pages as emanating from the most elevated regions, nearly half the number seems endemic, so far as hitherto can be judged, while not yet all the highlands of South-Eastern Asia are explored, and while we yet remain in uncertainty about the constancy of some of the characteristics on which the adopted new specific forms are systematically established. Of these restricted Papuan plants, two—namely, *Ischnea elachoglossa* and *Decatoca Spencerii* represent new genera, the one allied to the exclusively Italian Nananthea, the other to the Australian and chiefly Alpine Trochocarpa. Of the other endemic plants 17 are of Himalayan types—namely, *Hypericum Macgregorii, Sagina donatioides, Rubus Macgregorii, Anaphalis Mariæ, Myriactis bellidiformis, Vaccinium parvulifolium, V. amblyandrum, V. Helenæ, V. Macbainii, Gaultiera mundula, Rhododendron gracilentum, R. spondylophyllum, R. culminicolum, R. phæochiton, Gentiana Ettingshausenii, Trigonotis Haackei*, and *T. oblita*, though some of these show also a touch of the Sundaic vegetative element; and here at once may be alluded to the extensive display of Ericaceous (inclusive of Vaccinaceous) plants, which forms of vegetation are in Australia so very scantily developed, and then only in Alpine regions. Contrarily, however, we now perceive otherwise almost a preponderance of upland Australian or New Zealandian or sub-Antarctic types in the highlands vegetation of New Guinea, so far as already revealed; this is demonstrated by the endemic occurrence of *Ranunculus amerophyllus, Metrosideros Regelii, Rubus diclinis, Olearia Kernotii, Vittadinia Alinæ, V. macra, Veronica Lendenfeldii, Libocedrus Papuana, Phyllocladus hypophyllus, Schœnus curvulus*, and *Festuca oreobaloides*; furthermore this repetition of the features of the southern flora so far north is rendered still more expressive and significant by the occurrence of numerous plants absolutely identical with our southern species—namely, *Epilobium pedunculare, Galium australe, Lagenophora Billardièrii, Styphelia montana, Euphrasia Brownii, Myosotis australis, Sisyrinchium pulchellum, Astelia alpina, Carpha alpina, Carex fissilis, Uncinia riparia, U. Hookerii, Agrostis montana, Danthonia penicillata, Festuca pusilla, Lycopodium scariosum, Gleichenia dicarpa*, and *Dawsonia superba*—most of these being now shown for the first time to approach so near to the equator. Four Borneo plants, hitherto only known from lofty altitudes of Kini-Balu, have now been traced to the Papuan highlands also, viz. *Drimys piperita, Drapetes ericoides, Rhododendron Lowii, Phyllocladus hypophyllus*, three being of far southern type. Even a few of such British plants, not almost universally cosmopolitan, have now come like messengers from home before us from New Guinea as there also indigenous; thus, *Taraxacum officinale* and *Scirpus cæspitosus*, these being wanting even in the Malayan islands and in continental Australia, irrespective of the widely distributed *Aira cæspitosa, Festuca ovina, Lycopodium clavatum, L. Selago*, and perhaps *L. alpinum*, as well as *Hymenophyllum Tunbridgense* and *Aspidium aculeatum*. For the familiar northern genus Potentilla a truly indigenous position in the southern hemisphere has been gained now for phytogeography, as well as for Myriactis and Trigonotis, while Astelia, Uncinia, and Dawsonia are now seen to enter equinoctial regions in the eastern hemisphere. The *Styphelia montana*, the Astelia, and the Carpha mentioned indicate the commencement of a truly Alpine flora.

"On the Finisterre Range, the ascent of which was accomplished by Mr. Zoeller and his party during 1888 (this enterprise being inspired by myself in a lengthened interview with the leader), tree vegetation exists to the summit, therefore up to 11,000 feet, as indeed already telescopically ascertained by M. Mikluho Maclay. I can, however, furnish no data, which might assist our present purpose, on the nature of the vegetation there, as—against my expectation—no botanic specimens whatever, resulting from that courageous exploit, came to me as one who since many years has been engaged occasionally on connected elucidations of the Papuan flora. Sir William MacGregor found the arboreous vegetation to cease on the Owen Stanley's Ranges at 11,500 feet (despatch, July 1889, p. 10), and this cessation was not due to a change of geologic formation. The limits of tree vegetation may, however, on some other Papuan culminations under altered physical conditions be somewhat higher so near to the equator, in comparison to zones of vegetation in the Himalayas at and near the verge of the tropics.

