(Ithaca, N. Y.), Professor Geo. F. Atkinson offers five courses in botany during the summer of 1898 (Six weeks, from July 5th–August 13th). Three of these courses are especially designed to meet the wants of teachers in the high schools, and one course is to satisfy a growing desire for information concerning mycology.

THE Faculty of the University of Nebraska, after long consideration, have recommended the establishment of three 'general' groups or courses, viz., classical, literary and scientific, for the large class of students who desire general culture rather than specialization along any particular line. In these general groups fully three-fourths of the subjects are prescribed. In every case the aim has been to give the student an introduction to several of the principal lines of modern intellectual activity, without taking him into those phases of each subject which belong to the specialist. For the specialists in language, literature, history, economics and science the groups or courses hitherto existing will be still more extended to meet a growing demand.

THE University of Nebraska is erecting the north wing of its new Engineering Hall, to supply additional rooms for the work in electrical and mechanical engineering. Externally the walls are to be faced with chipped bricks, while all the interior surface is to be of smooth brick finish. This wing will provide about 21,000 square feet of floor space, which is a little less than one-half of the whole building.

AT a recent meeting of the Regents of the University of Nebraska the office of 'Dean of Women' was created, and Mrs. H. H. Wilson, of the class of 1880, was elected to the new office. She will assume her new duties at the opening of the next collegiate year. At the same meeting the Regents took action looking to the development of a department of domestic economy, and Miss Rosa Bouton, M.A., of the class of 1891, was elected to take charge of the work. Miss Bouton has been for six years an instructor in chemistry in the University and has already made considerable progress in the development of work in domestic chemistry.

PROFESSOR JAMES SHELDON, of the University of Wisconsin, has been elected professor of electrical engineering in Lafayette College.

DR. JAMES H. LEUBA, who was elected a year ago associate in psychology and pedagogy at Bryn Mawr College, will begin his courses next year. The fifth floor of Dalton Hall is being adapted to the requirements of a psychological laboratory, and the necessary apparatus is being procured.

WILLIAM B. HAMPSON, B.M.E., instructor in graphics and machine design in the University of Nebraska from 1893 to 1897, has been appointed mechanical engineer for the Oregon lines of the Southern Pacific Railway, with headquarters at Portland, Oregon. Frederic E. Clements, instructor in botany in the same University, has declined an election to the chair of plant pathology in the Maryland Agricultural College.

DR. F. NOLL, of Bonn, has been appointed professor of botany and director of botanical instruction at the Agricultural Academy at Poppelsdorf, in the place of Professor Friedrich Körnicke, who has resigned.

DISCUSSION AND CORRESPONDENCE.

ISOLATION AND SELECTION.

TO THE EDITOR OF SCIENCE: Mr. Hutton's letter in the last number of SCIENCE on 'Isolation and Selection' gives occasion to speak of a common misconception regarding the nature of evolution. So long as we proceed on the fundamental assumption that an organism, left to itself, will continue indefinitely to reproduce its like, neither Isolation nor Selection can be of any service in evolving characters *unlike* those of its ancestors. If heredity, the principle of breeding true, be assumed to be the fundamental principle controlling the generation and development of organic bodies, then the most favorable conditions of existence will be those least interfering with the operation of this principle, and the fittest race, or line of generating individuals, will be that one which reproduces its kind with greatest precision.

The very fact that isolation, or change of environmental conditions, results in increased de-

parture from the ancestral type is evidence that the hereditary principle is not the dominant one in organic activity, not the motive power, so to speak, which keeps up the continuity of living. Heredity is rather to be considered as the resultant of the total constraints and interferences of environment, an equilibrium established between the medium in which the organism lives and its own intrinsic energy. Hence, we may speak of heredity as acquired, while variation, change or evolution is that fundamental principle in all vital activity which constitutes the chief distinctive characteristic of living organic bodies.

It is expressed in the chemical phenomena of metabolism, in which there is a diversion from the normal relations of stability of equilibrium among atoms, up to a state of instability and complexity of composition; physically it is expressed in the phenomena of the cellular bodies passing from rest, simplicity and relative homogeneity, up to states of activity, multiplicity and heterogeneity and the development of the individual; and evolution of a race, or the acquirement of characters not possessed by ancestors, is a still higher exhibition of the same principle.

