a voluntary basis, limited by the quotas fixed for the university by the War and Navy Departments. The Naval R.O.T.C. unit, which is starting its third year, has a quota of 250 students, while the Army R.O.T.C., which has been in existence since 1919, can accept 1,100 for basic training and 370 for advanced training.

Instruction provided by the two programs is designed to promote qualities of leadership as well as to impart essential information in regard to military and naval affairs. Both units are an integral part of the university, and academic credit is given to students taking the work. The Navy and Army officers assigned to duty at the university are listed as members of the faculty.

The Naval R.O.T.C. unit, known as the department of naval science and tactics, is under the direction of Captain R. E. Cassidy. Freshmen are admitted only at the start of the fall term in October. A physical examination, similar to that given at the Annapolis Naval Academy, must be passed. A general intelligence test also is given to aid the Naval R.O.T.C. officers in selecting the most promising freshmen from those who make application for admittance. Qualities of character, scholastic standing, age, potential qualities of aptitude, force, honesty, integrity, leadership and loyalty also are considered.

The course of training given by the Naval R.O.T.C. provides the student with a knowledge of seamanship, ordnance, gunnery, engineering, electricity, communications, military law and navigation. Uniforms are provided by the Government and certain compensation is paid to students during the last two years of the course. Enlistment in a special section of the Navy's V-1 program brings exemption from selective service for members of the Naval R.O.T.C.

Successful completion of a four-year course and one sea cruise of approximately four weeks on a naval vessel will qualify the student for a commission as ensign, United States Naval Reserve, or as second lieutenant, United States Marine Corps, provided he also receives a degree from the university.

The Army R.O.T.C., known as the Department of Military Science and Tactics, is under the direction of Colonel W. A. Ganoe. Any physically fit student is eligible to enroll for a basic period of training, covering four terms. An advanced course of training, covering another four terms of work, is limited to the most promising students who successfully complete the basic training. Enrolments in the basic course are accepted at the beginning of any regular term. The Government bears all the expense of uniforms and pays the students who qualify for the advanced course approximately $200. Training is provided in infantry, ordnance departments, signal corps, corps of engineers, medical corps and quartermaster corps, with students receiving instruction appropriate to the unit in which they specialize.

Members of the advanced course of Army R.O.T.C. are exempt from selective service. Students taking the basic training may join the Army Enlisted Reserve Corps and thus be permitted to continue the joint project of completing their education and seeking a commission in the Army.

Successful completion of both the basic and advanced training plus a tour of duty at one of the Army's service schools qualifies the student for a commission as a second lieutenant in the Officer Reserve Corps.

CIVIL SERVICE EXAMINATIONS FOR JUNIOR METALLURGISTS

THE U. S. Civil Service Commission has issued the following statement:

Increasing numbers of scientifically and technically trained men and women will be required for the war effort this year and next. Junior metallurgists are urgently needed to conduct investigative, developmental or production work in various branches of metallurgy; to assist in the design, construction, installation and operation of metallurgical equipment; or to perform metallurgical work in the recovery or fabrication of metals.

The U. S. Civil Service Commission is recruiting junior metallurgists under a new announcement (No. 254) for which the qualifications are: (1) completion of a four-year college course in metallurgy or metallurgical engineering or (2) completion of a 4-year course in chemistry, geology, physics or engineering, supplemented by (a) one year of paid experience in metallurgy (college teaching in metallurgy is acceptable) or (b) 15 semester hours in metallurgy or metallurgical engineering or (c) completion of two War Training Courses in metallurgy.

There is provision for the acceptance of applications from college senior or graduate students who expect to complete the required courses within six months after filing applications.

In addition to the positions which pay $2,000 a year, there are a large number of vacancies in sub-professional positions at $1,800 and $1,620 a year. Applications will be accepted until the needs of the service have been met. There is no maximum age limit. No written test is required. Persons rated eligible as junior metallurgists under examination announcement No. 210 need not apply under the new announcement. Consult announcement No. 238 for information on higher grade positions.

Announcements and application forms may be obtained at any first- or second-class post office or from the Civil Service Commission, Washington, D. C.

COMMITTEE ON THE LOCATION OF NEW AND RARE INSTRUMENTS

REQUESTS have been received by the Committee on the Location of New and Rare Instruments for instruments from research workers who urgently need them.

If any reader of SCIENCE has such an instrument available to lend, lease or sell he is requested to write the undersigned.

