

before June 1 next, in order to allow ample time to draw up a report on the replies for consideration at the Conference.

It seems advisable that, as above stated, the action taken at Vienna should be carefully reconsidered under several heads which will now be recapitulated.

I. *Observations.*—In respect of this subject it will be most convenient to take the "Abstract Log" of the Brussels Conference, and to discuss the several subjects of observation therein in the order of sequence of the columns.

- Cols. 1 and 6. Date and position of the observations.—Is it your opinion that a fresh column should be added, headed "Course and Distance by the Log in every Watch of four hours"?
- „ 7 and 8. Currents.
- „ 9. Magnetic variation.—Is it desirable to give an additional column for the "Direction of Ship's Head"?
- „ 10 and 11. Wind, direction and force.—Is it possible to employ an anemometer at sea so as to give trustworthy results? Can the use of the Beaufort Scale be made universal?
- „ 12 and 13. Barometer.—To what degree of minuteness is it necessary to observe this instrument?
- „ 14 and 15. Thermometer—Dry bulb and wet bulb.—Should these observations be required from all ships?
- „ 16. Forms and direction of clouds.—Is this column sufficient, or should any notice be taken of more than one stratum of clouds?
- „ 17. Proportion of sky clear.—Is it not advisable to substitute for this heading "Proportion of sky clouded"?
- „ 18. Hours of rain, fog, snow, &c.—Is it desirable to retain this heading, or to substitute for it and No. 23 a column headed—"Weather by Beaufort Notation"?
- „ 19. State of the sea.—Should this be given according to a numerical scale?
- „ 20. Temperature of sea surface.
- „ 21. Specific gravity of sea surface.
- „ 22. Temperature at depths.—Is it desirable to retain these two last columns, or can the observations when taken be inserted in the column for "Remarks"?
- „ 23. Weather. See No. 18.
- „ 24. Remarks.

II. *Instruments.*—What patterns of instruments should be employed for any observations which may require them? Is there a reasonable possibility of introducing the metric and centigrade systems for general use at sea?

III. *Instructions.*—Is it possible to devise a general form of instructions to ensure uniformity in regard of methods of observation and registration?

IV. *Observers.*—What control should be exercised over the observers as to their instruments and registers? Is it desirable that all instruments employed should be the property of the central establishment, and lent to the observers?

V. *Co-operation of the Royal Navy.*—To what extent can ships of war assist in forwarding the ends of meteorological inquiry?

VI. *Discussion.*—Can general suggestions be thrown out as to the most profitable mode of discussion of the observations?

VII. *Subjects of Inquiry.*—To what extent can a division of labour as regards subjects of inquiry be carried out in a spirit of fairness to the collecting and discussing establishments respectively?

VIII. *Sailing Directions.*—In how far are purely practical investigations, such as the preparation of sailing directions, admissible for a scientific institution?

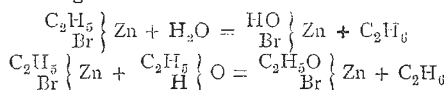
Any gentleman into whose hands this programme may come, and who is himself not likely to attend the Conference, is requested to forward any remarks he may wish to make on any of the subjects mentioned herein to Mr. Scott, at the above address, before July 1, 1874.

SCIENTIFIC SERIALS

THE *Journal of the Chemical Society* for May contains the following papers communicated to the Society:—On the action of bromine on alizarin, by W. H. Perkin. Alizarin heated in a

sealed tube with a solution of bromine in carbon disulphide yields monobromalizarin, $C_{14}H_7BrO_4$. This latter substance heated with acetic anhydride gives diacetobromalizarin, $C_{14}H_5Br(C_2H_3O)_2O_4$, and with nitric acid a mixture of phthalic and oxalic acids, while free bromine is given off. Specimens of cotton prints showing the difference in the shade of colour produced by alizarin and bromalizarin when used as dyeing materials accompany the paper.—Note on the action of trichloroacetyl chloride upon urea, by Raphael Meldola and Donato Tommasi. The authors have obtained trichloroacetyl urea

