members of the faculty of the University of Minnesota: Dr. Richard E. Scammon, of the Medical School, *chairman;* Professor Frederic Bass, head of the department of civil engineering; Dr. George M. Schwartz, associate professor of geology; Dr. Lorenz G. Straub, professor of hydraulics and administrative assistant for the College of Engineering and Architecture, and Professor Raphael Zon, director of the Lake States Experiment Station.

DR. ROBERT A. MILLIKAN, of the California Institute of Technology, Pasadena, gave on December 7 an address at a general convocation at the University of Cincinnati. He spoke on "Science and Individual Opportunity in the Future." Following the convocation Dr. Millikan was guest of honor at a luncheon given by the university section of Sigma Xi.

DR. DAYTON C. MILLER, professor of physics at the Case School of Applied Science, will present a series of three popular science lectures for young people on December 27, 28 and 29 at the Franklin Institute in Philadelphia. These lectures were inaugurated in 1926 under the James M. Dodge Lecture Foundation, and are designed to show by means of experiments the connection between the labors of the scientific men and the effect these labors have on the every-day life of the world. The series is entitled "Sparks, Franklin's Lightning and Jove's Thunderbolts."

ALFRED C. LANE, Pearson professor of geology and mineralogy, emeritus, at Tufts College, gave a lecture at the University Club in Boston on November 23. His subject was: "Does Mother Earth Show Her Age?"

DR. R. R. WILLIAMS, chemical director of the Bell Telephone Laboratories, New York City, gave on December 16 an address on "The Quest for Vitamin B" at a meeting of the Washington Academy of Sciences.

AUSTIN H. CLARK, of the U. S. National Museum, will be the principal speaker on December 7 at ceremonies connected with the celebration of the hundredth anniversary of the Medical College of Virginia at Richmond. The celebration is the last major event on the program of the Richmond Bicentennial.

DURING the coming meeting of the American Association for the Advancement of Science at Indianapolis, the American Society of Naturalists, in addition to arranging the Biologists' smoker on Tuesday evening, is presenting a symposium on Thursday afternoon on "The Nature of Protoplasm," with Drs. W. M. Stanley, S. C. Brooks and Robert Chambers as speakers. At the dinner on Thursday evening Dr. David H. Tennent will give the presidential address on "Some Problems in the Study of Photosensitization."

THE second annual symposium of the Division of Physical and Inorganic Chemistry of the American Chemical Society will be held in Cleveland at the Hotel Statler on December 27, 28 and 29.

DISCUSSION

MAN AND PLANTS IN ALASKA

THAT human agencies directly or indirectly have, wherever man lived, influenced more or less the plant life of the region, is in general well known, but the subject appears never as yet to have been dealt with universally or exhaustively. A highly interesting manifestation in this line occurs in Alaska.

For twelve years now there have been going on, under the auspices of the Smithsonian Institution and the National Museum, anthropological and archeological explorations of Alaska and the Aleutian Islands. Initiated by the writer in 1926 these expeditions have now covered the principal Alaskan rivers, most of the coasts, Kodiak Island and the main parts of the Aleutian chain.

One of the main results of these explorations has been the location of literally hundreds of more or less ancient sites of what once were native villages. And these sites were found to present interesting botanical conditions. They as a rule are located along the rivers and the coasts in the most favorable spots for man's occupation. They cover from approximately one half to over ten acres of ground. They are kitchen middens and village sites combined, their accumulations reach in depth from a few feet in some to over sixteen feet in others, and while some are fairly late others show human occupation of many centuries. The uppermost of their deposits reach from historic to prehistoric (pre-Russian) time. The accumulations consist of ashes, shells, sea-urchin spines, rotted wood and sod, bones of fish, birds and various mammals, including the whale, some blown dust or silt, and of all the organic refuse and cultural objects of such communities. In their constituents, depth and other conditions they are largely to almost wholly different from the soil of their surrounding territory.

