News and views

THIS FALL'S ENROLLMENT

OFFICE OF EDUCATION EXPECTS 8% DROP

Although earlier predictions have indicated a probable decrease in fall college enrollment of fifteen or twenty percent, a more optimistic view of the situation is taken by the United States Office of Education, according to Rall I. Grigsby, its deputy commissioner, who has reported an estimated drop of something less than eight percent under last year's figures. Dr. Grigsby, in addressing the eighty-ninth annual convention of the National Education Association held in San Francisco during early July, pointed out that the draft law has at least temporarily stabilized the status of college students and that most freshmen will be able to enter college and complete one year or more before becoming eligible for military service. Of considerably greater concern, he said, is the expectation that approximately twenty thousand college faculty members will either be dismissed or take leaves of absence this year. The loss of instructors would thus be about fifteen percent as compared with last fall's figures.

NPA PRIORITY AID FOR LABS

CONTROLLED MATERIALS FOR RESEARCH

The Department of Commerce announced on June 26th that the National Production Authority has acted to give priorities assistance to technical and scientific laboratories in the procurement of materials needed to carry on important research projects. The new NPA Order M-71 provides for a self-certification system to enable laboratories to obtain limited amounts of controlled materials during any one calendar quarter, the first of which began on July 1st. The amounts specified in the order are: carbon steel (including wrought iron), five tons; alloy steel (except stainless), one-half ton; stainless steel, three hundred pounds; copper and copper base alloy, brass mill products, copper wire mill products, copper and copper base alloy foundry products and powder, five hundred pounds; and aluminum, five hundred pounds. Prior to the new order, laboratories had been depending on emergency assistance from the NPA to acquire a substantial proportion of their needs, a time-consuming procedure that has caused delay in carrying out many research projects. Provision is also made in Order M-71 for allotment of controlled materials by the laboratory, within the limitations of the order, to its suppliers of CMP Class "A" products. Laboratories needing more than the amounts allowed by self-certification of delivery orders may apply to the National Production Authority for special quotas. Additional information may be obtained at Department of Commerce field offices.

NEW RESEARCH FACILITIES

MIT HYDRODYNAMICS LABORATORY

Dedication ceremonies were held early in June at the Massachusetts Institute of Technology to celebrate the opening of MIT's new $600,000 hydrodynamics laboratory. Located on Vassar Street near Main Street in Cambridge, the new laboratory has been planned to provide space and facilities for all types of research in the mechanics of liquid flow. A 108-foot ship model towing tank, to be operated by MIT's department of naval architecture and marine engineering, is included in the laboratory's permanent equipment. Other laboratory facilities are designed primarily to serve the department of civil and sanitary engineering. Arthur T. Ippen, professor of hydraulics, is laboratory director. The dedication program took place during the opening session of a symposium on hydrodynamics in modern technology which was held from June 4th to 6th in Cambridge and which was attended by more than two hundred scientists, hydraulic engineers, and naval architects.

NEW COSMIC RAY STATION IN CHILE

Following the article describing the high altitude cosmic ray laboratories of the world which appeared in the November, 1950, issue of *Physics Today*, Serge A. Korff, professor of physics at New York University, has reported two South American stations which had at that time been overlooked. These were the Institute of Andean Biology laboratory at Morococka, Peru, and the observatory at Chacaltaya, Bolivia. The two stations were described in the February and June, 1951 issues, respectively.

In a recent communication, Professor Korff writes from Santiago de Chile that one more high altitude cosmic ray observatory has been added to the present roster. The University of Chile has commenced construction of a new cosmic ray station at Cerro Colorado (about three hours by automobile east of Santiago) at geographic latitude 33° 20′ south and longitude 70° west, the geomagnetic latitude being about 21° south. The station, which is at an altitude of 3370 meters, or roughly 11,000 feet, will be accessible by automobile during the summer in the southern hemisphere, the road being blocked by snow during the several months in the winter. The initial electric plant will be a seven kilowatt gasoline-driven generator. Facilities for running water are being installed, and living accommodations for eight persons will be provided. Professor G. Alvial (head of the physics department, Facultad de Filosofia, Universidad de Chile, Santiago de Chile) is in charge of the installation. He has indicated a cordial interest, writes Professor Korff, "in receiving visitors

or research projects or cooperative proposals from recognized persons or organizations in countries other than his own."