$CO \left\{ \begin{array}{l} NH(C_2Cl_3O) \\ NH_2 \end{array} \right.$.—Researches on the action of the copper-zinc couple on organic bodies. Part V. On the bromides of the olefines; and Part VI. On ethyl bromide, by Dr. J. H. Gladstone and A. Tribe. The couple acts upon dry ethylene bromide, producing ethylene by double decomposition; in presence of alcohol the decomposition is explosive. The action of the couple is the same either in presence of alcohol or water, and the fact that these substances facilitate the action is explained by the authors by the solvent action of these liquids on the film of zinc bromide formed on the surface of the couple. Propylene and amylene bromides are decomposed in a similar manner, yielding the corresponding olefines. With regard to the action of the couple on ethyl bromide the authors are of opinion that ethylbromide of zinc $C_2H_5 \left\{ \begin{array}{l} H \\ Br \end{array} \right. Zn$ is always formed, and this on further heating produces zinc ethyl and zinc bromide or two semi-molecules of ethyl may decompose with the formation of ethane and ethylene. In presence of water or alcohol ethane is always produced according to the reactions:—



—The agglomeration of finely-divided metals by hydrogen, by Alfred Tribe. Copper, palladium, and platinum in a finely-divided state agglomerate when hydrogenised. By way of hypothesis the author suggests that the minute particles of the metals are surrounded by layers of liquid hydrogen which coalesce.—The last paper is by Andrew Fuller Hargreaves On the spontaneous combustibility of charcoal. The maximum amount of oxygen is absorbed from the atmosphere within three days after carbonisation, so that from that time charcoal may be used for gunpowder without danger, but up to that period spontaneous combustion is liable to occur. About three-fourths of the journal is devoted to foreign abstracts.

Transactions of the Manchester Geological Society, vol. xiii. Part IV.—The papers in this part are the following:—On coal-cutting machinery, by Mr. W. H. J. Traice; Additional notes on the millstone grit of the parish of Halifax, by Mr. James Spencer; On Permian and Trias, by Mr. E. W. Binney, F.R.S.; On Pleistocene mammalia found near Castleton, Derbyshire, by Mr. J. Plant, F.G.S.

Proceedings of the Geologists' Association, vol. iii. No. 5.—Besides an account of some of the excursions made by the Association during 1873 the number contains the following papers, abstracts of which have been given in our reports of the Society's proceedings:—On some fossils from the Margate chalk, by J. W. Wetherell, with illustrations; On the valley of the Vézère, Périgord, its limestones, caves, and Prehistoric remains, by Prof. T. Rupert Jones, F.R.S.; On ammonite zones in the Isle of Thanet, by F. A. Bedwell. The last-mentioned occupies a large part of the number, and is illustrated.

Bulletin of the Essex (Salen, U.S.) Institute, vol. iv., 1872.—The principal papers in the *Bulletin* of this very efficient Institute for 1872 are a communication from Mr. S. A. Nelson on the Meteorology of Mount Washington, the main purpose of which is to show the advantages for meteorological purposes mountain-stations offer over those less elevated; and a "Catalogue of the Mammals of Florida, with notes on their Habits, Distribution," &c., by C. J. Maynard.—The *Bulletin* for 1873 contains more papers of scientific interest than that of the previous year.—The first paper is a short one, by Dr. A. S. Packard, on the glacial phenomena of north-east America compared with those of Europe.—There is a short but interesting statement by Mr. J. H. Emerton of the results of his observations on worms of the genus *Nais*.—Mr. S. M. Allen contributes a paper on ancient and modern theories of light, heat, and colour.—Mr. H. Herrick contributes a Partial Catalogue, of con-

siderable length, of the birds of Grand Menan, N.B.—Mr. F. W. Putnam has a paper on the various forms of cutting instruments made of stone.—“Notes on the bird-fauna of the Salt Lake Valley and the adjacent portions of the Wahsatch Mountains,” is the title of a long paper by Mr. R. Ridgway, who also contributes a paper on the birds of Colorado, and, along with Mr. S. F. Baird, one on some new forms of American birds.—There are also interesting accounts of the numerous and profitable excursions made during the summer months by the Institute.—There is a very minute account of the celebration of the 25th anniversary of the Institute on March 5, 1873. Many well-known scientific men were present, and among others Prof. O. C. Marsh, who paid the high compliment to the Institute that through its influence the botany and zoology of Essex county were better understood than those of any other county in the United States. It was at the hands of the Essex Institute, he said, that he himself acquired his taste for scientific investigation.

