

cators object to the emphasis on theory as if the theory were taught in a pure vacuum. Good theories lead to deduction and the deductions are very much on the empirical level.

The number of presently known facts is appalling, and no good scientist will argue against the advantage of a solid background of facts. However, he may want to evaluate one fact against another or one process in science against another, and he may decide that in the limited time available it might be wise to choose certain areas and certain processes and eliminate other areas and processes of science. Perhaps after the student's formal schooling, much factual information can be attained more effectively in the process of solving particular practical problems. A good scientist never stops learning nor does a good engineer.

Sarton, Cohen, Butterfield, Conant, Campbell, and others feel that much of that which is essential to understanding science might well emerge from the inclusion of some history of science. This history unless mistakenly presented in an encyclopedic fashion rather than as a dynamic activity could help elucidate the scientific process. Engineering students must understand the fruitfulness of ideas, especially in a country such as ours, where the opportunities are so great. In order to understand the origin, development, and deductive capacity of the significant ideas in physical science, he should, sometime in his learning period, work through the development of those ideas fundamental to the great advances made in physics and engineering today. The development of ideas by men of genius, and the influence of the society of their times on the success or failure of the idea, are a dynamic aspect of science that should not be neglected. The historical development of ideas is well suited to the fundamental courses.

There has been a tendency of late to absorb fundamental courses into specialized curricula so that instead of students taking physical chemistry in the chemistry department they take it in the soils department; instead of taking thermodynamics in the physics department, they take it in mechanical engineering, or in chemical engineering, or in physiology. This tendency results in much duplication and creates new markets for textbooks particularly adapted to the specialty in question. The book turns out to be a third-hand presentation of the fundamental principles for four-fifths of the book, with a first- or second-hand presentation of the applicable field for the remainder of the text. This incorporation expands the engineering school curriculum and restricts the development of the student. A good look at many college catalogues would astonish almost anyone. Two students could graduate from some colleges without having a single course in common. Two engineering students might have such diverse training that a layman talking to them might not recognize both of them as prospective engineers. This is not an argument against specialization. It is an argument for a good solid education before specialization. This may mean an additional year of training to

their present education. If anything has to be reduced, many top notch engineers have said to us, "Give me a graduate in engineering with a good solid basic education and we will take care of the rest of his training in the field". However, with the vast compendium of engineering knowledge today, it is only fair to present a five- or six-year curriculum, and take this additional year or two out of the student's pre-college education or out of his post-college education. Certainly the engineering faculties have toyed with this idea. Competition among different engineering schools remains a factor in determining the time for an engineering curriculum. With the current scarcity of engineers, the normal struggle for existence plays only a small role in weeding out inadequately educated individuals. In the long run, however, our national economy will suffer under the strain of mediocre personnel, as will the patience of administrative officers and chief engineers.

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Bakker Succeeds Bloch as CERN Head

EUROPE's nuclear research center (CERN), which has been in formal existence for less than a year, has announced the forthcoming resignation of its director general, Nobel Laureate Felix Bloch of Stanford University. Professor Bloch, who "has found the administrative duties that have fallen to him during the period of construction unexpectedly heavy and too onerous to allow him to devote sufficient time to research", will return to Stanford in September. His successor will be C. J. Bakker, director of the Dutch Institute of Nuclear Physics and professor of physics and head of the University of Amsterdam's Zeeman Laboratory. In the interim Professor Bakker is serving as deputy director general of CERN in place of E. Amaldi, who has found it necessary to devote most of his time to the development of the research school of high-energy physics at the University of Rome. Professor Amaldi will continue to act as consultant to CERN in the field of cosmic-ray research.

The CERN program calls for the construction of a modern high-energy physics research laboratory equipped with two large accelerators: a 600 Mev synchrocyclotron and a 25 billion volt proton synchrotron. Completion of the laboratory and associated apparatus is expected to take at least until 1960. Meanwhile, the organizational structure of CERN has been established and research groups are active at the Geneva headquarters and elsewhere. CERN's governing body, the council of the European Organization for Nuclear Research, consists of 24 members, two appointed by each of the twelve participating nations. Sir Ben Lockspeiser, director of Britain's Department of Scientific and Industrial Research, is president, and Antonio Penzetta, president of the Corte di Cassazione, Rome, and Jacob Nielsen, professor of mathematics at the University of Copenhagen, are vice presidents.