the arguments in favour of or against the permanence of species, drawn from the observation of living species and from palæontology. Following this we have, *à propos* of the war, an article on field ambulances and hospitals, by Prof. Champouillon. In the number for July 30, we have the rectorial address of von Littrow to the University of Vienna, on the backward state of science among the ancients, and the conclusion of M. Broca's paper on the transformation of species, in which the subject is treated from a philosophical point of view, and the professor sums up strongly against the idea of permanence. The hypothesis of Natural Selection is then discussed, but a much less certain conclusion arrived at. The number for August 6 opens with a report of the discussion on the nomination of Mr. Darwin as corresponding member of the Academy of Sciences, to which we have referred in another column. This is followed by a singularly able and exhaustive review by M. Claparède, of Geneva, of Mr. A. R. Wallace's Essays on Natural Selection, in which he points out that while Mr. Wallace demands the intervention of a superior force to explain the foundation of the human races, and to guide man in the path of civilisation, he altogether denies the existence of such a force as assisting to produce the inferior races of animals and plants, which he attributes entirely to the operation of Natural Selection. In the same remarkably interesting number of the *Revue*, we have also Mr. Marey's extremely important paper on the Flight of Birds.

THE current number (No. XXXIX.) of the *Quarterly Journal of Microscopic Science* is an unusually rich one, containing several papers of great importance. Amongst them we may draw attention to one of considerable length by Dr. Beale, entitled "Bioplasm, and its degradation," with Observations on the Origin of Contagious Disease. He introduces and defends the use of the term Bioplasm, which we think is admissible enough, and serves very well as a distinguishing appellative for actually living matter, as opposed to protoplasm, which has been rather vaguely used to designate organic matter whether dead or alive. The application, however, of the new term is sufficiently wide, since Dr. Beale appears to consider them in a special form for each separate structure in the body originating in the primary mass of bioplasm of the egg. From each subdivision of the latter "in pre-ordained order, and with perfect regularity more are produced, no doubt according to laws, but laws which we know nothing about, except that they are not physical." This last assertion indeed seems open to question, for if we know *nothing* about them, how can it be said with certainty that they are not physical, as it is certain we are not acquainted with all the physical laws of the world. Dr. Beale proceeds to describe the Bioplasm of the Amœba, the principal forms of that of man, and its relations to such morbid products as pus and infectious poisons. An interesting paper follows, by Dr. Macdonald, of H.M.S. *Fisgard*, on the minute anatomy of some of the parts concerned in the function of accommodation to distance. Dr. Caton describes the means he has found best adapted for studying transparent vascular tissues in living animals. To this succeeds a capital *résumé* of Prof. Stricker's "Studien aus der Institut für experimentelle Pathologie in Wien aus dem Yahre 1869," and the part devoted to original communications terminates with two essays, one by Mr. E. Ray Lankester, on the Migration of Cells, and one by A. M. Edwards, on *Diatomaceæ*.

The *Transactions of the Linnean Society*, vol. xxvi., pt. 4, is entirely occupied by two papers on Fossil Cycads. The first, by Prof. W. C. Williamson, is descriptive of the remarkable *Zamia gigas* Lindl. and Hutton, or *Williamsonia gigas* Carr., found in considerable abundance in the Lias at Whitby. He believes it to have borne a strong resemblance to existing Cycads with diœcious flowers. In Mr. Carruthers's valuable monograph of Fossil Cycadean stems from the Secondary rocks of Britain, he shows that these fossils are, as far as is at present known, entirely confined to Secondary strata, the so-called *Cycadeæ* of the coal-measures and other palæozoic strata being rather referable to cryptogamic *Lepidodendra*, and the few specimens reported from Miocene beds being very imperfect and uncertain. In his description which follows, Mr. Carruthers describes four new genera from British rocks, *Yatesia*, *Fittonia*, *Williamsonia*, and *Bennettites*. Both papers are illustrated by excellent plates.—Vol. xxvii., part 2, is of more varied interest. Mr. John Miers contributes two botanical papers; a description of three new genera of *Verbenaceæ*, *Rhaphithamnus*, *Phelloderma*, and *Diostea*, from Chile and the adjacent regions; and a paper on the anomalous genera *Gœtzia* and *Espadea*, the position of which is very unsettled, and which he proposes forming into a new order. Dr. Birdwood describes and figures three new species of *Boswellia*, natives of the Soumali country, all of which yield frankincense, and one of them, he believes, the bulk of the olibanum of commerce. Dr. J. B. Hicks points out a singular resemblance between the genus *Draparnaldia*, and the confervoid filaments of mosses. We have descriptions of new Agarics and Lichens from Ceylon, the former by the Rev. M. J. Berkeley, the latter collected by Mr. Thwaites, and named by the Rev. W. A. Leighton, who also contributes notes on the Lichens of St. Helena, and a description of a new British Fungus, *Sphæria tartaricola*, Nyl. The longest paper in this part is an important monograph by Messrs. Henry Brady, Parker, and T. Rupert Jones, of the genus *Polymorphina*, an attempt to rescue this difficult genus of Foraminifera from the almost inextricable confusion into which it has fallen. Dr. A. Rattray contributes a paper on the anatomy, physiology, and distribution of the *Firolidæ*, forming the section of Heteropoda with a straight and elongated form, and either wholly naked or furnished with a very small shell, and including the genera *Carinaria*, *Carinaroides*, *Firola*, and *Firoloides*. Sir John Lubbock proceeds with his Notes on *Thysanura*, part iv.; and from Dr. Edward Moss we have an account of the genus *Appendicularia*, with its remarkable appendage, or "haus," the object of which in the vital economy has not been ascertained.

