

well-known names as Viñes, Meldrum, Algué, and others; to the variation of the storms with time and place; to their tracks and rates of progression of the vortices; the whole of which will repay careful perusal. Actual reference is not made to the article on the same subject in the valuable "Barometer Manual" issued by the London Meteorological Office, which epitomises the results of observations and experience extending over many years. A glance at this work, in conjunction with Mr. Hurd's compilation, explains how in either hemisphere the wind travels round the cyclonic centre in a direction contrary to the apparent diurnal course of the sun, the westerly wind being therefore always found in the portion of the whirl nearest to the equator. The average rate of progression (irrespective of the wind-force in the whirl) varies from about 300 miles a day in the West Indies to from fifty to 200 miles in the southern Indian Ocean. Fassig found that in the West Indies the average daily rate further increased after the recurve of the storm.

THE *Ergebnisse der magnetischen Beobachtungen* of the Royal Observatory of Wilhelmshaven for the year 1911, in addition to valuable information about magnetic diurnal and secular variation at Wilhelmshaven, contains an elaborate discussion by Prof. Bidlingmaier of what he calls "die erdmagnetische Aktivität." By "activity" he means a more exact numerical measure of the energy of magnetic forces than is afforded by the present international scale, which assigns 0 to a quiet, 1 to a moderately disturbed, and 2 to a highly disturbed day. Prof. Bidlingmaier's introductory remarks on the theoretical side are of extreme generality, but practically he assumes the "activity" for a given interval of time in a magnetic element to be proportional to the mean square of the differences of its values taken at a large, theoretically infinite, number of equidistant times throughout the interval from the mean value during the interval. By summing the "activities" for three rectangular components one would have a measure of the total "activity." The interval of time may be the hour, the day, or the year. In the first case, in practice, Prof. Bidlingmaier seems to approve of values at six-minute intervals. The labour involved in arriving at hourly "activities" throughout the whole year being very great, an attempt was made to see whether the "activity" in this case could be expressed as a definite function of the range. Hours having the same range were collected in groups, and the corresponding mean measured "activities" were plotted as ordinates of a curve of which the abscissæ were the ranges. A regular curve was thence derived, somewhat resembling part of an hyperbola. The work merits the attention of all interested in magnetic disturbance.

Engineering for August 8 contains an illustrated account of experiments on the distribution of wind velocity in the space surrounding a circular rod in a uniform current of air. These experiments were conducted at East London College by Prof. J. T. Morris. The wind velocity was measured by electrical apparatus. Electrically heated wires were attached to the

circular rod, and the cooling of these wires by the air current was used as a measure of the wind velocity. The method has been described already by Prof. Morris at the Dundee meeting of the British Association, and at the recent soirée of the Royal Society. The present article gives complete sets of curves showing the wind velocity at different distances from the rod for various speeds of main air current, together with velocity-contour lines for currents of fifteen and five miles per hour. The "shadow" of the rod is brought out clearly by these graphs, and extends much further at low than at high velocity. Judging from the results, the electrical method of measuring air velocities seems to possess considerable advantages in the field of experimental aerodynamics.

THE foreign commerce and navigation of the United States for the year ending June 30, 1912, is dealt with in a volume prepared by Mr. O. P. Austin, and published at Washington by the Department of Commerce and Labour in the United States. The bulky volume of 1342 pages is concerned almost wholly with statistics, and provides detailed information of every department of the trade of the United States. In the fiscal year 1912 the exports of manufactures from the States were larger than in any earlier year in the record of American commerce, and imports of manufacturers' materials also showed larger totals than in any earlier year except 1910. This increasing share which manufactures form in American exports, and manufacturers' materials form in the imports, is chiefly a development of recent years. Manufactures are supplanting foodstuffs as a leading factor in the export trade of the United States. While the value of foodstuffs exported increased from 1885 to 1900, it has actually declined since that date. The percentage which foodstuffs formed of the total exports has declined steadily since 1880; on the other hand, the percentage of manufactures has as steadily increased.

