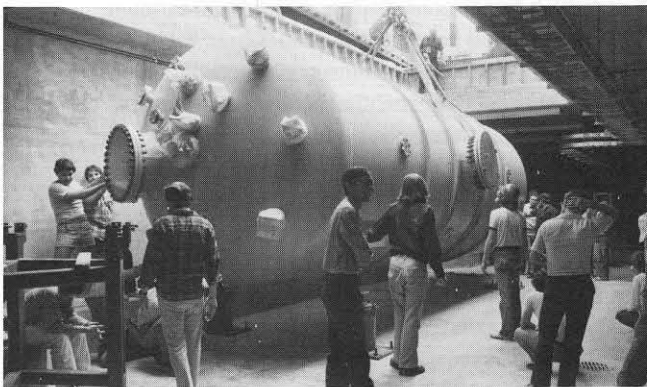


Most of the Kellogg Round Table gang lunching at the Athenaeum in 1934. From the left they are Norton Moore, John Read, Wolfgang von Finklenburg, Henry DeVore, Richard Crane, William Fowler, Lucas Alden, and Walter Jordan. The group's insignia was the candlestick on the table, which was made from an insulator for high-voltage tubes.



Together for the 50th birthday of Kellogg last November, the authors of 1957's classic paper on the synthesis of elements in stars — Margaret Burbidge, Fowler, Sir Fred Hoyle, and Geoffrey Burbidge.



The new tandem accelerator, around which many of the future research efforts at Kellogg will be built.

Yesterday, Today, and Tomorrow

Physicists gather from far and near to celebrate Kellogg Radiation Laboratory's 50th birthday—and a good time is had by all.

Special quantized numbers have played an important role in 20th-century physics, and nowhere more than at Caltech's Kellogg Radiation Laboratory where a recent conference centered on the importance of 1981 — and 50, 70, and 0. The year 1981 is important because it marked the 50th anniversary of the founding of the laboratory in 1931 by Charles Lauritsen. The significance of 70 is that 1981 also marked the 70th birthday of William A. Fowler who is now Institute Professor of Physics but who began as a Kellogg graduate student with Lauritsen in 1933. Since then, Fowler has carved out a distinguished career, both for himself and for the laboratory, in nuclear physics and astrophysics. And the meeting focused on 0 because of the dedication of a new tandem accelerator facility, around which many of the future research efforts of the lab will be built.

When the Kellogg gang get together, it's a party, and this two-day-long fete consisted of one historical session that covered Kellogg's past, two reviews of the present status of nuclear physics and astrophysics, and — looking toward the future — the accelerator dedication. The meeting wound up with a half-session of presentations by members of the current Kellogg staff sketching the directions of coming research.

Robert Bacher, professor of physics emeritus, was chairman of the historical session, which opened with a talk by Charles Holbrow, professor

Edwin E. Salpeter (right) represents the National Science Foundation at the dedication of the new accelerator. At the far right, Crane passes the Kellogg gang's long-treasured candle holder on to Fowler in honor of Fowler's 70th birthday.



of physics at Colgate and a frequent Kellogg visitor. He described the events leading to the founding of the laboratory by Lauritsen and R. A. Millikan, and the negotiations with W. K. Kellogg that made possible its construction and initial operation. (A very readable account of this early period has been published by Holbrow in the July 1981 issue of *Physics Today*.) Life and research in the lab in the prewar and postwar eras were covered in talks by H. Richard Crane, now professor of physics emeritus at the University of Michigan, and by Fay Ajzenberg-Selove, professor of physics at the University of Pennsylvania, who has often visited Kellogg and who was a close collaborator with Thomas Lauritsen.

The speakers in the sessions on the present state of nuclear physics and astrophysics are distinguished leaders in their fields and also "associates" of Kellogg in the sense of having been graduate students, postdoctoral fellows, or visitors. All of the speakers who dealt with nuclear physics were, in fact, once Kellogg graduate students: R. G. Stokstad of the Lawrence Berkeley Laboratory, E. G. Adelberger of the University of Washington, A. D. Bacher of Indiana University, and P. D. Parker of Yale University. Chairman of this session was Rochus Vogt, who is also current chairman of Caltech's Division of Physics, Mathematics and Astronomy.

In the period immediately following World War II, the two Lauritsens, Fowler and Robert Christy recognized that the low-energy Kellogg accelerators were ideally suited to provide the basic nuclear physics data required to understand the processes of nuclear energy generation by stars and the synthesis of the chemical elements. The importance and successes of these efforts were quickly recognized, and they led to a steady stream of postdoctoral fellows and visitors who were eager to participate in this exciting research area. The first era of this research led to the clas-

sic summary paper, "Synthesis of the Elements in Stars," by Burbidge, Burbidge, Fowler, and Hoyle in 1957, based largely on the experimental measurements of Charles Barnes, Ralph Kavanagh, and Ward Whaling. Known both reverently and irreverently ever since as B²FH, this paper has been the basis for what came to be called nuclear astrophysics, and the great majority of its practitioners have been Kellogg visitors at one time or another. This was certainly true of the participants in the conference session entitled "Nuclei, Stars, and Cosmology," which featured R. V. Wagoner of Stanford, Fred Hoyle of the University of Manchester in England, Stanford Wosley of UC Santa Cruz, E. E. Salpeter of Cornell, and — as chairman — J. N. Bahcall of Princeton.