Professor Korff attended the Fifth South American Congress of Chemistry, which met in Lima, Peru last May. He gave an invited paper on geiger counters and their applications to chemistry. He later delivered a series of lectures at the University of Chile, where he was named an honorary member of the faculty. He returned to New York in June.

NBS INSTALLS 50 MEV BETATRON

A fifty million volt betatron, designed and constructed by General Electric, has been installed in the National Bureau of Standards' new betatron laboratory, extending the Bureau's high-energy research into the region from two to fifty million electron volts. For work at even higher energies, a one hundred eighty million volt synchrotron, now being completed by General Electric, will be installed at the Bureau next year. The NBS research program with these machines has four main aspects: the investigation of shielding and protection against high-energy radiations, the medical applications of these radiations, their industrial applications, and their basic physical properties.

Standards for protection against low-energy x-rays have already been established by the Bureau, and the new betatron research program will fill the need for standards of protection in the higher regions now available to medicine. The much deeper penetration of high-energy x-rays requires entirely new scientific standards for full exploitation of these sources of radiation while maintaining adequate protection. Standards of protection have not only a safety aspect but an economic one as well. Today, the exact wall thicknesses and best structural materials are not known for high-energy x-rays. In order to be on the safe side, high-energy installations are over protected, with excessively thick walls and barriers which add greatly to the cost. In many installations the cost of protective walls and barriers exceeds that of the x-ray or betatron equipment itself. Accurate recommendations for barrier thicknesses in the high-energy field, similar to those previously developed for lower energies, will result in large savings.

The new betatron, according to the Bureau, may be thought of essentially as an alternating-current transformer with a laminated steel core in which power is fed into the primary, and the secondary current—the electron beam—is accelerated to high energies in a doughnut-shaped vacuum chamber. The accelerated electrons produce x-rays by bombardment of a thin metal target. The acceleration process takes place during the first quarter of each cycle of the alternating magnetic field and x-rays are produced in a burst once every cycle. With the 50 Mev betatron there are 180 x-ray bursts a second; with the 180 Mev synchrotron there will be 60 bursts a second. The 50 Mev betatron is now running at an x-ray output level of 200 r per minute at one meter from the target. X-ray intensity during each pulse is very concentrated—if the same concentration were emitted continuously, the x-ray output would be 2 million r per minute. Betatron x-rays are distributed in energy from zero up to a maximum determined by the energy attained by the electron striking the target. The x-ray beam is cone-shaped and the higher the energy the greater the concentration of x-rays in one direction. The betatron laboratory, housing the betatron and adequate for the coming synchrotron, is specially designed for high energy research work. For safety, it is made of reinforced concrete with walls varying in thickness between 2 and 8 feet. The over-all dimensions of the 3-story building are 120 x 40 feet; the principal bay is 60 feet long, 25 feet wide, and 30 feet high, providing for both the betatron and synchrotron installations. For studies of protective shielding, beams can be passed into a special radiation room through barriers up to 10 feet in thickness. The beam can also be taken out-of-doors for a distance of about 500 yards.

THE CORONA LABORATORIES

The Bureau has also announced the establishment of a new laboratory center at Corona, California, to be devoted to various phases of electronic research, development, and engineering. To be known as the Corona Laboratories, National Bureau of Standards, the new research center will be primarily concerned with technical problems of importance to the Department of Defense. The site was transferred to NBS by the Department of the Navy because of the Bureau's urgent need for new facilities. About twenty-two buildings are being renovated to accommodate NBS research and development activities being transferred there from Washington. R. D. Huntoon, formerly chief of the NBS atomic and radiation physics division, has been named associate director to head the new laboratories, which were expected to commence limited operations in June and be in essentially full-scale operation by September. The site has the advantage of proximity to other important research centers, especially the Navy installations at Inyokern and Pt. Mugu, and the aircraft industries in the Los Angeles area. Eighteen months to two years construction time was saved because existing buildings at Corona were easily adaptable to NBS research activities.

In the near future the most important activity at the Corona laboratories will be the development of guided missiles. Every phase of missile development will be covered from theoretical and applied research to construction of experimental parts and units. An analog computer occupying about one thousand square feet of floor space is being set up in the laboratories to be used in flight simulation problems where trajectories of guided missiles must be computed mathematically. Some of the existing buildings are now being remodeled to house electronic laboratories, the large computer, machine shops, a wind tunnel, cells for testing jet engines, altitude chambers, a missile assembly section.

and a technical library. Over two hundred members of the Missile Development Division of the NBS will move their families to Corona during the next few months. Building materials and credit restrictions have been eased to permit family housing construction.

