

Is There an Ether?

Physics

Science still must answer the great and fundamental question: "Is there an ether?" And despite the many feats of the Einstein theories of relativity in explaining and predicting observed facts of physics, such as the way the planet Mercury moves in its orbit, they are seriously menaced by having one of their foundations pulled out from under them.

For Prof. Dayton C. Miller has reported to the Optical Society of America that he has during the past year laboriously repeated the ether drift experiments that he has been making during the last nine years in a Cleveland laboratory and on high Mount Wilson in California.

Again he finds an observed effect in the light path of his apparatus such as would be produced by a relative motion of the earth and the ether of about ten kilometers (six miles) per second. This is the same result that Dr. Miller has obtained during the past few years. In 1925 his paper on this work won the annual prize of the American Association for the Advancement of Science. This continued ability to obtain the same results over a period of years, whether the apparatus is at normal level in Cleveland or on a California mountain, makes Dr. Miller's results all the more important.

Nor does Dr. Miller feel that his experiments repudiate the famous Michelson-Morley experiments on ether drift performed in 1887. Prevalent opinion holds that this historic test showed that there is no ether drift, that there is no something filling all space, and it was upon this interpretation that Prof. Albert Einstein based his special theory of relativity when he enunciated it in 1905. But Dr. Miller, studying the results of his latest experiments performed this year on the campus of the Case School of Applied Science, only about 300 feet from the location of the original Michelson-Morley interferometer of 1887, finds that his results showing the solar system moving

through space "fully agree with and confirm the original Michelson-Morley observations, although the present interpretation is different."

In the 1887 Michelson-Morley experiment there was discovered a slight difference in the time that it took light to travel over two paths, one at right angles to the other. But this was attributed to experimental errors, to those slight deviations that enter into all observations. Dr. Miller, by performing hundreds of experiments and by improving the details of the ether-drift interferometer, has by his results demonstrated that the observational differences of the original experiments and his many later tests are real and not due to error in the apparatus. Such refinements as shock-absorbing pads on the supporting piers and extreme precautions to eliminate temperature differences were taken in this year's experiments. The interferometer uses the interference of light waves to measure far more accurately than any mechanical means. Dr. Miller's instrument gives numerical results reliable to the hundredth part of a wave-length of light, although the length of the light path is 130,000,000 wave-lengths. He can detect a relative motion of earth and ether a twentieth of that which he actually observed.

The discovered motion of six miles a second is not a merely earthly phenomenon, but a cosmic one. It is fixed with relation to sidereal time;

that is, it is toward a fixed place in space. The earth and its millions and the whole solar system is rushing, Dr. Miller declares, "toward the point having a right ascension of 17 hours."

How are the scientists to reconcile with their theories this well-tested motion that the ether-drift experiments demonstrate? Dr. Miller says: "It seems impossible at the present time to account for a cosmic effect of this small magnitude and it will be necessary to continue these experiments and to coordinate them with others before an acceptable theory can be propounded."

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To Study Mayas

Anthropology

A combined scientific and educational expedition has left for the little known territory of Quintana Roo, last stronghold of Maya Indian tribes who have never submitted to outsiders.

The party is headed by Moisés Saenz, of the Mexican Ministry of Public Education, and its purpose is to study the actual social and economic conditions of that territory. Rural schools have been established all over Mexico in the last eight years, but Quintana Roo resists. Of three Indian chiefs who divide the territory among themselves to govern, only one has cooperated with federal officials in their educational campaign.

Another has enriched himself immensely on chicle which is sold to foreign merchants, and it is claimed that with his feudal power over his subjects he blocks progress. The region is wealthy to an unknown degree in chicle, Mexican cedar, and mahogany. It is for the most part unmapped, and existing maps are claimed to be largely wrong, because villages move about and are not now at the same places where they were when the last sketchy maps were made.

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