As illustrated by nuclear astrophysics, the Kellogg Laboratory has been instrumental in initiating new directions in physics, the prime example being the beginning of nuclear physics research by Lauritsen and his students in 1932. In 1948 C. C. Lauritsen suggested the construction of an electron synchrotron at Caltech, a suggestion that was considerably augmented by R. F. Bacher and R. L. Walker and that led to the present particle physics efforts at Caltech. In 1963 Fowler and Hoyle began research on the consequences of the theory of general relativity for stars — research that eventually led to the widely recognized relativistic astrophysics research group at the Institute. In 1968 Fowler supported development of a new generation of high-precision, high-sensitivity mass spectrometers by Gerald Wasserburg, professor of geology and geophysics, and Dimitri Papanastassiou, senior research associate in geochemistry. By means of isotopic analyses on meteoritic materials, these mass spectrometers have permitted fundamental insights into the origin of the solar system and the materials from which our solar system was made. During the

1970s Thomas Tombrello led the group into such new directions in applied physics as the design of superconducting accelerators, the interaction of ion beams with solids, lunar and planetary science, and the monitoring of radon emanation from rocks as a possible means of earthquake prediction.

At present Kellogg is an exciting blend of the old and the new, as well as the pure and the applied, but it has no intention of resting on its laurels. This was demonstrated by the dedication of the new accelerator and the final conference session entitled "The Beginning of the Next 50

accelerator was purchased with financial support from the National Science Foundation, which was represented by E. E. Salpeter, and — appropriately — the W. K. Kellogg Foundation, represented by Robert E. Kinsinger. A special spot on the program was reserved for Admiral J. T. Hayward, who is now retired from the U.S. Navy. Admiral Hayward was experimental officer at the Naval Ordnance Test Station at China Lake, California, and worked with the Kellogg Rocket Project during World War II, and he was instrumental in obtaining support for the laboratory from the Office of Naval Research in the period 1946-65.



Years." The chairman of this session was C. A. Barnes, Caltech professor of physics, under whose direction the accelerator was purchased and installed. The senior scientists speaking were Wasserburg and Tombrello, but some of the younger members of the Kellogg staff were also featured: Robert McKeown, who is assistant professor of physics; Steven Koonin, professor of theoretical physics; and Barbara Cooper, research fellow. Cooper described one of the first experiments planned for the new accelerator, a search for fractionally charged particles, which is a problem of fundamental importance to contemporary physics.

The highlight of the accelerator dedication, whose chairman was R. F. Christy, professor of theoretical physics and sometime Kellogg collaborator, was a christening of the instrument by Fowler. Thanks to an uncooperative champagne bottle, this ceremony required not one but two mighty blows. Speeches, of course, always go before action, and this occasion was no exception. Prefatory remarks were made by President Marvin Goldberger speaking for the Institute, President Emeritus Lee DuBridge in behalf of the Trustees, H. H. Barschall from the National Academy of Sciences, Rochus Vogt for the physics division, and C. A. Barnes as the principal investigator for the accelerator project. The

So much for physics. Charles Lauritsen believed, however, that, just as physics should be fun, physicists should have fun. Both precepts have been honored at Kellogg. A gala evening birthday banquet was held for Fowler, with Wasserburg in his true (though perhaps previously unsuspected) element as toastmaster. He was more or less aided by the perceptive remarks of Margaret Burbidge, Andy Bacher, Peter Parker, Ardiane Fowler, Fred Hoyle, and Charlie Barnes. Altogether fitting was the presentation to Willy by Dick Crane of a candle holder made from an insulator from one of the original Lauritsen high-voltage tubes. This prized antique had been used as an Athenaeum table centerpiece by Crane and Fowler and friends during their graduate student days.

Banquets are somewhat formal, so a second evening was given over to an old-fashioned Kellogg party in the informal tradition of C. C. Lauritsen. It featured dancing to a hastily reassembled, but highly proficient, Kellogg band with Barnes at the piano, Stokstad on the guitar, Cary Davids of Argonne National Laboratories on the trumpet, and Vic Ehrgott, emeritus member of the Kellogg staff, on the sax. Both evenings closed with singing led by, who else but, Fowler himself, and all the traditional Kellogg songs were included. □

There was no danger that all work and no play would make the Kellogg birthday participants dull boys — or girls. At the informal party on the last night of the conference Fowler and Fay Ajzenburg-Selove demonstrated how to cut a nonexistent rug. A reconstituted band played the music, and everything wound up with group singing led by Fowler.