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HIGH ENERGY PHYSICS

A Special Report

The elegant simplicity of basic scientific theory—simplicity as elegant as that of elliptical planetary orbits in a sun-centered system—has always been the hallmark of great science.

It is often elusive. When it is, as it now is in the domain of the particle physicists, the quest takes on urgency and drama.

So exciting is the search, in fact, that on a planet with problems including widespread human misery, and a question of human survival itself, sums have been provided to further the quest of the particle physicists out of all proportion to any possible immediate return.

As costs have risen, there have been calls for a halt.

Nevertheless, as in a penny-dreadful, each chapter in the drama of high energy physics—each addition of a new and more powerful (and more costly) accelerator to the world's arsenal—seems to lead close enough to a resolution so that another page must be turned, another chapter begun and another accelerator built, just to relieve the tension. And the price has been paid by—so far—not unwilling national legislatures.

With the dedication of the new 70 billion electron volt accelerator at Serpukhov in the Soviet Union—at the currently going rate of some $2 million per Bev—the world now has invested nearly $300 million in particle accelerators beyond the 12.7 Bev range. These machines—principally the 28 Bev operated at Geneva by CERN, a European combine, the 33 Bev at Brookhaven National Laboratory in the United States and the new 70 Bev in the U.S.S.R. were all planned, designed and committed in what may someday come to be recognized as an earlier time. It was a time, in the decades following World War II, when the search for scientific knowledge, particularly nuclear knowledge, was interpreted as an investment in national security, and freely made.

During this same period the next chapters in the particle physics drama were outlined, and accelerators of still higher energies conceived—the 200 (or 400) Bev planned for Weston, Ill., the 300 Bev designed for a European consortium and the 1,000 Bev machines under discussion in both the U.S. and the U.S.S.R.

But money for science is becoming harder to come by; harder questions are being asked.

In the United States, though the site has been selected and the designs pursued and refined, the future of the 200 Bev accelerator in Weston may hang on as far-removed a question as civil rights. Strong pressures have built to oppose what has now been described by one-time proponents as "a scientist's toy."

In England, France, Germany, Japan and other nations, where proposals either to join in the planned 300 Bev or build satellite national laboratories in energy ranges up to 45 Bev are coming up for decision, there are serious debates as to whether, at this time, the game is worth the candle. England may not go in; Japan's investment in a 42 Bev accelerator is by no means assured.

In an effort to explore the world of the particle physicists, the status of the major national and international programs in this complex and now controversial field, SCIENCE NEWS is devoting the bulk of this issue to the subject.

Warren Kornberg