

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.

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REMOVING FROZEN PLUNGERS OF GLASS SYRINGES

THE method of removing the plungers of frozen glass syringes suggested by McCoord¹ 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 needle 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.

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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.