BIOGRAPHY

Einstein Read Philosophy When Only 13 Years Old

EINSTEIN as a high school student "ate up" physics and mathematics, and at thirteen was reading the abstruse philosophical works of Kant. These and other high-lights from the childhood of the great German scientist are given in an article in the first number of *Scripta Mathematica,* a new journal of the history of mathematics, by Dr. Max Talmey, a New York physician.

Dr. Talmey first became acquainted with the young Albert Einstein when he was a medical student at the University of Munich, and Einstein a schoolboy. Although there was a difference of eleven years in their ages, young Einstein was so mature-minded that this was quickly lost sight of, and the two became fast friends. Talmey gave Einstein the first scientific works he ever read, two popular books in physics, and followed these with a text in plane geometry. Einstein disposed of all these in short order, and soon went beyond his older friend's depth in mathematics. Then he began to show interest in philosophy, and Talmey introduced him to the works of Kant, which he tackled with relish and apparent understanding at the mature age of thirteen.

"I associated frequently with the young scientist for five years," Dr. Talmey states, "and never saw him reading any light literature or keeping company with boys of his age. He usually held himself aloof, absorbed in books on mathematics, physics and philosophy. His recreation he found in music. He had taken instruction in violin playing, but only for two years."

Dr. Talmey lost touch with the Einstein family when they moved to Milan, taking young Albert with them. Subsequently they went to Zürich, where Einstein himself became a Swiss citizen in 1900. During his early post-graduate years he had rather a hard time of it, at first teaching, then in a poorly paid post in the Swiss Patent Office. During these years Dr. Talmey saw him only once, and then again lost touch with him through his own emigration to America. The old friendship has been renewed on the occasion of Prof. Einstein's visits to this country.

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will rush ahead for several years more until the immediate possibilities of this theory have been exhausted.

The list, which follows, of some of the apparent results of Eddington's theory may not appear imposing to the layman, but the thoughtful physicist must regard it with deepest satisfaction and must feel that his highest admiration for the achievement is insufficient.

1. Eddington has properly formulated the consequences of the fact that the fundamental electric charges—the electrons—are all exactly alike and interchangeable. This is the principle underlying the whole program. From it alone all the results follow.

2. The inverse square law, with improvements, for the force between electrons is at last derived and not assumed. Thus a blemish, apparent to every beginning student of quantum physics, is removed.

3. The Exclusion Principle of Pauli is deduced from general principles and not mysteriously added to patch up flaws in an imperfect theory. This Principle, used until now entirely *ad hoc,* is one of the most significant statements ever formulated by man. Roughly it can be stated as follows: Two similar parts of a system necessarily show differences in behavior.

4. The numerical value of the electronic charge is calculated from the velocity of light and the quantum of action. Thus the number of fundamental constants is reduced—a most important achievement in which every physicist can take pride. He needs in his powerful science only four separate constants in terms of which to describe all known phenomena. This result, however, is not yet fully attained—there is a serious discrepancy outstanding, which, if the theory is sound, will bring about new triumphs.

5. The problem of two bodies has for the first time been solved in a satisfactory manner in accordance with the requirements of relativity and quantum theory. The leading workers in the field have spent much of the past four years on this problem without success.

There are other results but these may suffice to indicate why some workers are enthusiastic over the paper. If it proves correct physics will rejoice and will spread the news in all detail. If it proves false, the matter will be dropped, but the "Physical World" will hereafter be very impatient with Sir Arthur.

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PHOTOGRAPHY-ENGINEERING

First Welded Penstock Built In California

See Front Cover

WELDING, an abundant source of beautiful photographs, furnishes another picture for the front cover of the SCIENCE NEWS LETTER this week; but beauty was not sufficient reason for its prominence in the cover position.

The picture was taken within a welded pipe, one-fourth mile long, tilted up a mountainside at an angle of 45 degrees. It is the penstock, or intake pipe, to Los Angeles' San Francisquito power plant number 2.

This pipe, says the Lincoln Electric Company who supplied the photograph, is the world's first arch welded penstock. It varies gradually in diameter from seven feet near the top to six feet at the bottom.

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