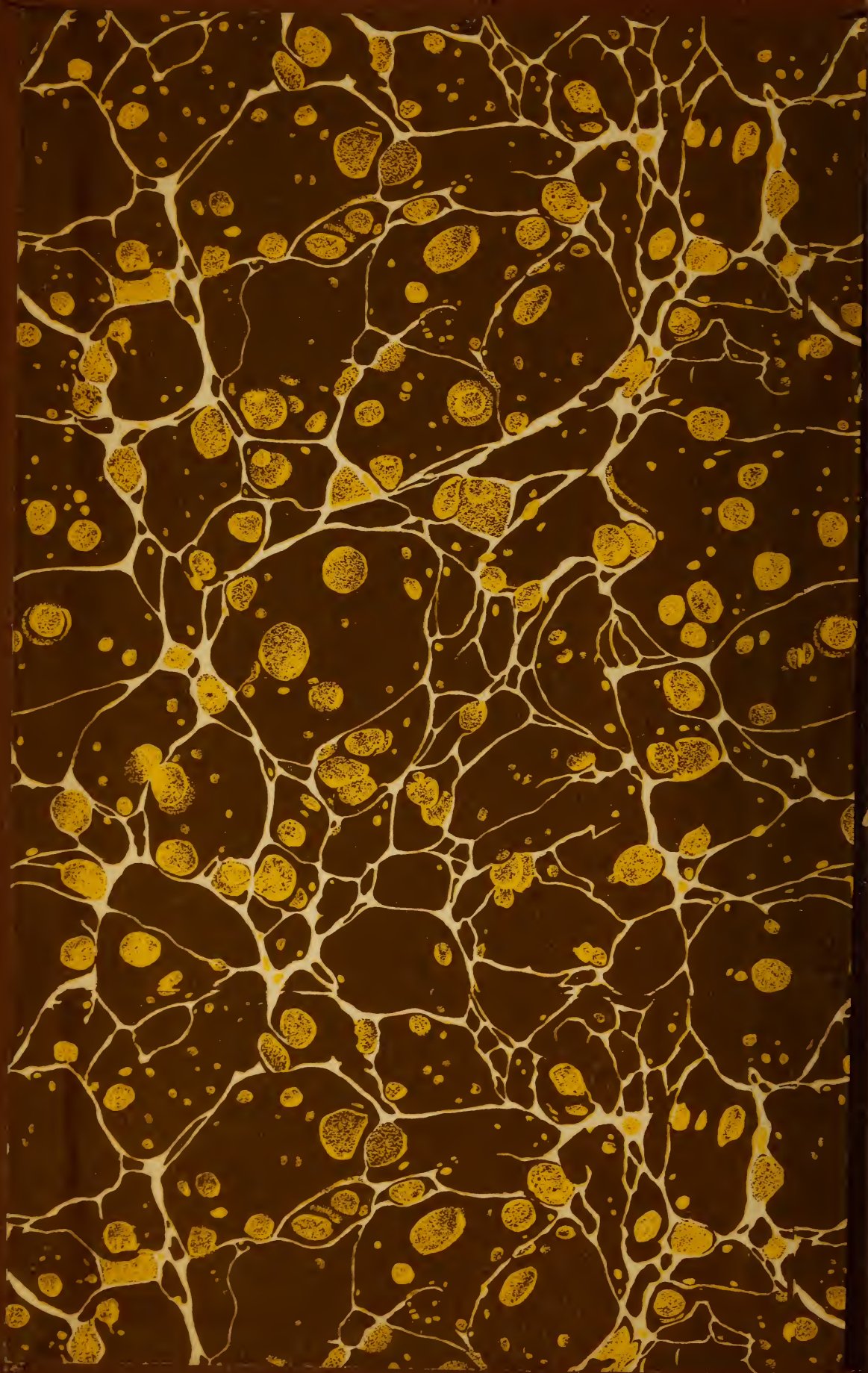
