cytes. 1 cc. of the modified extract killed a 300 gm. guinea pig in 7 days. The addition of non-toxic amounts of castor oil soap to the mushroom poison greatly increased its toxicity. The addition of 0.03 gm. of castor oil soap to 1 cc. of toxin reduced the life interval from 7 days to 1½ hours. A similar increase in toxicity has previously been noted by Larson[3] upon the addition of castor oil soap to Botulinus toxin. Various mixtures of castor oil soap and mushroom toxin were studied and it was found that increase in toxicity depended both upon the concentration of the soap and the concentration of toxin.

This is a preliminary report.

[1] Ford, *J. Infec. Dis.*, 1906, iii, 192.
[2] Ford, *J. Exp. Med.*, 1906, viii, 437.
[3] Larson, *Ibid.*, 1924, 278.

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The Increase in Toxicity of Mushroom Poison Produced by Sodium Ricinoleate.

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It has been found by the authors that mixtures of sodium ricinoleate and mushroom poison were more toxic than the mushroom poison alone. Experiments were carried out upon the effects produced by the separate injection of the two components into guinea pigs. Simultaneous but separate injections of mushroom toxin and castor oil soap gave toxic effects comparable to the injection of a mixture. The toxic effect was also evident if the injection of either component was delayed up to 48 hours. After the injection of an M.L.D of toxin, 1 cc. of soap injected 48 hours later, reduced the life interval from 7 days to 1 day. After the injection of 1 cc. of a 3 per cent soap solution, an M. L. D. of toxin injected after 48 hours produced a fatal termination in 2 days instead of 7 days. Various combinations of dosage at different intervals between injections showed that the longer the interval between injections, the larger must be the dose of toxin to produce corresponding results. With the injection of 0.03 gm. of soap, death is produced by the simultaneous injection of 0.1 M. L. D. of toxin. If, however, the injection of 0.1 M. L. D. is delayed 3 hours, the toxicity is not developed.

However, at this time 1/5 M. L. D. will cause a fatal toxemia. These results indicate that the binding or elimination of the injected castor oil soap is appreciable inside of the first 3 hours. The delayed injection of one M. L. D. of toxin shows that soap is still present in the animal body 72 hours after injection.

This is a preliminary report.

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Effects of Water Content on Muscular Efficiency.

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Since little or no specific knowledge is to be had regarding water and the physiological activity of cells, it was thought desirable to investigate the relationship between the variation in total water content and muscular efficiency.

The gastrocnemii muscles of normal frogs were removed by the usual method. After weighing they were suspended in an ordinary muscle chamber. Contractions were obtained by stimulating with an electric current of known strength. All the muscles were forced to lift a known weight, thus leaving the variation in height of contractions as the criterion of efficiency. Readings were made at one-half to one-hour intervals, with the experiments extending from 3 to 6 hours.

The variation in water content was produced osmotically by using Ringer's solution of different concentrations. All the solutions were prepared from a known stock solution. The muscles were immersed in the solutions at all times except when contractions were being taken.

The right gastrocnemius in all cases served as a control and was submerged in normal Ringer's fluid, whereas the left gastrocnemius of the same frog served as the experimental muscle and was submerged in either hypotonic or hypertonic Ringer's solution of known concentrations. After the experiment was completed, the muscles were again re-weighed and the percentage variation in weight was determined. The degree of weight change was dependent upon the strength used and presumably is due to alteration of the water content of the cells.

Fifty-two different experiments were carried on using various