OUR ASTRONOMICAL COLUMN.

RADIAL VELOCITY OF 915 STARS.—Prof. Campbell publishes in Lick Observatory Bulletin, No. 229, a further valuable contribution to the radial velocities of stars secured with the Mills spectrographs attached to the 36-in. refractor at Mount Hamilton, and with the instruments of the D. O. Mills Expedition at Santiago, Chile. Prof. Campbell states that the results for those brighter stars of classes F, G, K, and M, of which the radial velocities appear to be substantially constant, or the approximate systemic velocities may be estimated, including proper motion and other auxiliary data, relating to nearly 900 stars, have existed in manuscript form ready for the printer for more than a year. It was proposed to issue them in the form as previously published for the stars classes B and A, but want of funds made such a scheme impossible. Even now the necessary means are not forthcoming, so, to avoid further delay, he publishes them in the briefest form in the present bulletin.

All available results for stars of these spectral classes have been included, whether the observations of the same stars have been published or not in former lists; there are also included velocities for a few stars of classes B and A. Results for a few stars obtained at

other observatories are also inserted in the tables. Thus this and all preceding publications make available all the radial velocity results obtained at Mount Hamilton and Santiago up to date, excepting suspected variables and stars the spectra of which contain lines not sufficiently serviceable for measurement. The published lists include, therefore, all stars as bright as the 5.00 visual magnitude in the Revised Harvard Photometry, *Annals* 50, and, in addition, many hundreds of stars fainter than magnitude 5.00.

STELLAR PARALLAXES.—Prof. Frederick Slocum, in conjunction with Prof. S. A. Mitchell, of Columbia University, publishes in the July number of *The Astrophysical Journal* (vol. xxxviii., No. 1) the results of some stellar parallax determinations from photographs made with the 40-in. refractor of the Yerkes Observatory. The apparatus and methods used were similar in general to those previously described by Prof. Schlesinger, so the communication, to which reference is here made, is limited to the actual results of the investigation. The following table sums up in brief the values determined:—

Star	R.A. (1900) h. m.	Dec. (1900) °	Mag. and spectrum	Relative parallax	Probable error
♄ Andromedæ ...	1 4	+46 43	4.7 B ₈	+0.004	±0.008
48 Cassiopeiæ ...	1 54	+70 25	4.6 A ₂	-0.002	0.016
20 Persei ...	2 47	+37 56	5.7 F	-0.012	0.007
9 Camelopardalis ...	4 44	+66 10	4.4 B	-0.032	0.011
♃ Orionis ...	5 57	+9 39	4.2 A ₂	+0.036	0.016
Grönigen VII., No. 20.	16 21	+48 35	10.7	+0.125	0.012
Anonymous ...	17 33	+18 37	0.1	+0.108	0.011
BD 18°3423° ...	17 34	+18 37	0.0	+0.003	0.004
BD 18°3424° ...	17 34	+18 37	0.2	+0.003	0.008
16 Herculis ...	17 53	+20 50	5.5 B	-0.004	0.008
17 Lyræ C ...	19 4	+32 21	11.3	+0.124	0.008
P Cygni ...	20 14	+37 43	4.9 B ₄ P	-0.021	0.016
7 Cygni ...	21 10	+37 37	3.8 F	+0.006	0.016
Nova Lacertæ ...	22 32	+52 12	8 to 13 P	+0.007	±0.012

THE BIRMINGHAM MEETING OF THE BRITISH ASSOCIATION.

WE understand that the argument of the presidential address to be delivered by Sir Oliver Lodge at the Birmingham meeting is as follows:—A marked feature of the present scientific era is the discovery of, and interest in, various kinds of atomism, so that continuity seems in danger of being lost sight of. Another tendency is toward comprehensive negative generalisations from a limited point of view. Another is to take refuge in rather vague forms of statement, and to shrink from closer examination of the puzzling and the obscure. Another is to deny the existence of anything which makes no appeal to organs of sense, and no ready response to laboratory experiment.

