

PENETRATING RADIATION IN THE ATMOSPHERE.¹

By G. C. SIMPSON.

[Reprinted from Science Abstracts, Sect. A, June 25, 1917, §508.]

Experiments have demonstrated that the number of ions generated per cu. cm. per second in a hermetically sealed metal box increases rapidly with increase of height above the ground. This effect commences at about 2 kilometers and is continued up to 9 kilometers, the greatest height attained in the experiments. This can only be accounted for on the hypothesis of a far more penetrating radiation in the atmosphere than any previously known.² The source of this penetrating radiation has been the subject of speculation since its existence was established. E. von Schweidler finds that if the radiation were sent out from the sun the latter would have to possess a specific activity 170 times as great as that of pure uranium, a most improbable value. An alternative explanation that cosmical space is filled with a radioactive gas of a specific gravity 1/1200 that of uranium appears partially to account for the facts observed, though this explanation does not find favor with von Schweidler.

Linke has suggested a layer of strongly radioactive cosmical dust in the atmosphere at a height of 20 km. and puts forward several arguments in favor of this hypothesis. More observations are, however, required before this suggestion can be fully tested. Simpson pleads that mathematical physicists should take account of this new penetrating radiation, the existence of which is clearly demonstrated.—*J. S. Dines*.

¹ Nature, London, Apr. 12, 1917, 99:124-125.² Science Abstracts, 1916, Sect. A, §1373; See also this REVIEW, March, 1916, 44:118.

METEOROLOGY AND AVIATION.

By W. H. DINES.

[Condensed from Nature, London, July 26, 1917, 99:424.]

After reviewing the various ways in which the elements hinder the evolutions of the aviator and the aeronaut, particularly he who would have to carry mails and passengers long distances,¹ Mr. Dines concludes as follows:

Thus it appears that the demand of the airman on the meteorologist is that he shall be able to forecast wind and fog, and to a less extent clouds, on the route the airman is proposing to follow. It has long been the business of the [London] Meteorological Office to forecast wind, and a certain amount of precision has been attained. During last winter Maj. Taylor investigated the possibilities of forecasting fog, and gave the results in lectures to the Royal Meteorological and Aeronautical Societies. His work constitutes a considerable advance investigation of this difficult subject. If we express the wind in terms of its two components, W. to E. and S. to N., the probable error of a forecast for each component is perhaps about 10 miles an hour, and there is not much prospect of improving this; the estimate is for England and the Continent, but farther south the conditions are much better.

I do not wish to emphasize the difficulties which lie in the way of regular air services, but they are there, and the first step toward overcoming them is to admit their existence.²

¹ See this REVIEW, June, 1917, 45:270.² Full text was reprinted in Sci. Amer. suppl., No. 2174, New York, Sept. 1, 1917, p. 144.