SOCIETIES AND ACADEMIES

LONDON

Entomological Society, July 4.—Mr. Alfred R. Wallace, president, in the chair. The Rev. F. A. Walker and Mr. Edward Mackenzie Seaton were elected members. Numerous objects of interest were exhibited by or on behalf of Mr. Meek, the Hon. T. De Grey, Mr. F. Moore, Mr. Blackmoor, Mr. Albert Müller, Mr. Jenner Weir, Sir J. C. Jervoise, Bart., Mr. Tegetmeier, and others.—Prof. Westwood made some observations on a group of very minute four-legged *Acari*, and the President mentioned instances of protective mimicry in insects, recently observed by Mr. Everitt in Borneo.—The following papers were read:—"Further observations on the Relation between the Colour and the Edibility of *Lepidoptera* and their Larvæ," by Mr. J. Jenner Weir; "On a Collection of butterflies, sent by Mr. Ansell from South-Western Africa," by Mr. A. G. Butler; "Contributions to the Insect Fauna of the Amazons" (continuation, *Coleoptera longicornia*, Fam. *Cerambycidæ*), by Mr. H. W. Bates; "List of the *Hymenoptera* captured by Mr. J. K. Lord in Egypt and Arabia, with Descriptions of New Species," by Mr. Francis Walker.

EDINBURGH

Scottish Meteorological Society, July 21.—Half-yearly general meeting, Mr. Milne Home in the chair. The following report from the Council was read:—"The Council have to report that the number of the Society's stations is now ninety-one, there being an addittion of one since the last general meeting, in consequence of the services of an observer having been obtained for Leith. At the last half-yearly general meeting, reference was made to a renewed application by the Council to Government for pecuniary aid. The application was so far favourably received that the Board of Trade a second time recommended the Council to prefer to the committee of the Royal Society their claim, with a view to an allowance being made from the annual Parliamentary grant of 10,000*l.* for meteorological purposes, of which grant that committee have charge. The Council regret to say that the Royal Society committee have stated that they are unable to make or promise any allowance out of the grant, as the whole of it has been appropriated to other objects; for which objects the grant is, as the committee state, even too small in amount. The Council have in these circumstances been induced to renew their application to Government for a special grant to the Society. The Council have requested Mr. Buchan to prepare a report on the monthly temperature of the British islands, and to state to this meeting a few of the results obtained by him. The subject is one which it is believed has not been thoroughly investigated by any other society, or indeed by any meteorologist except Professor Dove; and Professor Dove's charts, which are now ten years old, were based on observations not only necessarily scanty, but in several cases unavoidably incorrect. The first chart which this Society prepared of the

temperature of the British Isles was published in the Society's journal in January 1864, and it has been frequently referred to by meteorologists as the only one existing. That chart was constructed on returns obtained during a period of five years; the new charts which Mr. Buchan is now constructing are founded on observations for thirteen years, ending December 1869. These charts, besides giving the mean temperature of the year for the whole British Islands, give also the mean temperature of each month. The Council anticipate that, when these charts are published, with the tables explanatory of them, they will be found to afford valuable aid in the discussion of many important questions of a practical nature."—Mr. Mohn, Professor of Meteorology in the University of Christiania, and director of the Norwegian Meteorological Institute, who was at the meeting, presented a work entitled the "Storm Atlas," referring to various storms which had passed over the north of Europe. The Swedish returns were from twenty-five stations, where the observations were made three times a day, and were sent gratuitously by the Swedish Institute.

