National Aeronautics and Space Administration; the National Science Foundation; and the Nuclear Regulatory Commission. (See page 11).

RECONCILIATION WITH THE FEDERAL SUPPORT TO UNIVERSITIES (CASE) SURVEY[1]

R&D plant reconciliation sheet for FY 1982 obligations

Relationship of data submitted for *Federal Funds XXXII* to data reported to NSF for the survey of Federal obligations to universities and colleges

Agency _____

R&D plant

(Dollars in thousands)

Amount reported in *Federal Funds* table XI, item 4, universities and colleges, excluding federally funded research and development centers.	$ _____
Amount reported for R&D plant to universities and colleges (total for all institutions) in the *Federal Support to Universities* (CASE) survey.	$ _____
Difference	$ _____
Explanation of any differences in amounts for R&D plant reported between the two surveys.	

Amount reported in *Federal Funds* table XI, item 5, federally funded research and development centers administered by universities and colleges.	$ _____
Amount reported for R&D plant to federally funded research and development centers (total for all centers administered by universities and colleges) in the *Federal Support to Universities* (CASE) survey.	$ _____
Difference	$ _____
Explanation of any differences in amounts for R&D plant reported between the two surveys:	

[1] To be completed by the following agencies and their subdivisions: The Departments of Agriculture, Commerce, Defense, Education, Energy, Housing and Urban Development, the Interior, Health and Human Services, Labor, State (AID), and Transportation; the Environmental Protection Agency; the National Aeronautics and Space Administration; the National Science Foundation; and the Nuclear Regulatory Commission. (See page 11).

industrial research and development

purpose and background

The National Science Foundation (NSF) has sponsored the Survey of Industrial Research and Development since 1953 to obtain data on the magnitude and underlying trends in the research and development (R&D) efforts of American firms. The Bureau of the Census conducts this annual survey and prepares the statistical tables for NSF. The survey is designed to collect data on dollar volume of research and development, sources of financing, employment of R&D scientists and engineers, and other economic characteristics of industrial R&D performance.

survey instrument

Since 1978, an abbreviated survey form has been mailed biennially to reduce the reporting burden on companies. The full questionnaire is sent to survey respondents in the intervening years. Copies of the 1981 and 1982 survey forms are reproduced on the following pages.

sample

The sample used for the Survey of Industrial Research and Development represents all manufacturing industries and those nonmanufacturing industries known—on the basis of earlier, more detailed samples—to conduct or to finance research and development. The sampling unit for the survey is the company defined as a business organization consisting of one or more establishments under common ownership or control. Approximately once every five years a new panel for the R&D survey is selected.

The 1982 industry survey is the 26th in the annual series sponsored by NSF and conducted by Census. NSF also sponsored two industry surveys covering the 1953-56 period, which were conducted by the Bureau of Labor Statistics (BLS). Data obtained from the BLS surveys are not directly comparable with the Census figures because of methodological and other differences in the surveys conducted by the two agencies.

references

The most recent NSF reports based on survey data are

Science Resources Studies Highlights, "Industrial R&D Spending Rises 17% During 1981" (NSF 83-313), available from NSF.

Research and Development in Industry: 1981. Funds, 1981; Scientists and Engineers, January 1982 (Detailed Statistical Tables) (NSF 82-325), available from NSF and NTIS.

Trends to 1982 of Industrial Basic Research (NSF 83-302), available from NSF and NTIS.

data access

Data on individual companies cannot be released by Census because of proprietary considerations. However, additional tabulations of data collected on the enclosed survey form are available directly from the Census Bureau. The cost is dependent on the amount of detail involved. Information on the availability of data and costs may be obtained from:

Ms. Elinor Champion
Industry Division
Bureau of the Census
Department of Commerce
Washington, D.C. 20233
(301) 763-5616

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DUE DATE: 60 DAYS AFTER RECEIPT OF FORM

O.M.B. No. 3145-0027: Approval Expires July 31, 1984

FORM RD-1

U.S. DEPARTMENT OF COMMERCE
BUREAU OF THE CENSUS
COLLECTING AND COMPILING AGENT FOR
THE NATIONAL SCIENCE FOUNDATION

SURVEY OF INDUSTRIAL RESEARCH AND DEVELOPMENT DURING 1981

RETURN TO: Bureau of the Census
1201 East Tenth Street
Jeffersonville, Indiana 47132

Name of person who supplied 1980 data

NOTE: Data supplied in items 2A and 2B and in item 5C, columns 2 and 4, for 1981 on this form, will satisfy the mandatory reporting requirement of Census Form MA-121 (title 13, U.S. Code). Although you are not required to complete the other items, your cooperation on these voluntary items is needed to make the results of this survey comprehensive, accurate, and timely.

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. The law also provides that copies retained in your files are immune from legal process.

Item 1 – NAME AND ADDRESS OF COMPANY – *Please correct any error in name and address including ZIP code*

Group	Survey
4	4001

PLEASE RETURN THIS COPY

CENSUS USE ONLY	1	2	3	4	5	6

GENERAL INSTRUCTIONS

- Please complete and return this form in the envelope provided within 60 days. Retain the file copy for your records. This report should cover your entire company, including all subsidiaries and affiliates, unless otherwise designated.
- Enter "None" where appropriate rather than leaving a blank space.
- Reasonably accurate estimates are acceptable.
- Be sure 1980 and 1981 figures are comparable.

PLEASE READ ENCLOSED INSTRUCTIONS BEFORE COMPLETING THIS FORM

Section I – GENERAL COMPANY DATA

Item 2 – DOMESTIC SALES, RECEIPTS, AND EMPLOYMENT FOR COMPANY	CT1	1980 [1]	1981 [2]
A. Domestic net sales and receipts of this company *(Thousands of dollars)*	2001	$	$
B. Total domestic company employment in all activities during the pay period which includes the 12th of March 1980 and 1981	2002		

Item 3 – RESEARCH AND DEVELOPMENT EXPENDITURES

Are research and development expenditures for entire domestic company, including subsidiaries and affiliates, reported on this form? . . . . . ☐ YES ☐ NO – *Please explain in remarks or on transmittal letter.*

Section II – RESEARCH AND DEVELOPMENT PERFORMED WITHIN THE COMPANY IN THE UNITED STATES

(Exclude R&D financed by the company but performed by others. Report such R&D in section III.)