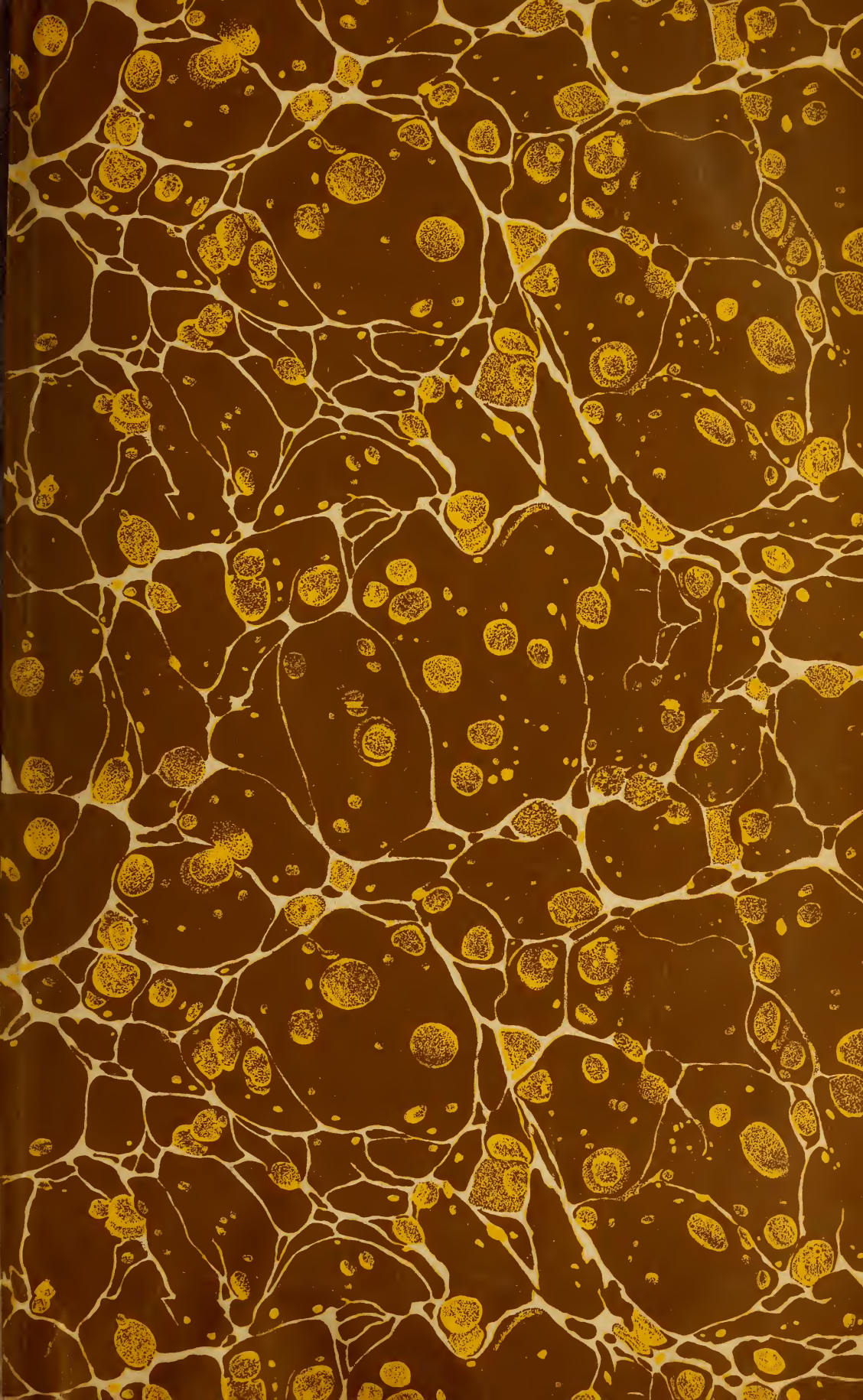


