Fundamental nutritive requirements may be considered, in a sense, to be satisfied, from one source or other, so long as life continues—if not from the food, then necessarily from the body.

It is sometimes only through the accumulation of discordant experimental results during the course of years that the effects of failure adequately to recognize the principle to which we call attention become apparent.

In spite of the simplicity and obviousness of the foregoing expressions, the experimenter in the field of nutrition will realize that the point of view is exacting and that its full observance would require very much more knowledge of the details of nutrition than is now possessed by any one.

The experimenter can only strive toward finality of results by planning his rations in consideration of the most that is known as to nutritive values of foodstuffs and nutritive requirements of animals—which, in a few words, and in most relations, signifies that in nutritional investigation rations should be complete, perfect and sufficient, in all characteristics except the single one upon which evidence is sought.

Information which would be most helpful, in relation to the whole subject of measures of nutritive effects and requirements, is detailed knowledge of specific nutritive deficiencies in relation to the utilization of food, and as to the extent of the protection, and the time element in the protection, of the animal, from food nutrient deficiencies, which may be afforded by drafts upon its own nutritive reserves.

E. B. FORBES

PENNSYLVANIA STATE COLLEGE

THE LAW OF EFFECT

THORNDIKE[1] has just come out with an unusually striking demonstration of the law of effect, the principle that in learning a "satisfying after-effect strengthens directly the connection producing it," and Ogden[2] has hurried forward to say that after all a dynamical account of such relationships is preferable and that the retroaction of satisfaction simply means that a total temporal integration is most firmly established when it has completed itself. The time may come when the scientific world can do without the concept of cause-and-effect, or may remake it so that a cause can be subsequent to its effect. However, I do not believe that we are yet forced to any such novel view in theoretical psychology. There are at least four possibilities from which to choose:

(1) Success stamps in the preceding action retroactively—which is what the law of effect seems casually to mean, though it may be interpreted as (3) below.

(2) Success is the consummation of a process that is stamped in as a whole, so that the first part of the process actually is affected by a later part—which is, I think, nearly what Ogden means.

(3) Organization of a content, being potentially learning for ultimate reproduction, leaves a trace which persists to be affected by subsequent events. I believe that this view is really Thorndike's.

(4) "Retroactive facilitation" is actually the absence of subsequent inhibition: all mental organization would lead to memory but for the subsequent destruction of the traces, and success provides conditions for minimal destruction. This view is derived from the experiment of Jenkins and Dallenbach.[3]

The difficulty with the first two views is that, simply conceived, they imply the reversibility of time, the dependence of the present upon the future. The temporal Gestalt has, it seems to me, clear value as a scientific concept, but not in the form of (2). With such sensible and plausible alternatives as (3) and (4), why should we refuse, as Ogden does, to discuss the interrelation and mutual effects of the parts of the total integration?

EDWIN G. BORING

HARVARD UNIVERSITY

IS THE SPELLING AMOEBA SACROSANCT?

I HAVE received two or three blue-pencilled copies of a statement made in SCIENCE of February 10 of the current year (page 170) to the effect that: "Generic names are sacred and their spelling may not be changed to suit the whims of writers. Amoeba can not become ameba." Inasmuch as I am one of the illiterate who have dared to use the spelling "Ameba" in a recent book, presumably to the corruption of the youth of the land, my curiosity has naturally been aroused, and I have followed up the matter a bit bibliographically. I find that the original spelling was *Amiba,* a name given by Bary de St. Vincent in 1822. Ehrenberg admits this in a paper in 1830, although he impiously changed the spelling to Amoeba and uses this form of spelling in his well-known monograph of 1838. Surely Ehrenberg had no more right in 1830 to lay profane hands on what is "sacred" than we have to-day, so the *oe* form should have no better standing than the *e* form among zoological ecclesiastics! But then why use the term at all? Taxonomists have agreed, I believe, in accordance with the "International Code of Zoological Nomenclature" to accept the generic nomenclature set forth in the tenth edition of Linnaeus' "Systema

[1] E. L. Thorndike, SCIENCE, 77: 173–175 (February 10, 1933).

[2] R. M. Ogden, SCIENCE, 77: 240 (March 3, 1933).

