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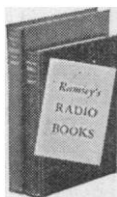
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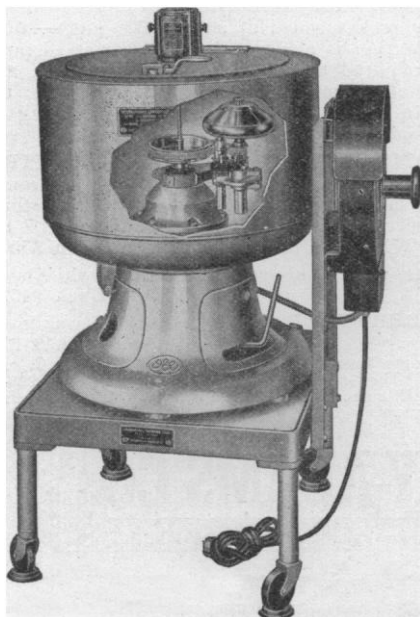
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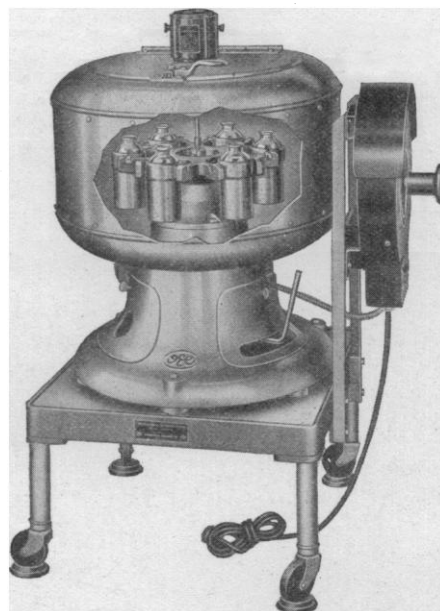
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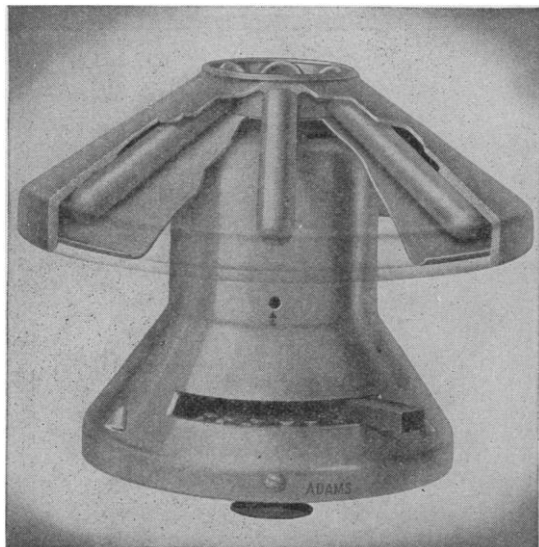


