from the primal drops. These combined drops would therefore have a bigger chance of meeting one another than of meeting a primal drop. There would be a tendency towards a greater production of drops consisting of 4 primal drops than of drops consisting of 3 primal drops, and the process would be extended to the next drops of 8 primal drops and so on. As regards the primal drops, Dr. Kohler found two sets with diameters in the neighbourhood of 7μ and 8μ respectively, but the 7μ group was far and away the most frequent.

From an analysis of the rime deposited at the Halde Observatory from fog or cloud, Dr. Kohler found that the average amount of chlorine present was practically the same as the average amount found in rain water collected at Cirencester by Kinch. The actual amount present in samples of rime collected on different occasions varied very greatly. The average was about 3·5 milligrams per kilogram of rime, and the quantities on different occasions varied from 0·07 milligram to 56 milligrams. From an analysis of the results it was found that the same law existed among the chlorine amounts as among the sizes of the water drops; that is, amounts $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$, or 2, 4, 6, 8 times the average amount, 3·5 milligrams per kilogram, were found, but there were practically no intermediate amounts. Dr. Kohler considers that the nuclei of condensation are nuclei of salt carried into the atmosphere from the sea, and that these salt nuclei also follow the law of 2. The weight of the primal salt particle is computed to be $1{\cdot}8879 \times 10^{-22}$ grams. Drops of water in the atmosphere are therefore really salt solutions of greater or less strength. The strength depends upon the water vapour pressure and the temperature of the air. If the vapour pressure falls or the temperature rises, water is evaporated from the drops until the solution becomes strong enough to be in equilibrium with its surroundings and vice versa. As the growth or decrease of drops by such processes is continuous, there ought to be drops of all sizes, which is contrary to the law of distribution of sizes of drops found in the earlier part of the paper.

The paper is full of interest. The observations collected in it are invaluable, and the information about the range of sizes of drops from about 4μ to 20μ is most important. Dr. Kohler has endeavoured to apply in statistical sense the criterion which he himself enunciates, that if meteorology is to exist as an exact science, it is necessary to be critical of hypotheses even when they appear to be more or less well founded; but nevertheless one feels that independent testimony—dare one hope, from Scotland—is required of the law of 2, both in the size of drops and in the amount of chlorine present, before it can be included among the established facts of meteorology.

E. GOLD.

The Lunar Eclipses of 1927.

THERE are to be two lunar eclipses in 1927, about the middle and end of the year. Some of their relations to the earth's atmosphere are as follows:

JUNE 15, 1927.—The first eclipse is at its height (mid-eclipse) at 8^{h} $24{\cdot}2^{m}$, Universal Time, but the moon barely gets within the umbra on the north side of the earth's shadow. The radius of the geometrical umbra is 40′·8; the outer limb of the moon at mid-eclipse is distant 40′·7 from mid-shadow. At this moment the edge of the shadow nearest to the moon's limb is cast by the earth's surface and atmosphere at about W. 97°·3, N. 63°·75, in the neighbourhood of Baker Lake, which drains into Chesterfield Inlet, on the west shore of Hudson Bay. It would be interesting to know the weather, cloud, and sky conditions in this region at that moment. But the atlas indicates scarcely any population there.

In the eclipse of Nov. 4, 1892, the outer limb of the moon was 43′·0 from mid-shadow, the radius of the geometrical umbra was 45′·4, so that the immersion was deeper than in the coming case. But Gale, at Sydney, N.S.W., reported the limb so bright as to give the impression that the eclipse was not total; Russell, also at Sydney, said definitely that it was not total; Doberck, at Hong Kong, remarked on the brilliancy of the immersed limb. We may expect this time an opportunity to observe the density of the earth's shadow very near to the edge, but due to weather and climatic conditions very different from those which ruled in 1892. Then the grazing-point was over water, between Iceland and Norway, north of the Shetland Islands.

The last rays on the moon's limb at first contact with the umbra graze the earth's surface or atmosphere about W. 174°·7, N. 32°·7. This is at sunset on the open Pacific, north of Pearl and Hermes. The rays at last contact in like manner graze about W. 69°·1, N. 17°·6, a point at sunrise in the Caribbean Sea, considerably south of Catalina Island, south of Santo Domingo. Observations of weather, cloud, and sky at these points are desired, for comparison with direct observations of the shadow edge at these moments.

The two internal contacts at this eclipse come so close together that they are scarcely separable from mid-eclipse. At mid-eclipse the sunrise-sunset line, centred about the sub-solar point at E. 54°·0, N. 23°·3, passes by Cape San Roque, Nova Scotia, Great Slave Lake, New Guinea, Gulf of Carpentaria, and Enderby Land. Of all this great circle, however, only a fraction, perhaps 35°, on the two sides of the Baker Lake region, is effective in illuminating the eclipsed moon.

DEC. 8.—The second lunar eclipse, on Dec. 8, with middle at 17^{h} $34{\cdot}6^{m}$, Universal Time, is of much deeper immersion, 11′ or more at most, in the southern half of the shadow. The inner (north) limb of the moon just covers the middle of the shadow. The grazing light at the contacts comes from regions about the points indicated:

First Contact; E. 41°·6, S. 25°·7, in the Mozambique Channel, between Tullear and Europa Island, at sunset.

Second Contact; E. 51°·0, S. 51°·3, in the Sea Tang, south of the Crozets, at sunset.

Third Contact; E. 164°·4, S. 22°·0, south-west of New Caledonia, at sunrise.

Fourth Contact; E. 157°·0, S. 3°·5, north-east of Bougainville Island, at sunrise.

Observations of weather, cloud, and sky at these points are desired, for comparison with observations of the shadow edge at the contacts.

At mid-eclipse the sunrise-sunset line is centred about the subsolar point at W. 85° 75, S. 22°·7, and passes over or near Kaiser Wilhelm Land, Fiji Islands, Sitka, Baffin Land, Cape Farewell, Timbuctoo, Mossamedes, Cape Town. The whole southern half of this great circle is effective in illuminating the eclipsed moon at this moment.

The mere naming of the grazing-points above indicates that observations within a few degrees of them are unlikely to be obtained. Still, it is desired that persons near any such, at sea or ashore, report their observations of weather, cloud, and sky at the sunrise or sunset moments indicated, either to a scientific journal or to the address, Lunar Eclipses, Harvard College Observatory, Cambridge, Mass., U.S.A.