A paper "On the Temperature of the British Islands," by Mr. A. Buchan, was read; thirteen charts illustrating the temperature of the British Islands in each month of the year being exhibited. The author said that the investigation, the results of which were now exhibited on the walls, was one of the most important of all that the Society had undertaken. An early attempt was made to partially solve the problem about seven or eight years ago, and a chart was constructed showing the mean temperature of different parts of Britain in July and in January. These observations had two inherent defects. They were based only on five years, evidently too short a period to yield such results as were quite trustworthy. They were also defective in respect of number of stations, there being some parts of the country very badly represented. Now, however, an investigation had been completed for thirteen years, which must be a very close approximation, indeed, to the solution of the problem. The real temperature of the various months could differ very slightly from what was now exhibited. Further, the number of stations now brought under review was four times what the Society had at first. The observations were upon a mean of thirteen years of 68 Scotch stations, 54 English stations, and 11 Irish stations—Ireland being yet very badly represented. To enable him to draw the lines on the outskirts of the British Isles with greater accuracy than could otherwise have been attempted he had calculated the mean temperature for Faroe. Several Norwegian stations he had obtained from Professor Mohn's publications, and he had also ascertained the mean temperature of places in Belgium and France. The temperatures had been reduced to sea level by the ordinary method of allowing a degree for every 300 feet of elevation, and the lines were drawn upon the charts to show each difference of a degree of Fahrenheit. Among the results brought out, it appeared that in January there was as high a temperature in the north of Shetland as there was in London. As soon as the westerly winds crossed the high mountain ridge that was on the west of the British Isles, they deposited their vapour, radiation took place, and the temperature rapidly fell. In the same way, in Ireland, the lower temperatures were found inside, the higher temperatures outside. Another very marked result was the effect of Ireland upon Britain in increasing the summer temperature and lowering the winter temperature opposite to that island. In regard to the influence of the Irish Sea, Mr. Tennent, a member of Council of the Society, who had for a year or two given a good deal of attention to the direction of winds in different parts of the British Isles, is of opinion that the winds of the Irish Channel were not so much westerly as in Scotland and Ireland, but flowed to a great extent through the centre of the Channel. Now, on looking at the charts, it would be seen that the effect of this current in the winter months was to push up the isothermal lines over the Irish Sea. Through the whole of the months, the observations all showed the marked effect which that open space of water had upon the temperature of the British Islands, as clearly as the effect which Ireland had upon the part of Britain opposite. Questions of temperature had an important bearing upon agriculture. Many agriculturists believed that if the night temperature fell to 40°, there was no growth for twenty-four hours. If the night temperature fell to 40°, the mean temperature might be expected to be about 46°. Thus, then, by observing the charts for the various months, and taking note of those parts of Britain whose temperatures were less than 46°, one would ascertain the places where during certain months there was little growth, a very important question in discussing the crops of the British Islands. The next important temperature for agriculture was that required to ripen cereals. It had been proved by observations made by persons competing for prizes offered by the Marquis of Tweeddale, President of the Society, that for the purpose in question, with the ordinary range of temperature in Scotland, there must be an average of 56°. If it fell below that, there was a deficiency in the crop; if it rose, the crop was so much the better, provided there were rain and other necessary conditions. Accordingly, with the charts for the different months, one could point to those parts of the British Islands where there was some hazard in rearing cereal crops—the places, namely, where the necessary temperature was scarcely to be expected, or where it occurred so seldom that the risk was too great. It was generally supposed that the temperature fell one degree for every 300 feet of elevation, so that supposing at the sea level there was a temperature of 58°, at an elevation of 600 feet the temperature would be 56°, or a temperature sufficient to ripen cereals. In reference to this point, however, it was interesting to compare the station of Braemar on the Dee-side with that of Wanlockhead in the Leadhills, which were among the best equipped stations of the Society. It was well known by experience that on Deeside oats could ripen up to about 1,500 above the sea; but at Wanlockhead, which was only 1,300 feet above the sea, oats were sown only for the straw. Here, then, were very marked differences in the effects of temperature, as shown in the growing crops. Taking the month of June, he found that, adding a degree for every 300 feet of elevation, he got a mean temperature at Wanlockhead of 54·9°, while at Braemar, applying the same correction, he got a temperature of 56·8°. The cause of the difference between the two places he was not prepared to hazard an opinion upon, but it had an important bearing on the produce of the country. He thought that if this question were a little inquired into at some other stations, they might get some general law for guidance in reference to such matters.