MISCELLANEOUS PUBLICATIONS
OF THE
BUREAU OF STANDARDS

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DEPARTMENT OF COMMERCE

BUREAU OF STANDARDS

George K. Burgess, Director

WASHINGTON

**SCIENTIFIC
AND TECHNICAL POSITIONS
IN THE
NATIONAL BUREAU OF
STANDARDS**

Miscellaneous Publication No. 94



(The Bureau of Standards is charged by law with the development, construction, custody, and maintenance of reference and working standards and their intercomparison, improvement, and application in science, engineering, industry, and commerce.

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SCIENTIFIC AND TECHNICAL POSITIONS, NATIONAL BUREAU OF STANDARDS¹

INFORMATION REGARDING APPOINTMENTS

Purpose of this Circular.

The Bureau of Standards desires to keep in touch with men and women who are well qualified to fill positions on its scientific staff. The aim of this circular is to answer queries received in the daily mail and give general information to prospective applicants who are interested in the scientific and technical work of the bureau.

Location of Bureau of Standards.

The bureau's location is pleasant, about 3½ miles from the center of Washington, at Connecticut Avenue and Upton Street. The bureau comprises a group of laboratory buildings on a 43-acre site, arranged like a university, situated on a natural hill amidst beautiful country surroundings.

Laboratory Facilities.

The bureau's facilities make it one of the best-equipped physical laboratories in the world for carrying on scientific research.

Scientific and Technical Work.

The work of the bureau includes many branches of physics, chemistry, and engineering, such as mechanics, heat, optics, electricity, sound, metrology, metallurgy, radio, electronics, thermodynamics, aerodynamics, engineering (gas, electrical, mechanical, aeronautical), also industrial technology (ceramics, paper, petroleum, rubber, leather, and textiles), including research and standardization, and offers valuable experience in these professions, combining as it does theoretical, experimental, and practical work.

¹ Prepared by William C. Fewell, personnel officer.

Training in the Bureau.

The bureau affords an excellent opportunity for training in scientific work, and its close connection with the industries makes bureau experience valuable in industrial research. Many employees have found a bureau position the stepping stone to some more highly remunerative one outside. Others who have remained in the service have been rewarded with steady advancement. It is generally recognized that the Government scientific and technical service is an excellent postgraduate training ground, and outside interests are ever on the alert to secure successful Government research workers.

Educational Opportunities.

Educational opportunities are afforded by the weekly meetings of the bureau staff, meetings of the various divisions and sections, the atomic physics seminar, cooperative study courses in physics, mathematics, etc., conducted by members of the staff and others, special lectures by visiting scientists, and meetings of national societies. The advanced courses at the bureau are accepted by several universities as credits toward a higher degree. Junior assistants are offered the opportunity of continuing their college work at local universities. In fact, employees appointed to positions in the subprofessional service are expected to prepare themselves by suitable education in some branch of the bureau's work for the broader field represented in positions of higher grades. The university courses are largely arranged to suit the convenience of persons in the Government service, and classes in most subjects are given in the late afternoon or evening. Arrangements are made at the bureau so that employees taking courses at the universities can be excused from their work early enough to attend these classes.

Library Facilities.

The Bureau of Standards has a highly specialized scientific library of 33,000 volumes and free use of the other scientific collections in Washington.

Mode of Entrance.

All positions on the staff of the Bureau of Standards are subject to the competitive requirements of the civil-service rules and regulations. Only those candidates can be considered who have passed appropriate examinations and who are certified by the United States Civil Service Commission among the three highest eligibles on the register as vacancies arise.

Needs of the Service.

For original appointment the demand is always much greater for junior assistants than for the higher grades, principally because, wherever possible, vacancies in the higher grades are filled through promotion. The bureau staff comprises approximately 375 professional, 210 subprofessional, 150 clerical, administrative, and fiscal, and 120 custodial positions. Naturally, in a force of this size vacancies often occur. The staff is also gradually increasing, so that there is frequent opportunity for the employment of young college men and women in scientific work.

Entrance Salary.

All appointments are made at the entrance salary of the grade for which eligibles have qualified through civil-service examination.

Duties.

No definite statement can be made as to the specific nature of the duties of a particular grade or position prior to offer of appointment. The duties are usually in connection with original investigations or testing in some field of the bureau's work. While experimental testing usually forms the major part of the early work of new appointees in the junior grades, opportunities for research are afforded.

