The effect was found for some eight electroscopes, one of which was arranged so that the electrode above the sulphur insulation was at a higher potential than the gold leaf. This insured that the effect was not due to a leak over the insulation. The effect was not due to a penetrating radiation and can hardly have been due to the formation of an active deposit on the walls of the electroscopes.

If this increased rate of leak was due to an increased ionization in the electroscopes, then this change is very similar to that which would take place when surface air is rapidly carried into upper regions of the atmosphere during thunderstorms. Such a large increase in ionization would remove one of the serious difficulties of the Wilson-Gerdien theory.

Recent work by Simpson indicates that the breaking of rain drops probably causes a considerable part of the separation of positive and negative electricity during thunderstorms. But it also seems possible that the condensation upon negative ions may also cause some separation of electricity. These ions may carry several charges and thus cause a greater separation. Simpson only considers negative ions to carry a single charge. It would be interesting to know whether the supersaturation necessary for condensation on negative ions is dependent on the size of the charge they carry.

THE SECOND POSTULATE OF RELATIVITY.[1]

BY RICHARD C. TOLMAN.

THE remarkable conclusions drawn from the theory of relativity are caused by the peculiar nature of the second postulate of relativity. This postulate may be derived, by combining the hitherto unquestioned first postulate of relativity with the principle that the velocity of light is independent of its source.

The alternative hypothesis, that the velocity of light and its source are additive, would lead to none of the complications of the theory of relativity. It is shown, however, that this new hypothesis as to the velocity of light would not lead to exactly the same results for the Doppler effect as the older and more usual hypothesis as to the velocity of light. An experiment is also described which indicated that the velocity of light from the approaching and receding limbs of the sun was the same.

Finally, a method is developed for obtaining all the more important conclusions of the theory of relativity based merely on the first postulate of relativity and the results of Kauffmann-Bucherer experiment without making any use of the second postulate of relativity.

[1] Abstract of a paper presented at the Boston meeting of the Physical Society, December 28–31, 1909.