the Stanford six million electron volt linear electron accelerator which presages a two billion electron volt one. Bradner, Bishop, Barkas, and Smith are applying improved techniques to make more precise meson mass determinations. Miller, Henderson, Potter, and Todd have made a careful study of the meson and proton momentum spectrum at three and four-tenths kilometers altitude. Lanczos has made an approach to a unified field theory by a logical extension of Einstein's field equations.

A good time. . . . —S. Neddermeyer

SCINTILLATION COUNTERS

CONFERENCE AT OAK RIDGE

During the past year, the scintillation counter has received widespread acceptance as a fundamental tool of nuclear research. It offers three advantages over previous counters: The light output is proportional to the amount of energy lost by the particle, thereby supplementing the beta proportional counter in the high energy region; it detects gamma rays about a hundred times more efficiently than Geiger counters, without a corresponding increase in cosmic ray background; and the time of passage of the primary particle can be measured to a hundred millionth of a second.

This was brought out at a conference on scintillation counters, held in Oak Ridge on June 3 and 4, the second of a series of conferences sponsored by the Oak Ridge National Laboratory, the first being the low temperature symposium of last summer. The scintillation conference was attended by approximately one hundred and seventy-five people which included one hundred and twenty-five out of town visitors from universities, industries, and government agencies throughout the country.

A conference on this same topic was held at Rochester a year ago, and so it is possible to review the progress made in this brief time. The theory of scintillation phosphors has been considerably advanced, chiefly by F. Seitz (of Carnegie Institute of Technology) and the Purdue group. Photomultipliers with much higher gain have been made experimentally and may soon be available in limited quantities. Several new phosphors have been discovered and the characteristics of all are much better known. The most commonly used transparent phosphors are anthracene, stilbene, and sodium iodide. Sodium iodide has a higher sensitivity to gamma rays per cubic centimeter of crystal than anthracene, but decays more slowly. Stilbene is faster than anthracene but the light output is not as great.

The first day of the conference was devoted chiefly to four lectures. H. Kallmann, of the Signal Corps laboratories, reported on the work that led to his discovery that naphthalene could be used in conjunction with a photomultiplier to count beta particles. He also described his subsequent investigations of other phosphors. Seitz discussed the possibility of obtaining crystals that would exhibit multiplication properties similar to a Geiger counter. George Morton, of the RCA Research Laboratories, reviewed the design and characteristics of present day photomultiplier tubes, particularly with reference to scintillation counting. P. R. Bell, physicist at the Oak Ridge National Laboratory, described his scintillation spectrometer and showed examples of its use for measuring the beta spectrum of several isotopes. This apparatus was demonstrated at the conclusion of the session.

Over one hundred members attended a dinner after which Dr. Kallmann told of some of his work at the Kaiser Willhelm Institute, and the tremendous difficulties of obtaining apparatus.

The second day's session was devoted to a discussion of the various aspects of scintillation counting. Several experiments in which scintillation counters were the primary tool were described: R. Hofstadter showed that gamma rays are scattered as predicted by the Klein-Nishina formula; L. F. Wouters described some of the work going on at Berkeley with fast neutrons and protons; and Martin Deutsch, who served as chairman of both sessions, gave an account of his work on the time of decay of the positron in various gases. Most of the second day was spent in discussing photomultiplier tubes, phosphors, light collectors, and electronic circuits.

—W. H. Jordan

THIN SLICES

FOR THE MICROSCOPE

Slices of metal and biological specimens less than two millionths of an inch thick may be cut with a new high-speed microtome developed by E. F. Fullam of the General Electric Company's research laboratory. The specimen is sliced by the shock wave which forms in the sample ahead of a knife blade moving with the speed of sound. A screw device feeds the specimen and its embedding material into the path of the knife which, mounted on a wheel spinning at sixty-five thousand revolutions per minute, is driven through the air at speeds up to seven hundred and fifty miles per hour.

Another method in ultramicrotomy for use in preparing very thin sections of biological tissue has been developed by S. B. Newman, Emil Borysko, and Max Swerdlow of the National Bureau of Standards. It provides for polymerizing an optically clear and easily cut embedding medium around the specimen. Smooth and continuous thermal expansion of the metal specimen holder towards the knife of a slightly modified conventional microtome can provide sections of tissue having uniform thickness of fractions of a micron over a large area, according to an announcement from the Bureau.

THIN FILMS

INTERNATIONAL CONFERENCE REPORTED

There are very few people who spend much time on the optical properties of thin films and a large percentage of them attended an international conference on the optical properties of thin films held at Marseille from April 19 to 23. The conference was sponsored by the French Centre National de la Recherche Scientifique and was organized by P. Rouard, the director of the physics laboratories of the Faculté des Sciences at Marseille. Among the representatives were A. Vasicek from Czechoslovakia, P. Jacquinot, M. Perrot, and P. Rouard from France,