Poggendorff's Annalen der Physik und Chemie, No. 3, 1874.—This number commences with a translation of Dr. Draper's recent paper on photography of the diffraction spectrum (which has already appeared in our columns).—The conductivity of flame for galvanic currents is known to be greatly exalted by presence of metallic vapours, and M. Herwig was led to inquire whether a gaseous layer, entirely formed of such vapours, would not show good conductivity even at low temperatures. He experimented with mercury, dense vapours of which can be had several hundred degrees under white heat. The vapour conductivity he finds to resemble that of the voltaic arc, rather than that of a simple metallic conductor. There is a peculiar transition-resistance, which is great in comparison with the hindrances which the current finds within the vapour-layer itself; so that the total resistance is in great measure independent of the extent of the vapour-layer. The transition-resistance is less with increased electromotive force of battery or strength of current. Further, the vaporisation in the positive mercury surface was increased by the current; another point of analogy to the voltaic arc (in which, if the electrodes be mercury and platinum, the mercury is vaporised only when it forms the positive pole); and, using a platinum point and a mercury surface, the resistance of the vapour (like that of the arc) was greater when the mercury surface was positive.—M. Friedrich Müller concludes his investigation on galvanic polarisation and the distribution of the current in electrolytes. He states that, with copper plates in dilute sulphuric acid, and also in a solution of sulphate of copper mixed with sulphuric acid, the polarisation follows a simple law: it is a linear increasing function of the density of current. Another observation of the author is that cupric oxide is reduced to copper by galvanic hydrogen (confirming previous observations that galvanic hydrogen is considerably more active than ordinary hydrogen).—The galvanic conductivity of sulphuric acid and muriatic acid, and its dependence on temperature, is the subject of a communication from M. Grotian.—In pursuing his researches on the compressibility of elastic fluids M. Regnault did not experiment with pressures lower than one atmosphere. The difficulty of the inquiry has perhaps deterred physicists since. We here find it undertaken, however, by M. Siljeström, who contributes a paper on the subject; in the first part here given the details of apparatus are fully described, and the numerical results of some sixteen series of experiments tabulated.—M. Schneider communicates a ninth paper on new salts of sulphur, and M. Kessler describes “the simple eutyoptic spectroscopy.”—Among matter from other journals we note a valuable paper by M. Boltzmann, On experimental determination of the dielectricity constants of insulators.

Astronomische Nachrichten, No. 1,995.—This number contains a large number of observations of position, taken at Leipsig, of some of the minor planets—Comet II. (Tempel), Comet III. (Borelly), Comet IV. (Henry), and Comet VII. (Coggia); also the mean planes of sixty-nine variable stars for the year 1873.—Prof. d'Arrest sends his observations on the position of Coggia's comet, taken during May last.—An astronomical prize is offered by the Academy at Copenhagen for research on the data of the ancients comprised between the time of Ptolemy and the eighteenth century.—The discovery of a new planet is announced from Toulouse by Mr. Perrotin, May 19, 10 P.M. R.A. 16h. 28m. 30s., D. 22° 48'.—No. 1,996 contains a discussion of the errors of levels due to the change of direction of attraction caused by the spheroidal figure of the earth and other local

causes, and Prof. Spörer gives the results of his sun-spot and protuberance observations for April and May last.