[3] J. G. Jenkins and K. M. Dallenbach, *Amer. Jour. Psychol.,* 25: 605–612 (1925). *Cf.* W. S. Hunter, "Foundations of Experimental Psychology," 599–605 (1929).

Naturae," and in that edition (1758) Linnaeus termed the creature in question *Volvox chaos,* later changing it to *Chaos protheus* in his twelfth edition. Thus the past nomenclature of Ameba seems to have been almost as protean as the creature itself. I suspect, however, that most of us will go on using the term Ameba or Amoeba, as our respective judgments may dictate. As to Paramecium, since the original spelling was with an *e* and not an *oe* or an *ae,* the correct form is obviously Paramecium.

M. F. GUYER

UNIVERSITY OF WISCONSIN

MORE OHIO MEDUSAE

IN my recent communication on an occurrence of fresh-water medusae at Akron, Ohio,[1] I made reference to the approximate number of such discoveries in the United States. Since I stated mine was the second such occurrence in Ohio, I must make this correction. I inadvertently overlooked others of recent dates.

In September, 1930, some medusae were found in Vermillion River, some in a quarry near Ashland, and in October, 1931, some in a quarry near Toledo, all localities in northern Ohio. These were reported in an abstract by Mr. Robert L. Baird, of Oberlin, Ohio.[2]

WALTER C. KRAATZ

UNIVERSITY OF AKRON

FARADAY'S DIARY

IN a recent review of Faraday's Diary (SCIENCE, Jan. 13) I pointed out that one of the most important experiments in electromagnetic induction, described in the First Series of Experimental Researches, noted as read on November 24, 1831, is entered in the Diary under date of December 26. I ventured to suggest that the date in the Diary must be wrong. After correspondence with Mr. Thomas Martin, the editor of the Diary, I am convinced that it was right. Mr. Martin permits me to say on his authority that considerable additions were made to the First and Second Series of the Experimental Researches in Electricity after the papers were read and before they were published.

No question of priority is involved, and I make this correction only for the sake of historical accuracy.

W. F. MAGIE

SCIENTIFIC APPARATUS AND LABORATORY METHODS

RECENT DEVELOPMENTS IN GRAVITY APPARATUS

THE greatly increased interest taken in the use of geophysical methods in searching for buried geological structure, has resulted in an increased use of gravity apparatus for determining the value of g. For several decades the Von Sterneck invariable pendulum apparatus, or some modification of it, was used by geodesists for determining gravity. The observations were planned to meet the needs of physicists and chemists working in laboratories, and to enable geodesists to determine the figure of the earth or isostasists to study the distribution of densities throughout the earth's crust.

As gravity stations have become more closely spaced, it has been found that there is a definite relation between the gravity anomalies and the density of the rock close to the stations. This relationship is indicated in one way by large differences in anomalies for stations close together, of which there are several notable examples.

The Coast and Geodetic Survey, having had many calls for gravity surveys, assigned E. J. Brown, one of its field engineers, to the task of modernizing its pendulum apparatus, which had been in use since the early nineties. Brown finished his work about a year ago and the apparatus, named after him, has since been given a very severe test in the field, during which about seventy stations were established. The results have been in every way satisfactory. With the Brown apparatus one station a day can be observed, provided the distance between stations is not excessive, while with the old apparatus of the Coast Survey it was impossible to observe satisfactorily more than five stations per month.

The essential features of the Brown apparatus are:

(1) The receiver supports are about in the same horizontal plane as the knife edge on which the pendulum swings. This arrangement greatly reduces the flexure of the apparatus.

(2) The oscillations of the pendulum are made to actuate a photoelectric cell and the impulses are amplified until they operate the chronograph pen. With this arrangement the time signals sent from the Naval Observatory by radio can be compared directly on the chronograph sheet with the oscillations of the pendulum and a chronometer is not needed as an intermediary timepiece.

(3) Another very important feature of the Brown apparatus is that most of the auxiliary parts of the gravity equipment are installed permanently in an automobile truck. These parts include the chronograph, radio apparatus used for receiving the signals, switchboard, batteries, etc. The only important part

[1] SCIENCE, 77: 87, 1933.

[2] *Ohio Jour. Science,* 32: 323, 1932.