

carried out, the results of which, owing to Dr. Sachs's untimely decease, will, we fear, never be given to the public.

Leaving Calabozo, Dr. Sachs continued southwards to San Fernando de Apure, and thence down the Apure and Orinoco to Ciudad Bolivar, the capital of this part of Venezuela. From Ciudad Bolivar steam quickly carried him to Trinidad, and thence back to Europe. Of this section of his journey, as of the former part, Dr. Sachs's narrative is full of interest—nor will any one who reads it fail to regret that so promising a life should have come to such an early conclusion.

OUR BOOK SHELF

*Education as a Science.* By Alexander Bain, LL.D. (C. Kegan Paul and Co., 1879.)

THIS work, belonging as it does, to *The International Scientific Series*, naturally calls for some notice in our columns. We must confine our remarks, however, to the portions which deal with Mathematical, Physical, or Natural Science. The author, though Professor of Logic and English Literature, has already appeared before the public as one of the Editors of *Arnott's Physics*, and has laid down the law in a somewhat peremptory way about Elementary Geometry. We expect to find, therefore, accurate science, and above all, clear and definite composition, in his work.

The first of the following extracts supplied a hint which enables us to make the book review itself. We have taken the liberty of italicising a few words, in other respects we quote *verbatim*.

"Definite descriptions of definite failures, without note or comment, are a power to punish. When there are *aggravations, such as downright carelessness*, a *damaging commentary* may be added; but in using *terms of reprobation*, still more strict regard has to be paid to discrimination and justice. The degrees of *badness* are sometimes numerical . . . this very *definiteness literally stated* is more cutting than *epithets*."

"The phrase '*cæteris paribus*' (other things remaining the same) is a mathematical coinage, for guarding against the error of supposing that a course (*sic*) will produce its effect under all circumstances indiscriminately."

"The advantages above set forth are such as Mathematics is peculiarly fitted to give, and *without which they* are scarcely ever attained at all. In so far as the physical sciences unfold similar advantages the way is paved for them by Mathematics. To this short sketch of what Mathematics does, we should, for the sake of clearness, append what it does not do, *and must be left undone*, if we stop with it."

"The earlier parts of such subjects as Geometry and Algebra need the *longest* iteration: the progress should be at an *accelerating* rate. The higher Mathematics should not be commenced with immature or incapable minds."

"How to embody the actual problems in mathematical language,—for example, the problems of motion in the scheme of differential coefficients,—is a standing embarrassment, not to be met by any of the arts of ordinary tuition."

"Try a child to lift a heavy weight first by the direct pull, . . ."

"Many trials must be allowed to *get a child into a new shade of vowel*, as, for example, when Scotch (*sic*) children have to learn the English sound of 'all.'"

"A high wrangler is a man professionally fitted for some special post involving Mathematics; but, if he turns to one of the other professions—Law, Medicine, the

"Church, the Public Service, *he has incurred* an irreparable waste of human strength."

Having attentively perused these extracts, the reader will probably be prepared to consider the following statement as more than plausible:—

"A purely psychological or metaphysical education *might* be the worst case of any . . ." P. G. T.

*Life in Asiatic Turkey. A Journal of Travel in Cilicia, Isauria, and parts of Lycaonia and Cappadocia.* By the Rev. E. J. Davis, M.A. Map and Illustrations. (London: Stanford, 1879.)

MR. DAVIS resides as Chaplain at Alexandria, and the present thick volume is the result of a tour in Northern Syria, in the summer of 1875. It is surprising that a region so full of interest should have been so little visited, and therefore Mr. Davis's account of what he saw is specially welcome. That there is much to interest in these parts is evident from all that Mr. Davis tells us, and his quiet and painstaking narrative will well reward a careful perusal. The pictures, coloured, from drawings by Mr. Davis, are unusually good, and add greatly to the interest of the volume, which is likely to take its place as a standard reference-work on the region with which it deals.

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 ensure the appearance even of communications containing interesting and novel facts.]

Tempel's Comet

WE find in NATURE, vol. xix. p. 347, some detailed particulars about the return of the comet 1867 II. (Tempel) in the course of the present year. In this article Sandberg's calculations are also taken into account. The real value of his studies about this comet seems to be but little known, as in other instances as well, new calculations are based upon them. In the *Astron. Nach.* Sandberg has only given a very short account of the results of his researches, and it is therefore but natural that their real value must be more or less concealed. Sandberg has published the details of the first determination of the orbit in a special treatise (*Specimen Inaugurale de Orbita Cometæ II., 1867, Zwollæ, 1869*), which seems to be not very much known, and it is not necessary to read much of this work to make sure of the negative value of the calculations.

I now take the liberty to give here some short notices, which are, however, quite proof enough to keep astronomers eventually from unnecessary calculations. Sandberg makes use of all observations, and forms the normal places by the deviations of the different observations from the provisional ephemeris. In doing this he rejects, "prompted by the example of others," (*sic*) all observations which deviate more than 1' 5". in R.A., and 20" in D. from the ephemeris, and not from the average. If, for instance, as with a normal place the mean deviation comes to + 14" in D., he rejects observations which deviate 6" from this average, whereas he accepts others to their full value, the deviation of which from the average is nearly 30" (- 14" from the ephemeris).

According to this proceeding is the accuracy of his calculations. An observation of Pulkowa deviates, according to his calculation, from the normal difference in D. (- 2' 2") 21" (18" 9). If he had taken the parallax with correct sign, the observation would deviate 4" from the average. In the same manner the above-mentioned great deviation from the average is wrong, and does in reality only come to about 3". These facts are sufficient. It would be easy to mention many others of similar nature, but I do not think it necessary to take up more room in your esteemed periodical.

W. VALENTINER

Mannheim Observatory, March 10