

Dalai Lama at CERN

The catalysis of proton decay is still not clear. M. Virassoro of Rome concluded that it is hard to imagine a mechanism to eliminate this Rubakof-Callan effect. J. Stone, Michigan, presented the first measurements from the IMB experiment on the lifetime of the proton (see also page 305). The product of the magnetic monopole flux and the magnetic monopole / proton interaction cross-section is lower than 7×10^{-40} per second per steradian (there is a lower limit obtained indirectly in astrophysics by the observation of neutron stars of 5×10^{-49} per second and per steradian). There would then be the choice between a very low flux or the non-decay of the proton! However all these results must be treated with caution for they involve theoretical and experimental work which is still being developed.

It now seems increasingly difficult to believe in B. Cabrera's single event but the experimental physicists are not losing heart. They are preparing new detectors sensitive to slow monopoles (between 10^{-5} and 10^{-3} of the speed of light), and covering ever larger areas. The next stage to be reached is 'Parker's limit' (the galactic magnetic field must not be destroyed by excessive monopole density). The size and cost of such experiments will be comparable to those on the lifetime of the proton.

Large superconducting projects are already planned in the US: 1 m^2 for B. Cabrera's screen target, 3500 cm^2 for the IMB project and 2800 cm^2 for the Chicago-Michigan project. Others are being completed in Britain (Imperial College) and France (CEA). The idea of a 100 m^2 superconducting detector is no longer a pipe-dream, but will the necessary finance be forthcoming?

Great progress has been made in calculating the interaction between

monopoles and matter. P. Musset of CERN is convinced that it is now time to set up a major European project for a scintillation detector covering several thousand square metres. It could be installed at the Gran Sasso laboratory in Italy.

S. Drell and co-workers recently calculated the Zeeman energy of the excitation of atoms by the magnetic field of a monopole. The level shift is great enough to produce a signal in a gas detector: the excitation energy of rare gases can easily be transferred to low-ionization-potential molecules. Loh and Ritson, Utah, are building a 800 m^2 gas detector, in which the gas is a helium-methane mixture. G. Charpak, CERN, described a project for a drift chamber containing helium with 2% TEA (a low-ionization-potential molecule). To some extent it is the detector part of a large Cherenkov image counter.

A. de Rújula, CERN, presented preliminary calculations on the magneto-acoustic and thermo-acoustic effects produced by monopoles passing through matter. These effects are very weak, and it is so far hard to imagine a detector which is sensitive enough. It might be necessary to seek inspiration from superconducting gravitational wave detectors.

Under the chairmanship of J. Perez y Jorba, the meeting demonstrated the current interest in magnetic monopole research and could help launch a major European project.

(We thank Pierre Petroff for supplying us with this information.)

On 30 August, CERN turned aside from its usual day-to-day preoccupations when Director-General Herwig Schopper played host to the Dalai Lama of Tibet and his entourage during the holy man's 1983 visit to Europe.

In welcoming his visitor, Professor Schopper stressed the role of particle physics in helping to understand man's place in the cosmos, and how the Dalai Lama's interest would further the interrelation of science, philosophy and religion.

The Dalai Lama visited the UA1 experiment (rolled back into its 'garage' during the present fixed target operations at CERN) and the large installations for the neutrino experiments in the West Area of the SPS machine.

After lunch, there was an intriguing exchange of views with CERN theorists, who described how science has continually modified our view of the world around us. The Dalai Lama said that in the quest for true reasoning, philosophers were obliged to take account of the latest scientific findings. He was particularly interested in the current status of belief in the indivisibility of particles. He was assured that while current theories are based on a series of 'indivisible' quarks and leptons, this has been tested down to about a thousandth of the dimensions of the clearly composite proton. More structure could yet appear when smaller dimensions can be probed.

Theorists also described the modern view of the (non-invariant) vacuum as something necessarily lacking symmetry and which itself mirrors all the laws of physics. In reply, the Dalai Lama stressed the difference between a 'vacuum', such as had been described by the particle theorists, and a more fundamental 'void', which might have

On 30 August, Director-General Herwig Schopper welcomed to CERN His Holiness the 14th Dalai Lama of Tibet.

(Photo CERN 203.8.83)

to be viewed differently.

The exiled Tibetan leader displayed impressive intellect and insight, and was able to provide a serene counterpoint to the conventional scientific dogma with which he was presented. His general comment was 'I am happy and impressed by this amazing work of scientific research by a common effort of people across national boundaries'.



Under the guidance of Carlo Rubbia, the Dalai Lama explored the computer graphics capabilities of the UA1 experiment.

(Photo CERN 264.8.83)

People and things

Bruno Pontecorvo



On people

Viktor Weisskopf, emeritus professor at Massachusetts Institute of Technology, has been awarded the J. Robert Oppenheimer Prize from the Center for Theoretical Studies at the University of Miami. The award was presented by Paul Dirac.

Bruno Pontecorvo celebrated his 70th birthday on 22 August. He started his research career on the properties of neutrons in Enrico Fermi's famous Rome group. In the Joliot-Curie Laboratory in Paris he investigated nuclear isomerism, the most interesting result being the production of beta-stable isomers by X-ray irradiation. Later came the idea of electron-muon universality and he carried out ex-

Felix Bloch, the first Director-General of CERN (1954-55), died on 10 September. A tribute will appear in our next issue.

periments to measure the muon's properties. He then turned his attention to neutrinos, and made major contributions to the development of techniques for detecting these elusive particles. Especially relevant to today's physics are his ideas on neutrino oscillations.

He is presently Academician of the USSR Academy of Sciences, Foreign Member of Academia dei Lincei, Head of Department at Dubna and Professor of Elementary Particle Physics at Moscow.

Theoretician Jon Magne Leinaas from the University of Oslo has been awarded the particle physics prize of computer manufacturer Norsk Data. He has made contributions to the understanding of geometrical and topological aspects of gauge theories. In collaboration with John Bell at CERN he has shown that the acceleration of electrons affects the electrons in a similar way to a strong gravitational field, and leads to a heating of the particles.

At the KEK Laboratory in Japan, work for the new TRISTAN collider has been brought together under the project leader, S. Ozaki. Former TRISTAN coordinator K. Kikuchi has become general research coordinator at KEK.

Philip I. Dee

Earlier this year, Philip I. Dee died at the age of 79, removing another of the links with the great days of nuclear physics at the Cavendish Laboratory, Cambridge, under Rutherford. After experiments with cloud chambers, Dee turned his attention in 1936 to the business of particle acceleration. From

Valerian Shevchenko, Vice-Director for Research of the Institute of Theoretical and Experimental Physics in Moscow, celebrated his sixtieth birthday on 27 June.



1945 to his retirement in 1972 he held the Chair of Natural Philosophy at Glasgow, where he played a major role in reshaping the Department of Physics.

Asian physics

The First Asia Pacific Physics Conference, held at the National University of Singapore in June, brought together about 300 specialists from many branches of physics, including the high energy and nuclear sectors. It has been decided to hold the second such meeting in Bangalore, India, in 1986. It is hoped that these conferences will become a permanent feature of the physics calendar. The co-chairmen of the second conference are A. Arima of Tokyo and K.K. Phua and P.P. Ong of the National University of Singapore.