

absorbable wave-lengths become more rare the greater the atmospheric layer the rays have already traversed. The author calculates from his experiments the proportion of carbonic acid in the atmosphere, finding it 3.27 in 10,000 parts by volume; a number agreeing so well with results of chemical analysis as to indicate that this is a good way of determining the carbonic acid in the atmosphere and its variations, applicable, too, at heights where direct measurements are impossible.

HERR WINKELMANN proves by experiment (*Wied. Ann.* No. 11) that the heat-conduction of ethylene decreases somewhat with increased pressure. The pressure was varied from 10 to 740 mm. (Comparative experiments with air showed no influence of pressure.) The author explains the phenomenon by the divergence of ethylene from Boyle's law. The action of cohesion-forces between the molecules is indicated by that fact; and this will cause, at each collision, a temporary retardation of the straight movements, which effect will occur oftener the greater the number of collisions (*i.e.* the greater the density). Hence this retardation will increasingly affect the velocity with which two contiguous layers of different temperature exchange the energy of their motions.

A REMARKABLE fall of rain in Austria and neighbouring parts on August 11-15 this year, has been closely investigated by Dr. Hann (*Wien. Akad. Anz.*), on the basis of data from 260 stations in Austria-Hungary, Bavaria, Switzerland, and Saxony. This fall caused the Danube at Vienna to reach (on the 18th) its highest summer level in this century. The rain began in Siebenburgen and south-east Hungary on the 11th, and in general went from east to west. It was most extensive on the 12th, and the heaviest fall was in Salzkammergut and neighbourhood. The rain-area is found to lie on the west and north-west side of the area of lowest air-pressure, and to stretch westwards far over the border of the minimum region. Near the centre of lowest pressure the precipitation was much less than in several parts distant from it. The non-existence of a minimum-producing power of rainfall (contrary to common views) and the incapability of so great rainfall as that in the present case attracting a minimum and influencing its propagation, are noteworthy. The general conclusion arrived at is that no relation is demonstrable between barometric variation and rainfall; the fall of the barometer does not primarily depend on the rainfall, and is not perceptibly influenced by it. Dr. Hann finds this confirmed by an examination of several other heavy rainfalls in their relation to distribution of air-pressure.

THE salt and the ice in cryohydrates have been regarded by Prof. Guthrie as in chemical combination. In 1877 Herr Pfaundler expressed the view that cryohydrates were merely mixtures of salt and ice. This view is also maintained by Herr Offer, who in a recent paper to the Vienna Academy raises various objections to the existence of cryohydrates as chemical compounds. The numbers expressing the quantities in which the water unites with the salts in various cryohydrates, indicate no stoichiometric law, and tell much rather in favour of chemical mixtures. No cryohydrate forms a clear and pure crystal, but always an opaque confused crystalline mass. The phenomena which occur when cryohydrates are brought into alcohol and into water are considered to be against Prof. Guthrie's view. The heat-absorption of cryohydrates in dissolving, as compared with that of the salt and ice separately, only presents differences which lie within the errors of observation. Further, Herr Offer compared the specific gravity of several cryohydrates with those of their constituents, and found pretty close agreement.

FROM recent magnetic researches Herr Auerbach (*Wied. Ann.* No. 11) finds the temporary magnetism of cylindrical bodies, *ceteris paribus*, proportional to the mass; greater the greater the length; the less the thickness; the greater the density; dependent only on form, not on size; in the case of nickel, according to density and force, a quarter to half as much as in iron. It increases with magnetising force, first proportionally, then (except with very small density) more quickly, and at last more slowly. The quick increase is greater the denser the body. The turning point is, for the same density, at the same place, but with stronger forces the greater the density; for magnetic saturation of powders extremely strong forces are necessary. Herr Auerbach theorises on these results.

