

PERMIT me to remark that far from "ignoring" Messrs. Hall and Knight's use of the terms "Elementary" and "Higher" for the two parts of their Algebra, I have called special attention to it. It seems to me that the term "Higher Algebra" (*algèbre supérieure*) having been employed by Serret as embracing "the algebraic resolution of equations" in general, and that of "Modern Higher Algebra" by Salmon for what "with greater precision might be called the Algebra of Linear Transformations," it is hardly open to the writers of what is really a text-book of elementary algebra in two parts to apply the same term to the second part of their work, and to object to a gentle protest from a reviewer. I am at a loss to see where in my subsequent remarks I have practically ignored their own use of the terms.

I observed that "the fundamental laws of algebra are for the first time gathered together and discussed in the thirty-fourth chapter." This implies that they have appeared *dispersedly* in the book before, but the references in this chapter hardly justify the contention that they have appeared as "*the fundamental laws*." In fact, the distinctive law of ordinary algebra that $ab = ba$, instead of being emphasized, is introduced as a fact "with which the student is familiar in arithmetic" ("Elementary Algebra," Art. 13), and nothing more said, as perhaps at this early stage might be expected. So again the "remainder theorem" does in fact appear in an article, *marked with an asterisk*, at the end of a chapter of "Miscellaneous Theorems" in the "Elementary Algebra," but only as an isolated proposition with a few exemplifications of its use. The point of my remark was that I should have expected such a fundamental theorem to be put in the forefront and largely made use of in the chapter on "Harder Factors." I would suggest this for the consideration of the authors in a future edition.

In like manner, as to my remark on the roots of equations involving radicals, the caution, which I regret that I overlooked in p. 99, appears only as a remark on one particular example, while nothing is said about it in the next, to which it is equally applicable, and in the answers at the end I find roots given which do not satisfy the equations as they stand. It is the practice of not requiring the pupil to select the signs suitable to each root, which I regretted to find that our authors in this way sanction.

Regard for your space prevents my adding more than the single remark that I regret that the practical commercial consideration of the cost of the first part of the book should have necessitated what I have regarded, and what, by urging this plea, the authors seem almost to admit, as, in itself, a "defect of plan." On reconsidering the matter for a future edition, the authors will, I cannot help thinking, find it possible, as it is desirable, to transfer so much from the second to the first part as will make the latter sufficient by itself, as at present it hardly is, for many pupils who need only a small portion of their higher part.

R. B. H.

On the Constant P in Observations of Terrestrial Magnetism.

HAVING been absent from town, I have to-day for the first time seen the letters of Prof. Harkness and Mr. Ellis on the calculation of P.

Though unaware that it was used at Greenwich, or elsewhere, Dr. Thorpe and I have, for a year at least, employed the formula given by Mr. Ellis in the reduction of observations made for the magnetic survey. We have, in fact, made it still more accurate by the addition of another term. Thus, if we write l and l_1 for $\log A$ and $\log A_1$, and μ for the modulus, it may easily be shown that—

$$P = \frac{r_1^2 r^2}{r_1^2 - r^2} \times \frac{l - l_1}{\mu} - \frac{r_1^2 r^2 (r_1^2 + r^2)}{2(r_1^2 - r^2)^2} \left(\frac{l - l_1}{\mu} \right)^2 \text{ nearly.}$$

Using the metric system of units and taking as is usual $r = 0.3$, $r_1 = 0.4$, this becomes—

$$P = 0.4737 (l - l_1) - 1.947 (l - l_1)^2.$$

The value of P for our first year's work calculated by the ordinary method is '000817. Deduced from the formula given by Mr. Ellis it is '000824, which the second term given above reduces to '000818.

In this case the effect of the correction on the value of H is considerably below the error of experiment, but as attention has been drawn to the matter, it may be as well to point out that by

means of the second term the accuracy of the approximation can be readily tested without the trouble of calculating P directly.

ARTHUR W. RÜCKER.

September 21.

A Meteor's Flash and Explosion.

AT 8.52 p.m. (Dublin time) of yesterday, Tuesday, September 13, my wife and I while walking home were startled by a sudden bright flash like lightning, but slower and more regular in its movement. Simultaneously an intensely brilliant meteor shot majestically across the sky from north-north-west towards south-south-east, passing near, but to the eastward of, the zenith in its route. It seemed to take its origin from between the Pointers and the constellation Perseus, and died out at a height of 25° or 30° above the horizon.

Precisely three minutes and a half later a dull report was heard, which resembled that of a very distant field-gun, or of a peal of thunder far away, but it did not reverberate as thunder would have done.

It was impossible not to connect the phenomena of the flash and the report with each other. I accordingly made a rough calculation, which gave 43.4 miles as the distance—not necessarily vertical, but absolute—at which the meteor had become incandescent, and exploded, as a result of its collision with the earth's atmosphere.

JOHN WILLIAM MOORE.

40 Fitzwilliam Square West, Dublin, September 14.

A Monstrous Foxglove.

MR. TENNANT in NATURE of September 22 (p. 482), after describing a curiously abnormal specimen of *Digitalis purpurea*, writes to ask if "such monstrous forms are at all usual." Thinking your correspondent may be unacquainted with Mr. Herbert Spencer's "Principles of Biology," I write to draw his attention to p. 226, vol. i. of that work, where, in speaking of some foxgloves growing in Derbyshire, Mr. Spencer says of one:—

"The following are the notes I took of its structure:—First or lowest flower on the stem, very large; calyx containing eight divisions, one partly transformed into a corolla, and another transformed into a small bud with bract (this bud consisted of a five-cleft calyx, four sessile anthers, a pistil, and a rudimentary corolla); the corolla of the main flower, which was complete, contained six stamens, three of them bearing anthers, two others being flattened and coloured, and one rudimentary; there was no pistil, but, *in place of it*, a large bud, consisting of a three-cleft calyx, of which two divisions were tinted at the ends, an imperfect corolla, marked internally with the usual purple spots and hairs, three anthers sessile on this mal-formed corolla, a pistil, a seed-vessel with ovules, and, growing to it, another bud of which the structure was indistinct. Second flower, large; calyx of seven divisions, one being transformed into a bud with bract, but much smaller than the other; corolla large, but cleft along the top; six stamens with anthers, pistil, and seed-vessel. Third flower, large; six-cleft calyx, cleft corolla, with six stamens, pistil, and seed-vessel, with a second pistil half unfolded at its apex. Fourth flower, large; divided along the top, six stamens. Fifth flower, large; corolla divided into three parts, six stamens. Sixth flower, large; corolla cleft, calyx six-cleft, the rest of the flower normal. Seventh and all succeeding flowers normal."

F. HOWARD COLLINS.

Churchfield, Edgbaston.

THE "UMBRIA'S" WAVE.

I HAVE been instructed by the Meteorological Council to send you the following report of the *Umbria's* wave from Capt. Watson, F.R.Met.Soc., who is General Superintendent of the Cunard Line of steamers.

HENRY TOYNBEE,
Marine Superintendent.

Meteorological Office, September 18.

MY DEAR CAPT. TOYNBEE,—I send you all the particulars I can get regarding the so-called "big wave" that struck the *Umbria*. No doubt there were some big waves knocking about the Atlantic on the morning of