Ohio, the whole constituting the broadest study on the "Great River Age" that has been made. He considers the great lakes as largely valleys of subaërial erosion, traversed by the Grand River which he has worked out. The Ancient buried course of the Niagara, the author considers as interglacial, being formed and closed subsequent to the closing of the Dundas Valley. Of course, all this presupposes the action to have been going on when the continent was six hundred feet higher, and from the pot-holes in the New York Harbor, we know it to have had an altitude of at least 900 above the present elevation. To perfect the work there remains the discovery of the outlet of Lake Ontario, which was not by the Mohawk, as in its valley near Little Falls, it passes over hard rock. Yet Prof. Spencer insinuates, in this paper, that he is on the track of this discovery also, and that the study will be pursued during the coming summer. We wish the author every success, and if this ancient outlet be discovered, certainly he will have added much to his already most important discovery, and will fairly be considered as one of the founders of this new scientific development.

It must be further stated that the author does not consider all the ancient buried rivers now running southward, but formerly flowing northward, as having in any way been derived from glacier action, and more recently than the paper, which we are reviewing, a notice by him was read before the American Philosophical Society showing that the Monongahela flowed directly northward by the upper Ohio, Beaver, Mahoning and Grand Rivers of Ohio (the last three reversed in Preglacial times) to Lake Erie, thus adding another important tributary to the Erie Basin and further changing the physical features of the Continent.

This paper, which is the first preliminary notice of his work on the Great River Age, will do much to draw attention to the interesting subject which is destined to have an equal place with Glacial Geology, with the extreme views of which it will be found to conflict more or less.

ON M. C. FAURE'S SECONDARY BATTERY.

The researches of M. Gaston Planté on the polarization of voltameters led to his invention of the secondary cell, composed of two strips of lead immersed in acidulated water. These cells accumulate and, so to speak, store up the electricity passed into them from some outside generator. When the two electrodes are connected with any source of electricity the surfaces of the two strips of lead undergo certain modifications. Thus, the positive pole retains oxygen and becomes covered with a thin coating of peroxide of lead, while the negative pole becomes reduced to a clean metallic state.

Now, if the secondary cell is separated from the primary one, we have a veritable voltaic battery, for the symmetry of the poles is upset, and one is ready to give up oxygen and the other eager to receive it. When the poles are connected, an intense electric current is obtained, but it is of short duration. Such a cell, having half a square metre of surface, can store up enough electricity to keep a platinum wire 1 millim. in diameter and 8 centims. long, red-hot for ten minutes. M. Planté has succeeded in increasing the duration of the current by alternately charging and discharging the cell, so as alternately to form layers of reduced metal and peroxide of lead on the surface of the strip. It was seen that this cell would afford an excellent means for the conveyance of electricity from place to place, the great drawback, however, being that the storing capacity was not sufficient as compared with the weight and size of the cell. This difficulty has now been overcome by M. Faure: the cell as he has improved it is made in the following manner:

The two strips of lead are separately covered with minium or some other insoluble oxide of lead, then covered with an envelope of felt, firmly attached by rivets of lead. These two electrodes are then placed near each other in water acidulated with sulphuric acid, as in the Planté cell. The cell is then attached to a battery so as to allow a current of electricity to pass through it, and the minium is thereby reduced to metallic spongy lead on the negative pole, and oxidised to peroxide of lead on the positive pole; when the cell is discharged the reduced lead becomes oxidised, and the peroxide of lead is reduced until the cell becomes inert.

The improvement consists, as will be seen, in substituting for strips of lead masses of spongy lead; for, in the Planté cell, the action is restricted to the surface, while in Faure's modification the action is almost unlimited. A battery composed of Faure's cells, and weighing 150 lbs., is capable of storing up a quantity of electricity equivalent to one-horse power during one hour, and calculations based on facts on thermal chemistry shows that this weight could be greatly decreased. A battery of 24 cells, each weighing 14 lbs., will keep a strip of platinum ⅝ths of an inch wide, 1-32nd of an inch thick, and 9 feet 10 ins. long, red hot for a long time.

The loss resulting from the charging and discharging of this battery is not great: for example, if a certain quantity of energy is expended in charging the cells, 80 per cent of that energy can be reproduced by the electricity resulting from the discharge of the cells; moreover, the battery can be carried from one place to another without injury. A battery was lately charged in Paris, then taken to Brussels, where it was used the next day without recharging. The cost is also said to be very low. A quantity of electricity can be produced, stored, and delivered at any distance within 3 miles of the works for 1½d. Therefore these batteries may become useful in producing the electric light in private houses. A 1250 horse-power engine, working dynamo machines giving a continuous current, will in one hour produce 1000 horse-power of effective electricity, that is to say 80 per cent of the initial force. The cost of the machines, establishment, and construction will not be more than £40,000, and the quantity of coal burnt will be 2 lbs. per hour per effective horse-power, which will cost (say) ½d. The apparatus necessary to store up the force of 1000 horses for twenty-four hours will cost £48,000, and will weigh 1500 tons. This price and these weights may become much less after a time. The expense for wages and repairs will be less than ¼d. per hour per horse-power, which would be £24 per day, or £8800 a year; thus the total cost of one-horse-power for an hour stored up at the works is ¾d. Allowing that the carriage will cost as much as the production and storing, we have what is stated above, viz., that the total cost within 3 miles of the works is 1½d. per horse-power per hour. This quantity of electricity will produce a light, according to the amount of division, equivalent to from 5 to 30 gas burners, which is much cheaper than gas.—*Chemical News*.

MICROSCOPY.

We offer the following notes culled from the pages of the *Journal of the Royal Microscopic Society*:—

A singular species of Ncarus is described by A. D. Michael, found by him at Land's End, England. It belongs to the genus *Dermaleichus* (Koch) *Analges* (Nitsch) but does not fit into any of the five genera, or sub-genera, into which Robins has divided the group. The leading feature in this curious creature was that the male had the left leg of the second pair conspicuously larger than its fellow on the right side, had a totally different tarsus, and supported by a different and more powerful epimeral and sternal arrangement. This deformity makes this species entirely different to any other *Ncarus*.

Haustein has observed in the central cells of *chara*, chlorophyll-bodies containing starch which could not be regarded as the product of assimilation. C. Dehnecke has now investigated a number of similar instances, in which the starch contained within the chlorophyll-grains appears not to serve the purpose of immediate assimilation, but to be stored up as a reserve material.

A new stereoscopic eye piece has been arranged by Professor E. Abbe. The special feature of this instrument