Item 4 – NUMBER OF RESEARCH AND DEVELOPMENT SCIENTISTS AND ENGINEERS *(See Instruction Manual, page 2)*	CT2	January 1981 [1]	January 1982 [2]
A. Federal research and development	3001		
B. Company and other research and development	3002		
C. TOTAL *(Sum of A and B)* →	3099		

Item 5 – COST OF RECEIPTS FOR RESEARCH AND DEVELOPMENT PERFORMED WITHIN THE COMPANY BY MAJOR TYPE AND SOURCE OF FUNDS		CT2	*Thousands of dollars* 1981 [1]	Federal funds [2]	Company and other funds, except Federal [3]	TOTAL *(Sum of columns 2 and 3)* [4]
A. Basis research. If "None," please mark ☐ 35105		3510		$	$	$
B. Applied research and development	1. Applied research	3521				
	2. Development	3522				
	3. Total *(Sum of lines 1 and 2)*	3529				
C. TOTALS *(Sum of A and B3)* →		3599				
D. 1980 TOTALS →		3598		$	$	$

	CT1	
E. Company and other funds, except Federal, budgeted for the year 1982 →	3800	$

Item 6 – COST OF RESEARCH AND DEVELOPMENT BY PRINCIPAL FEDERAL AGENCY	CT1	*Thousands of dollars* 1981 [1]	1981 [2]
Cost of Federal research and development during 1981 *(Breakdown of item 5C, column 2, of this form)*			
1. Department of Defense	3701		$
2. National Aeronautics and Space Administration	3702		
3. Department of Energy	3703		
4. All other Federal Agencies	3704		
5. TOTAL COST *(Sum of 1, 2, 3, and 4)* →	3799		$

Item 7 – COST OR CONTRACT VALUE OF RESEARCH AND DEVELOPMENT PERFORMED WITHIN THIS COMPANY BY MAJOR TYPE OF EXPENSE	CT1	*Thousands of dollars* 1981 [1]	1981 [2]
A. Wages and salaries of research and development personnel *(Include scientists and engineers, technicians, secretaries, and other personnel)*	4010		$
B. Costs of materials and supplies consumed (do not include in this item components, models, and other materials supplied by other research organizations)	4020		
C. Other costs (include service and supporting costs, depreciation, and share of overhead)	4030		
D. TOTAL COSTS *(Sum of A through C) (Same as Item 6C, columns 1 and 4)* →	4099		$

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Section II – R&D PERFORMED WITHIN THE COMPANY IN THE UNITED STATES – Continued

(Exclude R&D financed by the company but performed by others. Report such R&D in section III.)

Item 8 – FIELDS OF BASIC RESEARCH *(Of the total reported in item 5A for basic research, please give cost for the following fields.)*

	CT1	Thousands of dollars 1981 [2]
A. Chemistry	5001	$
B. Engineering (including metallurgy)	5002	
C. Geological sciences	5003	
D. Mathematics	5004	
E. Physics	5005	
F. Astronomy	5006	
G. Atmospheric sciences	5007	
H. Oceanography	5008	
I. Biological sciences	5009	
J. Clinical medical sciences	5010	
K. Other sciences	5011	
L. TOTAL BASIC RESEARCH COST *(Same as item 5A, columns 1 and 4)* →	5099	$

Item 9 – APPLIED RESEARCH AND DEVELOPMENT BY PRODUCT GROUP *(Of the total reported in item 5B, line 3, for applied research and development, please give cost of project for each of the following. See the instructions on how to classify and define research and development, page 6.)*

	CT2	Thousands of dollars 1980 Federal [1]	1980 Total [2]	1981 Federal [3]	1981 Total [4]
1. Atomic energy devices *(See Instruction Manual, page 6)*					
2. Food and kindred products	6200			$	$
3. Textile mill products	6220				
4. Industrial inorganic and organic chemicals	6281				
5. Plastics materials and synthetic resins, rubber, and fiber	6282				
6. Drugs	6283				
7. Agricultural chemicals	6287				
8. All other chemicals	6289				
9. Petroleum refining and extraction	6290				
10. Rubber and miscellaneous plastics products	6300				
11. Stone, clay, glass, and concrete products	6320				
12. Primary ferrous products	6331				
13. Primary and secondary nonferrous metals	6319				
14. Fabricated metal products	6340				
15. Engines and turbines	6351				
16. Farm machinery and equipment	6352				
17. Construction, mining, and materials handling machinery	6353				
18. Metalworking machinery and equipment	6354				
19. Office, computing, and accounting machines	6357				
20. Other machinery, except electrical	6359				
21. Electric transmission and distribution equipment	6361				
22. Electrical industrial apparatus	6362				
23. Radio and television receiving sets, except communication types	6365				
24. Electronic components and accessories, communications equipment	6366				
25. Other electrical machinery equipment and supplies	6369				
26. Missiles	6197				
27. Space vehicles	6198				
28. Aircraft and parts	6372				
29. Motor vehicles and equipment	6371				
30. Other transportation equipment	6379				
31. Professional and scientific instruments	6380				
32. Ordance, except missiles	6199				
33. Other – *Specify*	6998				
34. TOTAL APPLIED RESEARCH AND DEVELOPMENT COSTS *(Same as item 5B, line 3, columns 1, 2, and 4)* →	6999			$	$

Item 10 – COST OF RESEARCH AND DEVELOPMENT PERFORMED WITHIN THE COMPANY, BY STATE

Were all of the research and development costs reported in item 5C, column 4, on this form for 1981 performed in the State listed in the address block (Item 1) of this form? ..... [ ] YES [ ] NO

If "No," list the home State and any other States in which the various research and development laboratories or facilities are located, and estimate the costs associated with each State. If necessary, you may report up to 10 percent of your total as "Not distributed by State."