Application.

Formal applications for examination in any of the several grades can not be accepted until after an examination has been announced. Application is made on standard prescribed forms issued by the United States Civil Service Commission.

Examination.

Examinations for positions in the lower grades are held frequently throughout the country in practically every city of considerable size. Examinations for the higher grades are held from time to time as the needs of the service require. Applicants for the junior professional and subprofessional positions are required to report for a written examination. Applicants for positions of higher grade are not required to report for a written examination but are rated on their education, training, and experience, writings (publications, reports, or thesis), and corroborative evidence.

Notice of Examination.

Persons who desire to be notified of the announcement of an examination for positions of any grade or in any specialty in the Bureau of Standards may place their names on file for the purpose with the United States Civil Service Commission or the Bureau of Standards, Washington, D. C.

Annual examinations for junior chemist and junior engineer will be conducted by the United States Civil Service Commission in February, and for junior physicist and junior technologist in April. Announcements showing the exact dates on which the examinations will be held and giving full information regarding the requirements, places of examination, etc., will be mailed to the heads of appropriate departments of colleges and universities and other interested persons approximately one month in advance of the examination dates. Examinations in addition to the annual examinations may also be announced.

Physical Examination.

In view of the benefits granted employees under employees' compensation and retirement legislation, persons appointed will be required to pass a physical examination by a physician in the Federal service before entering on duty.

Senior Students.

Applications will be accepted from senior students when an examination is announced, subject to their furnishing proof of actual graduation before entering on duty in case appointment is made.

Citizenship and Sex.

All citizens of the United States who meet the requirements, both men and women, may enter these examinations; appointing officers, however, have the legal right to specify the sex desired in requesting certification of eligibles.

Residence and Domicile.

To be eligible for permanent appointment to the apportioned service in Washington, D. C., applicants must have been actually domiciled, for at least one year next preceding the date of the examination, in the State or Territory in which they claim legal residence. Practically all positions on the bureau staff are in the District of Columbia and are, therefore, subject to the above residence requirement.

Temporary Appointment.

Temporary appointments are also made through civil-service examination and certification; that is, if there are eligibles on civil-service registers who are willing to accept temporary appointment, they must be given first opportunity for such positions. Temporary appointment of others may be authorized by the United States Civil Service Commission in the event that there are no eligibles available for certification from existing lists, pending the announcement of an examination and the establishment of a new register of eligibles. There is, however, usually a surplus of civil-service eligibles available for certification in the lower grades, and there is seldom opportunity for such temporary appointment of others except in positions requiring specialized training and experience.

Summer Appointment.

There are no special provisions for appointments to cover the summer-vacation period. A few such appointments can sometimes be made, but, in general, the statements above regarding civil-service requirements for temporary appointments apply to

the summer positions as well. The bureau's operations have to be conducted under a budget providing for fairly uniform maintenance of its work and staff throughout the year. Furthermore, most of the work requires a considerable amount of experience before it can be carried on independently. The time required from experienced members of the staff in instructing and supervising new appointees makes employment for short periods uneconomical. In view of all these conditions, it is necessary to limit rather closely the number of summer appointments made.

Research Associate Positions.

Technical problems arise in every industry. Some are of such pressing importance that an industry or group of technicians concerned may apply to the bureau for cooperation. If facilities and other conditions are favorable, the bureau may authorize the appointment of a research associate. The industrial or technical group allots funds for the purpose. A research worker is then sought either by the bureau or the employing organization. If mutually acceptable, he is appointed as a research associate by the Director of the Bureau of Standards. Usually the appointee is a technical or scientific graduate qualified to initiate and conduct research. The employing organization is usually an association of an entire industry or a specialized scientific or technical group. These appointments are made without reference to civil-service examination, rules, and regulations. In view of the small number of research associate assignments, in comparison with the regular staff, vacancies seldom arise in these positions.

Nontechnical Positions.

