

In order to exhibit the constancy of the lag in the occurrence of the gradient variations behind those of the sun-spots, as well as the remarkable similarity in form of the two oscillations, I have reproduced the above figures graphically in the accompanying diagram, in which the baric gradient abnormalities are plotted out simultaneously with the *inverted* sun-spot abnormalities:—

It will be observed that there is an almost uniform lag in the baric gradient curve behind the inverted sun-spot curve of a little more than a year, while a variation of '01 inches on the barometer scale corresponds very nearly throughout (allowance being made for the lag) to 10 on the sun-spot scale.

As the strength of the prevailing west and south-west winds of these regions must necessarily depend on the amount of the baric gradient between places on the edge of the European continent like London, and those inland, and to the north as St. Petersburg, there is fair ground for concluding that the west and south-west winds must on the whole be stronger in years of minimum sun-spot than in those of maximum sun-spot.

Some direct evidence in favour of this notion has already been communicated to NATURE by Mr. S. A. Hill and Mr. Ellis of the Greenwich Observatory.

Moreover the amount of variation in the strength of the wind between London and St. Petersburg, following upon the change in the barometric gradient between the two during the cycle, should be enough to cause a *sensible* variation in the character of the weather; for according to Mr. Blanford the mean barometric gradient over the Bay of Bengal during the south-west monsoon is about 0'025 inches in 100 miles.

Now as the distance from London to St. Petersburg is about 1300 miles; in order to maintain a current of air between them throughout the year equal to that of the summer monsoon in the Bay of Bengal, there would have to be a total annual barometric gradient of 0'0325 inches. As the range of the abnormal gradient in the present case amounts to 0'08 inches it should cause a variation in the wind equal to one-fourth that of the monsoon.

For the period 1822-71 the normal mean annual gradient from London to St. Petersburg is + 0'098 inches. The variation of the abnormal is therefore nearly equal to the normal gradient.

Taking the results just obtained with those given by Mr. H. F. Blanford in his article in NATURE, vol. xxi. p. 477, it may be concluded that there is a barometric "see-saw" between Russia and Western Siberia and the Atlantic coasts of Europe, similar to that between the former districts and Indo-Malaysia.

Just as in the latter case the relation will probably be found to be more marked in the winter months, and may also be found to explain some of the numerous facts already ascertained regarding variations in the rainfall, cloud, and temperature of Western Europe, at different epochs of the sun-spot cycle.

E. DOUGLAS ARCHIBALD

#### CONGRESS OF THE FRENCH LEARNED SOCIETIES

THE session of the Congress of the French Learned Societies has lasted only three days, but has exhibited an unusual amount of interest. Many papers were read in the section of Science presided over by M. Milne-Edwards, the veteran member of the Institute.

M. Alluard summarised the results of rotation of the wind as registered by anemometers at an altitude where it is not to be feared that surface-friction should interfere. The number of rotations from north to south was 113. Of these 83 were in the positive direction, or by east, and only 30 by west; 49 of the 83 positive were continued to the west, and 34 stopped at the south or vicinity; consequently when a wind has come from north to south by east, the greater probability is that it will continue rotating to the west. When it has rotated to the west the probability is even greater that it will continue to the north. Again, of the 49 three-quarter rotations observed not less than 32 were completed, and only 17 stopped at the west and vicinity. The same thing cannot be said of the negative rotations: only 13 were from north to east, and of these only 6 were from north to north by west. These results are a confirmation of Dove's well known law.

General Nansouty, the director of the Pic-du-Midi Observatory, announced that the new buildings on the top of the mountain will soon be ready, and that next winter he will use them for taking readings. It is curious that the last winter has been one of unusual mildness in this exalted altitude.

M. Hébert read a long paper on the formation of cyclones, which he explains by the influence of mountain ranges on the great atmospheric currents loaded with humidity.

M. Vidal presented a photometer based on the action of light on a selenium element of the ordinary construction. M. Vinot, editor of *Le Ciel*, presented a refractor mounted equatorially, of which the price is less than 10*l.*, with a magnifying power of 150. M. Joubert gave details on the working of the Trocadéro Popular Observatory, which is now in constant operation, and where lectures on astronomical subjects are delivered regularly.

M. Guillemare read a paper on the use of soleine for lighting purposes. This product has been obtained by the distillation of a number of resinous matters, which have a point of ebullition from 150 to 160 Centigrade and a mean density of 0'860. When they have been freed from every other matter they can be used in a specially-prepared burner. This soleine can be prepared in immense quantities in all countries where pines are abundant.

A number of interesting communications were made on palæontology and zoology, generally advocating Darwinian views.

The final sitting was presided over, as usual, by the Minister of Public Instruction, and took place in the large hall of the Sorbonne. A number of crosses of honour and medals were distributed.