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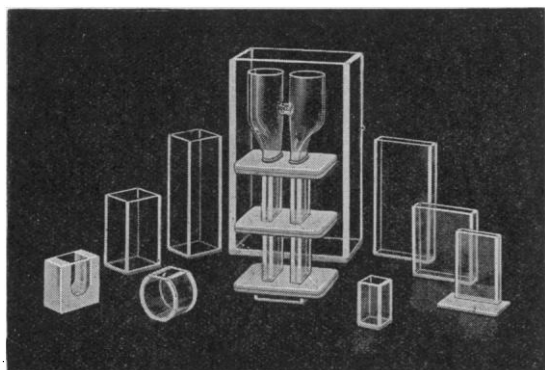
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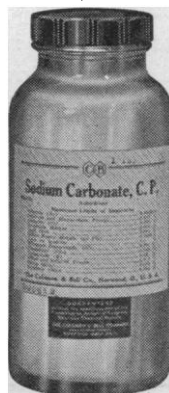
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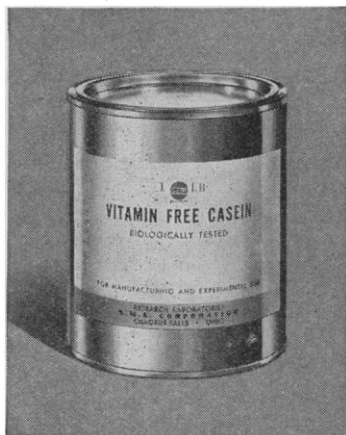
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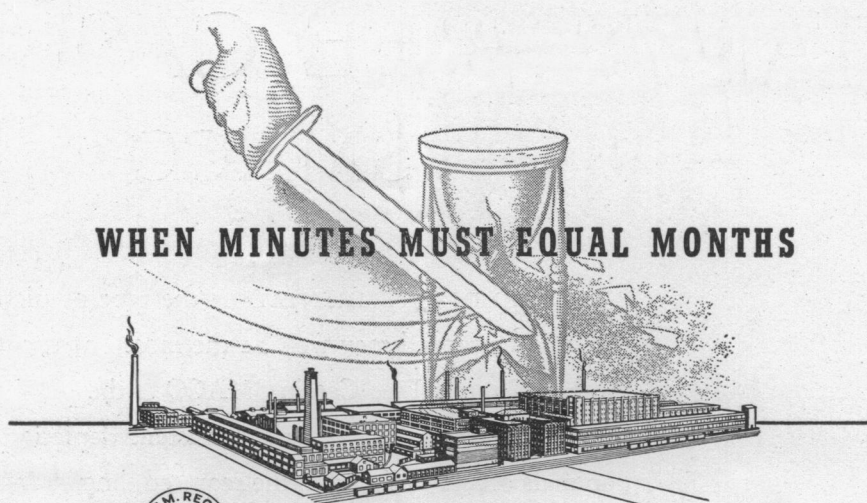
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1. ANSBACHER, S.: *Proc. Soc. Exp. Biol. & Med.*, 46:421:1941.
2. ANSBACHER, S., and LANDY, M. (In Press).

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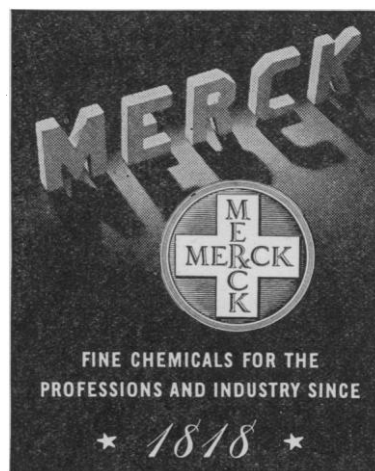
● In connection with the greatly increasing number of studies of nutritional problems, investigators have recognized the need for pure chemicals as the individual constituents of basic diets, to eliminate difficulties caused by the introduction of unknown factors. The rapid progress of recent years in 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.

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SCIENCE

VOL. 94

FRIDAY, NOVEMBER 14, 1941

No. 2446

The Transition from the Individual to the Social Level: PROFESSOR H. S. JENNINGS 447

Obituary:

John Stanley Plaskett: DR. BART J. BOK. *Deaths and Memorials* 453

Scientific Events:

The School of Public Health of the University of Michigan; The Engineers' Council for Professional Development; The Eighteenth Exposition of Chemical Industries; A British Society of Nutrition; The Havana Conference of National Committees on Intellectual Cooperation; Award of the Penrose Medal of the Geological Society of America 455

Scientific Notes and News 458

Discussion:

War Hysteria in Canada: DR. HARRY GRUNDFEST. *Diminution in Ability of the Liver to Inactivate Estrone in Vitamin B Complex Deficiency:* DR. MORTON S. BISKIND and DR. GERSON R. BISKIND. *Pantothen:* PROFESSOR ROGER J. WILLIAMS. *Wanted—Sedimentary Galenas:* PROFESSOR ALFRED C. LANE. *Collection and Filing of Scientific Data:* DR. FR. BLANK 461

Scientific Books:

Papers of Wade Hampton Frost: DR. HAVEN EMERSON 463

Special Articles:

