are printed with general accuracy and neatness. The proceedings are given in full, together with certain reports and papers read. Of the reports, the most important is that of Prof. W. A. Rogers, upon the standard micrometer: it bears the stamp of that thoroughness and exactitude which characterize all Professor Rogers's work. This standard is a platin-iridium bar prepared and authenticated by the U.S. bureau of weights and measures: it is very well ruled, and the error in each of the ten one-millimetre spaces has been carefully determined. The bar will be preserved by the society with due care, and proper copies prepared of it.

The volume opens with President Albert McCalla's address, 'The verification of microscopic investigation' which is followed by twenty-six papers. These last are mostly by amateurs, and show it, for the most part, more plainly than is consonant with a high scientific value. There is, we believe, not more than a single communication which appears to be the result of a serious and prolonged research by an experienced investigator. In fact, a society of so-called microscopists must necessarily be an association principally of amateurs, because the professional worker is not classified according to the instrument he uses, but according to the subject he studies: the amateur studies, *non multum, sed multa*, and so may be a microscopist. Yet we find in the volume articles of interest and value. Among these, we may signalize Dr. Blackham's very sensible article on the selection of objectives; Dr. Holbrook's, on the nerves of the kidney, in which the valuable method of making frozen sections of fresh tissues to be treated with gold is described; and Mr. Belfield's, on the detection of lard-adulterations (if his results are confirmed, they will be a valuable addition to the means of hygienic supervision). Dr. Clevenger's article on the brain is fortunately given only in abstract. The remaining essays are for the most part light: some betray a lack of acquaintance with scientific literature, and a few are treated kindly by being left uncriticised.

The society is doing useful work; and, as its activity and experience increase, we may hope for a constant elevation of its scientific standards. We expect that the future volumes of its proceedings will contain a still larger proportion of valuable researches; but we think the society will achieve its highest utility if it constantly inculcates the importance of perfected methods of work, and fosters and extends technique, the *sine qua non* of progress in microscopy.

DARWINISM.

Darwinism stated by Darwin himself. Characteristic passages from the writings of Charles Darwin. Selected and arranged by NATHAN SHEPPARD. New York, *Appleton*, 1884. 16+351 p. 12°.

Charles Darwin und seine lehre. Aphorismen gesammelt aus Darwin's eigenen werke und den werken seiner vorgänger und zeitgenossen. Leipzig, *Thomas*, 1884. 8+442 p. 12°.

IT is rather remarkable that the idea of compiling a series of extracts from the writings of Darwin should have occurred, after so long an interval, to an American and a German at the same moment. No large theory of the operation of natural causes has ever had so brief a struggle for existence, or penetrated so rapidly and so deeply into the general mode of thinking, as Darwinism; and if no great necessity has been felt hitherto for an abridgment of his works, it is because they are so admirably clear and of such absorbing interest, that the general reader has not had much trouble in getting through them all in the original form. Mr. Romanes, however, says that admirers of Mr. Darwin's genius are frequently surprised at the ignorance of his work which is displayed by many persons who cannot be said to belong to the uncultured classes; and to those who have read nothing more than Mr. Romanes' own excellent presentation of the scientific evidences of organic evolution, 'Darwinism as stated by Darwin himself' will be just what is needed for their next stage of development.

It gives extracts, of a page or two in length on the average, from all Darwin's books. The order followed in the arrangement is not exclusively that of the books themselves, but is designed to present the reader with a connected view of Darwin's researches on plants and worms; on the development hypothesis in general, and its application to man in his physical and moral aspect; and on the influence of natural and of sexual selection, and of geographical distribution. The design of the compiler is carried out with a reasonable degree of success. No scientific man, of course, who has any regard for his reputation, openly reads an abridgment; but the general reader may well be thankful for this compilation, and the greatest physicist in the world is, after all, nothing more than a general reader in paleontology and the theory of groups.