State *(Attach an additional sheet if necessary)*	CT1	Thousands of dollars 1980 Federal [1]	1980 Total [2]	1981 Federal [3]	1981 Total [4]
A.	71			$	$
B.	71				
C.	71				
D.	71				
E.	71				
F.	71				

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G.	71				
H.	71				
I.	71				
J. TOTAL COSTS *(Same as item 5C, on this form)* →	7199			$	$

Item 11 – RESEARCH AND DEVELOPMENT BY FUNCTIONAL CATEGORY *(Of the total reported in item 5C, COSTS OR RECEIPTS FOR RESEARCH AND DEVELOPMENT, columns 2 and 4, report the following functional categories.)*

ENERGY RESEARCH AND DEVELOPMENT Include the project cost or portion of project cost incurred for the purpose of increasing energy resources or capabilities. Include cost by type of energy.
If "None," please mark ⇨ 80996

Thousands of dollars

	CT2	1980 [1] Federal funds	1980 [2] Total funds	1981 [3] Federal funds	1981 [4] Total funds	1982 [5] Total projected costs
A. Total nuclear	8010	$	$	$	$	$
1. Fission	8011					
2. Fusion	8012					
B. Total fossil fuels	8020					
1. Oil	8021					
2. Gas	8022					
3. Shale	8023					
4. Coal	8024					
a. Synthetic fuels	8025					
b. Mining	8026					
c. All other	8027					
5. Other fossil fuels	8028					
C. Geothermal	8030					
D. Solar	8040					
E. Conservation and utilization	8050					
F. All other energy	8060					
G. Total of A through F →	8099	$	$	$	$	$

POLLUTION ABATEMENT RESEARCH AND DEVELOPMENT – Include the project cost or portion of the project cost incurred for the purpose of designing pollution abatement products or product characteristics or of designing pollution abatement features into processes. Include cost by form of pollution to be abated.
If "None," please mark ⇨ 81996

Thousands of dollars

	CT2	1980 [1] Federal funds	1980 [2] Total funds	1981 [3] Federal funds	1981 [4] Total funds	1982 [5] Total projected costs
H. Air	8110			$	$	$
1. Automotive emission	8111					
2. Electric power plant emissions	8112					
3. All other	8113					
I. Water	8120					
J. Solid waste	8130					
K. Other	8140					
L. Total of H through K →	8199	$	$	$	$	$

Section III – RESEARCH AND DEVELOPMENT PERFORMED OUTSIDE THE DOMESTIC COMPANY
(Not included in item 5) with company funds.

Item 12 – TOTAL COMPANY FUNDS SPENT FOR RESEARCH AND DEVELOPMENT ACTIVITIES PERFORMED OUTSIDE THE COMPANY WITHIN THE UNITED STATES
If "None," please mark ⇨ 90013

	CT1	Thousands of dollars 1980 [1]	1981 [2]
	9001		$

Item 13 – TOTAL COMPANY FUNDS SPENT FOR RESEARCH AND DEVELOPMENT ACTIVITIES PERFORMED BY FOREIGN AFFILIATES OUTSIDE THE UNITED STATES
If "None," please mark ⇨ 11603

	CT2	Thousands of dollars 1980 [1]	1981 [2]
	1160	$	$

Section IV – RESEARCH AND DEVELOPMENT DISTRIBUTION BY SPECIAL CATEGORIES

Item 14 – PRODUCT VERSUS PROCESS APPLIED RESEARCH AND DEVELOPMENT Allocate the total applied research and development dollar figures of item 5B3, columns 2 and 3 ("FEDERAL" and "COMPANY") to either product, process, or unclassifiable R&D.

	CT1	Thousands of dollars 1980 [1]	1981 [2]
A. Product research and development			
1. Federal funds	1210		$
2. Company and other funds	1211		
3. Total *(Sum of 1 and 2)* →	1212		$
B. Process research and development			
1. Federal funds	1220		$
2. Company and other funds	1221		
3. Total *(Sum of 1 and 2)* →	1222		
C. Unclassifiable as to product or process			
1. Federal funds	1230		
2. Company and other funds	1231		
3. Total *(Sum of 1 and 2)* →	1232		
D. TOTAL *(Sum of A3, B3, and C3)* →	1299		$

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Section IV – RESEARCH AND DEVELOPMENT DISTRIBUTION BY SPECIAL CATEGORIES – Continued

Item 15 – TOTAL COMPANY FUNDS (Exclude Federal) spent for research and development activities performed to meet the **present regulations** of the agencies listed below, and which would not have been performed in the absence of these regulations. Include expenditures to meet Government regulations which have been established but which have a future compliance data. Exclude expenditures to meet anticipated Government regulations.

IF NONE, MARK (X) ⟶ ☐ 13000

	CT1	Thousands of dollars 1	1981 2
A. Consumer Product Safety Commission	1310		$
B. Department of Energy	1311		
C. Environmental Protection Agency	1312		
D. Federal Aviation Administration	1313		
E. Federal Communications Commission	1314		
F. Food and Drug Administration	1315		
G. National Highway Traffic Safety Administration	1316		
H. Nuclear Regulatory Commission	1317		
I. Occupational Safety and Health Administration	1318		
J. Other Federal agencies – *Specify*	1319		
	1320		
	1321		
	1322		
K. State and local governments	1323		
L. Other – *Specify*	1324		
	1325		
	1326		
M. TOTAL *(Sum of A through L)* ⟶	1399		$

Item 16 – LONG VERSUS SHORT TERM RESEARCH DEVELOPMENT COSTS

Allocate the total R&D dollar figures of item 5C, columns 2 and 3 ("FEDERAL" and "COMPANY"), based on the actual or estimated future life of each of of your projects in the R&D cycle, into the following three categories:

	CT1	Thousands of dollars FEDERAL 1	FEDERAL 1981 2	COMPANY 3	COMPANY 1981 4
A. Less than or equal to 2-year project life in R&D	1410		$		$
B. More than 2-year but less than or equal to 5-year project life in R&D	1420		$		$
C. More than 5-year project life in R&D	1430		$		$

REMARKS

Name of person to contact regarding this report	Address *(No. and street, city, State, ZIP code)*	Telephone Area code	Number	Extension

CERTIFICATION – This report is substantially accurate and has been prepared in accordance with instructions.

Name of company	Address *(No. and street, city, State, ZIP code)*	
Signature of authorized official	Title	Date

FORM RD-1 (12-8-81)

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DUE DATE: 60 DAYS AFTER RECEIPT OF FORM

O.M.B. No. 3145-0027: Approval Expires July 31, 1984

FORM RD-1
(11-16-82)

U.S. DEPARTMENT OF COMMERCE
BUREAU OF THE CENSUS
COLLECTING AND COMPILING AGENT FOR
THE NATIONAL SCIENCE FOUNDATION

SURVEY OF INDUSTRIAL RESEARCH AND DEVELOPMENT DURING 1982

RETURN TO: Bureau of the Census
1201 East Tenth Street
Jeffersonville, Indiana 47132

Name of person who supplied 1981 data

NOTE: Data supplied in items 2A and 2B and in item 5A, columns 2 and 4, for 1982 on this form, will satisfy the mandatory reporting requirement of Census Form MA-121 (title 13, U.S. Code). Although you are not required to complete the other items, your cooperation on these voluntary items is needed to make the results of this survey comprehensive, accurate, and timely.