Abhandlungen der Schlesischen Gesellschaft für Vaterländische Cultur, 1872-73.—Dr. Grätzer here furnishes a number of social statistics regarding Breslau gathered from the census made in December of that year. From a comparison with Berlin, the population of which (825,389) was then nearly four times that of Breslau, it appears that Breslau is less crowded; there being in it a dwelling-house to every 38·9 of the inhabitants, whereas in Berlin the proportion is 1 to every 56·9. On the whole it appears that, notwithstanding the better proportion of dwellings in Breslau, the health of the two cities is nearly alike, Breslau having counterbalancing disadvantages in bad buildings, sites, drinking and underground water, and soil.—M. Limpricht contributes a report on the watershed between Weide and Bartsche, with a list of the plants found in that region.

Verh. der k.k. zool. bot. Gesellschaft in Wien, 23ter Band, 1873.—This volume, of more than 600 closely-printed pages, is chiefly occupied by papers on entomology and botany. Among the most important are:—*Insecta*.—Contributions to the Orthoptera of the Tyrol: Krauss; Diptera collected in Galicia; Hymenoptera: Kriechbaumer; Microlepidoptera of Leghorn, by J. Mann; Contributions to the nocturnal Lepidoptera of North America, by Prof. Zeller (second part) with figures: more than a hundred new species are described; Contributions to the Phryganidae, by Dr. Hagen of Cambridge, U.S.; Hungarian Diptera: Kowarz; Eight new German species of Diptera: Beling; New butterflies from Asia Minor; On certain species of Tipula and its allied genera: Beling.—*Crustacea*.—On *Lepidurus lubbockii* and the Phyllopora.—*Vertebrata*.—A graphic account of the breeding and habits of the Pelican on the Danube. Beside *P. onocrotalus* and *P. crispus*, *P. minor* was also found. On *Comephorus baicalensis*, a fish allied to the genus *Cottus*, with two figures: Dybowski.—*Mollusca*.—Contributions to the genus *Acoludia* and its allies, by Dr. Bergh of Copenhagen.—*Botany*.—Contributions to the flora of Lower Austria, by Von Reuss, jun.; Lichens of the Tyrol, by F. Arnold; Fauna of the Brdygebirg in Bohemia; Fungi of south-east Hungary, by Prof. Harslinsky; The flora of the state districts in the south-east of Lower Austria: Woloszczak; Contributions to the flora of Lower Austria, by Hackel. The volume contains a photographic portrait of the late Secretary of the Society, Ritter von Frauenfeld, with his latest contributions to Entomology and a biographical notice, by Von Wattenwyl.

Reale Istituto Lombardo. Rendiconti: t. vii, Fasc. i e ii.—These parts contain the following papers:—Prof. Serpieri communicates his observations of the meteor shower of August 10, 1873, made at Urbino.—Observations concerning the constitutions and combinations of bodies, a paper on molecular physics, by Dr. Guido Grassi.—On a fact of importance in silk-worm culture, by Prof. G. Balsamo Crivelli.—Prof. Cesare Lombroso tabulates the height and weight, cranial measurements and capacities, facial angle, &c., of 832 Italian prisoners, dividing them into homicides, thieves, highwaymen, incendiaries, tricksters, deserters, &c. These prisoners were Sicilian, Sardinian, Calabrian, Neapolitan, Piedmontese, Genoese, and Lombardian. The results are discussed in great detail.—Prof. Antonio Bucellati contributes a paper on political economy, entitled “On the theory of capital.”

SOCIETIES AND ACADEMIES

LONDON

Royal Society, June 11.—Spectroscopic Notes.—On the Evidence of Variation in Molecular Structure, by J. N. Lockyer, F.R.S.

1. In an accompanying note I have shown that when different degrees of dissociating power are employed the spectral effects are different.

2. In the present note I purpose to give a preliminary account of some researches which have led me to the conclusion that, starting with a mass of elemental matter, such mass of matter is continually broken up as the temperature (including in this term the action of electricity) is raised.

3. The evidence upon which I rely is furnished by the spectroscopy in the region of the visible spectrum.

4. To begin by the extreme cases, all solids give us continuous spectra; all vapours produced by high tension spark give us line spectra.