

A PAPER OF MICHELSON'S ON THE VELOCITY
OF REFLECTED LIGHT

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This paper appeared in the *Astrophysical Journal*, V. 37, pp. 190-3 in 1913, by which time Michelson was no longer the free-lance experimenter he had been when he and Morley did their more famous experiment. He had become a ball-player with the in-group of science. It was apparently at Einstein's request that he performed this experiment, which purports to demonstrate that light does not move at any different velocity after reflection by a moving reflecting surface, than it did before incidence.

We have no personal interest of our own in this matter as the transmission theory encounters no difficulties with moving reflectors. For it, it is merely necessary to tell what is the condition of motion of the presumed carrier for electromagnetic effects and after that all else is decided. We would assume that the motion of the carrier is concomitant with the motion of the reflector at the reflector; and that it accompanies the source near the source; between the two there is a continuous transition from one state of motion to the other and our light point moves at velocity c relative to that. Therefore, we do not have the motivation or time to waste in reviewing this paper of Michelson's in careful detail ourselves. We have decided, instead, simply to reprint it here in toto, as it is quite short. Those who espouse the emission principle of light propagation may then answer it and may use the pages of this *J.* for that purpose if they wish to do so. We are all ears to hear their criticisms of what Michelson has done.

Perhaps Kantor, Waldron, Wallace and Tedenstig can breathe some life back into the corpse of the ballistic-emission theories therewith. We suggest they give due and careful attention to Michelson's kiddie-like arithmetical errors, which at a superficial glance of our own would seem to be as much present in this work as they were in the paper with Morley on the Fizeau experiment. Also, we find amusing his weighting of his observations and suggest one beware of it, for it has the effect of corroborating his foregone conclusions regarding the outcome of the experimentation before he ever goes about assembling the first piece of apparatus. So there is some reasonable chance that this paper is flawed.

Despite our obvious scepticism about the validity of the ballistic-emission principle, we do have an open mind still. But it seems to us that it will be difficult to counter the evidence piling up counter to them in DeSitter's argument, Tolman's discussion (Tolman's paper is unclear as to whether he actually did an experiment or only a *gedanken* experiment), Majorana's experimental work, and Ives' investigations along the same line, as well as our own objections to the ballistic photon stated in this *J.* pp. 2348-9. We see no purpose gained in fantasizing a theory in the face of cold hard facts negating it - but maybe, the facts are not so cold and hard as they seem to be. We are prepared to listen, consider and weigh all reasonable debate, but the defense of the ballistic principle will have to be very good if it is to be convincing.