readily diffuse. He specifically does not recommend glass, but does not suggest an alternative. I also might have wished him to discuss the problem of drive-in targets for machines using the D(*d*,*n*) reaction.

I do not believe the omissions to be critical in view of the intended audience. Where the reader wishes to pursue a given topic, adequate references are provided. On the whole, I believe the book serves the purpose for which it was intended very well. However, a sophisticated researcher, as many of the readers of *Nuclear Technology* might well be expected to be, would probably wish for more depth.

A. Keith Furr, professor of nuclear engineering at the Virginia Polytechnic Institute and State University (VPI&SU), performed his PhD research at Duke University and Oak Ridge National Laboratory under the ORAU program. He joined the faculty of VPI&SU in 1960, where he worked with their Cockcroft-Walton, Van de Graaff, and reactor facilities. He was placed in charge of Van de Graaff operations for a time and, in 1970, was made director of their Nuclear Reactor Facility. While in this position, he developed an extensive neutron activation analysis laboratory, currently processing several thousand samples each year. In addition, in 1974 he developed an undergraduate health physics curriculum in association with the Department of Biology. In 1975, he was asked to develop a safety and health program for the University and was named director of the Office of Occupational Health and Safety; the University Radiation Safety Program is a division of this office. He is still active in research, publishing several papers each year, primarily in the field of neutron activation analysis.

Europe's Giant Accelerator

Authors	Maurice Goldsmith and Edwin Shaw
Publisher	Taylor & Francis Ltd., London (1977) (Distributed by Crane, Russak & Company, Inc.)
Pages	261
Price	$27.50
Reviewer	Jacob Shapiro

This handsome volume is the story of the 400-GeV Super Proton Synchrotron (SPS), 2.2 km in diameter, which straddles the countries of France and Switzerland at the Conseil Européen pour la Recherche Nucléaire (CERN). It is a first-hand account by two authors who have been intimately concerned with the developments at CERN. The SPS was proposed by the European Committee for Future Accelerators under E. Amaldi in 1963. It was given a considerable stimulus by the decision of the U.S. Congress to authorize the construction of a 200-GeV (now 500-GeV) synchrotron at Batavia. (The effectiveness with politicians of arguments based on international rivalries appears to have been demonstrated in the promotion of all types of projects.) Final agreement was reached by 10 of the 12 member states of CERN on a program for construction of the accelerator in 1971, and the maximum design energy of 400 GeV was reached on June 17, 1976.

The book takes us through the trials and tribulations accompanying the design, construction, and startup of the machine, and gives vivid portraits of the personnel connected with the project. There are clear explanations of the guiding and focusing methods, the systems for injecting, extracting, and controlling the circulating proton beams, and the accelerating systems. There is also background material, some philosophical in nature, covering the objectives of building accelerators and the techniques of machine builders. It is profusely illustrated with photographs of the progress of construction, of the components, and of the people who brought this giant project to fruition. The material can be readily digested by the nonmathematician, as there is not a single equation in the entire text.

The organization of CERN is spelled out in some detail, for the successful completion of a project under the aegis of 12 countries is no mean feat. CERN was successful in getting adequate funding not only to build the machine, but to design and build the most refined supporting experimental equipment. It learned how to "do its costing and it did not bargain away a position of realism by accepting cuts essentially imposed by the horse-dealing tendencies of politicians." High-energy scientists from the U.S. who have seen their budgets for experimental work decimated in recent years may envy the success of their peers at CERN.

Many nontechnical problems had to be faced because the machine was located in two countries. When the French introduced summer time while Switzerland remained on Continental time, the machine not only crossed a frontier but a time zone. The resolution was to leave the clocks on Swiss time over the entire center, but to advance the official hours of work half an hour.

The many illustrations provided are not coordinated with the text. This can be a bit confusing if one tries to alternate between the text and the photographs. Each must be examined more or less independently.

The feat of getting 12 western European countries to collaborate to build a machine that was beyond the capacity of any single nation is a credit to the participating countries. The significance is expressed very well in the foreword by E. Amaldi: "All of us hope that this extraordinary achievement may also help to convince the leaders of our society that advanced problems can be solved by a common effort. The success of European collaboration at CERN is not an accident, it is due to the structure of the organization which encourages the commitment of everyone to the pursuit of a common goal, but has room for understanding when an individual partner has special problems."

As health physicist to the Harvard University Health Services, Dr. Jacob Shapiro directs the radiation protection program at Harvard University. He has been involved with a wide variety of problems in the accelerator, medical, industrial, and university areas. His research interests are in environmental and occupational contamination hazards and in the dosimetry and hazards of low-level radiation. He is the author of a widely used manual, Radiation Protection, A Guide for Scientists and Physicians, *published by the Harvard University Press.*