#### UNIVERSITY AND EDUCATIONAL INTELLIGENCE

OXFORD.—The lectures of the summer term commence this week. At the University Museum Prof. Clifton will conduct a class in practical physics and will lecture informally on the use of optical instruments. Mr. Stocker will give an experimental lecture in mechanics, and Mr. V. Jones will lecture on mechanical problems, in continuation of their courses last term. Prof. Odling will continue his course of lectures on organic chemistry, and Mr. Fisher will finish his inorganic course.

At Christ Church Mr. Harcourt lectures on the metals, and Mr. Baynes on the theory of gases. At Balliol Mr. Dixon gives an experimental lecture in elementary physics.

In a Congregation holden on Tuesday, April 27, it was resolved that candidates, not being members of the University, may present themselves at any of the ordinary examinations for Responsions. Last term a statute was passed instituting an examination to take place in the Long Vacation. This examination, which can be passed by candidates before matriculation into the University, is to be passed in lieu of Responsions. The effect of the statute will be that all young men may pass Responsions before they matriculate, and less of their University time will be consumed in getting up school work.

The proposal to designate the unattached students as students of the University Hall was lost by a large majority, 90 voting against the proposal and only 9 for it.

#### SOCIETIES AND ACADEMIES

##### LONDON

Chemical Society, April 21.—Dr. Debus in the chair.—It was announced that a ballot for the election of Fellows would take place at the next meeting, May 5.—The following papers were read:—On the distillation of mixtures of carbon disulphide and carbon tetrachloride, by F. D. Brown. The objects of the research were to find the boiling-point of every possible mixture of the two liquids, and the composition of the vapour evolved by any mixture when boiling. Tables and curves giving these results accompany the paper. The author also finds that the composition of the vapour evolved is independent of the pressure under which ebullition takes place.—On the estimation of hydric peroxide by means of potassic permanganate, by W. E. Adeney.—On the oxidation of sulphurous acid, by H. P. Dixon. The author finds that when sulphur dioxide, steam, and oxygen are exposed to a temperature of 100° C. no diminution of volume takes place, and therefore no sulphuric acid is formed. If the temperature be allowed to fall so that water condenses, a slight contraction in volume is observed.—On the reduction of cinamic alcohol, by F. Hutton and W. R. Hodgkinson. When this substance is heated to 100° C. for three or four days



with sodium amalgam (containing 15 per cent. sodium), and a small quantity of water cinnamene and methylic alcohol are produced.

**Entomological Society, April 6.**—W. L. Distant, vice-president, in the chair.—One Ordinary and one Honorary Member were elected.—Mr. J. Jenner Weir exhibited an undetermined *Noctua*, apparently allied to the genera *Dicycla*, or *Gortyna*, which was found in a nursery garden at Blackheath in August last.—Mr. R. McLachlan exhibited three rare species of the Neuropterous genus *Dilar*, Ramb.—Rev. A. E. Eaton exhibited a specimen of *Haplophthalmus elegans*, Schöbl., a woodlouse new to the British fauna.—Miss E. A. Ormerod exhibited two termites' nests from British Guiana.—Mr. T. R. Billups exhibited specimens of two rare British insects—*Ichneumon erythraeus*, Gr., and *Lasiosomus enerovis*, Herr. Schäff.—The Secretary announced the death of Herr J. H. C. Kwall, a well-known entomologist of Courland, at the age of eighty-two.—Mr. R. McLachlan read a description of a new species of *Cordulina* (*Gomphomacromia fallax*) from Ecuador.—Mr. J. B. Bridgman communicated a paper entitled "Some Additions to Mr. Marshall's Catalogue of British *Ichneumonidae*." Upwards of sixty species (most of which were exhibited to the meeting) were noticed as new to the British fauna, including thirteen new to science.

**Meteorological Society, April 20.**—Mr. C. Greaves, F.G.S., vice-president, in the chair.—W. H. Goss, F.G.S., and Admiral L. L. Massie were elected Fellows of this Society.—The following papers were read:—On the frequency and duration of rain, by Dr. Wladimir Köppen of Hamburg.—Results of experiments made at the Kew Observatory with Bogen's and George's barometers, by G. M. Whipple, B.Sc., F.R.A.S.—On a discussion of Mr. Eaton's table of the barometric height at London with regard to periodicity, by G. M. Whipple, B.Sc., F.R.A.S.

