SCIENCE EDUCATION

Berkeley physics course

A new two-year elementary physics course being developed at Berkeley has produced its first textbook, *Laboratory Physics, Part A*, which appeared at the end of September. Work on the course goes back to 1962, when an interuniversity committee was formed at Berkeley to develop it. Specific objectives of the committee were to introduce coherently the ideas of special relativity, quantum physics, and statistical physics into an elementary curriculum. The material which is emerging is intended for all students who have had a physics course in high school and who are taking a calculus course concurrently.

Five volumes have been projected for the course. These include *Mechanics* (Ruderman, Knight, and Kittel), *Electricity and Magnetism* (Purcell), *Waves* (Crawford), *Quantum Physics* (Wichmann), and *Statistical Physics* (Reif).

To accompany the course, A. M. Portis has designed the *Berkeley Physics Laboratory*, of which *Laboratory Physics, Part A*, is the first section. It will appear in three parts, each including twelve experiments plus supplementary material.

Each volume of the course will have been tested for three or more semesters before the preparation of the final manuscript. The first volume is scheduled for January 1965, and the second volume for the summer of 1965. This fall, a preliminary version of the first volume is in use by regular classes at the University of Texas, Austin; the University of Michigan; Long Beach State College; and at the Santa Barbara and Berkeley campuses of the University of California. In addition, the preliminary version of the second volume is being used this semester at MIT, Austin, and Berkeley.

A special effort has been made by the large-scale use of questionnaires to locate specific difficulties experienced by students with the draft course material. In general, the new material has been observed to interest a wide range of students, teaching assistants, and instructors.

The course and laboratory materials are being published by the McGraw-Hill Book Company, Inc. Copies of the preliminary materials as available can be obtained by persons concerned with undergraduate instruction by writing to Mrs. Gerald Maloney, Berkeley Physics Course Committee, Department of Physics, University of California, Berkeley 4, Calif.

The project was encouraged by the Commission on College Physics, and has been supported by the National Science Foundation through a grant to Educational Services Incorporated. Members of the original Berkeley Physics Course Committee included L. W. Alvarez, W. B. Fretter, C. Kittel, W. D. Knight, P. Morrison, E. M. Purcell, M. A. Ruderman, and J. R. Zacharias. Several of the original members have dropped out, and A. M. Portis, E. D. Commins, F. Reif, F. S. Crawford, Jr., and E. H. Wichmann have joined the committee. Many other people, including astronomers, biophysicists, geophysicists, and mathematicians, have helped with the program.

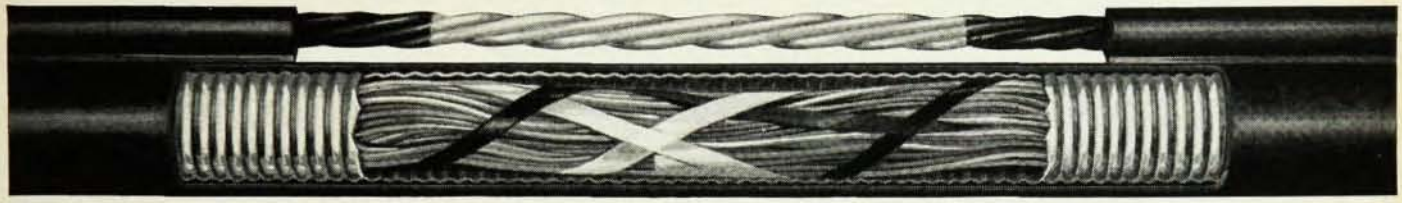
Twin-tower observatory

This fall, Northwestern University will begin construction of a twin-tower observatory as the first step in its projected Benjamin F. Lindheimer Astronomical Research Center. The new observatory, designed for on-site research by students and faculty, will cost almost $1 million and will be supported by matching grants from the National Science Foundation and the family of the late Mr. Lindheimer. The facility will consist of two 70-foot-high domed towers connected by a structure housing a telescope control room and various equipment. A 40-inch Cassegrainian/Coudé reflecting telescope will be the principal optical instrument in one of the domes, and the addition of an electronic image conversion device to this telescope is expected to increase its light detecting ability an estimated 100 times. The dome on top of the other observatory tower will house a 16-inch reflector telescope. At the base of the towers

Report from

BELL LABORATORIES

"UNDULATED" CORE MAKES SELF-SUPPORTING CABLE PRACTICAL



ABOVE: Drawing of new self-supporting cable structure shows "undulated" core of telephone wires encased in aluminum and polyethylene sheath members. Edges of corrugated aluminum sheath are butted along top of cable. Polyethylene sheath extends over steel strand on top to provide built-in cable support. BELOW: Photographs show, left to right, older-type ring-supported cable, present lashed cable, and new self-supporting cable.

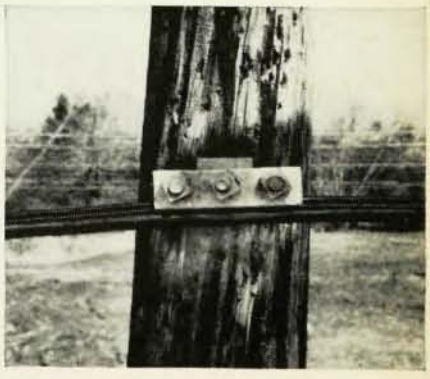
Telephone cables strung along pole lines need mechanical support. Heretofore, this support has been provided by a separate, strong steel strand from which the cable is suspended—either by wire rings or by a lashing wire wound helically around the strand and cable.