AEC NEWS

ATOMIC DEVELOPMENT BY INDUSTRY

The Atomic Energy Commission has announced that negotiations with four groups of business and industrial firms to study the practicability of industrial development and operation of nuclear reactors for producing power and fissionable materials are nearing completion and that no further negotiations will be started for the time being. Consideration of additional proposals will be postponed, the AEC said, in view of the present heavy commitments of its technical personnel and its laboratories and contractors. Agreements have already been signed with two of the groups: the Dow Chemical Company and the Detroit Edison Company, and the Commonwealth Edison Company and the Public Service Company of Northern Illinois. A third group, the Pacific Gas and Electric Company and the Bechtel Corporation of San Francisco, has indicated its acceptance of the agreement with the AEC. Negotiations are continuing with the Monsanto Chemical Company and its associate, the Union Electrical Company of Missouri.

In general, the terms of the agreements already executed provide that the companies will make a survey of the Commission's reactor development activities to determine the economic and technical feasibility of their designing, constructing, and operating a nuclear reactor to produce materials and power. The studies will also determine the research and development work needed, if any, before such a reactor project can be undertaken, and the companies will offer recommendations concerning such a project in reports to the Commission, as well as their opinions regarding industry's role in undertaking and carrying it out.

These study projects, the Commission emphasized, do not include a special proposal by the Bendix Aviation Corporation of Detroit for study of an isotope-producing reactor to be built with private funds. The Bendix proposal is now in a preliminary discussion stage.

THE AD HOC COMMITTEE'S REPORT

In late June the AEC released a formal report submitted on March 28th by the three-men ad hoc advisory committee on cooperation between the Commission and the electric power industry (defined as comprising publicly or privately owned utilities which produce or distribute electricity for public use). The committee, which was set up by the AEC in the summer of 1949, was headed by Philip Sporn, president of the American Gas and Electric Company; other members were E. W. Morehouse of the General Public Utilities Corporation and Walter Seymour, at present advisor on power problems to the Economic Cooperation Administration. In making its survey, the ad hoc committee held numerous discussions with the Commission and members of its staff and visited atomic energy installations at the Argonne, Oak Ridge, and Brookhaven National Laboratories, the Hanford Works, the Knolls Atomic Power Laboratory at Schenectady, and the Bettis Field Laboratory at Pittsburgh.

No valid judgment can yet be made, the committee's report emphasized, as to whether and on what scale nuclear reactors will ultimately contribute to energy resources. "Nevertheless," the report continued, "our own observations, reinforced by recent pronouncements of the AEC, convince us that the prospects of an important new source of power within the next decades are robust enough to warrant a strong present and continuing interest on the part of the electric power industry." Commercial feasibility of atomic power, the committee noted, depends largely on the AEC's nuclear reactor program, which for the most part is still in the research and pilot plant stage.

In its report, the ad hoc committee made a number of recommendations for continued studies of areas of mutual interest to the industry and the Commission. In particular, the report urged the formation of a permanent advisory committee representing the industry, with the suggestion that its first assignment be to provide organized power industry assistance to the various Commission projects in identifying the places where industry personnel could be helpful and to locate the personnel within industry who might be detailed to fulfill these needs.

TEACHERS AND ENGINEERS

SCIENCE TEACHER TRAINING PROGRAM

Massachusetts Institute of Technology and Harvard University have announced plans for a joint five-year program aimed at increasing the number of broadly trained science and mathematics teachers available to secondary schools. Under the new Harvard-MIT curriculum, beginning next September, young men and women will be trained for science and mathematics teaching in high schools and junior colleges; their course will lead to the degrees of Bachelor of Science in General Science at MIT and Master of Arts in Teaching at Harvard.

"At present," said the official announcement of the program, "the production of teachers of high caliber and adequate training falls far short of the demand, particularly in the various areas of science and mathematics. There is every indication that this situation will grow more acute in the next decade. The project is intended to help alleviate this shortage by increasing the number of able teachers who are qualified to an exceptional degree, both in the breadth of their outlook and in the excellence of their professional training."

The Harvard degree of Master of Arts in Teaching is designed to give preparation for classroom teaching positions. It is usually awarded to college graduates who complete a year of study at the Graduate School of Education. An integrated five-year course of study,