

in which (a) one parameter has a value slightly below 2.780, or (b) two of the parameters are nearly equal. Amongst the sulphonic chlorides and bromides two isomorphous series are seen, the second series being restricted to compounds in which an iodine atom is present; it is noteworthy that the two chloriodobenzenesulphonic chlorides are found in different series, and that one of them was on one occasion obtained in a labile form, the crystals becoming cloudy and opaque when removed from the solvent from which they had separated. This behaviour indicates clearly that certain members of the series are actually dimorphous, and the whole series may therefore be regarded as isodimorphous. Isodimorphism was also detected amongst the anilides and toluides. It is remarkable that two other series, containing the halogen atoms in the *meta* position, which were examined by Dr. E. C. Jee in 1900, proved to be isotrimorphous and isotetramorphous respectively. The completion of the work on these series will be awaited with interest.

A SECOND edition of "A Text-book of Zoology," by Profs. T. Jeffrey Parker and W. A. Haswell, is announced as nearly ready by Messrs. Macmillan and Co., Ltd. The work has been subjected to careful revision throughout; some parts have been to a great extent rewritten, and a considerable number of new illustrations have been added.

#### OUR ASTRONOMICAL COLUMN.

VELOCITIES AND ACCELERATIONS OF THE EJECTA FROM HALLEY'S COMET.—Profs. Barnard and Lowell and Senor J. Comas Sola all deal with the velocities and accelerations of the matter ejected from the body of Halley's comet, during May and June, in No. 4441 of the *Astronomische Nachrichten* (pp. 11-16).

From measures of photographs taken at the Yerkes Observatory (Y), Honolulu (H), and Beirut (B) on June 6, Prof. Barnard found the velocities of recession, of a well-marked feature in the tail, given in the following table:—

Stations	Interval between photographs Hours	Hourly motion	Recession per second			
			From comet		From sun	
			Miles	km.	Miles	km.
Y-H ...	4.25 ...	3.60 ...	23.1 ...	37.2 ...	39.7 ...	63.9 ...
Y-B ...	15.15 ...	5.17 ...	33.1 ...	53.3 ...	49.7 ...	80.0 ...
H-B ...	10.90 ...	5.78 ...	37.3 ...	59.7 ...	53.9 ...	86.4 ...

These results show a strong acceleration in the mass measured, which was about  $1.5^\circ$  from the head; from the last two photographs this acceleration was about 14 miles (22 km.) per second.

Similar results are obtained by Prof. Lowell from the measures of two photographs taken, with rather less than an hour's interval, on May 23. On these photographs are shown four knots in the tail, at distances varying from  $1^\circ 28'$  to  $6^\circ 15'$  from the head, and the measures give for the velocities of the particles composing the knots 13.6, 17.2, 19.7, and 29.7 miles per second respectively, thus showing an acceleration of the velocities as the particles receded further from the head.

Senor Sola, dealing with the velocities of the gaseous globes ejected from the nucleus on June 4, shown on photographs taken on June 4, 6, and 7, finds that between June 4 and 6 the acceleration of these ejecta was 0.148 metre per second, and between June 6 and 7 was 0.248 metre per second.

OBSERVATIONS OF COMETS.—New observations of three comets are published in No. 4441 of the *Astronomische Nachrichten*. A number of observers give positions, determined during August, of Metcalf's comet, 1910b, and generally describe it as a faint object, magnitude about 11.0, having a central condensation and a suspicion of a tail.

D'Arrest's comet was observed at the Algiers Observatory on August 26 and 29 and September 1 by M. Gonnessiat. The correction to Leveau's ephemeris was

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an increasing quantity, and on September 1 had the value  $-1m. 19.39s., +6' 16.2''$ ; the comet is described as a diffuse nebulosity of 2' or 3' diameter, with a feeble, central condensation of about magnitude 14.5.

With a 9-inch refractor Mr. Innes found that, on August 11 and 12, Halley's comet was a most difficult object, and was, therefore, much fainter than the magnitude (7.4) given in No. 4423 of the *Astronomische Nachrichten*. Observations made between July 26 and August 11 indicate a correction of about  $-11s.$  to the ephemeris given in the same place; the ephemeris is nearly correct in  $\delta$ . When last seen the comet was a nebulous object, of 1' diameter, showing a slight condensation.

THE SOLAR PHYSICS OBSERVATORY, SOUTH KENSINGTON.—From the report published by the Board of Education, dealing with the work done at the Solar Physics Observatory, South Kensington, during 1909, we learn that spectroheliograms of the solar disc were obtained on 147 days during the year; of the 286 negatives secured, 231 have been selected for the measurement of flocculic areas in pursuance of the scheme for establishing a cooperative daily record of such areas. Fifty-seven photographs showing the calcium prominences at the limb were also secured with the spectroheliograph. Visual observations of the sun were possible on 232 days, and "no spots" was recorded on five occasions. The spectra of 138 spots were observed visually, and show that the lines chiefly affected, in the region F-D, are due to V, Ti, Sc, and Mg, associated with H. A powerful instrument for the photographic recording of sun-spot spectra cannot be used owing to the vibration occasioned by traffic in the vicinity. Work with the 36-inch reflector on Halley's comet and other objects was also restricted by the poor observing conditions. A large number of photographs of stellar spectra were secured with various prismatic cameras, those obtained with a calcite-quartz optical system being employed for the temperature-comparisons of various stars.

THE DETERMINATION OF LONGITUDE.—In an interesting brochure of sixty-two pages, now published as an extract from the journal *L'Horloger*, Dr. Jean Mascart recounts the history of the determination of longitudes, with a special chapter on the invention and development of marine chronometers, and an account of the voyage of the *Flore*, which had for its purpose the actual testing of the different methods of determination, in 1771-2. The brochure is well illustrated with portraits and cuts of historical instruments and their parts, and contains numerous references to the literature of the subject with which it deals.

#### THE ROYAL COMMISSION ON WELSH MONUMENTS.

THE first report of the commission contains a general account of work already done, and an outline of the work proposed to be done. The first volume of classified information the commission hopes to publish in the course of the present year, in the form of an inventory of monuments in the county of Montgomery.

The task undertaken is truly immense. No type of monument nor available source of information seems to have been overlooked in the outline given. There are, of course, inevitable limitations to be considered, but it is not likely that the work in value and extent will ever be a subject for serious adverse criticism. As, however, the commission's plan of campaign has been published at a time when that plan may be reconsidered in some details before the information collected has been cast into a final form, one may venture to direct attention to a class of facts which is not even mentioned in the report, but which may be shown to be by far the most important within the scope of the inquiry.

The most important documents are the monuments themselves. Whatever facts may be directly elicited from them take precedence of all facts elicited from "finds," folklore, and documentary information. They may be