DUBLIN

Royal Irish Academy, June 23.—The Rev. Professor Jellett, B.D., president, in the chair. Mr. Frith read a very interesting paper on arterial drainage in the west of Ireland. Mr. W. Andrews mentioned the second occurrence on the coast of Ireland of the rare Cetacean *Xiphis sowerbii*; it had been found in May last, in Brandon Bay, Co. Kerry. It was seventeen feet in length, the back of head and fins were of a velvety black colour with lines of white. Although sadly mutilated by the fishermen, yet several important parts had been obtained sufficient to enable him to supplement his (Mr. Andrews) provious paper on this very rare whale.—A paper was read by the secretary on the Book of Clonenagh.—The last part of the proceedings was laid on the table, and the receipt of a MS. index to the volume from the Rev. Dr. Reeves was acknowledged with many thanks and ordered to be printed.

PARIS

Academy of Sciences, August 1.—A note was read by M. G. Rayet, on the spectrum of the solar atmosphere, in which the author noticed the variability of the bright lines, in confirmation of Mr. Lockyer's observations. M. Berthelot communicated some thermo-chemical investigations upon the sulphurets, in which he described the action of the alkaline sulphurets upon metallic salts in solution, the action of acids upon the alkaline sulphurets, that of sulphuretted hydrogen upon various metallic salts, and of acids upon the metallic sulphurets. A note by M. L. Henry, on the action of pentachloride and pentabromide of phosphorus upon various æthers, was read. M. F. Pisani presented an analysis of nadorite, a new mineral from the province of Constantine. This mineral was supposed to consist of one equivalent of oxide of antimony, and two equivalents of oxide of lead; the author gave as its formula $(Sb^2 O^2, Pb O) + Pb Cl$. A note by Mr. F. C. Calvert, on the evolution of pure nitrogen from nitrogenous organic matters was communicated by M. Chevreul. The author described the evolution of nitrogen from animal matters, by the action of hypochlorite of lime, and gave a tabular view of the quantities produced from gelatine, albumen, calcine, wool, and silk; these amounted in each case, to rather more than one-third of the whole quantity contained in the substance operated upon. A note was read by M. Contejeau, on the maximum of temperature at Poitiers, on the 24th July, 1870. The maximum observed was at $1^h\ 10^m$ P.M. when the thermometer suspended under the shadow of a tree showed

41°·2 C. (= 106°·16 F.).—A note by M. V. Raulin on the rain-fall of the French Alps was communicated by M. Leverrier. It included tables of mean, annual, seasonal, and monthly rain-falls for sixteen stations.—M. C. Saint-Claire Deville communicated an extract from a letter of M. Chassin on a severe earthquake felt in Mexico on the 11th May of the present year. This earthquake destroyed the town of Pochutta, in the State of Oaxaca, in twelve minutes; it continued until the 19th.—A note was read by M. Marès on the corpuscular disease of the silkworm, and Marshal Vaillant contributed some extracts, showing the advantages which have been obtained in various places by the adoption of the processes of selection of silkworm's eggs recommended by M. Pasteur.—M. Decaisne presented a note by MM. Planchon and Lichtenstein on the specific identity of the *Phyllosceræ* of the leaves and roots of the vine.—A note by M. E. Roze on some mycological experiments, was communicated by M. Brongniart. The author confirmed the results obtained by M. Oersted as to the production of *Rœstelia penicillata* on the hawthorn by means of *Podisoma clavariæforme* from the juniper, and described some important experiments on the relation of *Claviceps purpurea* (Tul.) to the *ergot* of rye and other grasses.—A note by Mr. F. C. Calvert on the employment of phenic acid as a disinfectant, was presented by M. Chevreul. The author claimed the first application of phenic acid in this way for Dr. D. Davis, of Bristol, in 1867. The perpetual secretary states in a note that it was used on a large scale in Paris in 1865.

