He has collected numerous specimens from various countries, and reaches some interesting conclusions. Thus it appears that the terms used in calling animals are generally corruptions of their names, and usually the expressions addressed to them are from the language of the place. Certain inarticulate sounds, as the click, used with us to start horses, and the chirp, uttered to hasten their pace, are in vogue in remote lands also, as in India, but with a reverse meaning. Even between France and Switzerland such examples of counter-sense are quoted. This illustrates that the adoption of these sounds is purely conventional, and the only curious feature remains that the same sound is repeated in widely different localities. There is also evident an unconscious attempt on the part of man to lower his language to the comprehension of the brute by abbreviations.

D. G. Brinton.

University of Pennsylvania.

ASTROPHYSICAL NOTES.

The Harvard Observatory makes an important contribution to astrophysics in Part I. (pp. 1–128) of Vol. XXVIII. of its Annals. This contains a discussion, by Miss A. C. Maury, under the direction of Professor E. C. Pickering, of the spectra of the brighter stars photographed with the eleven-inch Draper telescope. This laborious investigation has involved the examination of nearly five thousand photographs of 681 stars north of 30° south declination, and has been in progress for several years. From one to four prisms were placed before the object-glass, and the length of the photographed spectrum, between the hydrogen lines β and ϵ, was from 2 to 8 cm. accordingly.

A scheme of classification was outlined by Miss Maury, containing 22 groups of spectra, with three 'divisions,' *a*, *b* and *c*, into which each group might be subdivided according to the appearance of the lines present in it. The groups are presumed to represent in some degree successive stages of stellar development, I to V containing spectra of the Orion type (Vogel's II *b*), while groups VII to XI, XIII to XVI, and XVII to XX respectively include Secchi's first, second and third types. VI and XII are considered as transitional groups. Group XXI is Secchi's type IV, and XXII is Pickerings fifth type—bright-line stars and planetary nebulæ. Typical stars of each group are cited, and about forty pages are given to a detailed description of the characteristics of each group. The desirability of the introduction of a new classification of stellar spectra may be open to question, but there can be no doubt that the results of minute study of spectra must be expressed in some systematic way, since gradations of spectra are perfectly evident. Miss Maury is quite justified in thus systematizing her work, as she has done without undue reference to theories of development. It is, however, hardly to be expected that this classification will be generally adopted. The time has not yet come for general agreement on stellar classification. Further laboratory researches and theoretical investigations upon luminescence must be awaited before stellar spectra can be interpreted.

Separate chapters are devoted to the Orion lines;* to the solar lines between λ 3686 and λ 5896 with their occurrence and intensity in the stars, to the lines in stars of division *c*, and to the relative intensities of lines. Chapter VIII. contains a table of the stars in their order by groups and subgroups or divisions, followed by several pages of valuable notes on individual stars. Chapter IX. is a general catalogue of the stars investigated, in order

*The identification of these lines with those of heilum was discovered too late for discussion until the close of the volume.

of right ascension, with assignment to group and reference to the numbers of the plates.

The tabular form of statement of results, which has become rather characteristic of the Harvard Annals, is followed in this volume. It is sometimes doubtful whether the compactness thus gained compensates for the difficulty of understanding the tables without minute study of them—a difficulty especially felt by foreigners. The notes on individual stars would be more convenient if the name of the star had been used, besides the reference number.

Although the quantitative accuracy of the spectrograph cannot be expected of the objective-prism, yet it seems adequate for the purposes of the volume under review. The objective-prism alone could collect such treasures of information as are included in the vast number of photographs stored in the Harvard Observatory and drawn upon in successive annals.

THE *Atlas der Himmelskunde*, of which the first of its thirty parts is at hand, is chiefly devoted to the reproduction of recent astronomical photographs. The author, A. von Schweiger-Lerchenfeld, has had the assistance of numerous astronomers and instrument makers in preparing this work, which promises to fully represent—especially by its five hundred excellent engravings and half-tones—the instruments and results of modern astro-photographic research. (Wien und Leipzig, A. Hartleben's Verlag.)

E. B. F.

CURRENT NOTES ON METEOROLOGY.

RECENT ARTICLES ON KITE-FLYING.

THE rapidly increasing interest that is being taken in kite-flying is shown by the fact that the May number of the *Century Magazine* contains three articles on the subject. The first, by J. B. Millet, the only one which deals more particularly with the meteorologic aspect of the matter, is entitled *Scientific Kite-Flying* and presents the general facts regarding the different forms of kites and the methods of work and the results obtained at Blue Hill Observatory. The second article, *Experiments with Kites*, is by Lieut. Wise, of the U. S. Army, and describes the experiments made by him at Governor's Island, New York Harbor, with an account of the ascent of January 22, 1897, on which day Lieut. Wise was lifted 42 feet from the ground by means of four kites. The last article, by W. A. Eddy, on *Photographing from Kites*, concerns the experiments made with a camera carried up by kites and also gives an account of the first telephoning and telegraphing through a line held by kites. All the articles are illustrated and will undoubtedly attract considerable attention. Although kites can be used for many purposes, the interest that meteorologists have in kite-flying is limited chiefly to the possibility of elevating self-recording instruments to considerable heights above sea level by this means. It is this exploration of the free air by means of meteorographs sent up on kite lines which has been so actively and so successfully carried on at Blue Hill Observatory, as already stated in these Notes.

DEFORESTATION AND CLIMATE.

CLIMATIC descriptions contain frequent allusions to the supposed influence of deforestation on climate, although we have not as yet enough reliable meteorological data to warrant our holding any definite opinion as to this influence one way or the other. In a lecture on the diamond mines of Kimberley, delivered at the Imperial Institute, London, on November 16th last, and reported in a recent number of *Nature* (April 1), Dr. Wm. Crookes, F. R. S., referred to the deforestation which has been going on around Kimberley and to the change in climate which is believed to have resulted from this deforestation. It is reck-