light of an unconformity, the interval represented being a stage between two high water marks when the old lake-waters completely dried up. Early Bonneville yellow beds are correlated in time with a first epoch of humidity superinduced by conditions of glaciation; while the white later Bonneville beds belong to the second Glacial epoch. The two parts of the section are thus represented as being separated by an erosional interval of long duration, occupying a time between two epochs of large rainfall and notable ice-forming.

Two features in particular militate strongly against these deposits either being normal stream-silts or being laid down during two distinct epochs separated by a long epoch of excessive dryness. This simpler and very different interpretation for the phenomena presented does not postulate violent and frequent changes of climate. It appeals to no other than the ordinary climatic conditions and geologic processes that prevail to-day in the region. It takes into account only the familiar geological activities of the desert.

Close examination of the deposits discloses the fact that they are not typical stream-silts, but that they have a grain very much coarser. In size the individual particles appear to be about midway between those of normal clay and fine sand. Although obscurely laminated the material in all physical aspects seems to be essentially loess or adobe. Thus, instead of being normal river-silts swept into still water these deposits really represent dusts, borne by the winds from the neighboring deserts, that have dropped on the surface of the lake waters and have settled to the bottom.

Compared with desert deposits of other regions the white marly upper beds of the section which have such a variable thickness are essentially what the Mexicans call *caliche*. It is formed through ordinary soil tension by which lime salts of porous formations below are carried to the surface of the ground, where the water evaporates, leaving behind the solids. In some places there is sufficient lime deposited interstitially to give the beds the aspect of chalk. Upon further induration some layers passed into limestone.

The juncture of the yellow and white beds is a sharp, irregular line that is easily mistaken for an erosion uncomformity. That it is not at all probable that in the Bonneville basin this line actually represents uncomformable relationships between the beds above and those below is clearly indicated by the fact that the phenomenon is a common one throughout arid lands where porous formations reach sky.

The yellow Bonneville clays do not appear, therefore, to represent a deposit which was laid down during a high-water precursor of the high-stage Lake Bonneville; and the irregular line separating the yellow and white sections does not stand for a long interlacustrine epoch when the lake waters were completely desiccated, during a dry interglacial time. The white marls seem to be very recent in formation, produced directly from the yellow clays long after Bonneville waters had finally receded. Their especial climatic significance is manifestly very different from that formerly postulated. The ascribed peculiarities are really every-day desert phenomena.

Charles Keyes

Des Moines, Ia.

INTERNAL TELIA OF RUSTS

To the Editor of Science: A recent article[1] lists up the references in pathological literature regarding the production of internal rust spores. The present writer in 1912[2] described such internal production of teliospores in the leaf of *Xanthium Canadense,* in the following words:

> Within the mixture of parenchyma cells and mycelium, which replaces the normal tissue, there are cystlike bodies which are composed of masses of mycelium. These objects are hollow spheres, and from the inner surface arise telial spores exactly similar to those borne in the normal way upon the exterior of the leaf.

[1] "Discovery of Internal Telia Produced by a Species of *Cronartium,*" by R. H. Colley, *Jour. Agr. Research,* VIII., No. 9, February 26, 1917, pp. 329–332.

[2] "Relations of Parasitic Fungi to their Host Plants," *Bot. Gazette,* LIII., No. 5, May, p. 381.

The writer is calling attention to this former note since it was included in an article upon a broader subject, which accounts for the oversight of the reviewer.

ERNEST SHAW REYNOLDS
AGRICULTURAL COLLEGE, N. D.

PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES

THE fifth number of Volume 3 of the *Proceedings of the National Academy of Sciences* contains the following articles:

The laws of elestico-viscous flow: A. A. Michelson, department of physics, University of Chicago. A number of empirical formulas are given.

A new equation of continuity: Frederick G. Keyes, Research Laboratory of Physical Chemistry, Massachusetts Institute of Technology. A comparison of a modification of van der Waals' equation with experimental results extended over wide ranges, showing satisfactory agreement between the equation and experiment.

The classification of vascular plants: Edward W. Berry, Geological Laboratory, Johns Hopkins University.

Displacement interferometry in connection with U-tubes: C. Barus, department of physics, Brown University.

Attempt to separate the isotopic forms of lead by fractional crystallization: Theodore W. Richards and Norris F. Hall, Wolcott Gibbs Memorial Laboratory, Harvard University. One may infer that the molal solubilities of the nitrates are probably essentially identical, and that isotopes are really inseparable by any such process as crystallization.

Hybrids of Zea tunicata and Zea ramosa: G. N. Collins, Bureau of Plant Industry, U. S. Department of Agriculture.

Distribution of gall midges: E. P. Felt, New York State Museum, Albany, New York. A discussion of the existing distribution and of hypotheses concerning the way in which it may have been brought about.

Fertility and age in the domestic fowl: Raymond Pearl, Biological Laboratory, Maine Agricultural Experiment Station. There is a steady and progressive decline in fertility after the first breeding season.

A kinetic hypothesis to explain the function of electrons in the chemical combination of atoms: William A. Noyes, department of chemistry, University of Illinois.

Transverse displacement interferometry: Carl Barus, department of physics, Brown University.

The proteins of the peanut, Arachis hypogœa: Carl O. Johns and D. Breese Jones, Protein Investigation Laboratory, Bureau of Chemistry, Department of Agriculture, Washington. Peanut meal contains a high percentage of lysine and could well be used to supplement a diet of corn and wheat.

A design-sequence from New Mexico: A. V. Kidder, Phillips Academy, Andover, Mass. It has been possible to identify five successive steps in the modification of a design.

The equilibrium between carbon monoxide, carbon dioxide, sulphur dioxide and free sulphur: John B. Ferguson, Geophysical Laboratory, Carnegie Institution of Washington.

Physiological effect on growth and reproduction of rations balanced from restricted sources: E. B. Hart, E. V. McCollum, H. Steenbock and G. C. Humphrey, departments of agricultural chemistry and animal husbandry, University of Wisconsin. Studies pointing to the necessity of the accumulation of further information on the *physiological* behavior of feeding stuffs.

What determines the duration of life in metazoa? Jacques Loeb and J. H. Northrop, Laboratories of the Rockefeller Institute for Medical Research, New York. *Drosophila* has a temperature coefficient for the duration of life of the order of magnitude of that of the chemical reaction. Since we know that the duration of the larval stage is determined by a specific hormone, we must consider the possibility that the duration of life is also primarily determined by the formation of a hormone in the body.

The interrelation between diet and body condition and the energy production during mechanical work in the dog: R. J. Anderson and Graham Lusk, physiological laboratory,