

Harnack (4730), and nearly nine times as high as that given in Lieberkühn's formula (1612). The molecule contains nine atoms of sulphur, of which two are easily separated. Submitted to a temperature of 40°, the solution of albumen changes its properties, and its temperature of freezing is lowered.—On the measurement of density of sea-water, by Vice-Admiral Makaroff. This elaborate work gives the results of measurements made on board the corvette *Vityaz*. The value of various instruments used during the cruise is discussed in detail, and the following formulæ are given as expressing the results of the observations between the temperatures of 0° and 30°. For distilled water, the density is—

$$S_0 = 0.9998795 \\ = S_0(1 - 0.000061398t + 0.0000080021t^2 - 0.0000004586t^3),$$

maximum density at 3°.972. For sea-water, the density of which at 15° compared with that of distilled water at 4° is = 1.019, the formula is—

$$S_0 = 1.0207769 \\ = S_0(1 + 0.000022268t + 0.0000069801t^2 - 0.0000004761t^3),$$

maximum density at -1°.570. For sea-water, the density of which, also at 15°, is = 1.026, the formula is—

$$S_0 = 1.0280936 \\ = S_0(1 + 0.000050453t + 0.0000062833t^2 - 0.0000003852t^3),$$

maximum density at -3°.876. The last two formulæ gave excellent results for temperatures down to -5°. A comparison between the figures obtained by the *Vityaz* and those obtained by the *Challenger* proved very satisfactory. Finally, the author gives six most valuable tables of corrections. Tables I. and II. contain the corrections to be applied to $S_{\frac{15}{4}}$ for obtaining

$S_{\frac{t}{4}}$, and *vice versa*, from -5° to +36°, for both distilled and sea-water. Detailed interpolation tables are also given. Table III. contains the corrections due to the coefficient of dilatation of glass of the areometer being not equal to the normal coefficient 0.000028. The three other tables are for transferring densities $S_{\frac{17.5}{5}}$ into densities $S_{\frac{15}{4}}$.

Bulletin de la Société des Naturalistes de Moscou, 1890, No. 3.—On the *Protospirata centrodon*, Trd., by H. Trautschold (in German). The two Ichthyodornolithes from the Carboniferous of North America, described in J. S. Newberry's capital work upon the "Palæozoic Fishes of North America," Table xxxix., are very much like the Moscow fossils described by the author in the above periodical (1884 and 1886) under the names of *Eductus protospirata*, and later on, of *Protospirata centrodon*.—Geo-botanical notes about the flora of European Russia, by D. I. Litvinoff (in Russian). The common Scotch fir (*Pinus sylvestris*) grows, as known, chiefly on a sandy soil. However, it also appears in the hilly tracts of Europe and Asia, and there it grows upon a rocky soil, chiefly limestone. In the lowlands of Germany and Russia, the appearance of fir upon a rocky ground is extremely rare; but there are some exceptions to this rule—namely, on the chalk hills of the Donets, the Volga mountains, the Middle Russian plateau, and the Silurian limestones of the Baltic provinces; in all those places the fir appears in company with a number of sub-Alpine and Alpine plants which are not met with elsewhere in the Russian plains, and with a number of endemic plants very rare in Russia as a whole. The author considers these rocky islands of fir-growths as survivals from the pre-Glacial period. The paper is full of most interesting botanical data and valuable remarks upon the connection of the glaciation of Russia with its present flora.—The influence of friction upon the rotatory motion of celestial bodies, by Th. Sloudsky (in French). The auxiliary theorems, upon which the principal theorem relative to the effects of friction is based, are demonstrated, the sun being taken as an illustration.—On the origin of endosperm in the embryo-pouch of certain Gymnosperms, by Miss C. Sokolowa (in French, with three plates). Strassburger's researches have proved the similarity between the formation of endosperm and of multicellular albumen, and the partition of cells, especially as regards the Angiosperms. The same researches are pursued by Miss Sokolowa as regards the Gymnosperms, attention being paid to the part played by the nucleus in the formation of partition walls.—

Contribution to the morphology and classification of the Chlamydomonads, by Prof. Goroschankin (in German, with two plates).—Preliminary note upon inter-glacial layers about Moscow, by N. Krichtafovitch.

No. 4.—Traces of an inter-glacial period in Central Russia, by N. Krichtafovitch (in German; already analyzed in NATURE).—Remarks upon the function of the nucleus in cells, by J. Gerassimoff (in German), being observations upon cells without a nucleus in *Spirogyra* and *Strogonium*.—On the molecular weight of the albumen of the egg, by N. Alexandroff (Russian).—Why the relative masses of the brain decrease in proportion to the increase of the weight of the body, in the same type of Vertebrata, by Fernand Lataste (in French).—*Tarentula (Lycosa) opiphex*, new species, by W. A. Wagner (French, with a plate). This trap-spider inhabits Middle Russia, and is especially numerous in the fields of Orel. Its thin trap, made of one sheet of web with some mould, is even more ingenious, for its shape, than that of the *Clemiza*.