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. The law also provides that copies retained in your files are immune from legal process.

Group	Survey
4	4001

Item 1 – NAME AND ADDRESS OF COMPANY – *Please correct any error in name and address including ZIP code*

PLEASE RETURN THIS COPY.

CENSUS USE ONLY	1	2	3	4	5	6

GENERAL INSTRUCTIONS

- Please complete and return this form in the envelope provided within 60 days. Retain the file copy for your records. This report should cover your entire company, including all subsidiaries and affiliates, unless otherwise designated.
- Enter "None" where appropriate rather than leaving a blank space.
- Reasonably accurate estimates are acceptable.
- Be sure 1981 and 1982 figures are comparable.

PLEASE READ ENCLOSED INSTRUCTIONS BEFORE COMPLETING THIS FORM

Section I – GENERAL COMPANY DATA

Item 2 – DOMESTIC SALES, RECEIPTS, AND EMPLOYMENT FOR COMPANY	CT1	1981 (1)	1982 (2)
A. Domestic net sales and receipts of this company *(Thousands of dollars)*	2001	$	$
B. Total domestic company employment in all activities during the pay period which includes the 12th of March 1981 and 1982.	2002		

Item 3 – RESEARCH AND DEVELOPMENT EXPENDITURES

Are research and development expenditures for entire domestic company, including subsidiaries and affiliates, reported on this form? . . . . . ☐ Yes ☐ No – *Please explain in remarks or on transmittal letter*

Section II – RESEARCH AND DEVELOPMENT PERFORMED WITHIN THE COMPANY IN THE UNITED STATES

(Exclude R&D financed by the company but performed by others.)

Item 4 – NUMBER OF RESEARCH AND DEVELOPMENT SCIENTISTS AND ENGINEERS *(See Instruction Manual, page 3)*	CT2	January 1982 (1)	January 1983 (2)
TOTAL →	3099		

Item 5 – COST OR RECEIPTS FOR REASERCH AND DEVELOPMENT PERFORMEO WITHIN THE COMPANY BY SOURCE OF FUNDS	CT2	*Thousands of dollars* 1981 TOTAL (1)	1982 Federal funds (2)	1982 Company and other funds except Federal (3)	1982 TOTAL *(Sum of columns 2 and 3)* (4)
A. TOTALS →	3599	$	$	$	$
B. 1981 TOTALS →			$	$	$
C. Company and other funds, except Federal, budgeted for the year 1983 →	CT1 3800		$		

Please continue on reverse side

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Section II – R&D PERFORMED WITHIN THE COMPANY IN THE UNITED STATES – Continued
(Exclude R&D financed by the company but performed by others.)

Item 6 – RESEARCH AND DEVELOPMENT BY FUNCTIONAL CATEGORY *(Of the total reported in Item 5A,* **COSTS OR RECEIPTS FOR RESEARCH AND DEVELOPMENT,** *columns 2 and 4, report the following functional categories.)*

ENERGY RESEARCH AND DEVELOPMENT Include the project cost or portion of project cost incurred for the purpose of increasing energy resources or capabilities. Include cost by type of energy. *If "None," please mark (X).* ☐ 80996	CT2	Thousands of dollars				
		1981		1982		1983
		1 Federal funds	2 Total funds	3 Federal funds	4 Total funds	5 Total projected costs
A. Total nuclear	8010	$	$	$	$	$
B. Total fossil fuels	8020					
C. All other energy	8060					
D. TOTAL of A through C →	8099	$	$	$	$	$

POLLUTION ABATEMENT RESEARCH AND DEVELOPMENT – Include the project cost or portion of the project cost incurred for the purpose of designing pollution abatement products or product characteristics or of designing pollution abatement features into processes. Include cost by form of pollution to be abated. *If "None," please mark (X).* ☐ 81996	CT2	Thousands of dollars				
		1981		1982		1983
		1 Federal funds	2 Total funds	3 Federal funds	4 Total funds	5 Total projected costs
TOTAL →	8199	$	$	$	$	$

Section III – RESEARCH AND DEVELOPMENT PERFORMED OUTSIDE THE DOMESTIC COMPANY
(Not included in item 5 with company funds.)

Item 7 – TOTAL COMPANY FUNDS SPENT FOR RESEARCH AND DEVELOPMENT ACTIVITIES PERFORMED BY FOREIGN AFFILIATES OUTSIDE THE UNITED STATES

If "None," please mark (X). ☐ 11603

CT2	Thousands of dollars			
	1981	1	1982	2
1160	$		$	

Remarks – *Attach additional sheet if necessary*

Name of person to contact regarding this report	Address – *Number and street, city, State, ZIP code*	Telephone		
		Area code	Number	Extension

Period covered by this report ☐ Calendar year ☐ Fiscal year – *Specify* →	From – *Month/day/year*	To – *Month/day/year*

CERTIFICATION – This report is substantially accurate and has been prepared in accordance with instructions.

Name of company	Address – *Number and street, city, State, ZIP code*	
Signature of authorized official	Title	Date

FORM RD-1 (11-18-82)

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federal support to universities, colleges, and selected nonprofit institutions

purpose and background

The purpose of this survey is to collect data on Federal obligations to individual U.S. universities and colleges. The interagency system for reporting Federal obligations to universities and colleges was originally established in 1965 under the auspices of the Committee on Academic Science and Engineering (CASE) of the Federal Council on Science and Technology. Since 1968 these data have been collected annually by the National Science Foundation (NSF) through the Survey of Federal Support to Universities, Colleges, and Selected Nonprofit Institutions. Data are currently supplied by 15 Federal agencies accounting for over 95 percent of all Federal obligations to the institutions included.

Data are provided by the agencies at the institution or campus level; however, all records on tapes are maintained at the institutional level, with separate totals for system offices where funds were obligated to a system of institutions and the funding agency was unable to determine the ultimate distribution of the money among the institutions within the system.

survey instrument

More detailed information about the participating agencies and subagencies, the definitions of the categories of support and the fields of science and engineering, and the formats used by agencies when submitting data are found in the annual NSF publication, "Instructions and Specifications for Reporting Federal Support to Universities, Colleges, and Selected Nonprofit Institutions," copies of which are available at no charge from the Division of Science Resources Studies.

references

The most recent NSF reports based on the data cited above are

Federal Support to Universities, Colleges, and Selected Nonprofit Institutions, Fiscal Year 1981. A Report to the President and Congress (Final Report) (NSF 83-315), available from NSF, GPO, and NTIS (PB 84-134246).