Undoubtedly Darwin, writing the 'Origin of Species,' thought he had discovered, in Natural Selection, the chief cause of this evolution, and evolutionists have since been following his lead. But a calm review of the facts in the case must convince us that we are no nearer finding the cause of evolution than we were before Darwin. In explaining, so far as we have, the Origin of Species, we have been discovering the relations which natural selection, isolation and other so-called 'factors of evolution' bear to the production of those temporary vortices in the path of evolution which we call 'individuals' and 'species.' The method of action of these 'factors' is by inducing the repetition of favorable steps of variation, swinging them back into cycles of reproduction, and thus making species where favorable conditions exist; in other words, the method is by establishing the habits or laws of heredity within organisms.

It is the recognition of the evolution principle as fundamental that puts us on the right path of discovery. What we have to account for is not the evolution, but the haltings of evolution in the various stages of cell, individual and species.

Given material particles, in motion, in a resisting medium, and vortices are explainable; but no amount of change in the medium is capable of accounting for the initiation of motion in particles normally at rest.

H. S. Williams.

New Haven, Ct., April 26, 1898.

To the Editor of Science: Kindly allow me space for a word of comment on the letter of Professor W. H. Hutton in your issue of April 22d.

Professor Hutton protests against the use of the term Selection in certain cases, saying: "Selection means the act of picking out certain objects from a number of others, and it implies that these objects are chosen for some reason or other." As he refers to my views later on I think it possible that he has seen the table which I published in this Journal, November 19, 1897, reprinting it from a book of mine, in which I note twelve sorts of 'selection' in the current literature of evolution. Seeing that the definition given by Mr. Hutton is pre-Darwinian, and that much of the warfare which Darwin and subsequent evolutionists had to wage was precisely over this term Selection, leaving aside the question whether Darwin chose the term wisely or not in the first instance, it is scarcely possible now to go back to the pre-Darwinian view which Professor Hutton advocates. Indeed, he himself, in this letter says concerning natural selection: "The term has become so firmly established that it can well be allowed to pass if used only in Darwin's sense of advantage gained in the struggle for existence, either by the individual or by the species."

This admitted, there is only one thing to do, that is to recognize the two general uses of the term Selection, the pre-Darwinian (or conscious) Selection, 'for some reason or other,' and the Darwinian (or post-Darwinian) Selection of which *survival on ground of utility* is the sole criterion. Now it is true enough that all sorts of confusion arise from the interchange of these two sorts of selection; and it was with a view

to the correlation of the different conceptions under certain headings ('means' and 'result') that I drew up the table. At the same time, I recommended that Selection in the Darwinian sense should be used only when the essential conditions of organic progress by survival are present, namely, variations* and physical heredity. These requirements the different usages of the table do fulfill; so that as each has its qualifying word ('natural,' 'sexual,' 'organic,' etc.), the use of the term Selection is not ambiguous. Further, in Selection of the pre-Darwinian sort, as defined by Professor Hutton, *whenever it is a question of organic evolution*, these two conditions are also requisite, *i. e.*, variation and heredity, as in Darwin's artificial selection. So while I fully agree with Professor Hutton on the need of sharp definition of Selection, I do not see the need of taking our nomenclature back to pre-Darwinian zoology. Moreover, the attempt would be quite futile.

Professor Hutton goes on to say that Darwin's term 'Natural Selection' is better than 'Organic Selection.' He seems to suppose that the two are used for the same thing. As the proposer of 'Organic Selection' (and all the other users of the term, so far as I know, *e. g.*, Osborn, Ll. Morgan, Poulton, etc., have given it the same meaning) I have only to say that nothing of that sort is intended. Organic Selection is supplementary; it is based upon and presupposes Natural Selection. † It recognizes the positive accommodations on the part of individual animals by which they keep themselves alive and so have an advantage over others *under the operation of natural selection.* I agree with Professor Poulton in holding ‡ that, so far from coming to replace natural selection or impair our confidence in it, it does quite the reverse. And I also think that it explains phenomena of 'determinate evolution' which are not fully explained by natural selection alone. So some such new term is justified; and it is really a form of 'selection' in the Darwinian sense, for it requires both variations and physical heredity. Moreover, it is contrasted with natural selection on a point of which Professor Hutton speaks. He says: "Natural Selection is not truly selection, for the individuals can hardly be said to select themselves by their superior strength, cunning, or what not." Now, 'organic selection' supposes them doing this, in an important sense. It is a sort of artificial selection *put in the hands of the animal himself*—that is, *so far as the results go.*

