by friends in the course of last year. They bring out indirectly all the qualities of Emin's character, and no one can read them without being filled with admiration for his sustained enthusiasm, his inexhaustible energy, and his unaffected simplicity and modesty. He has been too much occupied with official duty to devote as much time as he would have liked to scientific investigation; but he is an ardent student of zoology, botany, and ethnography, and he says enough to show that we may expect from him hereafter very important contributions to our knowledge of all these subjects. So far as the present volume is concerned, the most valuable of the letters, from a scientific point of view, are those relating to the various tribes whose habits and customs he depicts. His descriptions are remarkably vivid, and are evidently the result of much careful observation. His description of the Wanyoro, for instance, is a model of what such a piece of work ought to be. The writer omits no characteristic that is likely to be suggestive to anthropologists, while he has taken care not to spoil the general effect of his sketch by the intrusion of unnecessary details. Dr. Felkin's introduction is written with perfect tact and judgment, and Mrs. Felkin has done her work as a translator admirably. An excellent map has been prepared by Mr. Ravenstein, who has also done good service by marking the latitude and longitude of every place mentioned in the index and glossary.

Colour. By A. H. Church, M.A. (London: Cassell and Co., 1887.)

IN a work which has been limited to somewhat less than 200 pages, there has of necessity been a good deal omitted which would have been found in a larger work. In the part devoted to the production of the spectrum, the details are almost absent in some particulars and perhaps are rather too full in others. The subject of polarized light is also dismissed too briefly. There are one or two statements to which exception can be taken. The first is where the author states (p. 44) that "calorescence may be regarded as a variety of fluorescence." The introduction of the term calorescence at all is a mistake; but it is a greater mistake to mix it up with what is a really distinctive phenomenon.

Another is at p. 78, where the author says, when speaking of a person who is "red" colour-blind, that "the nerve fibrils which in the normal retina receive the sensation of red are not, indeed, wanting, but transmit to the brain the same sensation as that transmitted by the second set of fibrils, the green." This doctrine is rather against facts: the fibrils are either wanting or else are paralyzed, as the total amount of light perceived by the red colour-blind person in white light is less than that perceived by the normal-eyed person. The sensations of the green and blue primary colours are on the average equal in both, but the normal-eyed person has in addition the red sensation. If the fibrils which in the normal-eyed person respond to the red respond to the green in the red colour-blind person, this would not be the case.

With these and one or two minor exceptions the work is to be recommended for accuracy; and the author may claim to have accomplished what he states in his preface he has endeavoured to do, viz. "to present and to explain in a concise yet popular form many of the chief facts connected with the origin, the phenomena, and the employment of colour."

Astronomy for Amateurs. By J. A. Westwood Oliver. (London: Longmans, Green, and Co., 1888.)

THIS volume, to quote the preface, "is intended to afford the amateur astronomer, possessed of limited instrumental means, but yet anxious to devote his labours to the furtherance of astronomical science, such hints and suggestions as will help him to direct his efforts into the channels

which experience has indicated as best fitted to his qualifications and equipment." Its pages are accordingly entirely devoted to practical astronomy, theories of every description being disregarded. The different branches of the subject are dealt with by well-known specialists, Mr. Oliver's share in the work being chiefly editorial. The fundamental chapter on the telescope and observatory, which is full of practical information, is appropriately contributed by Sir Howard Grubb. Mr. Maunder contributes an instructive chapter on the sun; Mr. Gore deals with variable stars, of which an admirable list is given; and Mr. Denning gives directions to those who are anxious to distinguish themselves as comet-discoverers. The chapter on the moon is very detailed, and, with the index map, will be of great service to observers of our satellite. Special stress is in all cases laid upon the importance of adapting the ends to the means. The book is thoroughly practical throughout, and Mr. Oliver deserves the thanks of all who are interested in the progress of astronomy, for bringing together such an excellent series of papers. Celestial spectroscopy and photography are reserved for a forthcoming volume, which we sincerely hope will not be behind the one already issued.

LETTERS TO THE EDITOR.

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of NATURE. No notice is taken of anonymous communications.]

The Micromillimetre.

PROF. RÜCKER'S note in NATURE, of February 23 (p. 388) induces me to ventilate a suggestion in nomenclature which, among other advantages, might reconcile the practice of botanists and biologists with the C.G.S. system by leading to the disuse of the prefixes *mega-* and *micro-* in favour of *self-significant* prefixes.