Studies on Inhibition of Fermentation by Yeast Maceration Juice: DR. REINHARD MARCUSE. *On the Porphyrin Nature of the Fluorescent "Blood*

Caked" Whiskers of Pantothenic Acid Deficient Rats: DR. L. W. McELROY and OTHERS. *The Polarographic Curve of Serum from Rats Fed p-Dimethylaminoazobenzene:* PROFESSOR H. P. RUSCH, DR. D. L. MINER and A. J. DIRKSEN. *Vitamin B₆ and Growth of Excised Tomato Roots in Agar Culture:* DOROTHY DAY 466

Scientific Apparatus and Laboratory Methods:

The Preparation of Sterile Proteins in the "Lyophilized" State: DR. IONE RAPP RAILTON, DR. BURRIS CUNNINGHAM and PROFESSOR PAUL L. KIRK. *Removing Frozen Plungers of Glass Syringes:* DR. JOSEPH M. LOONEY 469

Science News 10

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THE TRANSITION FROM THE INDIVIDUAL TO THE SOCIAL LEVEL¹

By Professor H. S. JENNINGS

THE UNIVERSITY OF CALIFORNIA AT LOS ANGELES

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?

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

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 co-operation 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

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

The test medium chosen was Brewers thioglycollate broth⁴ 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.	Lyophilized 24 hours	Lyophilized 24 hours plus Tol- uene	Relyo- philed
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.	Lyophilized 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 lyophilizing, 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 lyophilizing, it may be dissolved in the amount of distilled water removed, toluene again added and relyophilized. 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 lyophilized state in sterile condition in this manner.

IONE RAPP RAILTON
BURRIS CUNNINGHAM
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DIVISION OF BIOCHEMISTRY,
UNIVERSITY OF CALIFORNIA MEDICAL SCHOOL,
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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.

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.

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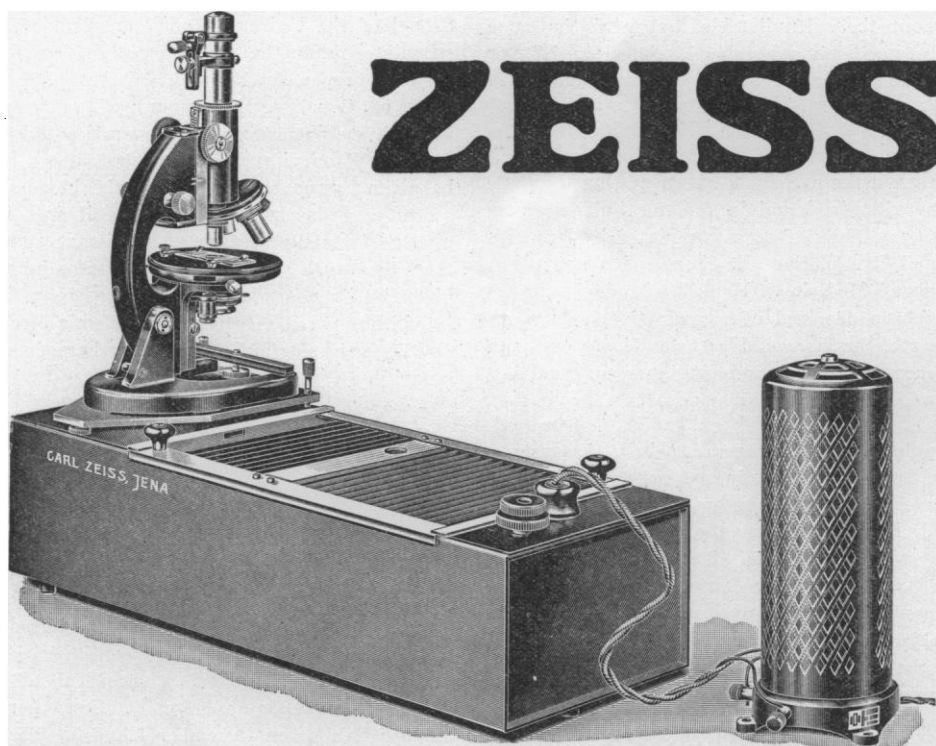
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