"As regards prospective utilitarian gain from the world of plants likely to emanate from this expedition, we may look forward to the acquisition of the 'cypress' (*Libocedrus Papuana*), which constitutes the principal forests on the summit of Mount Douglas and Winter's Height, for arboreta even of countries of the cool temperate zone, and with this cypress-like tree could doubtless be associated in parks far outside of the tropics also the tall 'bamboo' (see Sir William MacGregor's despatch, p. 8), with which the dry region above the nebular zone begins at (about 8500 feet). The several hardy and gaudy rhododendrons could aptly be consociated by dissemination with the many Sikkin species, now so frequent as garden favourites. The dwarf raspberry would give us an additional table-fruit. How far the Korthalsia palm would bear actual frigour, remains to be ascertained. The species of Papuan highland grasses are rather gregarious than numerous.

"Why so many plants from cold southern latitudes suddenly reappear on the Papuan and perhaps also on the Bornean highlands in evidently coæval forms of common origin; why the highest regions, and these almost only, should, like in New Zealand, reiterate plant-life, otherwise typical of Tasmania, of continental Australia, of islands in the Southern Ocean, and also of Fuegia and Patagonia; whether this indicates a continuity of portions of the Papuan Island with a once vastly extending southern land, now mostly submerged; what clues can be obtained for all this from the study of glacial drifts occurring during former enormous telluric changes, such as geologic science endeavours to explain; what part possibly could have been taken by any migratory birds in effecting so wide a dispersion of some of these plants even into so exceptional isolations; all this and other momentous considerations involved in these questions must be reserved for future discussions and generalizations in a special essay, perhaps under the advantage of access to ampler working material, and at not too distant a day."

SCIENTIFIC SERIALS.

THE *American Meteorological Journal* for July contains an article by Prof. H. A. Newton on the late Prof. E. Loomis, of Yale College, U.S. (see NATURE, vol. xl. p. 401). In early life he paid much attention to terrestrial magnetism, and published the first magnetic charts of the United States; but his most important contributions were to meteorology. In a discussion of the storms of 1842, he adopted the use of synchronous charts very much like those now generally employed. The later years of his life were spent in discussing the materials collected by the Signal Service, and he published twenty-three memoirs upon them, entitled "Contributions to Meteorology." A large portion of his estate was bequeathed to the endowment of an astronomical observatory.—Prof. H. A. Hazen has an article setting forth the observations most needed in the study of tornadoes. He points out that, after fifty years' observations, our knowledge of this subject is very unsatisfactory.—Lieut. Finley gives tornado statistics for the States of Florida and South Carolina. The observations for the latter extend over 128 years. The month of greatest frequency in Florida is September, and in South Carolina, March.—M. H. Faye continues his articles on trombes and tornadoes, dealing especially with their action upon forests, and the carrying of heavy *débris* to great distances.—Prof. W. A. Rogers continues his article concerning thermometers, dealing principally with the pulsatory movements of a mercurial column found to exist in nearly all the thermometers investigated.—The last article is devoted to American opinions on the relation of the influenza epidemic to meteorological conditions, being abstracts of papers read at the meeting of the American Medical Association in May last.

SOCIETIES AND ACADEMIES.

LONDON.

Entomological Society, August 6.—Captain H. J. Elwes, Vice-President, in the chair.—Prof. Meldola, F.R.S., exhibited a male specimen of *Polyommatus dorilis*, Hufn., a common European and Asiatic species, which had been taken at Lee, near Ilfracombe, in August 1887, by Mr. Latter. At the time of its capture Mr. Latter supposed the specimen to be a hybrid between *Polyommatus phlœas* and one of the "Blues," and had only recently identified it as belonging

to a well-known species. Mr. Stainton, F.R.S., Mr. Jenner-Weir, and Colonel Swinhoe made some remarks on the specimen, and commented on the additions to the list of butterflies captured in the United Kingdom which had been made of late years.—Mr. W. F. H. Blandford exhibited, and made remarks on, five specimens of *Athous rhombeus*, Ol., recently collected by himself in the New Forest.—The Rev. Dr. Walker exhibited a large collection of Coleoptera which he had recently made in Iceland. The following genera, amongst others, were represented, viz. *Patrobus*, *Nebria*, *Byrrhus*, *Aphodius*, *Philonthus*, *Barynotus*, *Chrysomela*, *Agabus*, *Creophilus*, and *Carabus*. Mr. Champion, Dr. Sharp, F.R.S., and the Chairman made some remarks on the collection.—Captain Elwes exhbited three species of the genus *Atossa*, Moore, three of the genus *Elcysma*, Butl., and three of the genus *Campylotes*, West.,—all from the Himalayas and North-Eastern Asia. The object of the exhibition was to illustrate the remarkable differences of venation in these closely-allied forms of the same family. Colonel Swinhoe, Mr. Warren, and Mr. Moore took part in the discussion which ensued.—Mr. P. Crowley read a paper entitled "Descriptions of Two New Species of Butterflies from the West Coast of Africa," and exhibited the specimens, which he proposed to name respectively *Charaxes gabonica* and *Cymothoe marginata*. He also exhibited several other new species from Sierra Leone, which had been recently described in the *Annals and Mag. of Nat. Hist.*

PARIS.