As to 'isolation' (Professor Hutton's other topic), it is certainly important, but is Professor Hutton right in considering it a positive cause? He says: "It is isolation which produces the new race; selection merely determines the direction the new race is to take," and "isolation is capable of originating new species." But how? Suppose we isolate some senile animals, or some physiological minors, will a new race arise? The real cause in it all is reproduction, heredity with its likenesses and its variations. Both isolation and natural selection are negative conditions: what are called in physical science 'control' conditions, of the operation of heredity. So in seeking out such principles as 'selection,' 'isolation,' etc., we are asking how heredity has been controlled, directed, diverted, in this direction or that. Isolation is as purely negative as is natural selection. Any influence which throws this and that mate together in so far isolates them from others, as I have said in a notice of Romanes' and Gulick's doctrine of isolation,* and inasmuch as certain of these control conditions have already been discovered and otherwise named by their discoverer as 'natural selection,' 'artificial selection,' 'sexual selection,' etc., it is both unnecessary and unwise to attempt now to call them all 'isolation.' For if everything is isolation then we have to call each case by its special name, just the same, to distinguish it from others.

There remains the question as to whether isolation, in the broad sense of the restriction of pairing to members of a group, can result in specific differences without any help from 'selection' of any kind. If that should be

*I there said natural selection and physical heredity, but the first requisite is really the supply of variations.

†See my papers in the *American Naturalist*, June, July, 1896.

‡SCIENCE, October 15, 1897, and *Nature*, April 14, 1898, p. 556.

* *Psychological Review*, March, 1898, p. 216.

proved,* then there would be, it would seem, justification for the term 'isolation' in evolution theory, with a meaning not already preempted. This Professor Hutton claims, with Romanes and Gulick.

J. Mark Baldwin.

Princeton, April 26, 1898.

A VIEW OF THE OHIO VALLEY IN 1755.

Apropos of the interesting historical essay by Mr. Baker (Science, April 22, 1898), allow me to refer to an early and highly appreciative account of the Ohio valley by Lewis Evans, a clear headed contemporary and townsman of Franklin's, and the author of a 'Map of the Middle British Colonies in America,' with a descriptive text published in 1755.

Among other praises, he wrote: "Ohio is naturally furnished with salt, coal, limestone, grindstone, millstone, clay for glass-houses and pottery, which are vast advantages to an inland country, and well deserving the notice I take of them in the map. * * Were there nothing at stake between the crowns of Britain and France but the lands on that part of Ohio included in this map, we may reckon it as great a prize as has ever yet been contended for between two nations; but if we further observe that this is scarce a quarter of the valuable land that is contained in one continued extent, and the influence that a State vested with all the wealth and power that will naturally arise from the culture of so great an extent of good land in a happy climate, it will make so great an addition to that nation which wins it, where there is no third state to hold the balance of power, that the loser must inevitably sink under his rival."

While thus urging His British Majesty to dispute with the French the acquisition of the great Ohio country, Evans argues curiously against any dangerous influence that such an increase of possessions might have on the loyalty of the colonies. "Supposing the Colonies were grown rich and powerful, what inducement have they to throw off their independency? * * * Each colony having a particular form of government of its own, and the jealousy of either having the superiority over the rest, are unsurmountable obstacles to their ever uniting to the prejudice of England upon any ambitious views of their own. But that repeated and continued ill usage, infringements of their dear-bought privileges, sacrificing them to the ambition and intrigues of domestic and foreign enemies, may not provoke them to do their utmost for their own preservation, I would not pretend to say, as weak as they are. But while they are treated as members of one body and allowed their natural rights, it would be the height of madness for them to propose an independency, were they ever so strong."

Evans must have had a sharp eye for topography, as his geographical descriptions are still good enough to quote, and are indeed much better than many accounts of later date. He recognizes the fall line—'this rief of rocks, over which all the rivers fall.' The great Appalachian valley is held to be "the most considerable quantity of valuable land that the English are possest of; and runs through New Jersey, Pensilvania, Mariland and Virginia. It has yet obtained no general name, but may properly enough be called Piemont, from its situation." Of the Alleghenies, he says: "The Endless mountains * * * come next in order. They are not confusedly scattered and in lofty peaks overtopping one another, but stretch in long uniform ridges scarce half a mile perpendicular in any place above the intermediate vallies. * * * The mountains are almost all so many ridges with even tops and nearly of a height. To look from these hills into the lands is but, as it were, into an ocean of woods, swelled and deprest here and there by little inequalities, not to be distinguished one part from another any more than the waves of the real ocean."

Can any of the readers of Science give me a clue by which to reach some of the descendants of this early American geographer.

W. M. Davis.

Harvard University.

MRS. PIPER, 'THE MEDIUM.'

To the Editor of Science: Your reference to my name in the editorial note in Science for April 15th, entitled 'Mrs. Piper, the Me-

* At present it is far from being proved. Cf. Professor Cockerell's review of Romanes in this Journal, April 29, 1898.