**Anthropological Institute, April 12.**—F. W. Rudler, F.G.S., vice-president, in the chair.—The election of Lieut.-Col. R. G. Woodthorpe, R.E., and of Thomas Vincent Holmes, F.G.S., was announced.—Mr. Joseph Lucas read a paper on the ethnological relations of the Gypsies. In tracing back the past history of the races described under the common name of Gypsies we pass through two periods—the first *historical*, dating from A.D. 1414; the second partly historical, partly inferential. This older section formed the subject of Mr. Lucas's paper. The author premised that linguistic evidence shows that the various tribe of Gypsies now scattered over Europe can be referred to several Eastern tribes from India to Persia. The investigation dates back to archaeological times, especially in relation to the working of metals and the presence of a large number of pure Sanscrit words in the language of European Gypsies, many of which do not occur in Hindustani. The "archæological" section embraces all that was not included under the several sections—"The Gypsies in Egypt," "Gypsies among the Romans," or "The Dark Ages"; but a good deal of the evidence upon which the archaeological conclusions rest runs through those several sections, as well as through sections specially devoted to the names *Zingaro* and *Rom*. It will thus appear that the term "Gypsy" is used by the author in the widest sense as meaning "an Asiatic tribe which has wandered into Europe," though strictly it should mean only those who came by way of Egypt.

#### PARIS

**Academy of Sciences, April 18.**—M. Wurtz in the chair.—The following papers were read:—Microscopic inscription of movements observed in physiology, by M. Marey. The accuracy of the curves from M. Marey's instruments has been doubted, on the ground that vibrations proper to the light lever may be added to the physiological movement. He now removes this objection by greatly diminishing the range and velocity of the lever so as to give microscopic curves on smoked glass (which is also moved more slowly). The inertia of the lever becomes negligible. The curves, when examined in the microscope or by projection, are found identical with the others. The method greatly extends the field of phenomena that may be registered, e.g. the vibrations of blood in the vessels, which give a sound, produce a distinct microscopic trace. The portable character of the apparatus is an advantage.—On the Eulerian integral of the second species, by M. Gylden.—On the surface of Kummer with sixteen singular points, by M. Briochi.—On the action of heat on ammoniated bases, by M. Hofmann.—Report on a memoir of M. Peris-é, entitled "Causes which tend

to warp the Girders of Iron Bridges, and Means of Calculating these Girders for Resistance of Warping Forces."—On the secondary battery of M. Faure, by M. Reynier. This is an improvement on M. Planté's. M. Faure quickly gives his couples a power of almost unlimited accumulation by covering the lead electrodes with a layer of spongy lead formed and retained thus: The two sheets of lead are each covered with minium or other insoluble oxide of lead, then with a felt envelope held by lead rivets. They are then placed near each other (in spiral, it may be) in acidulated water. The electric current changes the minium to peroxide on the positive electrode, and to reduced lead on the negative. On discharging, the reduced lead is oxidised and the peroxidised lead reduced. A quantity of energy capable of giving 1-horse power for one hour may be had with a Faure battery of 75 kg. The battery, under certain conditions, returns 80 per cent. of the work expended in charging it.—A letter from Ampere to Lacroix was read. It was written when he was Professor in the Lyceum of Lyons, and expresses his enthusiasm for mathematical studies.—On the earthquake of Chio, by M. de Pellissier, Consul-General at Smyrna. The amplitude of the first oscillation, on the afternoon of April 3, was estimated to be between 0'15 m. and 0'20 m. From then till the 5th 250 shocks were felt, thirty or forty of which were capable of throwing down a solid wall. All the oscillations were in the direction east to west. The Governor's palace, of very light construction, but chained throughout at the level of each storey, resisted all the shocks, while the wall inclosing the grounds, 0'70 m. thick, was everywhere thrown down. Smyrna has become a refuge for the wounded.—On Fuchsian functions, by M. Poincaré.—On Abelian functions, by the same.—On a class of functions, the logarithms of which are sums of Abelian intervals of the first and third species, by M. Appell.—On the formulæ of representation of functions (continued), by M. Du Bois-Reymond.—On stellar photography, by Prof. H. Draper. By exposing 140 minutes in the telescope, he has succeeded in photographing stars of magnitude 14'1, 14'2, and 14'7 (Pogson's scale) in the nebula of Orion; the weakest is of the sixteenth magnitude on Herschel's scale. The minimum of visibility for the 9-inch telescope used has been thus nearly reached, and Prof. Draper hopes soon to be able to go still further. The nebula extends over a surface about 15' in diameter.—Action of electrolysis on toluene, by M. Renard.—Structure and comparative texture of the ink-bag in cephalopoda of the French coasts (continued), by M. Girod. The species observed were *Sepia officinalis*, *Loligo vulgaris*, *Sepiolo Rondeleti*, and *Octopus vulgaris*.—On the large dunes of sand of the Sahara, by M. Rolland. These dunes move toward the south-east, and the sum of sand is increased by disaggregation of rocks; but the movement and increase are almost insensible in a generation.

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