Due to these factors, these sites present wide and in cases seemingly almost absolute botanical differences from the rest of their region. With some experience it is possible to detect such an old village site from as far as it can be seen with some clearness. Its vegetation is darker and much richer in development. It not seldom reaches to over four, five and in places even over six feet in height. When seen at close range, moreover, it is seen to consist, and that materially to

predominantly, of different species of plants from those of the neighborhood. Some of these plants apparently exist nowhere else in the region, while not a few of those of the vicinity, in turn, do not grow on the site of the human habitation. Furthermore, the site-flora of one region in Alaska is not the same as that of another region; and even on the same site there will grow different plants according to the nature and amount of the underlying deposits. And in forested regions these sites, though they may border on woods, remain indefinitely free from brush or trees.

A few examples may be mentioned. On Kodiak Island the main plant of these old sites is everywhere the stinging nettle, interspersed with the wild parsnip; and the elderberry bush, rare elsewhere, was found to be common on the sites over burials. The east slope of the point of our pre-Russian site at Uyak Bay, over slate rock, was full every year with fine forget-me-nots, the only ones seen anywhere in the neighborhood. On Amoknak Island (Unalaska), our site was covered, aside of much luxuriant wild parsnip, with a lot of fine monkshood, fireweed and other flowering plants. While at Agatu, westernmost Aleutians, the sites were covered with high stout grass on the slopes and by a thicket of the wild parsnip, with some monkshood and other flowering plants, over the top.

These are mere general notes. What they endeavor to convey is that the old human sites in Alaska—as doubtless also elsewhere where similar accumulations exist—show botanical phenomena which seem well to deserve an expert study. They show that under different chemical and physical conditions in the ground the same region may produce very different and richer flora than is characteristic of the same under ordinary conditions.

ALEŠ HRDLIČKA

U. S. NATIONAL MUSEUM

NUTRITION VS. GROWTH

IT seems possible that clarity might have been forwarded if Rose[1] in his recent review of his splendid studies on the rôle of the amino acids in nutrition in this journal had interpreted his results solely in terms of nutrition and left growth out of it entirely.

These studies and others like them are not studies of the part nutrition plays in growth; they are investigations of whether or not certain amino acids need be in the diet.

Rose might have written: "Some amino acids are dispensable in the diet of rats. This is shown by the fact that the animals will gain in weight to apparently normal extent when these are omitted from the diet. But these amino acids are essentially universal components of living protoplasm. It is therefore inconceivable that they are dispensable components of living substance. It follows that dispensability in the diet is not evidence of dispensability in protoplasm. What these experiments show, then, is that the rat can make these dietary dispensable amino acids from other dietary constituents."

It would seem as if this is the limit to which interpretation of these and similar data should go when the measure of influence is mass or weight change. Mention of growth seems not only superfluous, but even misleading.

In the first place weight loss on withdrawal of a given amino acid is no evidence that the compound is directly significant to growth. The loss may be due to an absolute increase of catabolism by removal of a brake thereon, quite as much as to an absolute decrease in anabolism by removal of a stimulus thereto. It may be due to loss of stored fat or to water drainage. And it is conceivable that growth—or the continued increase in living and essential structural substance—could go on, even though weight is being lost through disturbance in water balance or undue fat combustion.

The same might also hold true in principle where weight remains stationary on withdrawal of a given amino acid from the food of an animal capable of weight increase.

Further—growth is not single, it is multiple, the combined expression of integrated developmental and incremental factors, processes and functions.

Mass or weight increase is obviously no index to which of these several expressions is subject to a given amino acid.

It is conceivable that an amino acid might factor one phase of growth and not another, and hence its influence—determined as it might be by the physiological age and state of the organism at the time of observation—might be masked by coterminous weight or mass changes in the opposite direction due to expression of other activities—be they growth or metabolic.

Also, mass or weight increase measurements by themselves allow no distinguishment even between increment due to growth and that due to storage of fat or any other substance.

Finally, it is conceivable that a given amino acid may have no direct influence on any growth process at all; but only on some phase of metabolism, interference with which might produce a growth reaction secondarily. Thus a compound might act to sustain maintenance or to act as a brake on catabolism. Either effect might produce retardation in weight increase. Yet this alone would give no basis from which one could tell whether the amino acid in question was significant to maintenance, catabolism or growth.

These several considerations, taken together with

[1] W. C. Rose, SCIENCE, 86: 298, 1937.