on recognisable geological factors, namely, the wearing out of the chasm of the Zambesi and the retrocession of its falls, we have an advance in our positive knowledge as to the remote age of the Palæolithic stone implement beds of South Africa. H. W. FEILDEN.

Terminology in Electrophysiology.

TAKING the diagram given by Dr. Fraser Harris (p. 5), all writers will agree with him that A is positive plate and negative pole, and I believe that the use of the word "zincative" has gone some way to promoting this agreement.

Dr. Harris goes on to say that no loophole for confusion could be left if the qualifying words *externally* or *internally* were added, by stating, *e.g.*, that A is internally electropositive to B and externally electronegative to B.

I find three objections to this suggested clarification:—(1) The expressions thus qualified are cumbrous, and must infallibly become abbreviated in current language by omission of the qualifying words.

(2) The expression "externally electronegative" contradicts the conventional use of the word "electronegative" which is attached to the plate and not to the pole.

(3) There is no provision for the complementary qualification to denote that a tissue is capable of being aroused to electromotive action, *i.e.* capable of being rendered zincative, *i.e.* zincable.

I freely admit that this convenient jargon offends the ear while arousing the understanding. I will gladly bury the words "zincative" and "zincable" when they have fully served their purpose as danger-signals that confusion is possible; but until we have agreed that active tissue shall be called "externally or galvanometrically negative" or "internally electropositive" I do not think loopholes for confusion have been closed. I should be satisfied with the old external word "negative" if it did not involve the conception of an internal "propagation of a wave of negativity," and the occasional misstatement that a wave of electronegativity is propagated through nerve and muscle. I should be glad to say that A is electropositive to B if I were not convinced that the prefix "electro" would be occasionally dropped to the further confusion of the reader accustomed to be told that A was (externally) negative.

So that, *en attendant mieux*, in order that there may be no confusion as to my own meaning that A is externally negative and internally positive, I say that A is like zinc or zincative. The parable, if there be parable, is intended to point out and avoid a confusion, but there appears to be an unfortunate tendency to confuse an indication of confusion with an introduction of confusion.

The physicist does not help us much. When he has appreciated the ambiguity of our physiological language, which is of physical origin, he supposes it to be no more than another case of the ambiguity familiar to us in the naming of accumulator poles, where, in order to avoid the perplexities that would arise from calling the same plate positive during charge and negative during discharge, the convention has become accepted always to call positive the plate that is connected with the positive pole of the charging battery or dynamo.

Our trouble is that there is among physiologists no accepted clear convention analogous with this convenient custom of miscalling the positive plate of an accumulator in a perfectly intelligible manner. Therefore again, when it seems particularly desirable to indicate seat of activity and direction of current internally as well as externally I still say "*zincative*" in order that there may be no mistake of meaning. A. D. WALLER.

BOTH Dr. Harris (p. 5) and Prof. MacDonald (p. 28) somewhat misrepresent the use by physicists of the signs + and −. As applied to a closed circuit they are purely relative, each point being simultaneously positive to all points on one side of it and negative to all those on the other. The confusion arises from the fact that terms belonging properly to electrostatics were adopted long ago in describing the phenomena of the galvanic battery.

It is impossible to define direction in a circle—or any closed circuit—with less than four points—one lying in a different plane from the other three. In a circle drawn on paper, one of these is given, namely, the position of the observer behind or in front of the paper. If we put two others on the circle there is still ambiguity, for we may go from + to − in either direction, as in the armature coils of a dynamo; but with the use of three symbols the ambiguity vanishes. Thus *abc, bca, cab* indicate one direction, and *cba, acb, bac* indicate the other. As with formulæ containing an asymmetric carbon, the enantiomorph is given by turning the diagram over.

In diagrams of electric circuits some portion of the apparatus, either the source of E.M.F. or the place where it is being used, is tacitly taken as the third symbol, and the signs + and − put on either side of it to indicate which way the current flows. Dr. Waller's word "zincative," to anyone who knows how zinc behaves, indicates without possibility of error the direction of the current across the region that generates it, and the electrically-minded student may trace its course thence by arrows, remembering that while the circuit is closed the tail of each arrow is positive to its head, but directly the circuit is broken the whole of the side that ends with a head is positive to the whole of the side that ends with a tail.

To the physicist the terminology formerly used by physiologists was most confusing—in my own case it conveyed an entirely wrong impression until I had made an experiment with my own hands. It is most desirable that the anomaly should be removed, and in my opinion it may best be done by dropping the unsuitable terms positive and negative, and saying either that current flows from the more active to the less active part of a tissue or that the one is zincative to the other. GEORGE J. BURCH.

University College, Reading, November 11.

Action of Radium Salts on Gelatin.

ON continuing the experiments detailed in NATURE of October 26, I found that lead and strontium salts produced the same results upon gelatin as was the case with radium, but the strontium "growths" were much less vigorous than the others.

On considering the results, it is seen that the metals named are those which form insoluble sulphates, and it occurred to the writer that the "growths" were simply a precipitate of some insoluble body formed by the action of the salts used upon the gelatin.

Various solutions of bouillon and gelatin were prepared, and to each were added a few drops of solution of radium or barium or lead salts, with the result that in each case a precipitate was obtained which on careful examination was found to consist of a sulphate, or at all events an insoluble compound, containing sulphur.

The precipitate produced by the radium salt was tested to see whether it was in any way different from that produced by the barium salt, but, with the exception that it was radio-active, it appeared to be similar in all respects. It was insoluble in strong acids, and gave a sulphide on fusion with sodium carbonate on charcoal, and qualitatively contained no other metal than barium.

In making the experiments, a few drops of the gelatin were placed on a glass slide, and particles of radium and barium salts added as described in the last communication. The "growths" appeared. Some solution of barium nitrate or radium salt was now added to the liquefied jelly. The usual precipitate appeared, and this was filtered off through a porous tube. The clear jelly was now tested with radium and other salts, and no growth could be seen even after seven days.

I think this proves very conclusively what the alleged "growths" are, viz. that they are nothing more than finely divided precipitates of insoluble barium salts. I have examined these precipitates with the highest microscopic power at my disposal, and cannot, in any case, perceive that there is anything of the nature of cell division occurring.

Of course, many pairs of particles may be found, but the grouping must be purely fortuitous.

As there is only a limited amount of matter in the gelatin which can be precipitated by the radium, a concentration occurs at the point of contact of the salt with