railroad tracks and yards. Fibers of plants and considerable humic material were mixed with the dust. The amount of dust in the caked mud would increase the total that would pass the 200-mesh screen to approximately 90 per cent. Assuming these samples to be representative the amount of dust deposited on each square mile would equal the astonishing total of 801 tons.—*H. L.*

RAIN-MAKING AGAIN!

[Reprinted from *Nature*, July 21, 1921, p. 659.]

The popular fallacy that explosions can precipitate rainfall found expression in the question asked by Maj. Morrison-Bell in the House of Commons on July 13 as to whether the Government would be prepared to initiate experiments which might possibly have the result of precipitating a downpour of rain. The answer given was to the effect that from past experiments meteorologists were of the opinion that explosions would not induce a fall of rain, and rightly so; for experiments were conducted on a vast scale, not, it is true, with that particular end in view, on the western front during the Great War. The collation of statistics of rainfall with the gunfire failed to show any certain connection. The only way in which the water vapor in the atmosphere can be condensed into clouds is by cooling. Unless an explosion can produce a cold current, or cause to any appreciable extent such a disturbance in the atmosphere as will bring about the mixture of a stratum bearing a cold current with that carrying a warmer current, it can not produce rain. The compression in the air produced by a bursting shell is propagated as a sound wave. The amplitude of the motion, therefore diminishes as the square of the distance from the origin, so that at the distance of a quarter of a mile it would probably be no greater than one ten-thousandth of an inch. In 1917 M. Angot, Director of the French Meteorological Office, showed that in the extreme case of two equal masses of saturated air, one at 0° C. and the other at 20° C., it would be necessary, in order to produce rain of even so small an amount as 1 mm. (0.04 inch), for the two masses rapidly and thoroughly to mix throughout an atmospheric layer of 6,850 meters (about 4 miles) in thickness. Nor are dust particles and ions, which form the nuclei of raindrops, sufficient of themselves to cause precipitation unless there be a concomitant reduction of temperature.

CORRECTION OF A MARINE BAROMETER FOR ERRORS DUE TO SWINGING.

By W. G. DUFFIELD and T. H. LITTLEWOOD.

[Abstracted from *London, Edinburgh, and Dublin Philosophical Magazine*, July, 1921, pp. 166–173.]

A swinging barometer, such as is used in gravity determinations and for meteorological purposes on shipboard, is subject to two sources of error as a result of the swinging. First, the effect of small oscillations about the point of support tends to make the reading too high. Second, the swinging about the point of support tends to make the reading too low because of the action of the centrifugal force in the mercury. The purpose of the investigation was to so arrange the barometer that these two errors, which are of opposite sign, would exactly neutralize each other. This adjustment may be made either by keeping the point of suspension fixed, which will keep the distance from the center of oscillation to the center of gravity constant, and make such adjustments to the barometer as will change the length of an equivalent simple pendulum; or, by altering the point of suspension, thus changing both of the lengths mentioned above. In the latter case, the point must be found where the required relationship is attained. In a marine barometer upon which tests were made, it was found that practice agreed closely with theory, and, for that particular instrument, the error was zero when the period of oscillation was about 1.66 seconds (first method); and (second method) when the center of oscillation was 21.5 cm. below that used in the first method. The authors recommend that all marine barometers, whether they are to be used merely for meteorological purposes or for more precise gravity work, should be so constructed as to permit of these adjustments.—*C. L. M.*

CLOUD FORMATION BY SUPERCHARGED PLANE.[1]

[Reprinted from *U. S. Air Service*, July, 1921, p. 13.]

An altitude flight was made in the morning at McCook Field [Dayton, Ohio] recently, by Lieut. J. A. Macready in a La Pere with supercharged Liberty. When the airplane reached a height of 26,000–27,000 feet at 11:50 a. m., a long feathery white streamer was observed forming behind a rapidly moving dark speck. The cloud was of the cirrus variety, well defined at its edges and apparently 10 to 15 times the width of the plane. The sky behind the first portion was clear blue with no other clouds in the near neighborhood. The first streamer seemed perhaps 2 miles long. Then a gap of one-quarter mile. The second streamer formed with a background of light cirrus cloud and after 2 or 3 miles the plane seemed to go into the cirrus background, for the streamer formation ceased while an apparent path of blue continued beyond for a way in the cirrus cloud. The whole streamer may have been 3 miles long. After 20 minutes the streamer had drifted and spread until it merged indistinguishably with the other cirrus clouds visible. The weather conditions at the time were generally very clear, warm, with perhaps 0.1 of the sky in cirrus clouds.

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[1] *Cf.* Varney, B. M.: The Argonne battle cloud. MO. WEATHER REV., June, 1921, 49: 348–349, also Wegener, A.: Frost-supersaturation (Frostübersättigung) and cirrus. *Ibid.* p. 349.