Science Resources Studies Highlights, "Federal Science/Engineering (S/E) Support to Universities and Colleges Rose by 6% in FY 1981; Non-S/E Support Down 25%" (NSF 83-306), available from NSF.

data access

Data for 1975 through 1982 are currently available on a single multiyear tape. Data for 1971, 1972, 1973, 1974, and the 1976 Transition Quarter are available on separate tapes. The survey populations for these years are given below.

For further information regarding data tape availability or contents please contact:

Ms. Catherine Joseph
Abt Associates
NSF Surveys
55 Wheeler Street
Cambridge, Massachusetts 02138
(617) 492-7100

The cost of the multiyear tape is $325 for the period 1975-82; the 1982 single-year tape is $250; and remaining single-year tapes are $100 each. A *Data User Guide* has been developed for 1971-82 tape users that documents the compatible code structure utilized in NSF's Integrated Data Base—a 4-survey system of academic institutions' personnel and financial resources devoted to science and engineering (S/E) activities, of which this survey is a part. A copy of this guide may be obtained from:

Mr. J. G. Huckenpahler
Division of Science Resources Studies
National Science Foundation
1800 G Street, N.W., Rm. L-602
Washington, D.C. 20550
(202) 634-4673

Fiscal year	Total	Academic institutions	Academic FFRDC's[1]	Nonprofit institutions	Nonprofit FFRDC's[1]
1971	2,414	2,383	31	—	—
1972	2,465	2,434	31	—	—
1973	2,482	2,459	23	—	—
1974	2,659	2,509	21	123	6
1975	2,718	2,512	21	179	6
1976	2,759	2,534	21	199	5
1976 transition quarter	2,603	2,440	20	143	—
1977	2,802	2,565	21	212	4
1978	3,061	2,733	20	303	5
1979	3,192	2,636	19	531	6
1980	3,188	2,667	19	496	6
1981	3,280	2,712	19	543	6
1982	3,275	2,803	19	447	6

[1] Federally funded research and development centers.

scientific and engineering expenditures at universities and colleges

purpose and background

The purpose of this survey is to collect information on three areas of academic spending for scientific and engineering (S/E) activities: Separately budgeted research and development (R&D) expenditures; current-fund expenditures for research equipment; and capital expenditures for S/E activities. Separately budgeted R&D expenditures are reported by source of funds and by S/E field.

The Survey of Scientific and Engineering Expenditures at Universities and Colleges originated in 1954 and has been conducted annually since 1972. The populaton surveyed in most years consists of the 500 to 600 universities and colleges which annually perform over $50,000 in separately budgeted research and development; these institutions account for over 95 percent of the Nation's academic R&D expenditures. In addition, approximately 19 academically administered federally funded research and development centers (FFRDC's) are surveyed.

In most years the expenditures surveys have collected information on three areas of academic spending for S/E activities: Separately budgeted R&D expenditures; expenditures for instruction and departmental research (discontinued in 1978 survey); and capital expenditures for S/E activities. Two significant changes from other survey years were made for the FY 1978 survey as part of an NSF experiment with biennial reductions in the survey scope to lessen response burden. First, unlike the FY 1972-77 and 1979-81 surveys, the survey population for 1978 was restricted to doctorate-granting institutions and FFRDC's. Secondly, in contrast to the other years, the 1978 survey collected information via a shortened survey form which included a limited number of items as indicated below.

Although all surveys in the Integrated Data Base have collected data on separately budgeted R&D expenditures by source of funds (total and Federal) and by S/E field, the 1978 form omitted questions on character of work (e.g., basic research) and on capital expenditures for S/E activities. Expenditures for instruction and departmental research were collected annually during the period 1972-77 but were discontinued in 1978 and are not available on the current multiyear archival tapes. In FY 1980, an item on current-fund research equipment expenditures by S/E field was added as a regular part of the form.

references

The most recent NSF report based on the data cited above are:

Academic Science/Engineering: R&D Funds, Fiscal Year 1981 (Detailed Statistical Tables) (NSF 83-308), available from NSF and NTIS (PB 83-228213).

Science Resources Studies Highlights, "Real Growth Rate of Academic R&D Expenditures Slowed to 2% in FY 1981" (NSF 83-304), available from NSF.

data access

Data for 1975-82 are currently available on a single multiyear tape. Data for 1972, 1973, and 1974 are available on separate tapes. The survey populations for these years are as follows:

FY 1972—591 Academic Institutions; 23 FFRDC's
FY 1973—591 Academic Institutions; 23 FFRDC's
FY 1974—597 Academic Institutions; 22 FFRDC's
FY 1975—537 Academic Institutions; 22 FFRDC's
FY 1976—536 Academic Institutions; 21 FFRDC's
FY 1977—537 Academic Institutions; 21 FFRDC's
FY 1978—318 Doctorate Institutions; 18 FFRDC's
FY 1979—565 Academic Institutions; 19 FFRDC's
FY 1980—563 Academic Institutions; 19 FFRDC's
FY 1981—563 Academic Institutions; 19 FFRDC's
FY 1982—563 Academic Institutions; 19 FFRDC's

For further information regarding data tape availability or contents, please contact:

Ms. Catherine Joseph
Abt Associates
NSF Surveys
55 Wheeler Street
Cambridge, Massachusetts 02138
(617) 492-7100

The cost of the multiyear tape is $325 for the period 1975-82; the 1982 single-year tape is $200; and the 1972, 1973, and 1974 tapes are $100 each. A *Data User Guide* has been developed for 1972-82 tape users that documents the compatible code structure utilized in NSF's Integrated Data Base—a 4-survey system of academic institutions' personnel and financial resources devoted to S/E activities, of which this survey is a part. A copy of this guide is available from:

Mr. J. G. Huckenpahler
Division of Science Resources Studies
National Science Foundation
1800 G Street, N.W., Rm. L-602
Washington, D.C. 20550
(202) 634-4673

NSF Form 411 (11-82)

FORM APPROVED
OMB No. 3145-0015
Expiration Date: 7/31/84

NATIONAL SCIENCE FOUNDATION
Washington, D.C. 20550

SURVEY OF SCIENTIFIC AND ENGINEERING EXPENDITURES AT UNIVERSITIES AND COLLEGES, FY 1982

Organizations are requested to complete and return this form to:

NATIONAL SCIENCE FOUNDATION
1800 G Street, N.W., Room L-602
Washington, D.C. 20550
Attn: UNISG/R&D

This form should be returned by February 1, 1983. Your cooperation in returning the survey questionnaire promptly is very important.

