

this sense represent by far the highest controlled energy available to physics. It is hoped that the beams can be used to examine the validity of quantum electrodynamics in an energy region which has so far only been accessible in rare cosmic ray events.

Finally, I shall discuss a report by Heisenberg on progress being made in his theoretical group (Munich) toward the development of a general theory of elementary particles. They assume that the most general symmetry principles of the type summarized above are sufficient to specify a differential equation, the eigenvalues of which are connected with properties of the particles. Thus the symmetry principles rather than the particles themselves are regarded as the elementary notions of physics. A prototype of such theories is the relativistic wave equation proposed thirty years ago by Dirac, who was able to give a deductive account of electron spin and to anticipate the discovery of the positron. Several years ago, Heisenberg and Pauli proposed a non-linear spinor equation to which they were led by symmetry considerations. It appears that, since then, some significant steps have been taken toward illuminating the mathematical properties of the equation and deducing some of its physical consequences. There is as yet, however, no strong experimental evidence for or against the theory. Aside entirely from computational difficulties, the theory is open to certain conceptual objections. One of them stems from the

fact that, for the equation to have non-trivial solutions, it must deal with an indefinite metric in Hilbert space. This leads to probability amplitudes of negative norm, for which no interpretation can be given in the usual formulation of quantum mechanics. Heisenberg hopes, however, that all such cases will correspond to virtual states of physical systems, and that negative probabilities may for this reason not be incompatible with the present structure of physics.

It may be clear from this sampling of the conference that the physics of high energies is active on many fronts. It should also be clear that there are fundamental questions still unanswered. Are there still more classes of particles? Are the strict principles of present theory applicable at very small distances and at very high energies? Is there a 'universal' weak interaction, and is there a field quantum associated with it? Are the particles themselves to be regarded as the ultimate entities of physics, or are their properties derivable from a set of simple principles? At any stage in the development of our knowledge there is always a class of questions which seems inaccessible to the methods of physics, but which is nevertheless eventually answered within the context of later developments. It is with a faith strongly supported by this observation that physicists are attacking the provocative questions now before them.

E. M. HAFNER

NEWS and VIEWS

Cloud Physics at the Imperial College of Science and Technology, London : Prof. B. J. Mason

DR. B. J. MASON has been appointed to a newly created chair in cloud physics at the Imperial College of Science and Technology as from October 1960, thus gaining academic recognition for sustained original work in this field over the past decade or so. He joined the Department of Meteorology at the Imperial College of Science and Technology in 1948, following graduation in physics with first-class honours at University College, Nottingham, in 1947 and some research with Dr. G. D. Yarnold on surface tension in the following year. Mason was led to take up research in cloud physics on reaching the Imperial College of Science and Technology, and he soon formed around him an active group of research students concerned mainly with microphysical processes, while his colleague, Dr. F. H. Ludlam, led parallel work on the macrophysics of clouds, to the benefit of the subject as a whole. Cloud microphysics, in Mason's hands, has advanced mainly by his skill in exploiting laboratory techniques and he has designed a number of quite beautiful experiments. Notable among these is the use of the diffusion cloud chamber, in collaboration with Dr. J. Hallett, to determine the forms—needles, plates, prisms, dendrites—in which ice is deposited as a function of temperature and supersaturation. This work has contributed not only to meteorology but, quite notably also, to modern solid-state physics. Mason was awarded the D.Sc. of the University of London in 1956, and was appointed Warren Research Fellow of the Royal Society in 1957. His authoritative text, "The Physics of Clouds", was published in 1957, and he has served on the

Councils of the Royal Meteorological Society and the British Association and on Government research committees. Prof. Mason may now, with extra facilities and his noted enthusiasm, be expected to make an increasing impact on the study of cloud physics in Great Britain.

Physics in Hong-Kong : Prof. W. D. Chesterman

DR. W. D. CHESTERMAN has been appointed to the vacant chair of physics in the University of Hong-Kong. Dr. Chesterman graduated at the University of Bristol in 1934. He then became a student apprentice at the British Thomson-Houston Co. and on completion of his apprenticeship was appointed to the staff of the Company, where he remained until 1939, when he joined the Admiralty. His work in the Admiralty has been mainly in the fields of photographic and optical techniques and in underwater acoustics. He became a Fellow of the Institute of Physics in 1943 and of the Physical Society in 1945. During the past ten years he has gained an international reputation for his work on photographic techniques. He has published a book and a number of papers on high-speed photography, which have been very well received. During 1956–58 he was chairman of the International Committee on High Speed Photography, and in 1958 he was elected a Fellow of the Royal Photographic Society. In 1959 he was awarded the degree of doctor of science by the University of Bristol. The papers put forward for his doctorate included published accounts of his work in the fields of underwater acoustics, illumination optics, high-speed photography and oceanographic research.