It is not improbable that, in spite of Prof. Rücker's protest, the arbitrary definition of the prefixes *mega-* and *micro-*, laid down in the C.G.S. system may come, or continue, to be disregarded in different departments of science, until the ambiguity thence arising necessitates their disuse, as the disuse of the words *billion*, *trillion*, &c., is necessitated by their different senses in English and French. Be this as it may, it is certainly desirable that those who are not in the daily habit of speaking of *megohms*, *megadynes*, *micrometres*, &c., should be saved the necessity of recalling, or hesitation in realizing, the precise meaning of the prefixes.

Instead of denoting *decimal multiples* by Greek, and *decimal parts* by Latin, prefixes to the name of the unit, let the multiples be denoted by the addition of a termination *-n* (say), with a suitable vowel, and the parts by that of a termination *-t* (say), and let the *order* of multiples and parts alike be denoted by numeral prefixes indicating the *power* of ten by which the unit is multiplied or divided, or, what is the same thing, the distance of the digit denoting it from the units digit.

Thus, starting from the *metre*, instead of the scale—

metre { decametre, hectometre, kilometre, &c.,
decimetre, centimetre, millimetre, &c.,

we might adopt the following:—

metre { metron (or monometron), dimetron, trimetron, tetra-
metron, &c.,
metret (or monometret), dimetret, trimetret, tetra-
metret, &c.

Then the *micromètre* (the botanists' *micromillimetre*), would become the *hexametret*; the *megohm*, the *hexohmen*; the *megadyne*, the *hexadynen*, &c.

As an aid to the memory, such a system would be valuable, reinforcing the *visua* memory, which has (I think) in many cases to be relied on, by a corresponding *oral* reading. Thus, the unit of attraction of gravitation in the C.G.S. system is about $6\frac{1}{2} \times 10^{-8}$ dynes, that is, in the proposed language, $6\frac{1}{2}$

octodynets. So, too, Joule's equivalent J, which is about " $4 \cdot 2 \times 10^7$ ergs per gramme-degree Centigrade" (Everett's "Units and Physical Constants"), would be more easily remembered as $4 \cdot 2$ *heptergons*. Again, the velocity of light would be (approximately) expressed as 3 *octometrons* per second, or 3 *decavelons*, if the word *vel* were adopted for the unit speed in the C.G.S. system—namely, that of 1 centimetre (or *dimetret*) per second. I have chosen these instances, as cases where the prefixes mega- and micro- would be of little use as aids to expression or memory.

The system I am advocating coincides exactly with the method, which I believe most intelligent teachers of arithmetic are adopting, of reckoning the place of any digit of a number by its distance, not from the decimal point, but from the unit's digit. This distance it has been proposed to call the *order* of the digit, so that the order of the unit's digit is 0; those of the tens, hundreds, &c., 1, 2, &c.; and those of tenths, hundredths, &c., -1, -2, &c. Then, if the *order* of a number be regarded as that of its highest digit, its *order* is the *characteristic* of its logarithm. I forbear to dilate on the advantages of this reform in arithmetical language, but it is obvious that the proposed system naturally arises out of it. If the British Association or the Physical Society should, after discussion, accept the principle of the proposed nomenclature, and give it the stamp of their authority, I believe they would add to the benefits they have already conferred on science by the introduction of the C.G.S. system of units. My proposal would not extend to attempting to replace the words in ordinary use—kilometre, millimetre, kilogramme, &c.—unless they, in the course of time, died out, replaced by the synonyms here proposed on the principle of the "survival of the fittest."

Harrow, February 27.

ROBT. B. HAYWARD.

IN NATURE of February 23 (p. 388) there appears an interesting letter from Prof. A. W. Rücker with reference to the equivalent value of the "micromillimetre." It is therein mentioned that the micromillimetre is commonly employed by biologists as equivalent to one-thousandth of a millimetre; but that the proper name for the thousandth of a millimetre (μ) is "micrometre," and not "micromillimetre."

Permit me, however, to suggest that even the denomination "micrometre," may be hardly acceptable to scientific workers. The denomination for the measure of the one-thousandth of a millimetre (μ), or 0·000001 metre, is "micron," and not "micrometre."

For the "micron" we have the authority of the "Comité International des Poids et Mesures." One shudders at the thought of the confusion likely to arise when computers are required to deal with both micrometre-units and micrometer-divisions.

The Comité International have also recommended the use of the following metric denominations for minute measurements:—

Denomination.	Symbol.	Equivalent.
Micron	μ ...	0·001 millimetre.
Microgramme ...	γ ...	0·001 milligramme.
Millilitre	<i>ml</i> ...	0·001 litre.
Microlitre	λ ...	0·000001 litre.

For the millionth of a millimetre we have at present the (C.G.S.) denomination "micromillimetre" ($\mu\mu$), as pointed out by Prof. Rücker.

