Dr. F. H. H. Calhoun, who discussed two features of glaciation in the northwestern part of Montana. The first was as to the relative ages of the ice of the Kewatin ice sheet, and the ice of the mountain glaciers. The second dealt with the question of the Albertan drift period. From data gathered in the three river valleys, the conclusion was reached that the mountain ice was the older of the two sheets. In the valley of Birch Creek a valley train from the mountain glacier was found beneath lake deposit formed in front of the Kewatin ice sheet. In the valley of the Two Medicine River, the moraine of the mountain ice was covered by lake deposit, and in the same valley further east, the moraine of the Kewatin ice sheet rested on a valley train from the mountain glacier. In the valley of the Belly River, the mountain drift was found under the Kewatin drift. Dr. Calhoun also arrived at the conclusion that the so-called Albertan drift sheet of Dawson was nothing more than old river gravels picked up by the Kansan ice sheet, and now found at the bottom of that drift sheet. This paper will be published by the U. S. Geological Survey.

HAVEN METCALF,
Secretary.

ONONDAGA ACADEMY OF SCIENCE.

AT the last meeting of the Academy, held in Syracuse, N. Y., October 21, Dr. H. C. Cooper addressed the meeting on 'Physical Chemistry and its Service to the Other Sciences.'

Physical chemistry was shown to have an important bearing on physiology in virtue of the application of the modern theory of solution to vital processes and the discovery of the similarity of behavior between enzymes and inorganic contact agents. The work of van't Hoff and his pupils on chemical equilibria in various geological formations, and the determinations of the transition-points of geologically important substances were commended to the study of geologists. The speaker also showed how, by physico-chemical methods, various physiologically and mineralogically important substances have been prepared in the laboratory.

J. E. KIRKWOOD,
Corresponding Secretary.

WELLESLEY COLLEGE SCIENCE CLUB.

THE first regular meeting of the club for the year was held at the Whitin Observatory on October 18. Professor Ellen Hayes presented a paper on 'Nature the Master of Man.'

The second meeting was held in the Physics Lecture Room on November 8. Mr. Albert E. Leach, of the Massachusetts State Board of Health, read a paper on 'The Purity of our Food.'

GRACE E. DAVIS,
Secretary.

DISCUSSION AND CORRESPONDENCE.

DAVENPORT'S 'STATISTICAL METHODS.'

TO THE EDITOR OF SCIENCE: In the preface to the second edition of Dr. C. B. Davenport's useful 'Statistical Methods' occur the following sentences: "Especial attention is called to Table IV., which is an extension of Table IV. of the first edition that was calculated by Professor Frederick H. Safford, and appears to have been the first published table of the normal probability integrals based on the standard deviation. More recently Mr. W. F. Sheppard has published in *Biometrika* a similar table. * * *"

In justice to Mr. Sheppard I wish to point out that his tables in *Biometrika* are only the extension of the table which appears in his memoir read before the Royal Society in 1897 and issued in 1898 (cited by Dr. Davenport, second edition, pp. 84, 101). Dr. Davenport's first edition of his 'Statistical Methods' did not appear until 1899. Thus there can be no claim as to priority for Professor Safford's table of 1899. If we desire to be absolutely accurate in the matter, we shall probably not attribute the first published table even to Mr. Sheppard, still less to Professor Safford. On the other hand, Mr. Sheppard's table at present stands quite unsurpassed for its range, accuracy and the number of decimal places in the probability integral.

KARL PEARSON.
UNIVERSITY COLLEGE, LONDON, ENGLAND,
November 5, 1904.

CORALS.

TO THE EDITOR OF SCIENCE: I find myself in the position of an author replying to a

reviewer (pp. 503–5, October 14, 1904) with the greater part of whose remarks he is in cordial agreement, and whose work he has ever found to be characterized by the greatest care and the fullest consideration of every point.

My endeavor has been throughout to clearly show the species and to some small degree their variation, *vegetative, continuous* and *discontinuous*. My reason for not publishing *in detail* my observations on the influence of environment on mode of growth of corals was simply lack of means to pay for the necessary illustrations. I kept careful records of a considerable number of species for this purpose, but on reconsideration *now* I am of opinion that any account, or at least the first account, of the same should be written while still on the reef and capable of verifying any point that may arise. The best way would be to take the necessary physical observations in three or four different environments containing the same species of corals, to carefully chart the character and organisms of the same, and to show photographically their variations. The specimens, from six or eight square yards of each, being subsequently mounted in the positions in which they grew in respect to one another and other organisms, would form most instructive and unique exhibits in any museum which had the funds and enterprise to undertake such a work. The best locality would undoubtedly be the West Indies, since its broader physical conditions are, perhaps, better known than those of any other suitable coral-reef region, and because it is the home round which coral literature is entwined.

I used the term *continuous* in respect to variation in its ordinary sense, excluding, however, *vegetative* variation, that due to the action of the environment on the organism during its growth. I do not restrict the term to series from one locality grading into those from others, as it may be equally well seen in series from one locality, or even from one environment of the same. Where the *modes* of series from diverse localities differ in certain characters from one another, as seems to me frequently to be the case, and yet the individual specimens of the different species merge, we would seem to have before us *true* cases of natural selection acting on *continuous* variation. Yet—and this is the point—*neither new species nor new genera seem to result from this action.*

In attempting to adopt a classification more in accordance with our present ideas than that of Duncan, I found that I had in the works cited by Mr. Wayland Vaughan less than a quarter of the information required to turn out a 'good job,' and less than a sixth of the necessary specimens in Cambridge required to complete the other three quarters. Under the circumstances I treated each genus by itself, satisfying myself first as to its validity, merely adopting a well-known order for convenience of reference. I tried to lay the foundations in the species themselves, and I left the gross classification in the hope that some one, who has the specimens—I know no one more capable and with wider knowledge of recent and fossil corals than your reviewer—might be induced to consider the whole. Further, in the present state of our knowledge I found it hopeless to work out a *scientific* classification, based, as I consider such must be, on the polyphyletic origins of the so-called astræid, fungid and perforate groups.

I have no doubt Mr. Wayland Vaughan is correct in respect to the generic names to which he refers. I have, however, considered the identity of *Mussa* with *Symphyllia* and of *Cœloria* with *Mœcendrina,* and in spite of Professor Verrill's and Mr. Wayland Vaughan's opinions I still separate them; the anatomy and development of their polyps and coralla should be compared and would settle the question.

J. Stanley Gardiner.

Cambridge, England.

SOME FURTHER COMMENTS ON THE GUATEMALAN BOLL WEEVIL ANT.

In his reply to my remarks on the feasibility of establishing the Guatemalan boll weevil ant in Texas, Dr. O. F. Cook shows how dubious are the claims for the much-advertised efficiency of this insect. Clearly there are two distinct problems involved in the discussion; first, the establishment of the boll weevil ant in the southern states, and