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VITAMIN-FREE CASEIN

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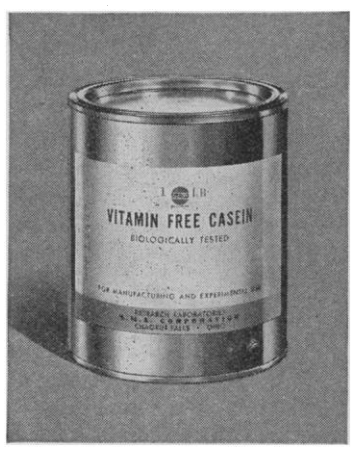
IN VITAMIN EXPERIMENTATION the type of dietary protein employed may well be the most important factor. When Vitamin-Free Casein SMACO is the protein in the deficiency diet, uniform and consistent depletion of test animals occurs well within the required time interval specified by the U.S.P. or other standard test methods. Recent work suggests the suitability of Vitamin-Free Casein SMACO for vitamin K[1] and biotin[2] assay and experimental procedures in chicks.



Vitamin-Free Casein SMACO is prepared in our laboratories by a special extraction process which insures a completely vitamin-free product. Each package bears a control number that identifies the protocols showing rigid biological assay, control of uniformity and freedom from complicating vitamin factors.

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1. ANSBACHER, S.: *Proc. Soc. Exp. Biol. & Med.*, 46:421:1941.
2. ANSBACHER, S., and LANDY, M. (In Press).

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● In connection with the greatly increasing number of studies of nutritional problems, investigators have recognized the need for pure chemicals as the individual constituents of basic diets, to eliminate difficulties caused by the introduction of unknown factors. The rapid progress of recent years in the isolation, identification, and synthesis of the vitamins, especially those of the B complex, has fulfilled part of this need, but there remains the problem of the supply of pure amino acids in the required quantities.

The successful activities of Merck & Co. Inc. in furthering research and development of the vitamins, particularly those of the water-soluble group, has led the Company to engage in the commercial production of pure amino acids.

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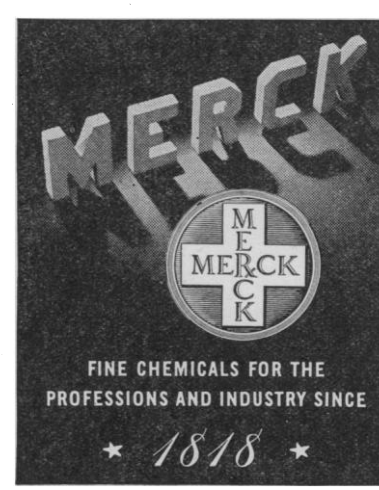
***Available in restricted quantities.**



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THE TRANSITION FROM THE INDIVIDUAL TO THE SOCIAL LEVEL[1]

By Professor H. S. JENNINGS

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THE self-sustaining biological individual in its most elementary, non-social condition is seen in the free single cell. I shall deal with such free single cells, known as Protozoa, and shall try to trace the various directions in which there is transition in their activities from the individual to the social level. I shall deal mainly with those Protozoa which are known as ciliate infusoria.

As criteria of social action several points or relations are distinguishable. First, in any grouping of organisms, are the individuals influencing each other? Second and perhaps more important is the question of the functional value of the relations of the individuals: are there relations of mutual benefit, of cooperation in the performance of necessary biological activities? (In some cases the functional value is negative; the individuals harm each other.)

Third is the question of functional differentiation, of division of labor among individuals that are reaching socially. This is perhaps equivalent to the question whether there exists social *organization*. Only if the individuals play different functional roles is there social organization.

Social behavior commonly manifests itself in the

[1] Symposium on "Levels of Integration in Biological and Social Systems. Group or Population Aspects," University of Chicago, Tuesday, September 23.

lyophiled protein for tissue culture studies, we made quantitative investigations of bacterial survival after certain combinations of chemical treatment and lyophiling.

The test medium chosen was Brewers thioglycollate broth[4] because it supports the growth of anaerobes as well as aerobes.

A local contaminant (gram positive spore-former) was used as a test organism, since previously it had been shown to be more resistant to chemical and thermal treatment (toluene, ether, chloroform, acetone, propylene glycol, various degrees of heat) than any of four standard test organisms,[5] *Staph. aureus, Staph. albus, Ps. pyocyanea, B. subtilis.* The organism was always used as a 24-hour culture of a 24-hour culture.

