

electrodynamic symmetry in the bivalent ion is different from that in the monovalent ion; it is characterised by the emission of triplets.

Spectroscopically the chemical elements show a uniform behaviour in a striking way. Their monovalent ions emit series of doublets of analogous structure and identical magnetic behaviour; their bivalent ions emit series of triplets likewise of analogous structure and identical magnetic behaviour. From element to element the variables are only the proportions of the spectra or the constants of the laws of the series of doublets and triplets.

Göttingen, March 5.

J. STARK.

The Kew Bulletin.

A FEW words of explanation may be useful to anyone interested in the Kew Bulletin. It was started in 1887, partly to meet a suggestion made in the House of Commons and partly to serve as "an expeditious mode of communication to the numerous correspondents of Kew in distant parts of the Empire." It has been the vehicle for the publication of a vast amount of information of various kinds, some on purely scientific, but mostly on economic subjects. The number of copies printed has necessarily been limited, but it has always been hoped that the Press would aid in the further diffusion of information of general interest to the public.

The volumes before 1892 have long been out of print. To meet this difficulty, selected papers which proved to be of permanent interest have been from time to time reprinted.

Since 1901 the Bulletin has been somewhat in abeyance, though the routine appendices which are required for various purposes have been kept up. The fact is that to produce the Bulletin satisfactorily requires—what it has never had—some sort of staff which would be specially charged with it. The volume of work which falls on Kew is little understood. Besides its own routine and administrative duties, Kew acts as technical adviser to all Government departments at home, as well as in a varying measure to India and the colonies. For many years the annual number of letters sent out has averaged about 14,000, which is about two-thirds of that of the Commercial Department of the Foreign Office. The publication of the Bulletin has simply been crowded out.

My functions as director ceased on December 15, but I was retained in a consultative capacity until March 31. In order to give my successor a clear start I have done my best in the interval to clear off arrears. The third and concluding volume of the "Index Floræ Sinensis" has been issued. An eighth volume of the "Flora of Tropical Africa" has been all but passed through the press. The long delayed "Wild Fauna and Flora of the Royal Botanic Gardens" has been published. A catalogue of the exhibited collection of portraits of botanists has been prepared and is in type, and a second edition of the "Hand-list of Ferns and Fern-allies cultivated at Kew" is in the printers' hands. A third quinquennial supplement to the "Index Kewensis" is being prepared for the press.

The continuation of the "Flora Capensis" is being actively pushed forward, and other much needed undertakings are in view.

In order to restore the Bulletin to something like vitality, it was thought advisable to issue in one or more numbers for each year such matter as was available, with title and table of contents. This will allow the annual volumes to be bound, and the series made continuous to the satisfaction of careful librarians. The volumes for 1900 and 1901 are already issued, and the succeeding ones will follow immediately. A word of acknowledgment must be given to the generous aid of the new and active Controller of H.M. Stationery Office in expediting the work.

The director has taken up the publication of the Bulletin from the present year, and will, I hope, be able to continue it, but on a somewhat more elastic plan. No attempt will be made to issue it monthly, but material and documents of general interest will be printed at once.

Kew, March 30.

W. T. THISELTON-DYER.

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Interpretation of Meteorological Records.

I QUITE agree with Mr. Omond's remarks in NATURE of March 29 with regard to the heating of downward moving air, that if it had been simply a case of air which had previously been in thermal equilibrium and moved downwards its temperature would have been raised to that of the lower air; but in this case it was a mixture of air and water, and the water would absorb the heat produced by the compression of the air, and, further, any little heating that might not be so absorbed would increase the dryness of the air, and so cause evaporation and absorption of heat.

With regard to the effects of electricity on rainfall, they are much too little understood to be entered on here, but it may be stated that a sudden fall of rain, or an increase in rate of fall, is often observed very shortly after a flash of lightning.

JOHN AITKEN.

Ardenlea, Falkirk, N.B., March 31.

Request for Prints of Photographic Portraits.

I SHOULD be grateful to your photographic readers, whether amateur or professional, who would send me, within the next two or three weeks, waste photographic portraits, to be cut up, mounted, reduced to a miniature scale, and so to be published *without names*. They are wanted in considerable numbers to control results at which I have already arrived, relating to resemblance. Family portraits would be particularly acceptable. I make this appeal, finding it extremely troublesome, as well as costly, to obtain the needed material in other ways.

FRANCIS GALTON.

42 Rutland Gate, London, S.W.

Peculiar Ice Formation.

As the question of earth-bearing ice-pillars has been recently raised in your columns (pp. 464, 485), there are one or two points to which I should like to direct attention, as they may be of interest to your readers. While working in company with a colleague on Divis Mountain, Belfast, in 1902, our attention was attracted by the peculiar formation of ice so admirably described by your correspondent of March 15. It seemed perfectly obvious that the ice-pillars had, in growing, lifted the earth and stones by exerting a pushing force in the direction of their length, and that without lateral support, putting the expansive force of water on freezing out of the question as an explanation. All doubt on this point was removed by our finding an impression of a nailed boot, made in the mud before the frost, and on which the pillars had grown on all parts of the mud on which there were no impressions of nails, and were wanting wherever the nails had been. This gave a curious effect, as if the boot had been shod with long spikes, each nail being represented by a narrow cylindrical pit an inch and a half deep. The pressure of the nails had evidently destroyed the conditions which led to the formation of the pillars.

I was unable to determine whether the ice in each pillar was in crystalline continuity, but there was nothing to lead one to suspect the contrary. I thought I could distinguish a rude hexagonal form in some of the pillars, but this may have been merely chance. On the whole, it would seem as if the idea that a growing crystal is capable of exerting a mechanical force in some definite direction is not entirely without support. Such a force would go far towards explaining many peculiarities of the natural growth of crystals. Take, for example, the horizontal veins of fibrous gypsum so common in the Keuper Marl. It is impossible to conceive of the formation in soft rocks of a horizontal fissure of the extent of some of these veins, and it is difficult to escape from the conclusion that the growth of the fibrous crystals forced apart the sides of the vein, lifting the enormous weight of rock above. This suggestion is by no means a new one.

W. B. WRIGHT.

28 Jermyn Street, S.W., March 27.