to the ocean, enclosed sinks, a varied coast-line, a wide range of depth and offshore banks supporting some of the most productive of sea fisheries can all be reached within a few hours' sail from Woods Hole, while the transition from regions of extreme turbulence to waters more stable can be followed within short distances. The thermal diversity (regional, bathymetric and seasonal) is also wide, with temperatures ranging within a few miles of Woods Hole, and at different seasons, from below the freezing-point of fresh water to values almost tropical. A wide variation in the fertility of the local waters for pelagic plants is reflected by variations in the mass productions of the latter, while the faunal associations (including the planktonic) are equally diverse and abundant.

In short, there is hardly an oceanographic problem but can be hopefully attacked close to Woods Hole, unless primarily associated either with tropical shallows, with Arctic ice or with mid-oceanic conditions. The northeastern coast of the United States with neighboring parts of Canada is the most convenient headquarters for studies in the last two of these fields combined, because of nearness on the one hand to the ice-laden Labrador current (chief discharge of Arctic waters into the Atlantic) and on the other to the open Atlantic basin, with Bermuda in the offing as the possible site of a future substation.

The preceding remarks introduce one of the most important features of the institution's program, namely, that it expects to own and operate a seagoing ship, of moderate size, with convenient living quarters, capable of extended voyages and equipped to carry on investigations at all depths in the various fields of sea science. This is the more desirable because no other American marine laboratory independent of governmental control is at present in condition to do this. To make the most of such facilities, it is planned to keep the laboratory open with resident staff and the ship in commission the year round.

Plans for the laboratory building, docks, etc., are now being prepared and the institution hopes to open its doors by the summer of 1931. Before that time the trustees expect to announce in detail what facilities can be offered and what initial program of research is planned, based on the general purpose of offering every opportunity (compatible with work on shipboard) for participation by visiting oceanographers, whether from America or from abroad. This implies field-investigations in a variety of subjects, for which the offing of Woods Hole is favorable for the reasons just stated. The most essential activities of the institution may be expected to center around the work at sea. In this connection it must, accordingly, be recognized that the technical requirement of oceanography (necessity for obtaining the raw data for the major problems at sea) will confine the projects that can be undertaken at any one time to those that can be provided for simultaneously by the station's fleet. Consequently the activities, not only of the staff but likewise of many of the visitors, must be coordinated parts of a joint program. At the same time the laboratory purposes to offer every hospitality to individual workers who may elect to attack, independently, any problems the data for which can be obtained from the pier or from small boats.

At present few opportunities are open for the student of oceanography to gain experience in the technique of his subject, and the first-hand intimacy with the sea that he requires as a background for his detailed studies. The institution therefore expects to offer to university students instruction in oceanographic methods by participation both in the cruises and in the general work of the laboratory.

To carry out this part of the program, as well as to make the facilities available to qualified investigators, friendly and continuing relations with universities are obviously essential. Equally essential will be a constant endeavor to encourage the coordination of effort between various scientific institutions of this and other countries, that is especially needed in oceanography, where the area to be covered is so vast and where so many fields of science intertwine.

SCIENTIFIC EVENTS

THE DEGREE OF CHEMICAL ENGINEER AT CORNELL UNIVERSITY

IN response to an increasing demand on the part of industry for engineers who have had a specialized training in chemistry, the College of Engineering and the Department of Chemistry of Cornell University have been authorized by the Board of Trustees to offer jointly a curriculum leading to the degree of chemical engineer. This curriculum comprises five years of required and elective work. During the first four of these five years the student who expects ultimately to receive the degree of chemical engineer will be registered in the College of Arts and Sciences as a candidate for the degree of bachelor of chemistry, receiving that degree upon the completion of a definite four-year curriculum, the last two years of which contain a number of fundamental engineering subjects. During the fifth year of residence, the stu-

dent will be registered in the College of Engineering as a candidate for the degree of chemical engineer and will receive that degree upon the satisfactory completion of this additional year of required and elective work.