Academy of Sciences, August 4.—On the exhaustion of land by culture without manure; study of drainage waters, by M. P. P. Dehérain.—Observations of Coggia's comet (July 18, 1890) made with the Brunner equatorial of Toulouse Observatory, by M. E. Cosserat. Observations of position were made on July 21 and 22.—Elements and ephemeris of Denning's comet (July 23, 1890), by M. Charlois. The elements have been calculated from observations made at Nice on July 24, 28, and 30.—*Résumé* of solar observations made at the Royal Observatory of the College of Rome during the second quarter of 1890, by M. P. Tacchini. (See Our Astronomical Column.)—On the density of nitrogen and oxygen according to Regnault, and the composition of air according to Dumas and Boussingault, by M. A. Leduc. The author draws attention to a difference between the results obtained by Regnault and by Dumas and by Boussingault. If x = the proportion of oxygen in 100 volumes of air, d and d' the densities of oxygen and nitrogen, then

$$dx + d(100 - x) = 100, \text{ and } x = \frac{100(1 - d)}{d - d'}.$$

Replacing d and d' by Regnault's values ($d = 1{\cdot}10563$ and $d' = 0{\cdot}97137$), we get

$$x = 21{\cdot}324,$$

and for the percentage composition of air by weight,

$$\text{Oxygen} = 23{\cdot}58, \text{ and Nitrogen} = 76{\cdot}42.$$

Dumas's mean value was $23{\cdot}0 \pm 0{\cdot}1$, and the author throws out several suggestions as to the probable cause of the discordance. He has also made some determinations of the density of nitrogen, and obtained values comprised between 0·972 and 0·973.—Electrical resistances of gases in a magnetic field, by M. A. Witz. The author has previously communicated his researches on the action of magnetic fields on Geissler tubes (May 12, 1890), and has studied the effects produced by variations in the intensity of the magnetic field and the position of the tube with respect to the lines of force; he has now determined the influence exercised by changes in the pressure of the gas in the tube. The experiments have led to the conclusion that the action of magnets upon Geissler tubes is due to a variation in the capacity of the tubes, so that they constitute true condensers, and their illumination is the result of an oscillatory discharge of the same order as that of a Leyden jar, of which the period T is a function of the capacity C of the jar, and of the coefficient L of self-induction of the conductor of small resistance, and $T = \pi\sqrt{CL}$. A variation of the capacity C would thus modify the vibratory state of the, gas and would be the cause of the differences observed in the luminous phenomena in intense magnetic fields.—Reactions of alkaloid salts, by M. Albert Colson. Some investigations on heats of formation are given.—On the division of sulphuretted hydrogen between the metals of two dissolved salts, by M. G. Chesneau.—On some derivatives from acetylacetone, by M. A. Combes.—Experimental researches on thermic sensibility, by M. Charles Henry.—Experimental researches on the affected nerves of chronic lead poisoning, and on the causes determining their appearance, by MM. Combemale and François.—On the combinations of hæmoglobin with carbonic acid, and with a mixture of carbonic acid and oxygen, by M. Christian Bohr.—On the colouring of the silkworm by feeding, by M. Louis Blanc. From the investigations it would appear that very soluble and diffusible substances, such as fuchsin, are absorbed by the epithelium intestinal of the silkworm, and colour the cells of the secretory organs, but not the product of secretion.—On the cellular division of *Spirogyra orthospira*, and on the re-arrangement of the colouring matters driven to the ends of the spindle, by M. Degagny.—The treatment of black rot, by M. A. de l'Écluse.

BOOKS, PAMPHLETS, and SERIALS RECEIVED.

La Photographie Judiciaire: A. Bertillon (Paris, Gauthier-Villars).—British Cage Birds, Part 4: R. L. Wallace (U. Gill).—The Canary Book, Part 4: R. L. Wallace (U. Gill).—The Elements of Solid Geometry: R. B. Hayward (Macmillan).—Les Facultés Mentales des Animaux: Dr. F. de Courmelles (Paris, J. B. Baillière).—English-Eskimo and Eskimo-English Vocabularies: R. Wells and J. W. Kelly (Washington).—Photogravure: W. T. Wilkinson (Iliffe).—Bulletin from the Laboratories of Natural History of the State University of Iowa, Vol. i., Nos. 3 and 4 (Iowa).—Journal of Physiology, Vol. xi., Nos. 4 and 5 (Cambridge).

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