

possesses an independent grasp of the subject. The only notable instance of lack of insight is in the section on continuants, where two pages (pp. 179, 180) are unintentionally devoted to proving the theorem—

$$\frac{mA}{mB} = \frac{A}{B'}$$

this very theorem itself being employed in the proof. Mr. Hanus will doubtless yet come to see that the book in which this originally appeared requires to be perused in a spirit of scepticism rather than of faith. We may note also that the identity (5) on p. 37 is exactly the same as (3) on the preceding page, that the footnote on p. 196 is misleading, and that the investigations referred to on p. 199 might with advantage have been further drawn upon. These latter, however, are small points which can be attended to in the second edition. The book, on the whole, is trustworthy, and well adapted for College use. On this account, and as being the first American text-book on the subject, it deserves a cordial welcome both in America and in Britain.

THOMAS MUIR.

#### OUR BOOK SHELF.

*The A B C of Modern Photography.* 22nd Edition. (London: The London Stereoscopic and Photographic Company, 1887.)

ALTHOUGH this is called a new edition, it is really a new book, having been reconstructed and much new matter added. Those who are about to begin photography cannot do better than study and carry out the instructions which are here clearly stated. The book is divided into two parts.

In Part I. the beginner is taken through the whole process—exposing, developing, printing, &c.—and this is followed by tables of weights and measures.

Part II. contains good accounts of all the advanced parts of the art, such as re-touching, portraiture, &c., together with chapters on photo-micrography, instantaneous photography. One of the latest developments of photography is shown in the "detective book camera," which has the appearance of an octavo book of a thickness corresponding to about 200 pages. The new method of taking negatives on paper is fully described. Lastly, under the headings of "New Apparatus and Processes," Rayment's patent tripod top is mentioned, which allows the camera to be pointed in any direction, and also the patent photographic Gladstone bag, which is fitted up so as to contain a complete photographic outfit. We must not omit to say that the book is fully illustrated, the frontispiece being a photo-mezzotype taken by a pupil of the Stereoscopic Company.

*Newcastle-upon-Tyne Public Libraries.* Supplementary Catalogue of Books added to the Lending Department. (London: G. Norman and Son, 1887.)

IN this supplement the compiler has given nearly as much space to 10,000 volumes as was occupied by twice that number in the catalogue published in 1880 (see NATURE, vol. xxiii. p. 262). Most of the works have been published since 1880, but some earlier books have also been added. The rapid accumulation of knowledge makes it extremely difficult to provide adequate references to the subjects of pamphlets and of articles in treatises and serial publications. The compiler has, however, recognized the importance of this part of his work, and the results of the labour he has devoted to it will be of real service to students who may have occasion to consult the supplementary catalogue.

#### 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.]

#### Thought without Words.

I DO not see that Prof. Max Müller's theory of the inseparability of thought from language, whether true or erroneous, has any important bearing on the origin of man, whether by evolution or otherwise. It is a question at all events to be studied by itself, and to be tested by such experiments as we can make by introspection, or by such facts as can be ascertained by outward observation.

My own opinion is strongly in favour of the conclusion urged by Mr. F. Galton. It seems to me quite certain that we can and do constantly think of things without thinking of any sound, or word, as designating them. Language seems to me to be necessary to the progress of thought, but not at all necessary to the mere act of thinking. It is a product of thought; an expression of it; a vehicle for the communication of it; a channel for the conveyance of it; and an embodiment which is essential to its growth and continuity. But it seems to me to be altogether erroneous to represent it as any inseparable part of cogitation. Monkeys and dogs are without true thought not because they are speechless; but they are speechless because they have no abstract ideas, and no true reasoning powers. In parrots the power of mere articulation exists sometimes in wonderful perfection. But parrots are no cleverer than many other birds which have no such power.

Man's vocal organs are correlated with his brain. Both are equally mysterious because they are co-operative, and yet separable, parts of one "plan."

ARGYLL.

Argyll Lodge, Kensington, May 12.

HAVING much of the same experience as Mr. Galton, I nevertheless prefer dealing with a larger group of facts. I have often referred to the mutes of the seraglio at Constantinople, who cannot be charged with thinking in words. They have their own sign conversation among themselves, and which has no necessary reference to words. Even the names of individuals are suppressed among themselves, though they sometimes use lip reading to an outsider to make him understand a name. Anyone having a knowledge of sign language is aware that it is independent of words. The tenses of verbs, &c., are supplied by gestures.

The mutes are not deficient in intelligence. They take a great interest in politics, and have the earliest news. It is true this is obtained by hearing, though they are supposed to be deaf-mutes, but among themselves everything is transmitted by signs.

HYDE CLARKE.

32 St. George's Square, S.W., May 12.

I THINK that all who are engaged in mechanical work and planning will fully indorse what Mr. Francis Galton says as to thought being unaccompanied by words in the mental processes gone through. Having been all my life since school-days engaged in the practice of architecture and civil engineering, I can assure Prof. Max Müller that designing and invention are done entirely by mental pictures. It is, I find, the same with original geological thought—words are only an incumbrance. For the conveyance and accumulation of knowledge some sort of symbols are required, but it appears to me that spoken language or written words are not absolutely necessary, as other means of representing ideas could be contrived. In fact, words are in many cases so cumbersome that other methods *have* been devised for imparting knowledge. In mechanics the graphic method, for instance.

T. MELLARD READE.

ON reading Mr. Galton's letter, I cannot help asking how Prof. Max Müller would account for early processes of thought in a deaf-mute: does he deny them?

S. F. M. Q.