

SCIENCE EDUCATION

OECD physics curriculum

Physics courses in European secondary schools fail their primary purpose by concentrating on the physics major rather than the general student, according to the Organization for European Economic Cooperation in a report that is sharply critical of physics curricula in its member countries (*A Modern Approach to School Physics*, OECD, Scientific Directorate, 2 rue André Pascal, Paris 16).

In most European countries, the report says, a typical child's scientific education begins when he is twelve or thirteen years old and ends when he leaves school at the age of sixteen or seventeen. Except for a small number who have superior mathematical ability or who can appreciate abstract concepts for their own sake, the logical development of the subject from a few simple physical principles, or "laws," that characterizes most of the existing syllabi is too divorced from modern physics to be interesting. Study of the physics developments of the last few decades is reserved for those students who continue their education beyond the secondary-school level. Too much emphasis is placed on elementary mechanics, for example, and not enough on such recent developments as the discoveries made with accelerators and radio telescopes. The authors of the study feel that "nothing less than a radical change will suffice" if physics is to be made meaningful and stimulating to the majority of students.

The physics course visualized in the study would extend over four years, with an average of three or four periods per week, beginning at ages 12 to 14. The proposed course breaks down as follows:

- (a) the particle nature of matter; differences between atoms, molecules, and electrons.
- (b) basic concepts and laws of mechanics, with an emphasis on their physical significance.
- (c) simple properties of gases and vapors; temperature and pressure as phenomena of particles in motion;

states of matter and change of state in terms of aggregations of atoms and molecules; chemical bonds.

(d) measurement of temperature and the transfer of heat; the laws of thermodynamics; the energy supply available in nature.

(e) structure of atoms; electrons as carriers of electricity; electrostatics; thermionics; electromagnetism; magnetism.

(f) mechanical, acoustical, and electromagnetic vibrations.

(g) light as electromagnetic radiation; geometrical optics; diffraction; interference; emission and absorption of light, simple ideas of quantum theory; emission of x rays.

(h) radioactivity; structure of the nucleus; nuclear reactions; equivalence of mass and energy; elementary introduction to relativity.

New physics facilities

A \$2.5-million gift from a New York investment banker will provide for the construction of a new physics building at New York University's Washington Square Center. The André and Bella Meyer Hall of Physics will be an eleven-storey structure occupying a block-long site. Preliminary plans call for 120 000 square feet of lecture and seminar rooms, laboratories, and faculty offices. When completed, the building will form part of a science complex being developed near the University.

A five-storey metallurgical and chemical engineering laboratory at Lehigh University has been named in honor of Martin D. Whitaker, former Lehigh president and director of the Clinton Laboratories. Intended for both undergraduate and graduate training, the \$2.75 million building will include areas for metallography, specimen preparation, electron and ion microscopy, physical ceramics, and physical-properties measurement. A glass-enclosed bridge will join the laboratory to a two-storey classroom struc-



EMI

Measuring low light levels

...requires extremely low dark currents coupled with maximum useful sensitivity. The EMI 6256, a 13-stage venetian blind 2" photomultiplier tube has the essential characteristics that are necessary for low light level applications. The unique 10mm cathode-DI geometry, together with the ultra-stable EMI venetian blind design, has resulted in its widely successful use in astronomy, biology and spectrophotometry. The EMI 6256B has a quartz window and the S-11 cathode (S-13) which has a peak quantum efficiency of 17% at 4,200 Å. The EMI type 6256S has 5 to 10 times lower dark current than the 6256B, and should be used when system performance is dark current limited. This type is also available for visible light applications as 9502B/9502S, or with 11 dynodes as 6094B/6094S. Many other EMI photomultiplier tubes are available for special applications from stock in sizes from 1" to 12". EMI photomultiplier tubes are available through qualified engineering representatives located in major marketing areas throughout the United States. A request on your company letterhead will bring you the name of your nearest representative as well as a copy of our latest catalog.



Whittaker
CORPORATION

GENCOM DIVISION

80 Express St., Plainview, L. I., N. Y.
516-433-5900 TWX 516-433-8790

*EMI ELECTRONICS, LTD.

ture, thus permitting maximum accessibility while insulating the lab from interchange of classes.

Dr. Whitaker, who served as eighth president of Lehigh from 1946 to his death in 1960, was head of the Clinton Laboratories at Oak Ridge, Tenn. during the Second World War. At Oak Ridge, he guided plutonium development through its early stages and coordinated design and operation of what later became the first peacetime atomic energy plant at Oak Ridge.

