the taxonomic importance of the petiole, by M. Louis Petit.—On the reproductive organs of vegetable hybrids, by M. Léon Guignard.—On the relations of geodesy and geology: a reply to the observations of M. Faye, by M. A. de Lapparent.

BERLIN

Meteorological Society, October 5.—Dr. Brix, in the name of the Telegraph Administration, handed over to the Society a paper containing the results of observations respecting earth-currents instituted through the medium of German telegraph lines, and giving a brief history of these investigations.—Dr. Assmann spoke of the thunderstorms of the summer of 1886.

Physical Society, October 22.—Prof. von Helmholtz in the chair.—Prof. Börnstein communicated the results of his investigations into the thunderstorms of July 1884. The days from July 13 to 17 were very prolific in thunderstorms, and respecting them the speaker had collected and elaborated observations from more than 200 stations in Germany. For twenty-four separate thunderstorms, drawings were made of the "isobronts," isobars, and isothermals, from which it appeared that a fall in the barometer always preceded the outburst of the storm; that with the occurrence of the sinking of the barometer the atmospheric pressure rose very steeply and then relapsed gradually to its former level; and that the temperature, which was very high before the storm, declined rapidly with the outbreak of the storm. Local observations had formerly led to the same result. The "isobronts," or the lines uniting the places where the first peal of thunder was simultaneously heard, had in general a north-south direction. The "isobronts" made the passage from west to east with an average swiftness of from 38 to 39 kilometres an hour. The "isobronts" were attracted by the mountains, so that the part in whose west-east direction a mountain was situated approached it sooner, and, after the passage of the "isobront," delayed there longer than did the remaining part. Rivers retarded the progress of thunderstorms, and small thunderstorms often terminated at large rivers without crossing them. This relation of thunderstorms to mountains and rivers might be explained on the assumption that the storms were caused by ascending air-currents. When such an ascending air-current approached a mountain, then the mountain hindered the horizontal air from flowing in at the anterior side of the ascending current. The air flowing in at the posterior side, on the other hand, thereby obtained the preponderance, and urged the phenomenon with all the greater force to the mountain. The reverse occurred after the thunderstorm had surmounted the mountain. The horizontal currents in front then obtained the preponderance, and delayed the progress of the storm. The influence of the rivers found its explanation in the fact that the air above the water was considerably cooler than the air above the land, whereby a descending air-current was continuously maintained, operating in opposition to the ascending current of the thunderstorm, to the possible degree even of annulling it. The speaker had been able artificially to produce an imitation of all these processes by causing, in accordance with the directions of Dr. Vettin, visible currents to ascend in a glass box filled with tobacco smoke, by means of local depressions of temperature, by setting these currents in constant motion, and making them strike against obstructions (corresponding with the mountains), as also on descending currents which were likewise artificially created. In the discussion which followed the above address, Dr. Vettin laid stress on the fact that precisely at the moment when the barometer mounted steeply from its lowest position, the thunder followed the lightning most rapidly, and discussed how, in accordance with his conception of the nature of thunderstorms, by the curving round of the ascending air-current, a whirling movement round a horizontal axis came into shape, whereby, as determined by its situation and its extent, were produced thunderstorms, sleet, and hail.—Prof. von Helmholtz described the formation of a thunderstorm observed by him in Rigi-Kaltbad. From a free point of prospect, allowing a survey of the plain as far as the Jura, he observed how the lower warm and moist layer of air was distinguished by a sharp horizontal boundary of somewhat long strips of cloud from the upper dry and cooler air. The cloud-masses resembling the stripe-shaped cirri diffused themselves and formed a coherent level boundary-layer between the two air-masses. He next noticed, at different spots, balls of cloud arise above the boundary-layer, evidently as the effects of ascending air-currents. The different cloud-heaps then rose higher and grew into larger cloud-masses within which different electric sparks leapt from one spot to another. It was only subsequently that he saw the lightning fly downward to the earth. At last a heavy rain rendered the lower air-mass, bounded by the horizontal cloud-basis occupying a position nearly at a level with the height of the stand-point, which had hitherto been clear, opaque. The phenomenon had developed itself under weather in which the wind was at rest, and could be followed very precisely into its details.—Prof. Schwalbe reported on an investigation of Herr Meissner, who, in the Strasburg Laboratory, had determined the warmth effect on the wetting of powdery bodies. In the way of powder were used amorphous silicic acid, glass, emery, carbon; as fluids, distilled water, benzol, and amyl alcohol. In all cases an increase of temperature was observed.

BOOKS AND PAMPHLETS RECEIVED

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