There are also other classes of positions on the staff of the Bureau of Standards, such as clerical, stenographic, administrative, mechanical, etc., but there is usually a sufficient supply of eligibles available to meet the demand of the service from current examinations conducted by the United States Civil Service Commission for the entire Government service. Requests for information concerning these positions should be addressed to the United States Civil Service Commission, Washington, D. C.

Probationary Period.

All civil-service appointees are required to serve a probationary period of six months, after which time the appointment becomes permanent if the employee's work and conduct have been satisfactory.

QUALIFICATIONS REQUIRED FOR ENTRANCE

The general requirements necessary for admittance to the examinations for the regular scientific and technical positions are given below. It is, of course, occasionally necessary to announce other special examinations, but these are usually of a highly specialized nature. The professional degrees must have been conferred by a college or university of recognized standing.

Junior Professional Grade (salary range, \$2,000 to \$2,500).

Physicist.—Graduation with a bachelor's degree with the completion of at least 118 semester credits, such course to have included as a minimum mathematics through elementary differential equations, and at least 18 semester-hours of physics. Applicants are examined and rated on the subjects of general physics, mathematics through calculus, and practical questions on the optional subject chosen.

Chemist.—Graduation with a bachelor's degree, such degree requiring the completion of at least 118 credit-hours, 30 credit-hours of which must have been in chemistry. Applicants are examined and rated on the subjects of general chemistry and elementary physics and practical questions on the optional subject chosen.

Technologist.—Graduation with a degree with the completion of at least 118 credit-hours, such a course to have included the fundamentals of chemistry, mathematics, and engineering or physics; provided, that applicants who have completed at least two years of such college course may substitute 12 months of qualifying experience for each of the other years lacking in the completion of such course. Such qualifying experience must have been particularly in connection with technical processes involved in some manufacturing or production plant

where such manufacturing or production processes are based upon fundamental principles of an applied science. Applicants are examined and rated on the subjects of general chemistry and elementary physics, mathematics up to and including calculus, and practical questions on the optional subject chosen.

Engineer.—Graduation with a degree in engineering, preferably along the line of the optional chosen. Applicants are examined and rated on the subjects of general physics, mathematics, general engineering, and practical questions on the optional subject chosen.

Assistant Professional Grade (salary range, \$2,600 to \$3,100).

In addition to meeting the preliminary requirements for the junior professional grade, applicants must have had at least two years of subsequent experience in work of a research or scientific character in the optional selected, showing a fair degree of progression in duties and responsibilities and some aptitude for investigative work; provided, that one year of graduate work will be accepted in lieu of each year of the required experience.

Associate Professional Grade (salary range, \$3,200 to \$3,700).

In addition to meeting the preliminary requirements for the junior professional grade, applicants must show that they have had at least three years of subsequent experience in a scientific position in a laboratory and should submit evidence of the quality of work accomplished and clearly show ability to assume increasingly important responsibilities* and to perform difficult scientific and investigative work in the optional applied for, scientific research accomplished, and professional attainments of a high order. Applicants may substitute one year of postgraduate work for each year of the required experience, but in order to qualify entirely on the basis of academic work an applicant must have received the doctor's degree.

Full Professional Grade (salary range, \$3,800 to \$4,400).

In addition to meeting the preliminary requirements for the junior professional grade, applicants must show that they have had at least five years' experience subsequent to graduation and of a scientific or investigative nature in the optional selected. The training and experience must have been sufficient to demonstrate ability to perform highly specialized and extremely difficult scientific or investigative work, must show a high degree of progression, scientific research successfully accomplished, and ability to assume increasingly important responsibilities.

Higher Professional Grades (salary range, \$4,600 to \$9,000).

Vacancies in the higher professional grades are usually filled by promotion, and it is seldom necessary to make appointments in these grades. Applicants for these positions must show broad fundamental scientific education, extended experience, demonstrated proficiency in the field of science involved, and exceptional executive ability. Examinations in the higher grades are announced only as the needs of the service require, and then only in highly specialized fields.

Minor Subprofessional Grade (salary range, \$1,020 to \$1,320).

