kurgans. As to the ethnic character of the people who spread them over this vast Scythian region, we have the direct testimony of the traveller Rubruquis, who, when visiting the Polovtzi or Kumans—the scourge of mediæval Russia—actually witnessed their erection over the grave-mounds or kurgans of that race. Their Turko-Tataric origin is indeed entirely borne out by their physiognomy, which, as I have myself had occasion for observing in various parts of Southern Russia, is of an unmistakably Mongolian cast, and their dress and accoutrements thoroughly bear out this identification, the head-gear in some instances being identical with that still worn by some Tekke-Turkomans. Individual divergences of type in some of the western examples may of course show that these Mongolian images were imitated by Wendish or Old Prussian, Polish, or Lithuanian hands. Two things, however, may be regarded as certain: that the stone figures of the steppes are of Turko-Tataric origin, and that the date of their Baltic reproductions is considerably later than Neolithic times.

ARTHUR J. EVANS.

VOLTAIC ELECTRICITY.

Voltaic Electricity. By T. P. Treglohan, Head Master, St. James's Science and Art Schools, Keyham, Devonport. (London: Longmans, Green, and Co., 1888.)

ONE occasionally hears of the evil effects of cram and bad teaching which the system of examination and payment by results so extensively made use of by the Science and Art Department is supposed to encourage. If such books as the above are in general use by teachers or candidates, it cannot be denied that the evil is very serious.

There is little of reasoning or explanation anywhere; but, instead, there are strings of statements which would, if they were accurate, consist of ready-made answers for such questions as may be set for the first stage or elementary course of voltaic electricity. At the end of the book will be found the elementary questions in voltaic electricity for the last twenty years, with numbers attached showing the pages where the answers may be found.

The book professes to be largely experimental, and the student is urged to make the apparatus and to try the experiments described. A few extracts will show how utterly misleading it is in this respect.

If the tongue is placed between a penny and a half-crown, "a feeble spark is seen as contact is made between the two metals."

"The missing Zn" (owing to the action of a voltaic cell) "is found in the cell, either in the liquid or at the bottom, as a grayish-coloured deposit."

"This" (the bichromate) "was a strong cell, and was tolerably constant; but, after a short time, was weakened in consequence of crystals of chrome alum forming in the liquid. To prevent this crystallization, the liquid must be frequently disturbed, either by lifting the plates out of it, or by some other means."

After speaking of the Daniell, Bunsen, and Grove, the author describes the Leclanché as "another very constant cell."

To show that zinc and carbon have a greater E.M.F. than zinc and copper in a cell, a condenser and two electroscopes are recommended to be used. In the figure the plates are shown separated and connected each to the zinc or copper and to one electroscope, of which the leaves are widely divergent. The student is not told that the connections must not be so made, nor is any practicable method of making the experiment described.

"In brine the positive and negative elements have the same relative order as in dilute acids; but in ammonia the relation is reversed, and those that were negative in the former case will be positive in the latter."

"It is found that the wire attached to the Cu, C, or Pt has free statical electricity apparent at its terminal, which repels the glass rod rubbed with silk, and that attached to the Zn free statical electricity, which repels the sealing-wax rubbed with flannel."

This extraordinary statement appears five times in a few pages.

Three or four Grove's cells are "necessary" to electrolyze acidulated water; the hydrogen gas collected in one of the tubes of a voltameter explodes "with a tolerably loud report." When a solution of common salt is electrolyzed, "the sodium of the salt and the hydrogen of the water" (appear) "where the current leaves the cell."

"Another simple experiment is to send the current through a solution of iodide of potassium. A brown substance—iodine—is seen at the anode, and the metal potassium at the cathode."

It is doubtful what some passages mean, as for, instance, the paragraph:

"If any number of plates be used together, the E.M.F. of such a cell would be the result of the difference of potential of the two plates which are furthest apart in the electromotive series."

Frequently, the language is more than careless; thus, after speaking of sulphuric acid and sulphate of copper, the author says *other* binary compounds; and, after describing the action of a solenoid, he says coils and helices *also* exhibit magnetic properties.

Those expressions of doubtful meaning—intensity and quantity—are freely used, as is the word potential, which fortunately has not its meaning explained. The names of some of the units are met with for the first time in the sentence: "Current strength is calculated in amperes, electromotive force in volts, and resistances in ohms." Not a word of explanation is given.

NATURAL HISTORY OF VICTORIA.

Prodromus of the Zoology of Victoria. Decades 1–15. By Prof. F. McCoy. (Melbourne, 1878–87.)

JUST ten years ago, Prof. Frederick McCoy decided, under instructions from the Victorian Government of the day, to commence the publication of a series of short descriptions, accompanied by coloured figures, of the indigenous members of the different classes of the animal kingdom. These were to be published in parts containing ten plates in each, which have appeared with commendable regularity to the present time. As the fauna of Victoria was not as well known as its flora, it was a necessary preliminary, in order to effectually carry out such a scheme, to have a large number of drawings made, as opportunity arose, from the living or