BERLIN

German Chemical Society, July 11.—Alexander Müller, having been engaged in analysing the waters of Berlin, stated the principles which he thinks necessary for procuring good analyses, as follows:—The bad property of water depends upon the organic matter contained in it. Water should therefore be evaporated *in vacuo* and submitted to dialysis, the colloid portion to be examined with the microscope. The organic matter should be determined by elementary analysis. Another portion should be evaporated with a weighed quantity of carbonate of soda, to separate silicic and phosphoric acids. The residue should be heated to redness; the loss corresponds to the nitric and nitrous acids and organic matter. The remaining weights, minus the carbonate of soda added, is that of the salts contained in the water, with the exception of phosphates and silicates.—Dr. Schwarz related his experiments instituted to obtain the homologues of isothionic acid with methylic, amylic, and butylic alcohols. Working with large quantities of sulphuric anhydride, he was unable to remark the two modifications which have been lately observed by Schultz Sellac. The boiling point of his anhydride (prepared by distilling Nordhausen acid with phosphoric anhydride) was 26° C.—M. Jaffé in describing an experiment concerning the constitution of rufigallic acid established the mode of the formation of colouring matters in plants. Gallic acid $C_7 H_6 O_5$, a derivation of benzol, when heated with sulphuric acid, yields rufigallic acid, until now considered as $C_7 H_4 O_4$. By treating this compound with zinc powder M. Jaffé has obtained anthracene $C_{14} H_8$. He therefore doubles the formula of rufigallic acid, and thinks it probable that the complicated vegetable colouring matters are derived from the tannic acids which are a constituent ingredient of most plants.—A. Oppenheim described experiments on the action of sulphuric acid on oxygenated organic chlorides. This he found to be analagous to the action of sulphuric acid on the corresponding chlorinated hydrocarbons. The chlorhydrine of glycol yields glycolsulphuric acid, just as chloride of ethyl yields ethylsulphuric acid. Epichlorhydrine, $C_3 H_5 Cl O$, yields the mixed ether of glycerine, $C_3 H_5 Cl OHSO_4 H$, just as chloride of allyl yields a mixed ether of propylic glycol. Acid chlorides yield sulphuric acids in which the organic acid radical replaces one atom of hydrogen. These compounds are decomposed by water into the acids entering into their composition. Thus we have acetyl-sulphuric acid, phthalyl-sulphuric and benzoyl-sulphuric acid. The latter, however, is gradually transformed into sulphobenzoic acid. By heating, this molecular transposition takes place at once, and thus a good method exists for preparing this acid free from any secondary product. The same chemist, conjointly with M. Ador, established the identity of this acid with that discovered by Mitscherlich. It yields the same salts and is transformed into isophthalic and oxybenzoic acids by fusion with formiate and hydrate of potassium.—L. Carus communicated observations on the temperature necessary for his method of organic analysis in sealed tubes. P. Griess established the formula of benzo-creatine, $C_8 H_9 N_3 O_2$, obtained by the action of potash on the cyanide of amidobenzoic acid.—L. Henry reported on the action of $P Cl_5$ on the ethers of diatomic monobasic acids.—MM. Merz and Mülhauser described the properties of naphthoilic or naphthylcarbonic acid—T. Thomsen described experiments on specific heat. In order to arrive at a standard quantity of heat he heated liquids by burning a certain volume of hydrogen. He arrived at the conclusion that mixtures of sulphuric acid and water have the specific heat of the water entering into the mixture. C. Rammelsberg communicated experiments on the specific weights of the different modifications of tin.

BOOKS RECEIVED

ENGLISH.—A Manual of Zoology, Vol. I.: H. A. Nicholson (Blackwood and Sons).—Heat a Mode of Motion; new edition: Prof. Tyndall (Longmans).—Irregularities and Diseases of the Teeth: H. Sewell (Churchill).—Notes on Electricity: Prof. Tyndall (Longmans).—The Laboratory Guide: A. H. Church (Van Voorst).—Murby's Scripture Manuals, Genesis: Murby. An Elementary Course of Plane Geometry: R. Wormell (Murby).—Cassell's Book of Birds, Part ix.—Co-operative Agriculture: W. Pare (Longmans).—Henfrey's Elementary Course of Botany, edited by Dr. Masters (Van Voorst) — Mushroom Culture: its Extension and Improvement: W. Robinson (Warnes).—Notes about Aldeburgh: N. F. Hele (J. R. Smith).

FOREIGN.—Archiv für Anthropologie, Vol. IV. (Trübner). — (Through Williams and Norgate) Berichte über die biologisch-geographischen Untersuchungen in den Kaukasus-ländern; with Atlas.

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ERRATUM.—Page 269, second column, last line of table, for 89,395, read 34,413.