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. No notice is taken of anonymous communications.]

Science at Oxford

THE anonymous "Oxford Man" who so effectively reformed his Alma Mater on paper in the last number of NATURE can hardly be complimented on his successful and unfilial misrepresentations. It is not true that "of all the 360 fellowships in the various colleges only five are held by persons (exclusive of professors) who have been elected to them in consideration of their attainments in physical science." At the present moment no less than six fellowships are being held by *biologists*, viz., at Exeter, two; at Magdalen, two; at Pembroke, one; and at Ch. Ch., one; and two fellowships at Merton, one at Brasenose, one at C. C. C., and two at Ch. Ch., are tenable for physics or chemistry solely. It is true that one Merton fellowship and the one at Corpus is at the moment vacant, but this does not affect the question. Thus there are *twelve* instead of five fellowships in the hands of natural science honour men, and considering the few who graduate in the science school as compared with the vast crowds who in the aggregate go out in other schools, the number is by no means despicable. There is, moreover, the equivalent of a fellowship held by the Millard Lecturer in physics, who receives from Trinity an annual grant of 200*l*. This list of prizes takes no account of those fellowships in which "the application of mathematics to physics has been allowed to count in establishing a students' claim to such fellowship."

It is difficult to make out why the statistics of 1875 should have been selected by "an Oxford Man," to whom one would imagine the calendar for 1877 should be by no means inaccessible, and the conclusions to which consideration of these statistics has led him irresistibly suggest to those who know Oxford as it is, that "an Oxford Man's" survey is retrospective.

That the public schools pay so little heed to physical science is matter for regret, which is however tempered by the assurance that a change has been inaugurated in places, and the conviction grows daily stronger that the claims of natural truth are forcing a recognition in these centres of preliminary culture. At Eton, at Rugby, and at Clifton, science is no longer a bye-word and a play, but with masters to teach and willing boys to learn, biology and physics and chemistry are fast becoming realities where, not very long ago, they were but phantom names.

It is folly to hint of "introducing any branch of physical science into any one of the compulsory examinations." Such a course would effectually crush the growing taste for natural knowledge; it is only by leaving it an optional or alternative subject that the present prejudice against the study of science can be satisfactorily subdued.

Only ignorance of the Oxford of to-day could have led to the expression "even the heads of houses are with few exceptions men who have been schoolmasters, or who hope to be so." The Master of University, and the Dean of Christ Church can alone claim to have served in the capacity which has been asserted of the majority. The conclusion of the sentence quoted is ridiculous when applied to the senior members of the collegiate bodies.

The concluding paragraph of "an Oxford Man's" article is perhaps most glaringly indicative of sublime ignorance of the Oxford of to-day. Those whose interest, it is assumed, "it is to suppress a class of studies of which they are themselves ignorant," include many names honoured even in metropolitan centres of scientific culture; and it would better become all "Oxford men" who, *in absentia*, are prone to think of the University as they knew it, to assure themselves that things have remained *in statu quo*, than to censure in ignorance that a little careful inquiry would completely dispel.

Magd. Coll., Oxford, March 12

CHARLES H. WADE

Just Intonation

OTHER occupations have prevented my replying sooner to Col. A. R. Clarke's amusing charge (vol. xv. p. 353), that it is I (instead of he himself) who "confound vibration numbers with their ratios." Three examples are included in his first letter: "The vibration numbers of the diatonic scale being represented by—

$$1, \frac{9}{8}, \frac{5}{4}, \frac{4}{3}, \frac{3}{2}, \frac{5}{3}, \frac{15}{8}, 2."$$

The figures are correct in this instance, but instead of being "vibration numbers," they represent only the *ratios* of vibration.

Then follows: "if we build the scale upon the dominant $\frac{3}{2}$ the vibration numbers will be—

$$1, \frac{9}{8}, \frac{5}{4}, \frac{45}{32}, \frac{3}{2}, \frac{27}{16}, \frac{15}{8}, 2,"$$

and if we built upon the sub-dominant $\frac{4}{3}$, the vibration numbers will be—

$$1, \frac{10}{9}, \frac{5}{4}, \frac{4}{3}, \frac{3}{2}, \frac{5}{3}, \frac{16}{9}, 2."$$

Such ratios as these could not pass unchallenged in NATURE, therefore I drew the anonymous writer's attention to the second and third scales, only pointing to the first intervals in each, and as "oversights." It was reasonable to expect that he would submit the scales to some competent musical friend, who would correct them throughout. Instead of doing so, the Colonel announced himself, and had the courage to write, "the errors and oversights with which Mr. Chappell charges me are imaginary." Under the plea of "making the matter clearer," he changed the ratios (January 18), but still he could not set them right. Col. Clarke's third letter convinces me that he does not permit his figures to be called in question by any person. Perhaps, then, one illustration of the Colonel's system of making, or of transferring,

ratios may interest the reader. I select his $\frac{45}{32}$, because its source may perhaps be pointed out. Mr. Colin Brown introduced that ratio as from F to B natural in the scale of F. The Colonel saw that F, G, A, and B *natural* were four consecutive long keys, and so also were G, A, B, and C, therefore the ratio of the one ought to do for the other. It was excellent geometry, because all the keys are of the same width; only, whether they were tones or semitones cannot have entered into the Colonel's calculation.

It may be assumed that Mr. Colin Brown did not construct any harmonic instrument of six octaves above F, in order to hear such a thorough dissonance among the quarter-tones as $\frac{45}{32}$ vibrations sounding in cycles against $\frac{9}{8}$, but that he had a sheet of paper before him, and added the intervals $\frac{9}{8}$ to $\frac{5}{4}$. The

$\frac{9}{8}$ was for the major tone from F to G, and the $\frac{5}{4}$ for the major

Third from G to B. This $\frac{9}{8}$ from F to G, might have assisted the Colonel to correct his sub-dominant scale.

Allow me to add a note which may be in time for Mr. George Grove's glossary. I now recollect that the so-called "Comma of Pythagoras" is claimed by Boethius, and, as his treatise was once a college text-book, it was in all probability from it that the moderns first applied the name "comma" to that most minute of intervals. It is a favourite plaything with mathematicians, but, being inaudible as a sound, whether as a difference, a ratio, or any other way, it may well be spared from books upon mundane music.

WM. CHAPPELL

Stratford Lodge, Oatlands Park, Surrey

Typical Division of Stars.—Borrelly's Comet

EXCUSE me asking you to allow me to rectify a statement in NATURE, vol. xv. p. 344, col. 2. It is stated there that M. Konkoly has followed M. Vogel's typical division of stars. I beg to observe that this typical division has been proposed by myself since my first publication in 1866 (*Memorie of the Societa Italiana*, ser. iii. tom. i. p. 1) and *passim* in my first publications.

Again you say that M. Vogel discovered, in 1871, the bright lines of β Lyræ. I beg you also to note that these lines were announced by myself in my first publication of the same year, 1866, and even printed in the special catalogue of spectral stars, published in Paris in 1867, and widely circulated (p. 21). I have also announced that these lines were invisible in after years.