This information is solicited under the authority of the National Science Foundation Act of 1950, as amended. All information you provide will be used for statistical purposes only. Your response is entirely voluntary and your failure to provide some or all of the information will in no way adversely affect your institution.

All financial data requested on this form should be reported in thousands of dollars; for example, an expenditure of $25,342 should be rounded to the nearest thousand dollars and reported as $25.

Where exact data are not available, estimates are acceptable. Your estimates will be better than ours.

Include data for branches and all organizational units of your institution, such as medical schools and agricultural experiment stations. Also include hospitals or clinics owned, operated, or controlled by universities, and integrated operationally with the clinical progams of your medical schools. Exclude data for federally funded research and development centers (FFRDC's). A separate questionnaire is included in this package if your institution administers an FFRDC. If you have any questions please contact Judith Coakley or Marge Machen (202-634-7674).

Please correct if name or address has changed

Financial data are requested for your institution's 1982 fiscal year.

Please circle the month in which your institution's fiscal year begins:

1 2 3 4 5 6 7 8 9 10 11 12

How many person hours were required to complete this form? ☐

Date Submitted _____

Scope:

This survey collects data on expenditures by universities and colleges for separately budgeted research and development (R&D) in science and engineering. Definitions used are compatible with OMB Circular A-21, revised July 23, 1982. Items 1 and 2 ask for *current fund expenditures* by source of funds and by field of science/engineering. Item 3 collects data on that *portion of current fund expenditures* reported in items 1 and 2 that went for the purchase of scientific and engineering research equipment. Item 4 collects data on capital expenditures for facilities and equipment for research, development, and instruction by source of funds and field of science/engineering.

Definitions:

1. ***Research and Development (R&D).*** R&D for purposes of this survey is the same as "organized research" as defined in Section B.1.b. of OMB Circular A-21 (revised). It includes all R&D activities of an institution that are *separately budgeted and accounted for.* R&D includes both "sponsored research" activities (sponsored by Federal and non-Federal agencies and organizations) and "university research" (separately budgeted under an internal application of institutional funds).
   a. ***Research*** is a systematic study directed toward fuller knowledge or understanding of the subject studied. Research is classified as either basic or applied, according to the objectives of the investigator.
   b. ***Development*** is systematic use of the knowledge or understanding gained from research, directed toward the production of useful materials, devices, systems, or methods, including design and development of prototypes and processes.
2. ***Current fund expenditures.*** Expenditures of funds available for current operations. Such expenditures include all unrestricted gifts and restricted current funds to the extent that such funds were expended for current operating purposes.
3. ***Capital expenditures*** (for facilities and equipment). A capital expenditure as defined in Section J.13 of OMB Circular A-21 (revised) means the cost of the asset including the cost to put it in place. "Equipment" as a capital expenditure means an article of nonexpendable tangible personal property having a useful life of more than two years and an acquisition cost of $500 or more per unit; lower limits may be established, consistent with institutional policy.

PLEASE TYPE OR PRINT NAME OF PERSON SUBMITTING THIS FORM	TITLE	AREA CODE	EXCH.	NO.	EXT.

NAME OF PERSON WHO PREPARED THIS SUBMISSION (If different from above)	TITLE	AREA CODE	EXCH.	NO.	EXT.

Instructions for Items 1 and 2

Separately budgeted research and development (R&D) includes all funds expended for activities specifically organized to produce research outcomes and commissioned by an agency either external to the institution or separately budgeted by an organizational unit within the institution. *Include* research equipment purchased under research project awards from "current fund" accounts. Also, *include* research funds subcontracted to outside organizations. *Exclude* training grants, public service grants, demonstration projects, and departmental research expenditures that are not separately budgeted. Also, *exclude* any R&D expenditures in the fields of education, law, humanities, music, the arts, physical education, library science, and all other nonscience fields.

a. *Federal Government.* Report grants and contracts for R&D (including direct and reimbursed indirect costs) by all agencies of the Federal Government.

b. *State and local governments.* Include funds for R&D from State, county, municipal, or other local governments and their agencies. Include here State funds which support R&D at agricultural experiment stations.

c. *Industry.* Include all grants and contracts for R&D from profitmaking organizations, whether engaged in production, distribution, research, service, or other activities. Do not include grants and contracts from nonprofit foundations financed by industry; these should be reported under *All other sources* (line 1175).

d. *Institutional funds.* Report funds, including indirect costs, which your institution spent for R&D activities from the following sources: (1) General-purpose State or local government appropriations; (2) general-purpose grants from industry, foundations, or other outside sources; (3) tuition and fees; (4) endowment income. In addition, estimate your institution's contribution to unreimbursed indirect costs incurred in association with R&D projects financed by outside organizations, and mandatory cost sharing on Federal and other grants. To estimate unreimbursed indirect costs, many institutions use a university-wide negotiated indirect cost rate multiplied by the base (e.g., direct salaries and wages, etc.) minus actual indirect cost recoveries. If your institution now separately budgets what was previously classified as departmental research, these data should be included in line 1161.

e. *All other sources.* Include grants for R&D from nonprofit foundations and voluntary health agencies as well as from all other sources not elsewhere classified. Funds from foundations which are affiliated with, or granted solely to your institution, should be included under line 1160, Institutional funds. Funds for R&D received from a health agency that is a unit of a State or local government should be reported under State and local governments (line 1125). Also include gifts from individuals that are restricted by the donor to research.

ITEM 1. CURRENT FUND EXPENDITURES FOR SEPARATELY BUDGETED RESEARCH AND DEVELOPMENT IN THE SCIENCES AND ENGINEERING, BY SOURCE OF FUNDS, FY 1982 (Include indirect costs)

Source of funds		(1) Total (Dollars in thousands)	(2) Basic research (Percent of column 1)
a. Federal Government	1110	$	_____ %
*b. State and local governments	1125		**Basic research** is directed toward an increase of knowledge; it is research where the primary aim of the **investigator** is a fuller knowledge or understanding of the subject under study rather than a specific application thereof.
c. Industry	1150		
d. Institutional funds	1160		
(1) Separately budgeted	1161		
(2) Underrecovery of indirect costs and cost sharing	1162		
*e. All other sources	1175		
f. TOTAL (sum of a through e)	1100	$	_____ %

*Combined data cell (See instructions for b and e).