H. J. CHANEY.

7 Old Palace Yard, Westminster, February 27.

ALLOW me to add a few remarks to Prof. A. W. Rücker's letter, published in your issue of February 23 (p. 388).

Mr. O. J. Broch, Correspondent of our Institute in its Section of Mechanics, and Director of the International Board of Weights and Measures, having kindly undertaken to ascertain by actual measurement my pendulum's coefficient of expansion by heat, began by asking how old it was. On my expressing surprise at such a question, he told me that, having carefully measured the length of a brass rod recently made and 1 metre long, he found that it became shorter by 8 *microns* in the first year, and 3 more in the second one. *Micron* is currently used here to express 1/1000 of a millimetre. French botanists call it μ , and seldom use its first decimal because they cannot see such a small space.

The only objection against *micron* is that, unlike other subdivisions of the metre, it does not define its length by its name.

But the word *metre* has itself the same fault. It is the ten-millionth part of a quarter meridian, and is, according to Clarke's computations, too short by 0·2 millimetre, or, more exactly, 187·7 microns. Improvements in geodesy will probably alter in either sense that fraction which is too small to disturb terrestrial requirements.

The quarter meridian being the true basis of our metrical system, it ought to have a name of its own, and might be called *megist*, as being the greatest space accurately measured. It should be the *metre* used in astronomy. Thus the velocity of light would be 30 *megists*, the motion of the star Aldebaran in the line of sight would be 18 *megists* per hour, and the sun's distance 15,000 *megists* $\pm$ 50. To give the latter in kilometres or miles is tantamount to describing the height of St. Paul's in London as being 1,100,000,000 microns. It is useless to express a distance in units so small that one of them may be added or subtracted without altering our useful notion of the whole sum. Moreover, those who can grasp at once a practical idea of such huge numbers are few and far between.

February 29.

ANTOINE D'ABBADIE.

Coral Formations.

MR. G. C. BOURNE's observations, as far as described in last week's NATURE (p. 414), appear to corroborate fully the view that corals grow more rapidly and luxuriantly on those parts of a reef or bank where there is an abundant supply of food, and only in scattered patches where the food supply is limited or where there is a quantity of sand or other inorganic materials in the currents. He states his belief that "the favourable conditions are due to the action of currents on coral growth." If it be not the food in these great oceanic currents, then Mr. Bourne should tell us what it is in "the action of currents" bathing the outer slopes of a reef that renders them favourable to growth; does he hold to the old view of more oxygen in the water?

It is to be hoped that Mr. Bourne has observed some of the corals feeding on the outer slope or in the lagoon, and can tell us of what their food consists. It will be interesting to know if he has worked his tow-nets in the outer currents, in the "strong currents," and in the still water, and has made a comparison of the results. If he has done so, his paper will doubtless be one of great interest and value.

There would appear to be a slip of the pen in the passage where Mr. Bourne refers to a current impinging directly on a slope.

JOHN MURRAY.

An Incorrect Footnote and its Consequences.

THANKS to the wide circulation of NATURE, my original note with the above heading has attracted attention in quite a number of the proper quarters. Several letters have reached me on the subject, and more than one of the writers, after reporting that the *Demonstratio eliminatiois Cramerianæ* had been found properly catalogued under De Prasse, proceed in consequence to express their surprise at Baltzer's mistake. Mr. Copeland's letter in yesterday's NATURE (p. 343) adds another instance of this correctness of cataloguing. The additional fact, which he mentions, that there are two copies of the *original edition* of the *Demonstratio* in the Dun Echt library is very interesting, and is a fresh proof of the existence there of valuable rarities.

When, however, Mr. Copeland diverges into the fruitless path of "the might have been" he is much less pleasantly instructive. Having read my letter on the search for a work by Mollweide, and on the discovery that the work meant was not by Mollweide at all but by De Prasse, Mr. Copeland turns to his catalogue under Mollweide, finds a cross-reference to De Prasse, looks up De Prasse, picks out the desired plum, and is pleased accordingly. In all this there is nothing singularly lucky or otherwise: it is exactly what ought to have happened. Mr. Copeland apparently thinks that the cross-reference in the Dun Echt catalogue was the missing link; but if he had had occasion to look up other catalogues besides his own he would have found the same cross-reference or a more complete one, and might then have given my helpers in the search a little more credit. The fact is that the booklet of mathematical tables which was the cause of the cross-reference (and whose title Mr. Copeland carefully transcribes) is a comparatively common book, having gone in its time through several editions. Its name is thus of not infrequent occurrence in catalogues, being placed under De Prasse with a reference to Mollweide, or *vice versa*; and, so catalogued,