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ON THE CALCIUM CLOUDS.

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(Continued from page 653, Vol. XXXIII.)

Oscillations of Stationary Ca Lines.

In apparent contradiction to the result that beginning from B3 and earlier no stellar line of ionized calcium should exist, is the fact, noted, I believe, first by Professor Frost, that several spectroscopic binaries

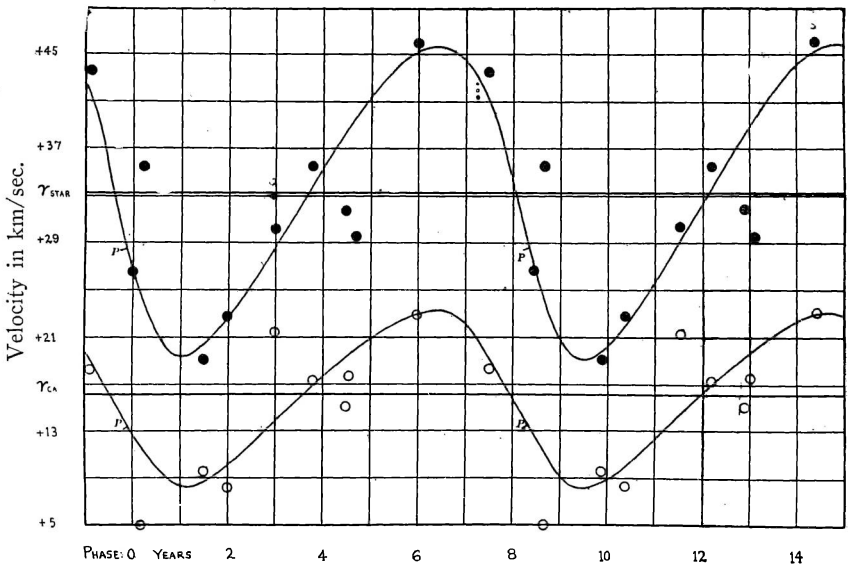


FIG. 4. Velocity curve of $37 \phi^1$ Orionis. The filled circles indicate the velocities of the star, while the open circles give the corresponding velocities of the stationary calcium lines. Phase 0 corresponds to the year 1900.0.

of types B3 and earlier show lines of the "stationary" type which oscillate with the same period as the other lines, but with a smaller amplitude. The velocity of the system derived from these Ca lines frequently does not coincide with that of the star, but resembles more nearly the reflex of the solar motion. In this respect such Ca lines behave exactly as the ordinary "stationary" type of line. Plaskett³¹ and others have

Dr. Miller Receives \$1,000 American Association Prize.—The award of the \$1000 prize of the American Association for the Advancement of Science to Dr. Dayton C. Miller, Case School of Applied Sciences, Cleveland, is a recognition of patience, perseverance and service to science as well as an acknowledgment that the results of Dr. Miller's work may require serious changes in the prevalent idea of the way the universe is put together.

The observations made in the course of the ether drift experiments during 1925 consisted of over 100,000 separate readings, a procedure that required Dr. Miller to walk, in the dark, in a small circle, for a total distance of 100 miles, while making at very frequent intervals the most delicate measurements possible.

Dr. Miller said in his prize paper: "I think I am not egotistical, but am merely stating a fact when it is remarked that the ether drift observations are the most trying and fatiguing, as regards physical, mental and nervous strain, of any scientific work with which I am acquainted."

That the results reported in the paper, which the judges decided was the most notable contribution among the thousand papers of the Kansas City meeting, will have a far-reaching effect on the foundations of physics and astronomy can not be doubted. Dr. Miller repeated the experiment that is fundamental to the Einstein theory and found that the accepted interpretation of the famous Michelson-Morley experiment of 1887 must be reversed. There is an ether drift, the earth does carry along with it through space some of the ether, whereas the Einstein theory was built upon the assumption and the results of the 1887 experiment that showed no such drift.

Either the Einstein theory must be modified to meet the new facts, or if such modification is impossible, it must be scrapped. When Dr. Miller announced preliminary results at the April meeting of the National Academy of Sciences, Einstein acknowledged that the data if confirmed would be a serious blow to his theory in its present mathematical formulation. Physicists do not believe, however, that results of Dr. Miller are impossible of reconciliation with a theory of relativity that is worked out upon new assumptions and facts.

That the earth and the solar system are speeding through space at the rate of 125 miles a second or more, ten times the speed previously suspected, was also revealed by Dr. Miller's experiments. Prof. F. R. Moulton of Chicago during the meeting explained that this high velocity may mean in part that our own stellar galaxy or universe is rushing through the ether. If so, the astronomers may be revising some of their ideas of the composition of the universe.

Dr. Miller began his experiments on ether drift thirty years ago. Soon he will again journey to Mount Wilson to repeat the experiments once more. Such is the method of science; the rewards are an inspiration to mankind.—(Science News Letter, January 23, 1926.)

Harvard Observatory Expedition to Chile.—During November two telescopes were transferred from the Harvard station at Arequipa, Peru, to Chuquicamata in northern Chile, in order that photometric and spectroscopic work on faint stars could be continued without much interruption during the season, from November into March, when cloudy conditions prevail at Arequipa. The station at Chuquicamata, which was occupied two years ago for the first time, is at an altitude of more than nine thousand feet, and the percentage of clear nights appears to be greater than for any other existing observatory. The telescopes in use at Chuquicamata are the 10-inch Metcalf triplet, which is employed in the study of faint Milky Way variables and in obtaining spectrum plates for the Henry Draper Extension, and a 3-inch Ross-Tessar lens which is employed