Applicants for the position of minor laboratory apprentice must show that they have graduated from a 4-year high-school course or completed 14 units of high-school work accepted for college entrance, and that their high-school work included at least a 1-year course in at least two of the following subjects: Physics, chemistry, or manual training. Applicants are examined and rated on the subjects of elementary algebra and geometry, elementary physics or chemistry, and mechanical drawing or essay (to be handed to the examiner on the day of the examination).

Under Subprofessional Grade (salary range, \$1,260 to \$1,560).

Applicants for the position of under-laboratory apprentice must have completed at least 30 credit-hours of college work, which shall have included as a minimum either a 6-hour course in college physics or a 6-hour course in college chemistry. Applicants are examined and rated on the subjects of general chemistry or elementary physics, mathematics through trigonometry, mechanical drawing or essay (to be handed to the examiner on the day of the examination), and education and experience.

Junior Subprofessional Grade (salary range, \$1,440 to \$1,740).

Applicants for the position of junior scientific aid must have completed at least 60 credit-hours of college work, such college course to have included as a minimum either a 6-hour course in college physics or a 6-hour course in college chemistry. Applicants are examined and rated on the subjects of general chemistry or elementary physics, mathematics through trigonometry, mechanical drawing or essay (to be handed to the examiner on the day of the examination), and education and experience.

Assistant Subprofessional Grade (salary range, \$1,620 to \$1,920).

Applicants for the position of assistant scientific aid must show that they have completed at least 90 credit-hours of study in a college or university of recognized standing and that they have majored in the optional subject selected in the examination. Applicants are examined and rated on the subjects of general chemistry and elementary physics, mathematics including differential calculus, mechanical drawing or essay (to be handed to the examiner on the day of the examination), and education and experience.

Higher Subprofessional Grades (salary range, \$1,800 to \$3,100).

It is seldom, if ever, necessary to hold examinations in the higher subprofessional grades except in unusual cases where special training and experience

are required. Employees in the subprofessional service engaged in laboratory work are usually promoted from the assistant grade to the junior professional grade upon receiving a college degree. The higher subprofessional grades are composed principally of mechanical or other types of positions not in line for promotion to the professional service.

GENERAL INFORMATION

Working Hours.

The regular hours for employees on the scientific staff of the Bureau of Standards, except for minor laboratory apprentices, are from 9 a. m. to 4.30 p. m. with one-half hour out for luncheon. The regular hours for minor laboratory apprentices are from 8.30 a. m. to 4.30 p. m. For four months during the summer, half holidays on Saturdays are customary.

Leave of Absence.

Employees of the Bureau of Standards are granted not more than 30 days, exclusive of Sundays and holidays, of annual leave in each year. During sickness of an employee salary may be paid for a period not in excess of 30 days annually.

Advancement.

The positions on the scientific staff form a continuous series from the entrance grade to the highest, subject to the limitations placed by the number of vacancies occurring. Promotion is possible from one grade to another without further examination other than the entrance examination, subject, of course, to the individual employee's efficiency, training, and accomplishments, and to the funds available for making promotion.

Retirement.

Classified employees who have reached the retirement age and have served 15 years are entitled to retirement with annuity. A deduction of $3\frac{1}{2}$ per cent is made from monthly salary to provide for this annuity, which will be returned with 4 per cent interest, compounded annually, to persons leaving the service before retirement.

Specimen Examination Papers.

The Bureau of Standards does not distribute specimen sets of previous examination papers. The character of the examinations for the various classes of positions is sufficiently indicated under the separate headings in this publication.

Transportation to New Appointees.

Persons accepting appointments must report to Washington, D. C., or assigned post of duty without cost to the Government.

Recreation.

Provision is made for the individual welfare of the bureau employees. Voluntary first aid is rendered in all principal buildings, and care is provided for those injured in line of duty. There are tennis courts at the bureau, and facilities for golf, tennis, bathing, baseball, polo, skating, and other sports are provided in the public parks. The Potomac River is much used for canoeing, swimming, and its banks for camping and hiking. The Library of Congress, National Museum, Art Gallery, Zoological Park, and many other civic institutions peculiar to the National Capital afford unusual opportunities for culture and recreation.