THE *Nuovo Giornale Botanico Italiano* for July contains two articles of interest to lichenologists: an account of the lichens of Brisbane gathered by Mr. F. M. Bailey, by Herr J. Mueller; and contributions to the lichen-flora of Tuscany, by Signor E. Baroni. Signor E. Tanfani has an important paper on the morphology and histology of the fruit of the Apiaceæ (Umbelliferæ), and Prof. C. Massalongo an account of the galls made by Acari on 45 species of trees, shrubs, and herbaceous plants, as well as of the insects which produce them.

SOCIETIES AND ACADEMIES.

LONDON.

Entomological Society, August 5.—Mr. Frederick Du Cane Godman, F.R.S., President, in the chair.—The President announced the death of Mr. Ferdinand Grut, the Hon. Librarian of the Society, and commented on the valuable services which the deceased gentleman had rendered the Society for many years past.—Dr. D. Sharp, F.R.S., exhibited *Jafyx solifugus*, from the Eastern Pyrenees, and stated that in his opinion it was a connecting link between the *Thysanura* and *Dermaptera*. He also exhibited pupæ of *Dytiscus marginalis*; one of these was perfectly developed, with the exception that it retained the larval head: this was owing to the larva having received a slight injury to the head. Dr. Sharp also exhibited specimens of *Ophonus puncticollis* and allied species, and said that Thomson's characters of the three Swedish species, *O. puncticollis*, *O. brevicollis*, and *O. rectangulus*, applied well to our British examples, and separated them in a satisfactory manner. Thomson's nomenclature, however, would, he thought, prove untenable, as the distinguished Swede described our common *puncticollis* as a new species under the name of *rectangulus*.—Mr. F. W. Frohawk exhibited a bleached specimen of *Epinephelajanira*, having the right fore-wing of a creamy white, blending into pale smoky brown at the base; also a long and varied series of *E. hyperanthus*, from the New Forest and Dorking. The specimens from the former locality were considerably darker and more strongly marked than those from the chalk. Amongst the specimens was a variety of the female with large lanceolate markings on the under side, taken in the New Forest, and a female from Dorking with large, clearly defined white-pupilled spots on the upper side. Mr. Frohawk further exhibited drawings of varieties of the pupæ of *E. hyperanthus*, and also a large specimen of a variety of the female of *Euchloë cardamines*, bred from ova obtained in South Cork, with the hind wings of an ochreous-yellow colour. Coloured drawings illustrating the life-history of the specimen in all its stages were also exhibited.—M. Sergé Alphéraky communicated a paper entitled "On some cases of Dimorphism and Polymorphism among Palæartic Lepidoptera."

EDINBURGH.

Royal Society, July 15.—Sir Douglas Maclagan, President, in the chair.—The Prince of Monaco gave an account of the new yacht which he has had fitted out for the study of the sea. He also described the investigations which he has conducted since 1886, first in the Bay of Gascony, and then around the Azores and off Newfoundland. The latter investigations extended over three years, and had as their object the investigation of the direction and speed of the surface currents in the North

Atlantic. Special floats were thrown into the sea in three different places, and their progress was traced from place to place. As a preliminary trial 160 floats were thrown into the sea between the Azores and the Canary Islands. Some of these arrived at the Bermudas eighteen months later. In all 1700 floats were despatched, and the result was that the great ocean currents of the North Atlantic were now fairly well known. The Prince's new yacht is provided with an electric search-light of 10,000 candle-power for illuminating the surface of the sea when investigations are being carried on at night. Soundings can be made to a depth of 8000 metres without much difficulty.—M. le Baron Jules de Guerne, President of the Zoological Society of France, read a paper on the zoological results of the voyages of the *Hivonelle* (the Prince of Monaco's former yacht). He described the work of exploration among the Oceanic Islands, and alluded specially to the new species which had been found.—Mr. J. Y. Buchanan described a cartographic device which is of great use in the treatment of some geographical and telluric problems.—Mr. W. E. Hoyle described a deep-sea tow-net, which, by means of an electrical device, can be opened and closed at definite (arbitrary) instants.—Dr. H. R. Mill exhibited an improved form of his self-locking water-bottle.

