SCIENCE EDUCATION

Planning a building?

Latest design features for 26 new physics buildings are presented in *Physics Buildings Today* recently issued by the American Institute of Physics. Floor plans, cost data, and department statistics accompany full-page illustrations as well as explanatory texts. The booklet is a supplement to a 1961 volume, *Modern Physics Buildings: Design and Function*, which is still recommended as a basic information source on design elements and equipment features.

The new supplement as well as the earlier volume result from AIP's awareness of the need for reliable and up-to-date information on new building design. Institutions of higher learning in America now spend yearly an estimated $300 million on new classrooms, $126 million for instructional laboratories, and about $104 million for new research facilities. In the later 1950's AIP and the American Association of Physics Teachers started a building design project which reported its findings in *Modern Physics Buildings*. Recently, AIP inquired in the physics community and found need for a supplement to the earlier volume.

Physics Buildings Today includes facilities devoted entirely to physics, like Clemson University's physics building, quarters that are shared with other disciplines, such as Stokes Hall at Haverford College, as well as research buildings like Florida State University's physics research laboratory.

Particular attention is focused on design flexibility, economy, and good visibility and acoustics. In Bryn Mawr's physical-sciences building, for example, flexibility for future change is achieved by using movable concrete-block partitions and mechanical and electrical services supported from channels cast into ceilings. Economy at Kansas State University is effected through modular laboratory and office design, using only one supporting pillar in each lab, and spraying with acoustic plaster instead of paint.

Design features in Macalester College's physics lecture room include a stepped-floor system, acoustically treated walls, recessed incandescent fixtures on a dimmer control, and strip-line diffusion for cross ventilation. The problem of fitting a large science complex into an academic setting is solved by Lake Forest College by building three small units, linked by an enclosed bridge at the second-floor level.

The publication also lists sources providing financial help for constructing physics facilities.

As a companion volume AIP has also issued *Checklist For Physics Buildings*. The *Checklist* is intended to prevent oversights in building construction and encourage cooperation between architect and client. Included are more than 300 ideas and suggestions under 28 headings, ranging from "general structural considerations" to "hardware, locks, and keys". A list of references has also been provided to pertinent reports on various aspects of planning and construction.

Compilation and publication of both *Physics Buildings Today* and *Checklist For Physics Buildings* were made possible by a grant from Educational Facilities Laboratories, Inc. Copies of the reports are being distributed to all physics departments in colleges and universities; further copies can be obtained from AIP's Education and Manpower Department.

Expansion at Stony Brook

Physics is growing at the Stony Brook campus of the State University of New York. Stony Brook, some 25 miles from Brookhaven National Laboratory on Long Island, is one of 58 branches in the New York State University system. Large state and federal support has enabled the physics department to triple its staff and quadruple the number of graduate students in the past few years. New laboratories are being built for research in radioactivity, solid-state physics, and nuclear structure, the last to include a 15-MeV Van de Graaff.

Pedagogical interests have kept pace with the Department's research emphasis. All members of the faculty, including full professors, teach undergraduate and beginning courses. Several members are engaged in the development of new curricular methods for physics and liberal-arts majors as well as high-school students, and recently the Department organized a conference on physics teaching at two-year schools in the state system. This fall, the Department has 80 undergraduate physics majors.

A few years back the Stony Brook Physics Department had few attractions to offer prospective faculty or students—a small teaching staff, and little in the way of advanced equipment. The State University was without a director, and Stony Brook itself did not have a president. There was promise, though, for the future. The State of New York gave its university a mandate with its 1960 Master Plan, which proposed that the state system establish comprehensive graduate centers at four campuses: Stony Brook, Buffalo, Albany, and Harpur. A $726 million capital budget was drawn up for the decade, and of this amount Stony Brook was to receive $82.7 million, plus $75 million for a medical school and hospital.

It took some time, however, before any results of the plans became evident at Stony Brook. As one faculty member put it, "We had to live through a long period of frustration and mixed mandates." During these early days, Leonard Eisenbud, well known for his theoretical work on nuclear structure, was head of the Department. Since there was no adequate supply of apparatus for experimental work, Eisenbud concentrated on developing a faculty strong in theoretical areas, especially in nuclear structure. In the fall of 1962, when T. Alexander Pond assumed chairmanship of the Department, the faculty that Eisenbud had assembled was

T. Alexander Pond

Clifford E. Swartz

Max Dresden

already prepared to take on graduate students.

With the aid of state and federal funds to provide new professorships and equipment, the Department entered a period of rapid growth. Last February, it was announced that John S. Toll, head of the University of Maryland's Physics Department since 1953, would become president of Stony Brook this fall. Shortly thereafter, it was reported that biophysicist H. Bentley Glass of Johns Hopkins University would become academic vice president. The Physics Department itself was greatly strengthened with the appointment of Max Dresden, an able theorist and teacher. Later in the year, it became known that Nobel laureate C. N. Yang was to come to Stony Brook for three months as a visiting professor in the spring of 1966, and that Gunnar Kallén, a quantum field theorist from the University of Lund, Sweden, would follow Yang in the summer of 1966.