In his address the president will contend against these tendencies. He will urge a belief in ultimate continuity as essential to science; he regards scientific concentration as an inadequate basis for philosophic generalisation; he believes that obscure phenomena may be expressed simply if properly faced; and he will point out that the non-appearance of anything perfectly uniform and omnipresent is only what should be expected, and is no argument against its real substantial existence.

Since we gave, in NATURE of July 17, summaries of the provisional programmes of most of the sections of the British Association, for the meeting to be held in Birmingham on September 10-17, notes on the forthcoming proceedings of the Engineering Section have reached us. A varied programme of engineering activity will be presented at the meetings of this section, under the presidency of Prof. Kapp, who will deal with electric traction in his opening address. A group of connected papers on the various influences which affect the propagation of electro-

magnetic waves will be read by Profs. Howe and Marchant and Dr. Eccles. Heat tests of electrical machines will be discussed by Mr. W. R. Cooper, and a practical demonstration of the varied uses of electric cooking appliances will no doubt prove of interest to the members of all sections.

Mechanical engineering claims a large share of the attention of the members, and will include an important paper by Mr. Lanchester, on the application of the internal-combustion engine to railway locomotion, in which he will describe his very successful work in this branch of engineering. Prof. Burstall will discuss the much-debated subject of solid, liquid, and gaseous fuels, and the committee on gaseous explosions will probably present a report on the temperature distribution in the cylinders of internal-combustion engines. A novel hydraulic weighing machine will also be described by Dr. Hele-Shaw, and a new process of bank-note engraving by Mr. Bawtree.

Considerable interest attaches to the report of the new committee for investigating the stress distribution in engineering materials, which will be discussed with the Mathematical and Physical Sections, and connected with this subject Prof. Coker will describe some optical determinations of stress in chain links and in thick cylinders under fluid pressure, Mr. Reid will discuss the flow of plastic solids, Prof. Dixon will deal with impact tests, and Mr. Robertson with the strength of free-ended columns.

Civil engineering is represented by a group of interesting papers, including one by Dr. Cornish on land-slides, accompanied by upheaval in the Culebra cutting of the Panama Canal, while Dr. J. S. Owens and Mr. E. R. Matthews will discuss the movements of sand and shingle in connection with marine engineering work.

A paper of great local interest, by Messrs. Gleadow and Shackle, will describe the fine new station of the Great Western Railway at Snow Hill, while the subject of metals for structures will be discussed by Mr. Walmisley.

The programme of the meeting of Section G is therefore not only of unusual interest, but many of the papers to be read are of considerable importance in relation to industries for which Birmingham is famous.

BONAPARTE RESEARCH FUND GRANTS.

THE committee of the Paris Academy of Sciences appointed to consider the distribution of the Bonaparte Research Fund has made the following recommendations for the year 1913:—H. Caillol, 3000 francs, for the completion of his work entitled "Catalogue des coléoptères de Provence"; A. Colson, 2000 francs, to enable him to continue his experimental work in physical chemistry; E. Coquidé, 2000 francs, to assist him in carrying out his study of the turf lands of the north of France from the agricultural point of view; C. Schlegel, 2000 francs, to enable him to continue his researches on Crustacean development; Jules Welsch, 2000 francs to assist him in his geological exploration of the coast lines of France and Great Britain, and to extend them to Belgium and Scandinavia; MM. Pitard and Pallary, 6000 francs, equally divided, for their scientific expedition in Morocco, organised by the Société de Géographie; Louis Roule, 2000 francs, for the continuation and extension of his researches on the morphology and biology of the salmon in France; M. Pougnet, 2000 francs, to enable him to continue his researches on the chemical and biological effects of the ultra-violet rays, and for the construction of a quartz apparatus to be used for studying the action of ultra-violet light