Cost of Living in Washington.

The cost of living in Washington is about the same as in other large cities of the country. The average cost of room and board in the vicinity of the Bureau of Standards is approximately \$45 to \$55 per month, including two meals per day. Rentals for apartments and houses would probably range from \$55 per month and upward, depending upon the size, location, etc.

Salary Ranges.

The following table gives the salary steps attached to the various grades and positions under the classification act:

Professional service

Grade	Descriptive title	Salary rates					
1	Junior.....	\$2,000	\$2,100	\$2,200	\$2,300	\$2,400	\$2,500
2	Assistant.....	2,600	2,700	2,800	2,900	3,000	3,100
3	Associate.....	3,200	3,300	3,400	3,500	3,600	3,700
4	Full.....	3,800	4,000	4,200	4,400		
5	Senior.....	4,600	4,800	5,000	5,200		
6	Principal.....	5,600	5,800	6,000	6,200	6,400	
7	Head.....	6,500	7,000	7,500			
8	Chief.....	8,000	8,500	9,000			

Subprofessional service

Grade	Descriptive title	Salary rates					
1	Minor.....	\$1,020	\$1,080	\$1,140	\$1,200	\$1,260	\$1,320
2	Under.....	1,260	1,320	1,380	1,440	1,500	1,560
3	Junior.....	1,440	1,500	1,560	1,620	1,680	1,740
4	Assistant.....	1,620	1,680	1,740	1,800	1,860	1,920
5	Main.....	1,800	1,860	1,920	1,980	2,040	2,100
6	Senior.....	2,000	2,100	2,200	2,300	2,400	2,500
7	Principal.....	2,300	2,400	2,500	2,600	2,700	2,800
8	Chief.....	2,600	2,700	2,800	2,900	3,000	3,100

Clerical, administrative, and fiscal service

Grade	Descriptive title	Salary rates					
1	Under.....	\$1,260	\$1,320	\$1,380	\$1,440	\$1,500	\$1,560
2	Junior.....	1,440	1,500	1,560	1,620	1,680	1,740
3	Assistant.....	1,620	1,680	1,740	1,800	1,860	1,920
4	Main.....	1,800	1,860	1,920	1,980	2,040	2,100
5	Senior.....	2,000	2,100	2,200	2,300	2,400	2,500
6	Principal.....	2,300	2,400	2,500	2,600	2,700	2,800
7	Assistant administra- tive.....	2,600	2,700	2,800	2,900	3,000	3,100
8	Associate administra- tive.....	2,900	3,000	3,100	3,200	3,300	3,400
9	Full administrative.....	3,200	3,300	3,400	3,500	3,600	3,700
10	Senior administrative.....	3,500	3,600	3,700	3,800	3,900	4,000
11	Principal administra- tive.....	3,800	4,000	4,200	4,400		
12	Head administrative.....	4,600	4,800	5,000	5,200		
13	Chief administrative.....	5,600	5,800	6,000	6,200	6,400	
14	Executive.....	6,500	7,000	7,500			
15	Senior executive.....	8,000	8,500	9,000			

Custodial service

Grade	Descriptive title	Salary rates					
1	Junior messenger.....	\$600	\$660	\$720	\$780	\$840	
2	Office laborer.....	1,080	1,140	1,200	1,260	1,320	\$1,380
3	Minor.....	1,200	1,260	1,320	1,380	1,440	1,500
4	Under.....	1,320	1,380	1,440	1,500	1,560	1,620
5	Junior.....	1,500	1,560	1,620	1,680	1,740	1,800
6	Assistant.....	1,680	1,740	1,800	1,860	1,920	1,980
7	Main.....	1,860	1,920	1,980	2,040	2,100	2,200
8	Senior.....	2,000	2,100	2,200	2,300	2,400	2,500
9	Principal.....	2,300	2,400	2,500	2,600	2,700	2,800
10	Chief.....	2,600	2,700	2,800	2,900	3,000	3,100

