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A Machine for Shell-Freezing Biological Materials in Small Glass Ampoules.

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The increasing use of desiccation *in vacuo* from the frozen state as a method for preserving biological materials has created the need for equipment which will shell-freeze small amounts of fluid in a few ampoules without undue effort and expense. The machine described below is suitable for this purpose. It eliminates the irregularities in thickness of shell which result from rotation of ampoules by hand and the prohibitive cost of a single small run in one of the shelling machines designed for large scale production.[1]

A cylindrical block, or rotor, of duraluminum, 4 inches deep and 5 inches in diameter, constitutes the main portion of the freezing unit (Fig. 1 and 2). Eight drilled holes which have a diameter of 11/16 inches for a depth of 2½ inches provide the spaces into which the ampoules fit with a minimum of play. The holes penetrate the entire block to facilitate cooling, but are reduced in diameter to ¼ inches throughout the terminal 2½ inches of their depth, the place at which the diameters change, forms a shoulder upon which the ampoule rests. A small electric motor turns the rotor at 35 r.p.m. through a reducing gear, the shaft of which is directly attached to the duraluminum block by means of a hub and set-screw. The freezing mixture of alcohol and crushed "dry ice" is placed beneath the rotor in a pan in such a manner that only a small segment of the circumference of the rotor is submerged to a depth of no more than ½ inches at its deepest point. The rotor and motor are mounted on a wedge-shaped base so that the outer surface of the rotor has an angle of about 5° with the surface of the chilled liquid.

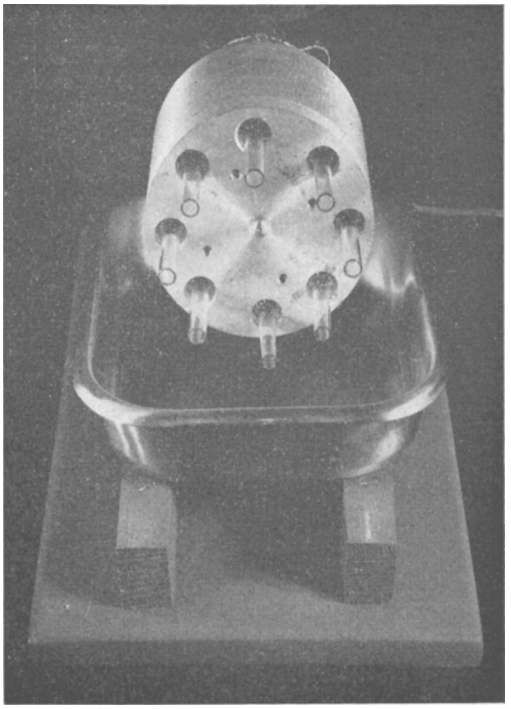

FIG. 1.
A machine for shell-freezing biological materials in small glass ampoules.

In operation, the rotor is first chilled by rotating for five minutes in the freezing bath and the cotton stoppered ampoules are then rapidly inserted in the holes. Approximately one minute is required to freeze an ampoule containing 3 cc of fluid. Approximately 400 ampoules can be processed in an hour with the apparatus illustrated. The unit is particularly useful for freezing small lots, such as one-half to 3 dozen ampoules; for this about 3 to 4 pounds of "dry ice" are required.

Summary. An apparatus is described for the rapid shell-freezing of fluids in small containers preparatory to drying from the frozen state (lyophilization).

[1] Strumia, M. M., and McGraw, J. J., *J. Lab. and Clin. Med.*, 1943, **28**, 1140.

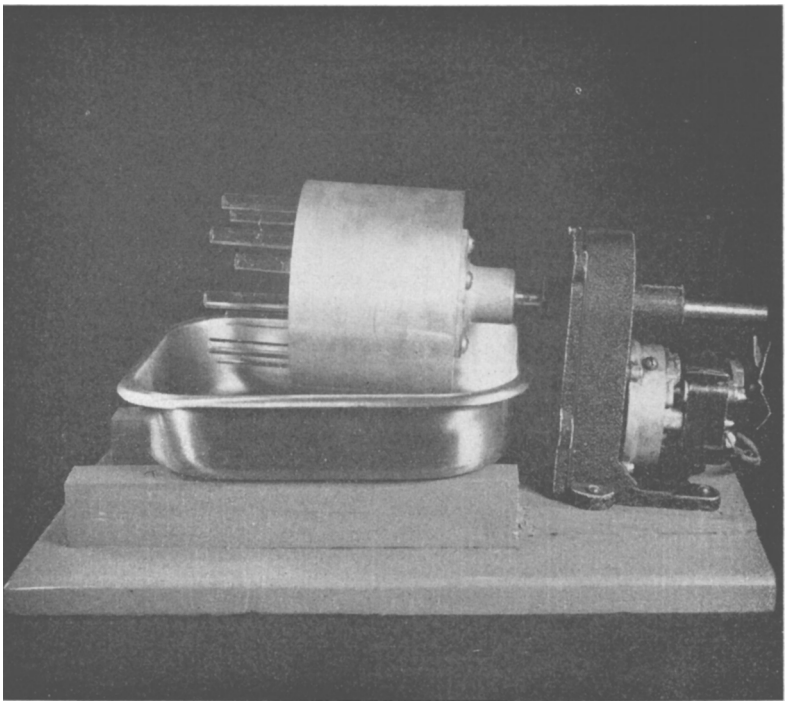

FIG. 2.
A machine for shell-freezing biological materials in small glass ampoules.

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Production of Fatty Infiltration of Liver in Rats by Alcohol in Spite of Adequate Diet.

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The part played by alcohol in liver cell injury and cirrhosis has not been conclusively established. Prior to the recognition of the influence of dietary factors in liver injury, many observations were made in an attempt to ascertain the solution to this question. Moon[1] summarized and critically evaluated these reports, concluding that there was no definite evidence that alcohol itself produced liver cell injury. At the time of Moon's review, 1934, the dietary factor was not given any consideration, and its significance was not apparently recognized. Lamson and Wing[2] showed that the combination of alcohol with carbon tetrachloride increased the severity and incidence of liver cell injury and cirrhosis. This observation was evidently acceptable to both sides of the question as a compromise and seemed to constitute the basis for prevailing opinion on the subject until recent years. Following the elucidation of the dietary factor in the problem of liver cell injury,[3,4,5]

[1] Moon, V. H., *Arch. Path.*, 1934, **18**, 381.

[2] Lamson, P. D., and Wing, R., *J. Pharm. and Exp. Therap.*, 1926, **29**, 191.

[3] Allen, F. N., Bowie, D. J., McLeod, J. J. R., and Robinson, W. L., *Brit. J. Exp. Path.*, 1924, **5**, 75.

[4] Best, C. H., and Huntsman, M. E., *J. Physiol.*, 1935, **83**, 255.