The results of these experiments are summarized in Tables I and II.

TABLE 1

STERILIZING EFFECT OF CHEMICAL ADDED TO THE DRY RESIDUE AFTER LYOPHILING. NUMBERS EQUAL VIABLE ORGANISMS/ML.

	Incubation 20 hours 37° C.	Lyophiled 24 hours	Lyophiled 24 hours plus Toluene	Relyophiled
Experiment 1	2,900,000	100,000		
Experiment 2	2,800,000		130,000	30

TABLE 2

STERILIZING EFFECT OF CHEMICALS ADDED TO THE AQUEOUS MEDIUM BEFORE LYOPHILING

	Incubation 20 hours 37° C.	Lyophiled 24 hours
Inoculated medium	1,100,000	53,000
Inoculated medium plus toluene	Less than 2,000	0
Inoculated medium plus propylene glycol	Less than 2,000	0

These results indicate that reasonably clean handling of the proteinaceous material, plus toluene treatment and lyophiling, will result in a sterile product.

The material from which proteins intended for subsequent sterile use are to be prepared should be handled in a clean way to reduce sources of contamination. Sufficient toluene should be added to saturate the original material, which then should be worked up in a cool room as quickly as possible to avoid multiplication of the contaminants present. If the product is not sterile, after lyophiling, it may be dissolved in the amount of distilled water removed, toluene again added and relyophiled. In a planned experiment, using organisms in prime condition and using a selective medium, the organisms became non-culturable.

Preparations of fibrinogen, thrombin and plasma, all from slaughter-house beef blood, and of chick embryo extract handled in the open air in non-sterile containers, have been obtained in the lyophiled state in sterile condition in this manner.

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BERKELEY

[4] J. H. Brewer, *Jour. Bact.*, 30: 10, 1940.

[5] M. S. Marshall, J. B. Gunnison, M. P. Luxen, *Proc. Soc. Exp. Biol. Med.*, 43: 672, 1940.

REMOVING FROZEN PLUNGERS OF GLASS SYRINGES

THE method of removing the plungers of frozen glass syringes suggested by McCoord[1] was formerly used in our laboratory exactly as he describes it. However, the difficulty in some cases due to the leakage of the water around the rubber gasket caused me to devise a somewhat surer method.

The same principle is used as that suggested by McCoord in which a small tuberculin syringe is utilized to give the necessary hydraulic pressure. Instead of connecting the two syringes by a hypodermic needle and rubber gasket, we have made use of a connector fashioned from the hubs of two broken hypodermic needles. These are brazed together so that they can be used to join the two syringes. In order to make certain that the hole in the needles has not been plugged up in the process of brazing they are subsequently drilled out with a small metal drill. It is important that all air be removed from the system before exerting pressure. This can be accomplished in the "frozen" syringe by using a fine neeedle which will pass freely through the nipple.

This method has been used in our laboratory for the past five years and has never failed to release the plungers even though they are sealed by coagulated blood.

JOSEPH M. LOONEY

WORCESTER STATE HOSPITAL

[1] SCIENCE, Vol. 94, p. 170.

BOOKS RECEIVED

CHATELAIN, VERNE E. *The Defenses of Spanish Florida, 1565 to 1763.* Pp. vii + 192. Illustrated. Carnegie Institution of Washington.

CORRINGTON, JULIAN D. *Working with the Microscope.* Pp. xi + 418. 121 figures. Whittlesey House, McGraw-Hill. $3.50.

GRAY, GEORGE W. *The Advancing Front of Medicine.* Pp. viii + 425. Whittlesey House, McGraw-Hill. $3.00.

POLYAK, S. L. *The Retina.* Pp. x + 607. 100 figures. University of Chicago Press. $10.00.

RIDGWAY, ROBERT and HERBERT FRIEDMANN. *The Birds of North and Middle America.* Bulletin 50, U. S. National Museum. Part IX. Pp. ix + 254. Illustrated. Superintendent of Documents, Washington, D. C. $0.40.

SEABROOK, WILLIAM. *Doctor Wood; Modern Wizard of the Laboratory.* Pp. xiv + 335. Illustrated. Harcourt, Brace. $3.75.

SWANN, W. F. G. *Physics.* Pp. xi + 274. 94 figures. Wiley. $1.75.