Recently, an Einstein professorship in theoretical particle physics was established in the Department under a program of the New York State Board of Regents for the creation of chairs of special distinction. An appointment to the $100 000-per-year professorship is expected to be announced shortly. Under consideration right now is the creation in 1966-67 of an institute for theoretical physics composed of permanent professors, experienced scientists, and young appointees, with members free to teach courses, take on students, and conduct seminars. Meetings for which the Department plans to be host during this year include the Eastern Theoretical Conference on November 26-27, and a topical conference on two-body reactions at high energy scheduled for April.

From seven members in 1960-61, the faculty has risen in number to 22 for the current academic year and is expected to more than double by the end of the decade. Graduate students have also increased, from thirteen in 1962-63 (the first year) to 53 for 1965-66.

Growth of Stony Brook's laboratory facilities has served to attract experimentalists in a broadening range of fields. A 92 000-sq-ft physical laboratory, completed in 1963, offers for the first time the possibility of on-campus experimental work. Laboratories already built or in the process of construction are those for radioactivity studies (including Mössbauer effect, beta decay, and positron processes), solid-state physics (including low-temperature studies of electron transport and resonance phenomena in metals), a bubble-chamber film measuring facility, and an optical-pumping lab. In addition, instrumentation laboratories for members of the faculty associated with Brookhaven are for particle physics, neutron physics, and molecular beam and resonance studies.

With initiation of its graduate program and building of various laboratories, Stony Brook now has a faculty about equally divided between experimental and theoretical physicists. Although in most departments with mature research programs, experimentalists outnumber theorists two or three to one, Stony Brook intends to maintain the present ratio in the Department. The reason is that Brookhaven is only a half-hour away by car, and close collaboration exists between physicists at Stony Brook and several of the experimental groups at Brookhaven. According to Pond, this has helped Stony Brook to bring such subjects as neutron physics and molecular-beam research to graduate level competence with single appointments.

Brookhaven, on the other hand, says Pond, is expected to profit from the theoretical strength at Stony Brook. "BNL, with one of the largest complexes of experimental facilities in the world, necessarily concentrates on experimentalists, with the result that its permanent theoretical staff, though superb in quality, is few in number."

Charles E. Falk, associate director of Brookhaven, says, "We certainly could use more physicists in the theoretical areas, and the stronger theoretical physics is at Stony Brook, the better it is going to be for us. Also, theorists like nothing better than threshing out their new ideas with students. Prior to Stony Brook there was no academic environment nearby to use as an inducement in recruiting

theorists to BNL. When our scientists wanted to teach they generally took a sabbatical and taught at a university far away from here. Now our staff can go over to Stony Brook and teach, without having to take a sabbatical, and they can come over here to do experimental work and attend our colloquia. This casual relationship between Stony Brook and BNL is going to increase."

"The inducement is not only for theorists," said Clarke Williams, Brookhaven's deputy director. "We find that most of our scientists like to teach, and the academic environment at Stony Brook is very attractive to them."

The Stony Brook Physics Department, under Pond's leadership, realizes the importance of building up an experimental research capacity that is firmly independent of BNL. "Stony Brook's faculty wish to remain is control of their own graduate program. We also realize that we would jeopardize collaboration with the BNL staff were we to do most of our experimental instruction at Brookhaven."

Brookhaven National Laboratory is operated by an independent corporation known as Associated Universities, and its facilities are open to the entire scientific community. Physicists can work there either independently, performing an experiment all by themselves, or they can join experimental groups. These groups are composed of BNL scientists and/or scientists from several universities or from a single university. At the present time Stony Brook scientists use BNL facilities only on an individual basis or by joining established groups. It will be quite a while, believes Pond, before Stony Brook can grow strong enough to support an independent university group at Brookhaven. "In the meantime, it is important for us to develop programs and hardware that clearly complement the Brookhaven facilities."

An example of such complementarity is the recent authorization by New York State (with a 15 percent participation from the NSF of a $2.2-million Nuclear Structure Laboratory at Stony Brook, which will house a 15-MeV King tandem Van de Graaff and associated experimental space. Brook-

haven's nuclear physics group, though underequipped by present standards with a 3-MeV electrostatic accelerator, will soon have in operation a 30-MeV double Emperor tandem accelerator. While this new machine can be operated in an energy spread from 4 MeV to 30 MeV, the BNL nuclear lab will prefer to take full advantage of its capacities and run the accelerator, most of the time, near its maximum energy. If the Brookhaven physicists need a lower energy for some experiment, they will be able to use the Stony Brook Van de Graaff, and not take up valuable time on their own machine.

Acquisition by Stony Brook of the 15-MeV machine, operating in an energy range that is now of prime interest in nuclear experimentation, will therefore complement the BNL apparatus. Stony Brook's accelerator is also designed to produce 22.5-MeV alpha particles and heavier nuclear particles at correspondingly higher energies. Heading the new facility will be Linwood L. Lee, Jr., member of the nuclear-structure group at Argonne National Laboratory, who will be assisted by Karl Eklund, formerly assistant director of Yale's nuclear-structure laboratory, and David B. Fossan of the Lockheed Corporation.