INSTRUMENTS SOUGHT

Microammeters and electrical meters generally.
Ultra-violet microscope.
Zeiss Optimeter (for measuring fine wires to 0.00001″).
Two-circle Reflecting Goniometer (Goldschmidt).
Electro-Encephalograph (3 channel).
Warburg Apparatus.

The following instruments are offered for use by others and inquiries for them are invited:

INSTRUMENTS OFFERED

Zeiss-Pulfrich Refractometer.
Hunter Reflectometer (Infra red reflectance).
Coleman Spectrophotometer (complete).
Capacigraph (*Jour. of Laboratory and Clinical Medicine*, 22, 1279, 1937; 25, 175, 1939).
Mechanical Ink Writing Recorder (*Am. Jour. Obstetrics and Gynecology*, 40, 330, 1940).
Grating Spectrograph: Focal length 2 meters
Dispersion 8 Å/mm, 1st order.
Grating Spectrograph: Focal length 8 meters
Dispersion ¼ Å/mm. 4th order.

The Committee on Location of New and Rare Instruments of the Division of Chemistry and Chemical Technology, National Research Council, will be glad to put inquirers in appropriate contact with those who can supply their needs. In so doing it assumes no responsibility, and owners of instruments must make their own arrangements with prospective users. Correspondence should be addressed to D. H. Killeffer, 60 East 42nd Street, New York, N. Y.

PROGRESS ON THE CONSTRUCTION OF A HUNDRED MILLION VOLT ELECTRON ACCELERATOR

IN response to a request of the editor of SCIENCE, Dr. W. D. Coolidge has sent the following statement in regard to the hundred-million-volt electron accelerator developed in the research laboratory of the General Electric Company at Schenectady, N. Y.:

Because of the demonstrated value of high voltage x-rays in the present war activity, the members of The National Inventors Council, at their meeting in Schenectady on August 18 and 19, were shown the status of the work of the General Electric Research Laboratory on the construction of a large induction electron accelerator based on the pioneer work of Dr. Kerst, of the University of Illinois.

This machine will be quite similar to the twenty million volt accelerator which was built in this laboratory with Dr. Kerst's help and has been loaned by the General Electric Company to Dr. Kerst and the University of Illinois. The new accelerator is designed for a hundred million volts and has, because of its size, presented many new engineering problems.

At the present time the special building to house it is completed and so are the magnet coils and the 24,000 KVA capacitor for their supply circuit. Much of the work on the 125-ton laminated steel core is finished and all the materials except the glass parts for the six-foot toroidal vacuum tube have been received. It is hoped that the device may be brought into operation this year or early next.

As it should make available x-rays and high velocity electrons corresponding to voltages up to a hundred million, it promises to be a very useful research tool.

So far as its immediate interest in connection with the war effort is concerned, the device will make it possible to determine the potentialities in the industrial radiographic field of x-rays produced by such electron energies as it can generate. Whether the electron current in the tube and hence the x-ray intensity producible by such a device can be large enough to make it a practical radiographic tool remains to be seen.

PRESENTATION TO THE ROYAL SOCIETY

AT a meeting of the Royal Society on July 16, a gold snuff-box, once the property of Charles Blacker Vignoles, F.R.S. (1793–1875), was presented to the society by his grandsons, Mr. E. B. Vignoles and Lieutenant-Colonel W. A. Vignoles.

Mr. E. B. Vignoles, in making the presentation, referred to the fact that in 1841 C. B. Vignoles presented to the Royal Society a fine portrait of Sir Isaac Newton, which had come to him as the result of a connection between his mother's family and that of Sir Isaac.

Continuing, Mr. Vignoles said that his grandfather, who was of Huguenot descent, came of a long line of soldiers and that he was an orphan and a prisoner in French hands at the age of thirteen months. He was educated by his maternal grandfather, Dr. Charles Hutton, F.R.S., the mathematician, the author of "Hutton's Logarithms," in the preparation of which Vignoles assisted. As a young man he served for a time in the Army, taking part in the disastrous attack on Bergen-op-Zoom in 1814.

Following the peace after Waterloo, he went to America, where he was engaged on survey work in South Carolina and Florida, then very little known. Returning to England in 1823 he was soon engaged in railway engineering, almost his first work being the first survey for the proposed Liverpool and Manchester Railway.

In the course of a long career he carried out important work at home and abroad as a railway and civil engineer, including the great suspension bridge over the Dnieper at Kieff and a railway through the Cantabrian Pyrenees from Bilbao to Tudela, which with its sharp curves and bold moving of a river, struck a