CONFIDENTIALITY

Information received from individual institutions in lines 1161 and 1162, or estimates for basic research expenditures, will **not** be published or released; only aggregate totals will appear in publications.

Total R&D expenditures reported in line 1100, column (1) and line 1400, column (1) should be the same.

Federally financed R&D expenditures reported in line 1110, column (1) and line 1400, column (2) should be the same.

ITEM 2. CURRENT FUND EXPENDITURES (TOTAL AND FEDERALLY FINANCED) FOR SEPARATELY BUDGETED RESEARCH AND DEVELOPMENT, BY FIELD OF SCIENCE/ENGINEERING: FY 1982 (Include indirect costs)

Field of science/engineering		Dollars in thousands)	
		(1) Total	(2) Federal
a. ENGINEERING (TOTAL)	1410	$	$
(1) Aeronautical & astronautical	1411		
(2) Chemical	1412		
(3) Civil	1413		
(4) Electrical	1414		
(5) Mechanical	1415		
(6) Other	1416		
b. PHYSICAL SCIENCES (TOTAL)	1420		
(1) Astronomy	1421		
(2) Chemistry	1422		
(3) Physics	1423		
(4) Other	1424		
c. ENVIRONMENTAL SCIENCES (TOTAL)	1430		
(1) Atmospheric	1431		
(2) Earth sciences	1432		
(3) Oceanography	1433		
(4) Other	1434		
d. MATHEMATICAL AND COMPUTER SCIENCES (TOTAL)	1440		
(1) Mathematics	1441		
(2) Computer sciences	1442		
e. LIFE SCIENCES (TOTAL)	1450		
(1) Agricultural	1451		
(2) Biological	1452		
(3) Medical	1453		
(4) Other	1454		
f. PSYCHOLOGY (TOTAL)	1460		
g. SOCIAL SCIENCES (TOTAL)	1470		
(1) Economics	1471		
(2) Political science	1472		
(3) Sociology	1473		
(4) Other	1474		
h. OTHER SCIENCES, not elsewhere classified (TOTAL)	1480		
i. TOTAL (sum of a through h)	1400		

*PLEASE EXCLUDE from your response any R&D expenditures in the fields of education, law, humanities, music, the arts, physical education, library science, and all other nonscience fields.

ITEM 3. CURRENT FUND EXPENDITURES FOR RESEARCH EQUIPMENT (TOTAL AND FEDERALLY FINANCED) FOR SEPARATELY BUDGETED RESEARCH AND DEVELOPMENT, BY FIELD OF SCIENCE/ENGINEERING: FY 1982*
(See page 5 for instructions.)

Field of science/engineering		Dollars in thousands)	
		(1) Total	(2) Federal
a. ENGINEERING (TOTAL)	1810	$	$
(1) Aeronautical & astronautical	1811		
(2) Chemical	1812		
(3) Civil	1813		
(4) Electrical	1814		
(5) Mechanical	1815		
(6) Other	1816		
b. PHYSICAL SCIENCES (TOTAL)	1820		
(1) Astronomy	1821		
(2) Chemistry	1822		
(3) Physics	1823		
(4) Other	1824		
c. ENVIRONMENTAL SCIENCES (TOTAL)	1830		
(1) Atmospheric	1831		
(2) Earth sciences	1832		
(3) Oceanography	1833		
(4) Other	1834		
d. MATHEMATICAL AND COMPUTER SCIENCES (TOTAL)	1840		
(1) Mathematics	1841		
(2) Computer sciences	1842		
e. LIFE SCIENCES (TOTAL)	1850		
(1) Agricultural	1851		
(2) Biological	1852		
(3) Medical	1853		
(4) Other	1854		
f. PSYCHOLOGY (TOTAL)	1860		
g. SOCIAL SCIENCES (TOTAL)	1870		
(1) Economics	1871		
(2) Political science	1872		
(3) Sociology	1873		
(4) Other	1874		
h. OTHER SCIENCES, not elsewhere classified (TOTAL)	1880		
i. TOTAL (sum of a through h)	1800		

*Current fund expenditures in each field for scientific research equipment should be a subset of the "Total" and "Federal" column reported in item 2.

Item 3 Instructions

Please report that *portion* of current fund expenditures reported in items 1 and 2 that went for the purchase of research equipment. This includes all research equipment purchased under sponsored research project awards from current fund accounts.

NOTE: These research equipment expenditures are not to be included under capital expenditures reported in item 4.

For column (1) report current fund expenditures for R&D from all sources: Federal Government, State, county, municipal, or other governments and their agencies (including State funds supporting R&D at agricultural experiment stations); industry; institutional funds; and private foundations and voluntary health agencies, individuals, and associations.

For column (2) include funds from grants and contracts for R&D sponsored by agencies of the Federal Government.

Item 4 Instructions

Please report expenditures for facilities that were in process or completed during FY 1982.

Capital expenditures for facilities and equipment **include** the following: (a) Fixed equipment such as built-in equipment and furnishings; (b) movable scientific equipment such as oscilloscopes and pulse-height analyzers; (c) movable furnishings such as desks; (d) architect's fees, site work, extension of utilities, and the building costs of service functions such as integral cafeterias and bookstores of a facility; (e) facilities constructed to house separate components such as medical schools and teaching hospitals; and (f) special separate facilities used to house scientific apparatus such as accelerators, oceanographic vessels, and computers.

Expenditures for administration buildings, steam plants, residence halls, and other such facilities should be **excluded** unless used principally for research, development, or instruction in the sciences and engineering. Land costs should be **excluded. Also exclude** scientific research equipment purchased under research project awards from current fund accounts that are reported under items 1, 2, and 3.

