with tinctures and fluidextracts, the difference is an average of 18.6 per cent. The intramuscular method gives more constant end points and, therefore, requires less time and material for an assay. Lot I, fluidextracts, illustrates this point. With this preparation we were unable to determine the effective dose on account of poor absorption even with injections of doses 20.6 per cent. above the intramuscular dose. Even ouabain, generally considered as satisfactorily absorbed from the lymph sac, has required an average dosage 15.6 per cent. less by the intramuscular method. Earlier experiments have been repeated at a different season on different lots of animals with similar results.

It is believed that division of the dose, better blood supply in muscle than in skin and massage from movements of the animal, account for the more constant results and for the smaller intramuscular dosage required.

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Evidences of a structure in gelatin gels.

By **ROSS AIKEN GORTNER** and **W. F. HOFFMAN.**

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Bancroft[1] recently reported some conclusions drawn from unpublished data of a Mr. Cartledge who dried gelatin gels of different concentrations down to a 96 per cent. gelatin content and then allowed these dried sheets to again imbibe water. It was found that "each swelled rapidly to the original concentration and then took up water slowly."

We have conducted experiments similar to those of Cartledge and have secured comparable results. Thus a 10 per cent. gelatin

[1] Bancroft, W. D., "Applied Colloid Chemistry," 1921, p. 251.

gel dried down to less than 3 per cent. moisture content had imbibed at the end of 72 hours 6.45 grams of water per gram dry gelatin as contrasted with 4.30 grams water for a 40 per cent. gel similarly treated. Comparable differences were observed when the dried sheets were ground and uniform sized particles sieved out and tested for hydration rate and maximum hydration capacity.

Our experiments indicate that gelatin gels have a structure and that this structure is fixed at the time of gelation and is not appreciably altered by drying the gel at room temperature. A crystal structure in which the gelation temperature is actually the melting point of the crystals would explain the peculiarities observed.

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The control of respiration.

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The movements of respiration are carried out by voluntary muscles and ought to obey the laws of voluntary movement. One of the chief points in muscular action is the dependence of motor response on sensory impulses. Without the guidance of sensory impulses movements are ataxic. Just how ataxic or abnormal movements become depends on the extent of loss of sensory impulses and on the ability of the mechanism to guide itself by sensory impulses from other sources. These statements hold true in regard to the movements of respiration. It has long been known that a modified respiration results from cutting off the sensory impulses from the lungs by section of both vagi. Many investigators have, however, kept animals with divided vagi so that one cannot maintain that the vagi are essential to respiration. However, it was pointed out by one of us[1] a number of years ago that animals with vagi divided are not nearly as efficient in times of respiratory stress as is a normal animal. It was shown by

[1] Scott, F. H., *Jour. of Physiology*, 1908, xxxvii, 301.