

very admirable manner, showing that they possess a perfect acquaintance with the subject.

There are, however, a few minor blunders; thus, for instance, the substitution of the word "length" for "longitude" in connection with the perihelion and node, plays havoc with the elements of a comet's orbit, given on p. 584, while the diagram on p. 387, illustrating the change of wave-length, is rendered unintelligible by the misplacement of the figures indicating miles per second.

A Practical Arithmetic on an entirely New Method. By John Jackson. (London: Blackie, 1885.)
Principles of Arithmetic. By Homersham Cox, M.A. (Cambridge: Deighton, 1885.)

As the title-pages indicate, these attack the subject from quite different sides: the former is eminently practical, and everything unpractical is carefully eschewed: the latter goes into the principles and considers all from the theoretic side, giving very little practice.

Mr. Jackson aims at giving the easiest and shortest rules he can; explanations are few, the deficiency to be met by black-board illustration. The fractional form for the solution of questions is adopted in the advanced rules; but the most noticeable feature is the exclusion of the rule of "subtraction" and the substitution of what the writer calls "incremental or complementary addition." To take an example in compound complementary addition:—A pays a bill of 15s. 8½d. with a sovereign; the tradesman says, "15s. 8½d. with a farthing (puts it down) make 15s. 9d., and 3d. (puts it down) make 16s., and 4s. (puts it down) make one pound." There is no new difficulty introduced here, and a beginner is taught a good practical lesson. There is a vast collection of examples, numerous examination papers, and a good store of sums worked out on the usual plan, as well as on that put forward by the writer. There are 25 pages of tables containing specific gravities, a mariner's compass, a perpetual calendar (to A.D. 1925), compound interest results, square and cube numbers, prime numbers and logarithms. Some space, as might be expected, is devoted to "mental arithmetic." We have shown, we think, that this book well merits its title of a "practical" arithmetic.

Mr. Cox at once states "the object is to give an account of the principles of arithmetic, omitting all merely mercantile applications." The author takes as his guide, in the main, Cantor's "Geschichte der Mathematik," consulting also Hankel and Nesselmann ("Algebra der Griechen"); but "the conception of the subject as a whole, and many of the details, have been taken from the mathematical portions of the works of Auguste Comte, and in especial from his last great work, the 'Synthèse subjective.'"

There is no index nor table of contents, which is a drawback to the ready use of the book. There is an introduction, and then come seven chapters. Chapter I. discusses Numeration; Chapter II. is devoted to the first four rules in four sections; Chapter III., on Properties of Numbers, is divided into four sections: (1) Theorems (the commutative, the associative, and distributive); (2) G.C.M.; (3) Prime and Composite Numbers; (4) L.C.M. Chapter IV., in four sections, treats of the four rules for fractions, and in the fifth section discusses Ratio and Proportion. Chapter V., in six sections, treats of Decimal fractions. Chapter VI., in four sections, discusses powers and roots, with geometrical illustrations and resumes (in Section IV.) the subject of Ratio and Proportion (applied to incommensurable quantities). Chapter VII., in three sections, resumes the discussion of Properties of Numbers, as regards Permutations, the Arithmetical and Geometrical Progressions, and Figurate Numbers. There are a few exercises appended to the sections. The book in parts reminds us much of De Morgan's Arithmetic: it will be valuable for teachers, even if they have read the works cited in Mr. Cox's pre-

face. It is by no means a school-book, though senior boys may derive much interest as well as profit from its perusal.

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.]
 [The Editor urgently requests correspondents to keep their letters as short as possible. The pressure on his space is so great that it is impossible otherwise to insure the appearance even of communications containing interesting and novel facts.]

The Recent Total Eclipse of the Sun

By last mail I sent you a brief account of my eclipse observations at Taboraite on the 9th inst., and a diagram illustrating the corona. Owing to a miscalculation as to closing time of mail the account had to be very hurriedly written; there was no time to revise it or to find out the longitude and latitude of the point of observation, but this information I am now able to supply from the Trigonometrical Survey Records at Napier:—

Centre of railway station at Taboraite, Hawkes- bay	} Longitude	} Latitude
	} 176° 5' 7"·07 ...	} 40° 13' 17"·22

The longitude and latitude of the nearest Trigonometrical Station, No. 83, from which the above were calculated, seems to have been originally fixed with reference to Trigonometrical Station No. 60, Lighthouse Reserve, Napier, whose latitude then, according to observations taken in January 1871, was 39° 28' 47"·30. According to fresh observations taken in February 1885 the latitude of the same point is 39° 28' 43"·52 ± 0' 0"·04. If both series of observations are correct, a reduction in latitude to the extent of about 3"·78 must have taken place since 1871.

Considering the position of New Zealand at the Antipodes of Europe, where a reduction of latitude seems to have occurred, a reduction like the one above indicated, bearing as it does on a very interesting question, has particular importance and urgently calls for confirmation. As mentioned in my last letter, the corona reminded me of an auroral display. The rays all seemed radially disposed and perfectly straight with well defined edges. The differences in length were very remarkable. All the observers I have spoken to agree as to the position of the longest ray, but not as to that of the others. The public attention was, however, fixed on the red protuberances and the other phenomena of the eclipse, and little notice was evidently taken of the corona.

N. A. GRAYDON

Hastings, Hawkesbay, New Zealand, September 25

Ophthalmologic Education in the United Kingdom

I DID not see your notice of my translation of Fuchs's "Causes and Prevention of Blindness" until to-day. I find two accusations brought against me, which I do not admit to be well founded.

(1) I am accused of "mistranslation" because I have often rendered "Augenheilkunde" by the word "ophthalmology." You state that "the treatment of diseases of the eyes" would be the correct translation. "Ophthalmic medicine," which is my alternative translation, is more correct than the translation you offer; but ophthalmology is quite sufficiently correct, and in many cases is employed by the author indifferently with "Augenheilkunde," to express the same thing. No doubt "ophthalmology," etymologically considered, is a more comprehensive word than "Augenheilkunde" or its English synonym "ophthalmic medicine;" but custom has sanctioned its employment in the limited sense of the latter word in Germany, in France, and in this country. Thus the Professor of Ophthalmic Medicine in Vienna was Professor of Ophthalmology. Fuchs constantly speaks of "ophthalmological clinics," and in many of the medical schools of this country the lecturers on what is in other schools called "ophthalmic surgery," "diseases of the eye," &c., are called lecturers on "ophthalmology" (King's College, Yorkshire College, Liverpool University College, Owens College, Catholic University School of Medicine, Dublin).

(2) I am blamed for not correcting Fuchs when he says, "As a rule no regular lectures on ophthalmology (Augenheilkunde)