

MORNING SESSION

K. F. NOVOBÁTZKY's Opening Address

Ladies and Gentlemen; our honoured guests !

May I, as the doyen of Hungarian physicists, welcome you to our country. Allow me now, to propose a motto for our colloquium, by quoting LESSING who said: "When God offers me in his right hand the full knowledge of the Universe, in his left hand the toil and struggle towards obtaining the same knowledge, I without hesitation choose the left hand." This struggle is the most cherished activity of all those, who have made a lifelong treaty with science.

In my long life I have had the opportunity to follow up the development of quantum theory from its birth to the present hour. I feel that for quantum mechanics, too, the poetical words of DUHEM, describing the struggle of science towards more general and advanced concepts apply in full, without reservation: "Through the theories, which arise to become later forgotten, through the hypotheses, acclaimed for a decade as unravelling the hidden mechanisms of the Universe to be regarded in the next decade as childrens' folly, proceeds the slow but continuous advance of theoretical physics. When the tide surges on the coast, a wave develops first climbing high on the hitherto dry shore; but the wave with its impetus is soon lost in the following wave. This continuous struggle of the individual waves, arising only to be submerged later, looks like a hopeless task of sea to occupy a height. But after a couple of hours the shore where men had walked is deep under water. In the incessant to and fro of the waves, in their relentless advance and retreat, creation and decay, has the vast ocean moved ahead."

You know very well indeed, my honoured colleagues, that a host of mathematical methods has been developed around the idea of canonically conjugate operators, due originally to HEISENBERG. These methods have been developed, mainly because of particular difficulties inherent to quantum mechanics. Quantum mechanics has to cope with singularities, ghosts, with an insufficient number of conservation laws, with the prodigal number of elementary particles, starting from a modest 30 and now around 185. Confronted with these problems the scientists themselves assume two attitudes. The optimists, such as PAULI was, pin their hopes on a future quantum theory,

to be capable of theoretically deducing a few evidently quantized physical properties, e.g. the elementary charge; the pessimists, however, think that present day mathematical methods and tools no longer have any connection with physics.

This present colloquium deals exclusively with problems of quantum mechanics when the number of the degrees of freedom is very high, and even tends to infinity. The central problems are therefore the quantum field theory and the case of a large number of particles. Problems, such as vacuum degeneration, leading to asymmetry of the vacuum, strongly deviating from the common symmetry properties of the Hamiltonian, will be discussed as well.

I can compare this colloquium perhaps to a single wave of DUHEM, which is but a component of the tide. I express the hope that your discussions will produce gratifying results. Wishing you a pleasant stay in our country, I hereby declare this colloquium opened.