In commenting on the innovation, Professor C. M. Dennis, head of the department of chemistry, stated that no student will be permitted to register for the degree of chemical engineer who has not completed the requirements for the degree of bachelor of chemistry or the full equivalent thereof, for years of observation and the testimony of alumni in industrial positions have convinced the Department of Chemistry that broad and thorough training in the various fields of chemistry is absolutely indispensable to the full success of the chemical engineer in his professional practice.

Professor Dennis points out further that there is a well-developed demand on the part of the chemical industries not only for graduates in chemistry and chemical engineering, but also for those who hold the degree of doctor of philosophy. "It is our expectation that many of the students who complete the course in chemical engineering will decide to continue for the doctorate, just as do many of those now who graduate as bachelors of chemistry."

Inasmuch as the fifth year of study for the degree of chemical engineer is graduate in character, the graduate school of Cornell University has ruled that this fifth year may be accepted as satisfying one year of the residence requirement for the degree of doctor of philosophy. In summing up the situation which exists in the chemical industry, Professor Dennis stated further:

> The student at Cornell University who wishes to prepare himself for the profession of chemistry may, therefore, receive the degree of bachelor of chemistry at the end of four years, the degree of chemical engineer at the end of a fifth year of study, and the degree of doctor of philosophy upon the completion of two further years of study and research. He may, of course, terminate his university residence at the end of the fourth year, or of the fifth year, or of the seventh year. There is demand in the chemical industries for all three groups of graduates. It should be borne in mind, however, that the training that the student acquires in the fifth year of study for the degree of chemical engineer is of great value for those who seek positions that have to do with the development and supervision of the operation of industrial chemical processes and plants. The advanced work leading to the degree of doctor of philosophy constitutes admirable preparation for responsible industrial positions that involve research or the supervision of research, and many of the larger chemical industries now require that their appointees hold this degree. Most universities and larger colleges also restrict appointments to higher positions on their staffs to those who hold the degree of doctor of philosophy.

GIFT OF THE GUGGENHEIM FOUNDATION TO THE GEORGIA SCHOOL OF TECHNOLOGY

THE committee of trustees appointed by Ambassador Harry F. Guggenheim, president of the Daniel Guggenheim Fund for the Promotion of Aeronautics, has authorized a grant of $300,000 for the establishment of an aeronautical engineering center in the south to the Georgia School of Technology.

Some months ago the trustees of the fund announced that a grant would be made for the establishment of such a center in the southern states to supplement previous grants made by the Daniel Guggenheim Fund for similar schools in other parts of the country. Twenty-seven requests were received by the fund from southern educational institutions, and each of these was investigated by a committee of four of the trustees of the fund appointed by the president.

In addition to personal inspection, a canvass of expert opinion was made among those in a position to judge which institution was best suited to carry out the kind of engineering work contemplated in the fund's plan. As a result of this inspection and investigation, three institutions were found to fill practically all the requirements of the fund, which rendered the final selection very difficult. Geographical location caused the elimination of a number of institutions which were otherwise well suited for the grant.

After much consideration and discussion, and giving due consideration to location, aviation environment, cosmopolitan characteristics of the student body and engineering requirements, in addition to the general requirements of the fund in connection with grants of this character, the committee finally decided to make the grant to the Georgia School of Technology.

This gift brings the total grants by the fund to educational institutions to about $1,500,000, as follows: California Institute of Technology, $350,000; Harvard University Graduate School of Business, $15,000; Massachusetts Institute of Technology, $264,000; Leland Stanford University, $195,000; University of Michigan, $78,000; University of Washington, $290,000; Georgia School of Technology, $300,000.

The award to the Georgia School of Technology is the final act of the fund, which officially ceased to exist on January 31, after having accomplished the purposes for which it was founded in 1926 by Mr. Guggenheim.