SOVIET PHYSICS

JETP

SOVIET PHYSICS JETP VOLUME 1, NUMBER 3 NOVEMBER, 1955

Albert Einstein

(1879 - 1955)

J. Exper. Theoret. Phys. USSR 28, 637-638 (May, 1955)

ON April 18, 1955, Albert Einstein died at the age of 76. All the world honored in him the great scientist, the "great regenerator of natural science" (Lenin), but it is easier for a physicist than for anyone else to realize, concretely and in detail, the significance of the scientific revolution due to Einstein.

Einstein was born on March 14, 1879, at Ulm, and spent his childhood in Germany, but at 14 he moved to Switzerland, where he received his higher education, and where he lived during the first period of his scientific career -- up to 1914 (with the exception of the two years, 1911-1912, during which time he was Professor at the University at Prague). His life in this period was an unusual one. Upon finishing at the Zürich Polytechnic Institute (1900), he busied himself with the activities of a teacher, but in 1902 he began work as an expert in the patent office in Bern. He worked there until 1909, and this period coincided with the beginning of his brilliant scientific work. During this time he produced the special theory of relativity, the quantum concept of radiation, works on the theory of diffusion and Brownian motion. In 1909, the scientific services of Einstein received official recognition. He was appointed Professor, first at the University of Zürich, then (in 1911) at the University in Prague, and subsequently at the Zürich Technical Institute. In 1913 Einstein was chosen a member of the Prussian Academy of Sciences, and in 1914 he went to Berlin.

In the Berlin period of his life, Einstein created the general theory of relativity, and also developed the quantum theory of the emission and absorption of radiation, and quantum statistics (the so-called Bose-Einstein statistics). After the Nazis came into power, Einstein left Germany and settled in Princeton, U.S.A., where he lived to the end of his life, continuing the development of various problems in the general theory of relativity.

Einstein was a member of many Academies of Sciences. In 1926 the Academy of Sciences of the USSR named him an honorary foreign member.

Both branches of theoretical physics of the twentieth-century -- relativity and quantum theory - owed their development to Einstein, although in unequal measure.

The theory of relativity appeared as a brilliant creation of Einstein. Its concrete physical content forms a necessary and basic element of contemporary physics. Phenomena in which the failure of the classical theory appeared in the eighth decimal place served as the starting experimental material for its construction; subsequently, the same theory of relativity explained phenomena in which the difference (change in mass) was measured by a factor of 100 (in the case of an accelerator) or even by $10^3 - 10^{10}$ (in cosmic rays). Contemporary nuclear physics and the physics of elementary particles would be unthinkable without the theory of relativity.

Moreover, the theory of relativity also has enormous significance as the theory which essentially changed the previous, oversimplified representations of space and time extension , as the theory which permits us in every phenomenon to distinguish quantities objectively inherent to it, which do not depend on the particular choice of the "frame of reference".

No less important is the general historical significance of the theory of relativity. After centuries of domination of the Newtonian concept, during which time the idea of universal applicability of the laws of classical mechanics became accepted in the minds of physicists, the concept

telescopes increases so much that it becomes comparable with its assumed radius of curvature, an appeal to the general theory of relativity will be inevitable.

(natural enough for us of the present day) developed that the study of a new range of phenomena, in a new scale of velocities, lengths, etc., could lead to a significant change in physical concepts and physical laws, since the previous laws and concepts possessed only limited applicability in the framework of the phenomena investigated in their development. This concept was clearly expressed by Engels and Lenin, but in the world of physics it marked a genuine revolution.

The general theory of relativity, containing in itself the theory of gravitation, has not yet found such wide application as the special theory, although its ideas have been confirmed in three phenomena in the field of astronomy. It undoubtedly will serve as a basis for the solution of cosmological and cosmogonic problems, whose investigation is still in the initial stages. When the dimensions of the region of space accessible to

The researches of Einstein on the quantum theory of radiation also have shown a notable effect on the subsequent development of physics. The concept of the quantum structure of radiation flow which he introduced with extraordinary daring in 1905 cannot be completely justified today from a purely logical viewpoint, and in no way possesses the completeness and rigor of the theory of relativity. This was a physically heuristic concept which showed itself, however, to be exceedingly fruitful in the clarification of a large range of diverse physical phenomena. It found its full basis and confirmation only within the last quarter century, when quantum electrodynamics was developed.

It is hardly proper here to speak of the other remarkable researches of Einstein, each of which appeared as a great scientific event. They remain in the background only because they are eclipsed by the theory of relativity-gravity in which the remarkable characteristics of Einstein as a thinker and his exactness of thought and fearlessness of mind are most strikingly evident.

Einstein took an active part in public life and was warmly aroused on questions which disturbed the more advanced of mankind. He repeatedly came out against war, for international understanding and against the use of atomic weapons.

Soviet physicists deeply honor the memory of Albert Einstein.

Translated by R. T. Beyer
117