ITEM 4. CAPITAL EXPENDITURES FOR FACILITIES AND EQUIPMENT FOR RESEARCH, DEVELOPMENT, AND INSTRUCTION, BY FIELD OF SCIENCE/ENGINEERING AND SOURCE OF FUNDS: FY 1982

Field of science/engineering		(Dollars in thousands)		
		Total (1)	Federal (2)	All other sources (3)
a. Engineering	1710	$	$	$
b. Physical sciences	1720			
c. Environmental sciences	1730			
d. Mathematical and computer sciences	1740			
e. Life sciences	1750			
f. Psychology	1760			
g. Social sciences	1770			
h. Other sciences, n.e.c.	1780			
i. Total (sum of a through h)	1700	$	$	$

ILLUSTRATIVE DISCIPLINES[1]

a. Engineering	
(1) Aeronautical & astronautical	Aerodynamics, aerospace, space technology
(2) Chemical	Ceramic, petroleum, petroleum refining process
(3) Civil	Architectural, hydraulic, hydrologic, marine, sanitary and environmental, structural transportation
(4) Electrical	Communication, electronic, power
(5) Mechanical	Engineering mechanics
(6) Other	Agricultural; industrial and management, metallurgical and materials, mining, nuclear, ocean engineering systems, textile, welding
b. Physical sciences	
(1) Astronomy	Astrophysics; optical and radio, x-ray gamma-ray, neutrino
(2) Chemistry	Inorganic, organo-metallic, organic, physical, analytical, pharmaceutical, polymer sciences (exclude biochemistry)
(3) Physics	Acoustics, atomic and molecular, condensed matter, elementary particles, nuclear structure, optics, plasma
(4) Other	Used for multidisciplinary projects within physical sciences and for disciplines not requested separately
c. Environmental sciences	
(1) Atmospheric	Aeronomy, solar, weather modification, extraterrestrial atmospheres, meteorology
(2) Earth sciences	Engineering geophysics, general geology, geodesy and gravity, geomagnetism, hydrology, inorganic geochemistry, isotopic geochemistry, organic geochemistry, lab geophysics, paleomagnetism, paleontology, physical geography and cartography, seismology
(3) Oceanography	Biological oceanography, chemical oceanography, geological oceanography, physical oceanography, marine geophysics
(4) Other	Used for multidisciplinary projects within environmental sciences
d. Mathematical and computer sciences	
(1) Mathematics	Algebra, analysis, applied mathematics, foundations and logic, geometry, numerical analysis, statistics, topology
(2) Computer sciences	Design, development, and application of computer capabilities to data storage and manipulation, information science
e. Life sciences	
(1) Agricultural	Agricultural chemistry, agronomy, animal science, conservation, dairy science, range science, wildlife
(2) Biological	Anatomy, biochemistry, biophysics, biogeography, ecology, embryology, entomology, genetics, immunology, microbiology, nutrition, parasitology, pathology, pharmacology, physical anthropology, physiology, plant science, botany, zoology, veterinary biology
(3) Medical	Anesthesiology, cardiology, endocrinology, gastroenterology, hematology, neurology, obstetrics; ophthalmology; preventive medicine and community health, psychiatry, radiology, surgery, veterinary medicine,[2] dentistry, pharmacy
(4) Other	Used for multidisciplinary projects within life sciences
f. Psychology	Animal behavior, clinical, educational, experimental, human development and personality, social
g. Social sciences	
(1) Economics	Econometrics, international, industrial, labor, agricultural, public finance and fiscal policy
(2) Political science	Regional studies, comparative government, international relations, legal systems, political theory, public administration
(3) Sociology	Comparative and historical, complex organizations, culture and social structure, demography, group interactions, social problems and welfare, theory
(4) Other	History of science, cultural anthropology, lingistics, socioeconomic geography
h. Other sciences, n.e.c.	To be used when the multidisciplinary and interdisciplinary aspects make the classification under one primary field impossible

[1]Also, see enclosed "Crosswalk" between NSF field of science/engineering codes and the NCES Classification of Instructional Programs (NCES 81-323).

[2]Institutions with schools of veterinary medicine should distribute R&D expenditures among the appropriate disciplines (agricultural, biological, and medical) rather than only in medical sciences.

science and technology inputs and outputs

science indicators literature data base

purpose and background

This data base includes complete coverage of over 2,100 of the world's most influential journals, spanning the physical and biological sciences. The data are derived from journals carried on the 1973 *Science Citation Index* (SCI) data base which was created by the Institute for Scientific Information. Machine-readable data for 13 specially constructed bibliometric indicators of international and domestic scientific activity are available, including national publication counts, national citation indicators, international co-authorships, etc. In most cases, these data are available for the years 1973 through 1980 in any one of the following fields as well as a total of all fields: Clinical medicine, biomedicine, biology, chemistry, physics, earth and space sciences, engineering and technology, psychology (1973-77 only), and mathematics.

sample

These more than 2,100 journals are the largest, most cited journals in the world. Although they are a sample, they represent virtually all the significant research literature of the world. The data base does not include journals added to the SCI after 1973 in order that comparisons over time can be made.

references

The most recent biennial National Science Board (NSB) report based on the data above is *Science Indicators—1982* (NSB 83-1), available from NSF and GPO.

data access

A complete description of the data base is contained in the publication, *Data User's Guide to the National Science Foundation's Science Literature Data Base* (1980). This publication is available from the Science Indicators Unit (202) 634-4682.

Data tapes for one or a set of indicators may be ordered from:

Computer Horizons, Inc.
1050 Kings Highway North
Cherry Hill, New Jersey 08034
(609) 779-0911

The cost is $100.00 for the first indicator and $50.00 for each additional indicator, plus shipping costs.

counts of patents applied for and granted in the united states

purpose and background

Data are provided by the Office of Technology Assessment and Forecasts, U.S. Patent and Trademark Office. Patent counts are classified by nationality of inventor and class of owner (individual, U.S. Government, U.S. corporation, foreign government, foreign corporation). They are also classified by field of technology (product field) by use of a computer concordance developed under National Science Foundation (NSF) sponsorship. Special tabulations have been made of patenting by small businesses and of energy-related patenting.

sample

All patents granted in the United States are covered. They are presented both by year of grant and year of application. Reports are updated biennially, and generally cover the period from 1963 to 1982.

references

The most recent report based on the data above is

Science Indicators—1982 (NSB 83-1), available from NSF and GPO.

data availability

Earlier Patent Office reports are unavailable, but the 1981 reports include the earlier data and are available in microfiche form. Copies can be obtained from the Science Indicators Unit, Division of Science Resources Studies, or from the Office of Technology Assessment and Forecast (OTAF). OTAF is also prepared to make special computer runs with their patent data file for a fee. Inquiries should be directed to:

Mr. John Terrapane
Office of Technology Assessment and Forecast
U.S. Patent and Trademark Office
Washington, D.C. 20231
(703) 557-3050

National Science Foundation
Washington, D.C. 20550

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