1888. From this summary it appears that the phenomena of spots and faculæ still continue to decrease, while the protuberances have increased. This confirms the remark already made that there is no close relation between these two orders of phenomena.—Determination of the heats of combustion of the isomerous acids corresponding to the formulas $C_4H_4O_4$ and $C_5H_6O_4$, by M. W. Louguinine. The constituent formulas of the fumaric and pyromalic, as well as of the mesaconic, citraconic, and itaconic acids have been the subject of frequent discussions amongst chemists. In order to throw some light on these obscure questions, the author here determines the heats of combustion of the acids in question. He concludes generally that fumaric differs greatly from pyromalic acid, the former being the lower homologue of one of the three acids with formula $C_5H_6O_4$. The formulas corresponding to these three acids are evidently closely related, the difference here being of quite another order from that which exists between the formulas corresponding to the fumaric and pyromalic acids.—On the slow combustion of certain organic substances, by M. Th. Schlœsing. The author's experiments with tobacco seem to show that the combustion arising in heaps of foliage, hay, and the like is in the first instance due to the action of micro-organisms, but with the increase of temperature it gradually assumes a purely chemical character. The influence of living organisms appears to cease between 40° and 50° C., after which the chemical action rapidly increases.

BERLIN.

Meteorological Society, April 10.—Dr. Vettin, President, in the chair.—Dr. Zenker communicated the second part of his research on the distribution of heat over the earth's surface. In the first part, of which he had spoken at the last meeting of the Society, he had shown that the distribution of heat depends not only upon the radiation from the sun and absorption by the atmosphere, but additionally upon the nature of the earth's surface, whether it is land or water. In previous researches on the distribution of heat, the mean values were determined from and based upon empirical observations; Dr. Zenker, on the other hand, has calculated the distribution of heat over the surface of the sea with the help of Hann's isothermal charts, starting with the temperature of a point on its surface which was quite uninfluenced by the neighbouring continents, and was consequently equally unaffected by any warm or cold currents. Using this factor, and the formulæ deduced in the theoretical part of his paper, he has calculated the distribution of heat from the pole to the equator for each successive parallel, and compared it with the distribution of solar radiation. As a basis for the distribution of heat over the surface of the land, it was first necessary to determine the conditions under which the influence of the neighbouring sea is either nothing or minimal in amount. The starting-point for this was the fact that the temperatures on continents exhibit very great variations, and from these was determined for each area, as a percentage, the relative influences of the sea and continent upon its temperature. The region where the influence of the sea was proved to be nil (or where, as the speaker said, the "continentality" was 100 per cent.) was in the neighbourhood of the east coast of Asia, whereas all other points were found to be affected by the neighbouring sea to a greater extent; the observed temperature on the land was therefore only partly dependent upon the position of the place on any given parallel, other influences making themselves more or less felt. Hence it was possible to calculate for each parallel the real and "accessory" temperature. The amount of heat radiated down from the sun was compared with these temperatures, and was found to be about the same for each 10° C. of difference in temperature; from 0°–10° C., however, quite considerable differences of radiation were necessary. In conclusion, Dr. Zenker compared the temperatures which really exist on the earth's surface with those which he had deduced, and found that in reality the climate on the sea of the southern hemisphere is colder than it should be according to calculation—a result which must be attributed to the oceanic currents of cold water. The continental climate in the northern hemisphere is slightly too warm, in consequence of the disturbance introduced by the Gulf Stream.—Lieutenant Moedebeck gave an account of a balloon journey which he made on March 31. The marked phenomenon during the same was the influence of rivers; thus, after the balloon had risen to a height of 300–500 metres, and was passing away over Berlin, it sank so rapidly over the Spree that when it was about 50 metres above the earth a large quantity of ballast had to be thrown out. At an elevation of 1200 metres he met with a long narrow rain-cloud, in passing through which the dry-bulb thermometer registered 1°·5 C., the wet-bulb 1° C.; at an elevation of 1300–1400 metres, both thermometers recorded the same temperature of 2°·5 C. At this height, and in circumscribed areas, a few very small semi-soft hailstones were observed. Shortly after this the balloon began to sink, and while still above the cloud, but at a lower level, somewhat larger but similar hailstones were observed for the second time. As soon as the balloon had passed through the cloud, rain fell for a short time, as the result of which the balloon was so weighted that it descended rapidly to the earth. The atmosphere above the cloud was not clear but rather misty.

BOOKS, PAMPHLETS, and SERIALS RECEIVED FOR REVIEW.

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