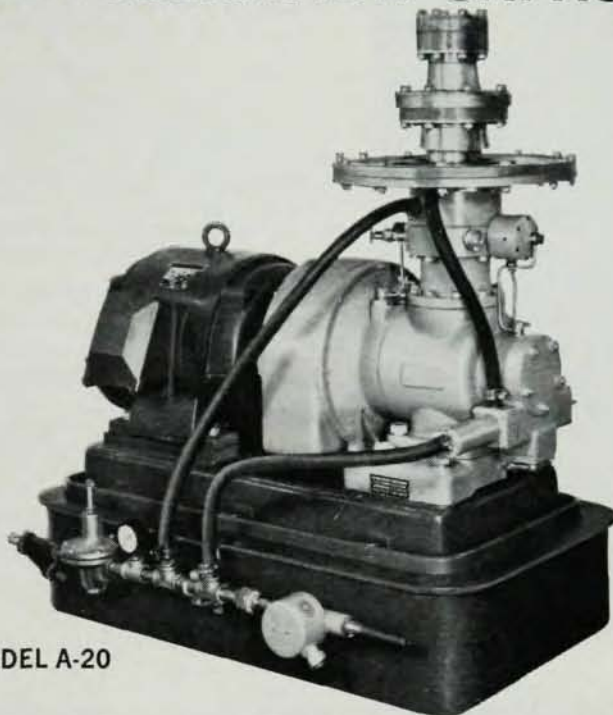
The physics department of Clark College in Atlanta, Ga., has obtained funds that will enable it to augment its undergraduate scientific equipment over the next two years. The National Science Foundation has awarded \$14 000 to the department which the college will match with another \$19 400. The General Electric Company, and the Western Electric and Bell Telephone Laboratories have made funds available for the purchase of x-ray diffraction units and other scientific equipment, visiting scientists, and technical films.

An x-ray diffraction laboratory is already in operation at Clark whose facilities are open to the physics, chemistry, and biology departments of all the colleges in the Atlanta University Center. Dr. O. P. Puri, chairman of the Department of Physics, is in charge of both the laboratory and the two-year equipment program.

Seminars

A series of advanced seminars in relativity and cosmology are to be conducted at Rose Polytechnic Institute from June 13 to June 25. Aimed at college and university teaching and research staff, including a few advanced graduate students, the program will be an intensive examination of the field's most active areas. Guest lecturers for the series are: Dr. Hong-Yee Chiu (Goddard Institute for Space Studies), Dr. P. J. Peebles (Princeton University), Dr. Lawrence Shepley (University of California, Berkeley); and Dr. Rainer Sachs (University of Texas). Funds, including participant support, are being requested from the National Science Founda-

NEW ULTRA-LOW CRYOGENIC REFRIGERATION CAPACITY

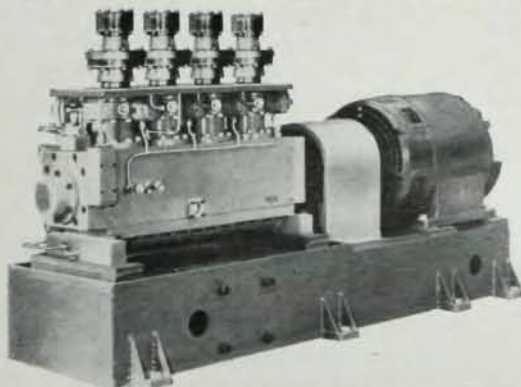


MODEL A-20

The Model A-20 Cryogenerator, utilizing the proven Stirling cycle principle, is capable of furnishing refrigeration at temperatures ranging from ambient down to 12°K. Its useful operating range extends from 80°K to 12°K. The thermodynamic design permits simultaneous extraction of refrigeration at two levels—50°K to 80°K at the intermediate freezer, and 40°K to 12°K at the cold freezer.

This unusual versatility makes the A-20 suitable for many ultra-low temperature applications including cold-spot cooling of IR systems, masers, lasers and other electronic devices; superconduction, cryo-pumping, and hydrogen or neon liquefaction/recondensation. Coupled with an external helium JT loop, the A-20 provides a compact, reliable helium liquefier or a 12°K-4°K dense gas refrigerator system.

In addition, the A-20 can be furnished with an optional basic flange provided with feed-throughs suitable for mounting an insulating enclosure.



MODEL B-20

The B-20 Cryogenerator, like its counterpart the A-20, has been similarly designed with cold and intermediate take-offs. However, refrigeration capacity is four times that of the A-20 Model.

Norelco®

**CRYOGENIC
DIVISION**

NORTH AMERICAN PHILIPS COMPANY, INC.
Mendon & Angell Roads, Ashton, Rhode Island 02805

E-65