What strikes one most, on turning over these pages, is the smallness of the addition which has been made to the general development theory since the publication of Darwin's two great works. Little or nothing has been done to change the main line of argument, or even

to increase its cogency. It is probably the only instance of a theory which has sprung from its author's brain fully grown, and armed at every point against its opponents; and it is in remarkable contrast to that great engine of mathematics which was invented by such men as Newton and Leibnitz, and which, nevertheless, has waited until comparatively recent times to be placed upon a thoroughly sound basis.

It is seldom that the press of any country brings out so poor an example of book-making as 'Darwin und seine lehre.' Its ostensible reason for existence is some recent action of the Prussian Diet; but the Prussian delegate must be a curious man, if he can shape his political course from any information which this book contains. There is no connection between the successive 'aphorisms,' and there is no reference to the volume or page from which they are taken. The extreme irksomeness of reading elegant extracts on any subject is naturally greatly intensified when the subject is one which depends for its interest on the cumulative nature of the evidence brought to bear upon it. One is surprised to find how Platonic an air sentences of Darwin's may have when separated from their context. No one would have believed that he has uttered so many fine sentiments. A selection from this selection would make a very respectable Darwin birthday-book. The extracts from predecessors and contemporaries, instead of making it plain just what had been said in the direction of Darwinism before Darwin's time, are also totally without any order or connection. They consist in such passages as these, — "Man is the great dash (*gedankenstrich*) in the book of nature" (*Jean Paul*); "Every being is as happy as it feels itself, not as I, with my intelligence, would feel in its place" (*Hartmann*); "Man was developed, not created" (*Oken*); "He who exists not, feels no kind of pain; annihilation, therefore, is not an evil" (*Fichte*), — together with others somewhat more to the point, chiefly from Haeckel and Büchner.

HOUZEAU AND LANCASTER'S METEOROLOGY.

Traité élémentaire de météorologie. Par J. C. Houzeau and A. Lancaster. 2e ed. Mons, *Manceaux*, 1883. 324 p., illustr. 24°.

The *Bibliothèque belge* for popularizing the sciences and arts includes this small volume as its second number. The authors have not succeeded in making it a very notable book, for it has about all the faults common to the many works of its class. It is essentially old-fashioned, except in the chapters on weather-services, which have a more modern flavor, although not of the best. Valuable space is given to the description of such instruments as the thermometer and barometer, which must already be familiar to a reader who has studied physics enough to appreciate the mention of expansion, radiation, and many other terms that receive no special explanation. The encyclopedic method is attempted: there seems to be a desire to say something of every thing, and consequently all mention of the *bora*, *mistral*, *föhn*, *sirocco*, *solano*, and *norther* is crowded into seven lines. It is a great mistake to suppose that the readers of popular scientific books will be content with such unsatisfying statements. The *föhn* may be a 'dry and warm wind,' but why is it so? The explanation involves some of the most recent and important applications of physics to meteorology, and a deliberate description of it would well replace the chapter on terrestial magnetism. But besides these errors, as they seem to us, in the plan of the book, there are implicit and explicit errors of fact. The low temperature of winter is regarded as the effect of the greater thickness of atmosphere through which the solar rays then pass, and no mention is made of their oblique incidence on the ground. The old error of two northern poles of minimum annual temperature is repeated. The less area of ice in the arctic than in the antarctic seas "must be attributed to the neighborhood of great continents which extend to the equator, and which transmit from point to point the heat thrown on the tropics." The maximum density of sea-water is given as 4° C. The equatorial current of the Indian Ocean is described as passing round the Cape of Good Hope, up and across the Atlantic Ocean, through the Gulf of Mexico, and thence as the Gulf Stream to Norway, without a word about the many branches on the way. Cloud-particles are considered chiefly vesicular; and their suspension in the air is said, before all, to be due to their electricity, which repels them far from the ground. The oblique motion of the trade-winds is wrongly explained, as usual, and part of their velocity is incorrectly regarded as an effect of the earth's rotation: they would flow faster if the earth stood still. The strength of storms is represented to be the simple direct action of the low pressure at their centre. 'Cyclone' is applied only to the Indian Ocean, and is said to be synonymous with 'tornado' in the United States. We cannot recommend the book.