ANOTHER paper on magnetism in these *Annalen* is by Herr Baur, and deals with the "function of magnetisation" for very small magnetising forces; the influence of temperature on it;

the magnetisability of iron at very high temperatures; Gore's phenomenon; and the function for varieties of iron. Among other results, the smaller the magnetising force the greater is the influence of temperature on the function in question. Up to a certain force the function increases with increase in temperature, but beyond that it decreases. With weak forces the temporary magnetic moment rises quickly (with rise of temperature) to a maximum at red glow, then sinks quickly to *nil*; with strong forces it gradually sinks, with rise of temperature, to a very low value at red glow. With increased magnetic force Gore's phenomenon becomes more intense and prolonged, and it occurs at a higher glow. In ordinary iron the function of magnetisation reaches its maximum very quickly, in iron filings later, and in electrolytic iron very late.

GEOGRAPHICAL NOTES

THE glacier of the Byeloukher Mountain, the chief summit of the Siberian or Great Altay, which has not been visited by men of science during the last fifty years, was recently explored by an expedition engaged in the study of the life of the West Siberian natives. After having crossed the 9000 feet high Alps of the Tchouya, the explorers descended into the pretty and wealthy broad valley of the Tchouya, whence, following the Arkhyt River, they soon reached the foot of the mighty Berel glacier. The glacier, which forms in its lower parts a *mer de glace* two miles long and 2800 feet wide, was accurately explored and surveyed during a week by the expedition from its lower end to a great ice-fall, where the travellers were compelled to stop their work before a moving wall of ice, while mighty masses of snow fell, one after the other, on the glacier from the neighbouring mountains. After having surveyed the glacier and made several drawings of the severe scenery which it affords, the travellers returned to the valley of Ouimon, and thence to the civilised towns.

THE astronomical determinations of positions which were made by M. Pyetsoff during his journey from Khobdo through Mongolia to Kalgan, and from Ourga to Kosh-agatch, are published by Col. Scharnhorst in the last number of the *Izvestia* of the Russian Geographical Society. They are most welcome, as they come from a country where exact determinations are very scanty. — The same fascicule of the *Izvestia* contains M. Larionoff's catalogue of seventy-five determinations of heights in the northern and eastern parts of the province of Kouldja and in the mountains which border it north and east; and M. Severtsoff's map of his route on the Pamir Rang-koul, south-east of the Lake Kara-koul.

THE Russian travellers who have been engaged in the exploration of Central Asia are now returning to St. Petersburg. Col. Prshevsky is expected every day, and the Russian Geographical Society, at its last meeting (December 15), elected the indefatigable traveller an Honorary Member. M. Potanin is already at St. Petersburg, and will soon give a lecture on his journey to Western Mongolia, as also M. Pyetsoff, who travelled with merchants from Biysk to Khou-khou-khoto, and who during his journey collected much material for the correction of the map of Mongolia. M. Mushketoff, who has explored the glacier of Zarafshan (*NATURE*, vol. xxiii. p. 44), gave a lecture at the last meeting of the Russian Geographical Society on his excursion. This traveller, contrary to M. Severtsoff's experience, did not find in the Thian-Shan any traces of the glacial period.

THE *Kouban News* announces the appearance, in the Sea of Azoff, of a new little island, some 150 feet in diameter, and 10 feet above the level of the water. Its appearance was accompanied with a kind of marine eruption. It is 150 brasses distant from the shore, where a crevice has appeared.

THE organisation of the Polar meteorological station on the Lena is being actively carried out by Prof. Lentz. The director of the station will be M. Yurgens.

PROF. NORDENSKJÖLD is again thinking of fresh enterprises. At present a ship is being built at the Lena estuary, in which he intends to start on a new Arctic expedition in the summer of 1882.

PRINCE BORGHESE, the Italian African traveller, has arrived near Tripolis from Wadai. This is the first time that a traveller from Darfur has reached the Mediterranean by way of Wadai and Bornu.

THE Leipzig publishing firm of Ferd. Hirt and Son announce that Major Serpa Pinto's great African work of travel will be published in January, 1881.