July 20.—The Hon. Lord McLaren in the chair.—Some additional observations, by Prof. McIntosh, on the development and life-histories of the marine food-fishes and the distribution of their ova, were communicated. By means of various kinds of tow-nets, an endeavour has been made to ascertain the distribution of the eggs of the food-fishes on our shores. They are found at all depths, at the surface, and at the bottom. The floating eggs of the pilchard and mackerel are chiefly found on the south and south-west shores. On the east coast of Scotland the ova of the cod, whiting, and haddock are abundant. On the west coast, those of the sole, &c., abound.—The Astronomer-Royal for Scotland read a paper on the bright streaks on the moon. When the moon is half full its brilliancy is not nearly one-half so great as its brilliancy when it is quite full. Now at full moon the surface is observed to be covered by bright streaks which originate at the craters. The author believes that the great brightness of the full moon is due to these streaks. He considers them to be convex or concave, and so to be largely invisible under cross light, while they are brilliantly illuminated when the sun shines full upon them. The paper was illustrated by a model in plaster of Paris, with glass beads attached to its surface.—A paper, by Prof. C. G. Knott, on the effect of longitudinal magnetization on the interior volume of iron and nickel tubes, was communicated.—Dr. H. R. Mill read an obituary notice of Prof. C. I. Burton.

PARIS.

Academy of Sciences, August 3.—M. Duchartre in the chair.—Experimental researches on the probable rôle of gases at high temperatures and pressures, and in rapid movement, in various geological phenomena, by M. Daubrée. The experiments show how gases at high pressure, and contained in a closed reservoir, may, by a sort of latent action, violently push out rocks into conical or bell-shaped formations without any noise or escape of gas occurring to indicate their gaseous nature.—Heats of combustion and formation of nitrobenzenes, by MM. Berthelot and Matignon. The heats of combustion of ortho-, meta-, and para-dinitrobenzenes are found to be respectively 704.6, 698.1, and 696.5 calories; and the heats of formation 0.5, 6.8, and 8.4 calories. The heats of combustion of the two isomeric trinitrobenzenes examined are 665.9 and 680.6 calories; and the heats of formation +5.5 and -9.2 calories.—On the oldest European Dicotyledons observed in strata at Cercal, Portugal, by M. G. de Saporta.—On some improvements carried out in the manufacture of artificial Seltzer water: the siphon arrangement, by M. de Pietra Santa.—On a new and improved construction of the thermo-cautery of 1876, by M. Paquelin.—Periodic variations of the latitudes of solar prominences, by M. A. Riccò. The author's observations demonstrate that solar prominences, like spots, approach the equator up to the minimum period of activity, and afterwards begin again to appear more numerous in high latitudes.—On induction inclination needles, by M. Ernest Schéring. This is a brief description of a new magnetic inclination needle constructed by the author, and with which it is said to be possible to determine inclination with a probable error of 4".2.—On the expansion of phosphorus, and its change of volume at the melting-point, by M. A. Leduc. The

coefficient of expansion for solid phosphorus between 0° and 44°.1 is found to be 0.000372, whilst for liquid phosphorus between 26° and 50° the coefficient is 0.000560. The expansion is regular up to the melting-point, but an abrupt change of volume then occurs. The relation between the volume of phosphorus in the liquid and solid state is 1.0345.—Study of the chemical neutralization of acids and bases, by means of their electric conductivities, by M. Daniel Berthelot. From the investigation it appears that, when potash is acted on by hydrochloric acid, acetic acid, and phenic acid, compounds are formed having approximately equal electric conductivities. Ammonia, with the first two acids, gives similar stable salts, but with the last acid an unstable compound having a less electric conductivity is produced. Aniline forms with hydrochloric acid a stable compound having good electrical conductivity; and with acetic acid, an unstable body whose conductivity is said to be mediocre.—Action of phenylhydrazine on phenols, by M. Alphonse Seyewetz.—On the development of sponges (*Spongilla fluviatilis*), by M. Yves Delage.—On *Isaria densa*, Link, a parasite of the white worm, by M. Alfred Giard.—The parasite of the cockchafer, by M. Le Moutl.—Action of poisons on the germination of the seeds of the plants which furnish them, by M. Ch. Cornevin.—On the resistance of the rabic virus to the action of prolonged cold, by M. Jobert.—Chromoscopic analysis of white light, by M. A. Charpentier.

Erratum.—On line 36, p. 336, instead of 0.1050 and 4.9720, read 1.1050 and 0.9720.

BOOKS, PAMPHLETS, and SERIALS RECEIVED.

Elementary Science Lessons, Standard III.: W. Hewitt (Longmans).—Elementary Geometry of Conics, 7th edition: Dr. G. Taylor (Bell).—Instructions Météorologiques, 3me édition: A. Angot (Paris, Gauthier-Villars).—Bush Friends in Tasmania: L. A. Meredith (Macmillan).—Illustrations of the C.G.S. System of Units: J. D. Everett (Macmillan).—Elements of the Differential and Integral Calculus: A. Harnack; translation (Williams and Norgate).—Denmark: its Medical Organization, Hygiene, and Demography (Churchill).—Statistical Investigations concerning the Imbeciles in Denmark, 1888-1889 (Churchill).

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