

purposes of a judgment. The finished conceptions are known to be standing, as it were, already built, and do not require to be mentally named, or newly reconstructed, in every act of thought. And similarly with respect to propositions, although we cannot doubt, from inquiries which we have made, that some eminent thinkers habitually employ the "*verbum mentale*" in the mechanism of their thinking much more than others equally eminent, yet we do not believe that any man who ever thought was in any large measure really dependent upon this *verbum*. Indeed it appears evident that in all cases that mental seizure of perceived relations, in which an act of judgment as such consists, must be prior to the statement of the act, whether internally or externally. No doubt the statement may serve in many cases to give clearness and precision to the judgment after it has been formed; but even here we are convinced that some thinkers are much less dependent upon this artificial assistance than others. In some minds whole trains of conscious reasoning upon matters of the most abstruse kind may pass without a single act of predication being performed, until the necessity arises for considering how these trains of reasoning may be expressed to other minds.

We have dwelt upon this point, because it is one to which we should like to see the attention of our psychological readers directed. But we may now conclude by saying that every one who desires to have his information on psychological matters brought up to date ought to procure this excellent text-book. It must have involved immense labour on the part of its author, and the result is one which deserves the substantial gratitude of the public.

GEORGE J. ROMANES

OUR BOOK SHELF

Numerical Exercises in Chemistry. By T. Hands, M.A., Science Master in Carlisle Grammar School. (London: Sampson Low and Co., 1884.)

THERE are now several of these small books of questions in chemical arithmetic before the public, and although serving a very useful purpose, the tendency to run into purely arithmetical exercises with a flavour of chemical connection or application is apparent to a greater or lesser degree in all of them. This is to be regretted, as there is plenty of room for purely chemico-arithmetical problems and questions. And then again it is not desirable that more time than necessary should be taken up by the chemical student in solving arithmetical problems, seeing the immense amount of work to be done by the chemical student before he attains to a very moderate knowledge of the subject. We have an ever-increasing number of students who pass elementary and advanced examinations but who are completely fixed by problems in practical or theoretic chemistry whose solution demands only a knowledge of the fundamental properties of the elements and the effects of mass or temperature. The questions in this little book are varied and not too numerous in any one section, and should be useful as leading up to chemical *thinking*.

Chimie Elementara. Partea I. Metaloides. By Prof. Licherdopol. (Bucharest, 1884.)

THIS is a text-book in use in the technical school in Bucharest, and for an elementary work contains a very large amount of matter, and with the usual exception of having theoretical considerations in the early part of the book it is well arranged. The present part deals with the so-called non-metallic elements, which are arranged and

treated in order of valency. At the end of each section are questions and problems. The appendix contains some good tables for the qualitative testing for acids and non-metallic substances and on rational formulæ, both for mineral and organic substances. The work has a decidedly practical stamp, and should be well adapted for a technical school of a general character.

Voyages of Discovery in the Arctic and Antarctic Seas and Round the World. By Deputy Inspector-General R. McCormick, R.N., F.R.C.S. Two vols. (London: Sampson Low and Co., 1884.)

It seems rather late in the day for Dr. McCormick to tell the story of the various voyages in which he took part, in two handsome and richly illustrated volumes. He is certainly extremely diffuse, and has evidently no idea of perspective and proportion. However, we can pardon much in a venerable officer who has done good service to his country and to science in his day, especially since his volumes contain much that is really valuable. Dr. McCormick was with Sir Edward Parry in 1827 in the attempt of the latter to reach the Pole from Spitzbergen. But the greater portion of the first volume is occupied with the journal he kept when serving as surgeon in Ross's Antarctic Expedition of 1839-43; curiously he mentions only once or twice the name of Sir Joseph Hooker, whose classical Antarctic and other Floras were the result of his exertions during the same expedition. The second volume is occupied with the account of a boat voyage by Dr. McCormick in search of Sir John Franklin, and with his own exceedingly minute autobiography. The student of science will find much to interest him in these volumes; the very large-scale illustrations of the forms of ice seen during the Antarctic voyage are of special value.

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.]

Science and the Sandhurst and Woolwich Examinations

AS one of a class of private tutors who, because they possess the secret of successfully preparing lads of moderate ability for the above examinations, are invidiously or ignorantly termed "crammers," I should like to say a few words on the subject of your excellent leader in NATURE of June 26 (p. 189).

With the opinions and suggestions therein propounded, I most cordially agree, and I believe they would be indorsed by every true friend of real education throughout the country. One or two of the facts connected with the table of percentages admit of an explanation founded on considerations besides those adduced by the writer, the exposition of which will, I think, tend to confirm still more the truth of the general conclusions arrived at. Thus the high percentage of success in French, both for Sandhurst and Woolwich, depends a good deal on the fact that it is compulsory for the preliminary examination in each case, a candidate naturally pursuing for his "further" examination, a subject which he has already partially acquired. It is, besides, *notorious* that this subject is highly marked.

Again, the percentage in the geography and geology for Sandhurst would not be so high were it not that a non-classical Sandhurst candidate generally pitches upon it as offering the easiest choice in the way of a fourth subject, because six questions in the paper are pure geography, a subject which is again obligatory for his "preliminary," while the geology, as the writer remarks, may perhaps be more readily crammed than any other scientific subject.

In the case of a Woolwich candidate who relies mainly on his mathematics, the necessity of a fourth subject is not so much