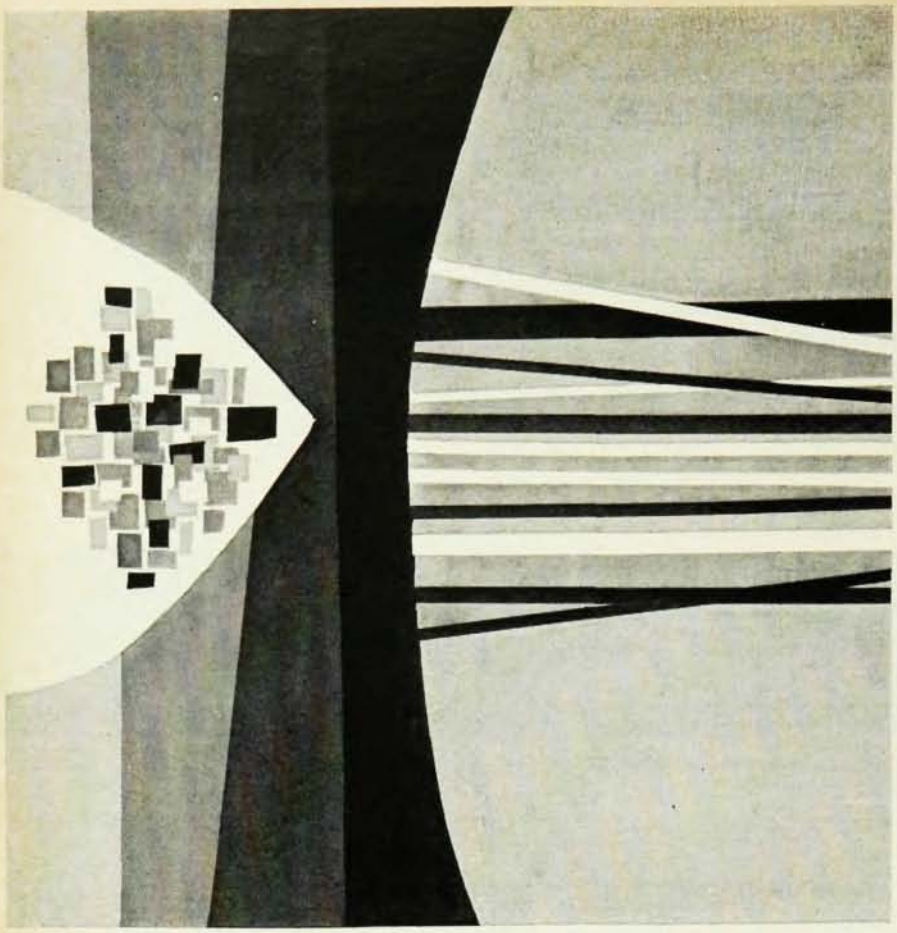
For ease of installation it is desirable to design the cable and strand into a single self-supporting structure. But in such designs the cable sheath and its core of telephone wires, as well as the strand, may be placed under tension when suspended between poles. With the wires under tension, craftsmen have no readily available slack wire, which is needed in making connections for bringing service to a customer's house.

To solve this problem Bell Laboratories engineers, working in close cooperation with engineers of the Western Electric Company, manufacturing unit of the Bell System, "built the slack into the cable." The slack is provided by an undulation incorporated into the core of telephone wires. To help prevent the polyethylene cable sheath from tightening around the wires during manufacture, the longitudinal edges of a corrugated aluminum sheath member are butted up against each other, rather than overlapped as in other cables.

The new cable permits both efficient and economical construction methods. It is rapidly raised, tensioned, and clamped to poles. Craftsmen easily pull slack wire from the cable and, using plastic "ready access" terminals, make the required connections.

Bell Telephone Laboratories
Research and Development Unit of the Bell System





Interpretation by William Thonson

will be the mechanical, electronic, and optical shops, as well as a photographic laboratory. The twin-tower observatory will allow new research programs, notably in image orthicon spectroscopy. Head of the research center is J. Allen Hynek, chairman of the Astronomy Department at Northwestern and director of the University's Dearborn Observatory.

Visiting scientists

A considerable expansion is planned during the current academic year in the AAPT/AIP Visiting Scientists Program for colleges. During the preceding year, the National Science Foundation provided support for visits of scientists to some 120 colleges and universities, whereas for 1964-65 approximately 200 schools will be visited. This year, all applications from colleges that have not previously participated in the program will be given priority. However, most of the applications from schools that have already participated can probably be accepted. Department chairmen should send their requests promptly to the Visiting Scientists Program in Physics—College, American Institute of Physics, 335 East 45 Street, New York, N.Y. 10017.

Lawrence Hall of Science

A search for equipment and instruments used in atomic research by the late Ernest O. Lawrence and other researchers in the early days of the Lawrence Radiation Laboratory has been launched to equip the Hall of Science under construction at the University of California in Berkeley.

The equipment will be collected and displayed in the Lawrence Memorial Room of the new facility. Dr. Lawrence, Berkeley's first Nobel laureate and the inventor of the cyclotron, founded and headed the Lawrence Radiation Laboratory until his death in 1958.

The Hall of Science is intended to be a national center for research in science education. It will be directed by Harvey E. White. The initial facilities will include a four-story building for study and demonstration in science teaching, a science informa-