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.

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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, Cornell University Medical College, New York City. The accomplishment of a given amount of mechanical work is always at the expense of a given amount of energy and the amount of energy required for the mechanical work is independent of the physical condition of the subject and of the quantity of carbohydrate present in the gastrointestinal tract.

Report of the annual meeting: Award of medals, research grants from the trust funds.

Edwin Bidwell Wilson
Massachusetts Institute of Technology,
Cambridge, Mass.

SPECIAL ARTICLES

NOTE ON THE SWELLING OF GELATINE AND AGAR GELS IN SOLUTIONS OF SUCROSE AND DEXTROSE

The tests reported in this note were made incidentally in connection with experiments by D. T. MacDougal[1] on the swelling of cactus tissues (*Opuntia*) and of certain artificial gels in water and in dilute solutions of acids and alkalis. The method was the same in all particulars as that described by MacDougal. Small plates cut from thin, dried sheets of the various gelatine-agar mixtures were placed in the sugar solutions and the increases in thickness which occurred as these plates imbibed water and swelled were measured by the auxograph. The experiments were at room temperature, which ranged between 60° and 70° F. (16° and 21° C.). In all cases the gels were the identical preparations used by MacDougal. The sucrose was the usual "c. p." grade. The dextrose was Merck's "highest purity." The sugar solutions were tested for neutrality to phenolphthalein and litmus. Sugar concentrations are in percentages by weight.

The results are given in the following tables as percentage increases in thickness of the gel plates after approximately 12 hours in the respective solutions. The original thicknesses were measured by a micrometer gauge. Preliminary tests for longer time periods indicated that the swelling was always complete or very nearly so, in 12 hours. In the tables, figures on a single horizontal line represent tests made at the same time and under substantially identical conditions, the only differences being between the concentrations of the sugar solutions.

[1] Science, N. S., Vol. XLIV., pp. 502–505, 1916.

EXPERIMENTS WITH SUCROSE

Distilled Water	0.5% Sucrose	2% Sucrose	5% Sucrose	25% Sucrose	50% Sucrose
Gelatine (without Agar)					
250	315				
250	250	210	260	210	
Gelatine 100—Agar 1					
630	670				
620		710	550	520	330
Gelatine 80—Agar 20					
300	350				
550		400	450	500	250
Gelatine 50—Agar 50					
875	850				
600		525	500	450	275
Gelatine 20—Agar 80					
1,150	1,050				
1,100		1,375	1,150	1,175	425
Agar (without Gelatine)					
825	733				
1,000		1,175	900	700	350

EXPERIMENTS WITH DEXTROSE

Distilled Water	2% Dextrose	5% Dextrose	25% Dextrose	50% Dextrose
Gelatine (without Agar)				
260	310	240	210	210
Gelatine 80—Agar 20				
300	450	400	500	375
Gelatine 50—Agar 50				
625	525	400	375	350
Agar (without Gelatine)				
1,200	1,175	900	725	500