"It would be a mistake, though," says Pond, "for people to think we are trying to create a research institute. This is a teaching department, and we are looking for physicists who are equally committed to instruction and research. The policy of the department is for everyone, including professors, to carry the same teaching load. The department average is about six and a half contact hours a week, and each one is encouraged to apply his own style of teaching in the course to which he is assigned."

Many of the faculty members take a strong interest in the methodology of physics instruction and in the new course curricula. Among these is Edward Lambe, a member of the Commission on College Physics, who recently returned from a two-year leave of absence as its executive secretary. Dr. Lambe has proposed establishment at Stony Brook of an Instructional Resources Center, concerned with new curricula and methods. Clifford E.

Swartz, who is a member of the NY State Department of Education Committee to Revise the High School Physics Syllabus, is concerned with the pedagogical problems of the beginning physics student. Leonard Eisenbud, former department chairman, is interested in the presentation of physics to the liberal-arts major. This past summer Professors Lambe, Eisenbud, Nandor Balazs, and Richard Mould attended a workshop conference at Seattle, scheduled by the Commission on College Physics, to prepare new multilevel monographs, lab and lecture materials, and course development in general.

The Department recently took the lead in organizing a conference, supported by NSF, on the teaching of physics at the 34 two-year, institutions of the State University. The original Master Plan of 1960 requires that the schools in the system share with one another new curricular ideas, and to this end, the Stony Brook conference was concerned with recent developments in the teaching of introductory physics, and how these innovations could be adapted to the two-year institutions.

How do physicists feel about teaching and working at Stony Brook? There is a consensus of satisfaction in being part of a young department in which everyone can participate in growth and exert some influence. As one faculty member expressed it, "Here, I do not have to outlive other people's mistakes," and as another said, "Now I have the opportunity to make errors which are not historically predetermined." Enthusiasm exists to try new ideas, both in research and teaching, that would not have been permitted at their old institutions. But perhaps the most compelling reason of those who have come to Stony Brook is its location. "I came from a school," said one senior professor, "that was more established and in every particular as good if not better than Stony Brook. But geography is a very important consideration with respect to physics. You learn physics not so much by reading what others have published as by talking with leaders in your own field about the latest developments. And where I was teaching, we were definitely iso-

PLACEMENT SERVICE REGISTER

of the

AMERICAN INSTITUTE OF PHYSICS

to be held in connection with the joint meeting of the

American Physical Society–American Association of Physics Teachers

January 26–29, 1966

New York Hilton Hotel, New York City

LOOKING FOR PHYSICISTS?

Universities, institutions, government laboratories, and companies wishing to post notices of positions may send descriptions of the openings on 8½ x 11 paper in multiple copies (*25 required*) to the Institute office by January 12, 1966, or post them on arrival at the meeting. If you plan to have a representative present, to interview applicants, please indicate his name at the bottom of the job description sheets.

SEEKING A NEW POSITION?

Applicants may obtain registration forms and further information from the Institute office. *Pre-registration is important.* Complete registration forms must be received at the Institute by January 10, 1966 to insure their inclusion at this register.

INTERVIEWS.

It is to the advantage of the registrants to be present. Interviews will be arranged between employers' representatives and applicants attending the meeting.

COMPLETE REGISTER of applicants will be available upon request at the meeting and after the meeting at a nominal service charge.

PLEASE REPORT TO THE FIFTH FLOOR, NEW YORK HILTON HOTEL, UPON ARRIVAL AT THE MEETING

AMERICAN INSTITUTE OF PHYSICS, 335 East 45 Street, New York, N.Y. 10017

lated. It is very difficult to build strong physics groups in those parts of the country where hundreds of miles separate one physics center from another, and I myself have seen several departments collapse because of their isolation. I used to plead with my colleagues to come and accept appointments but they would not come. They will come to Stony Brook because here they can find colleagues not only on this campus but at Brookhaven, Columbia, and a half dozen other nearby schools".

"We also want to remain in contact with other rapidly moving fields than our own," said theoretical physicist Peter Kahn, "and the environment here is excellent for this purpose".

For the future, Pond is thinking of a "canonical" department, with the diversity of research interests that characterizes existing centers of excellence. Paralleling the development of experimental particle physics will be further growth in atomic, solid-state, and nuclear physics. Interdisciplinary programs are also contemplated with the new Earth and Space Sciences Department, headed by Oliver A. Schaefer, formerly of Brookhaven, and also with the Chemistry Department.

Les Houches summer school

High-energy astrophysics will be the subject of the 1966 session of the Ecole d'Eté de Physique Théorique, an institute of the University of Grenoble which is supported in part by the NATO Advanced Study Institute Programme. The session will be held at Les Houches (Haute Savoie), France, from July 4 through August 27. An effort will be made to present those aspects of high energy physics and statistical mechanics which are necessary for a careful discussion of astrophysical theories.

The program will include elementary particles in astrophysics by H. Y. Chiu; elementary processes by H. Reeves and probably V. L. Ginzburg; general relativity by S. Chandrasekhar; properties of matter at high density by A. G. W. Cameron; accelerating mechanisms by E. Schatzman; origin of cosmic rays probably