Without exception, all gave a strongly positive reaction to the minor group toxin, though 20 were protected completely against the regular toxin, and three more partially so.

To further verify this stage of the work, we tried titrating any possible group antitoxin against the minor group by using a ripened minor group toxin, whose standardization, for obvious reasons, could not be attempted with standard antitoxin. Although we worked at the limit of sensitivity, approximately 1/500 M.L.D., we were unable to demonstrate the presence of any protective power in the blood of any of this group against the minor toxin. Seemingly, then, immunization with monovalent diphtheria toxin-antitoxin does not protect against infections of the minor group, as, of course, is manifest in the two cases of that type originally quoted and with whose cultures we started our work.

Two of the most important laboratories in the country have recently told us that they were likewise studying the toxins of certain diphtheria organisms which are not neutralized by the antitoxin in current use, so we hope after their publication that steps will be taken to include the minor group in the preparation of antitoxin, toxin-antitoxin, and Schick test toxin.

110 (1857)

An intramuscular method of digitalis assay.

By **M. S. DOOLEY** and **C. D. HIGLEY** (by invitation).

[*From the Pharmacological Laboratory, Syracuse University, Syracuse, N. Y.*]

Many observers have criticized the one-hour method of standardization on account of the failure of complete absorption.

During the course of work on the elimination of digitalis substances, one of us demonstrated the feasibility of making intravenous injections in the frog by the insertion of a fine hypodermic needle into the abdominal vein. It was suggested by Dr. Hatcher that an intravenous method of assay might be evolved upon the frog. Efforts to do so have not been successful but in testing the possibility the idea occurred to us to experiment with an intramuscular method.

Our method is to inject one half the total dose into the thickest part of each thigh, the needle being directed diagonally. The finest needle must be used and hemorrhage avoided. Otherwise the procedures are the same as for the Pharmacopeial method.

Judging by our results, the intramuscular method very largely and, we believe, satisfactorily, solves the difficulty of poor absorption.

TABLE I.

CRYSTALLINE STROPHANTHIN (OUABAIN).

Frogs.	S. S. S. Dose in Mg./Gm.		Per Cent. Difference.
	Lymph Sac.	Intramuscular.	
Lot 1.....	.00045	.00037	17.8
" 2.....	.00051	.00044	13.8
" 3.....	.00032	.00027	15.7
" 4.....	.00039	.00031	20.6
" 5.....	.00059	.00050	15.3
" 6.....	.00057	.00051	10.6
DIGITALIS-TINCTURES.			
Lot 1.....	.70	.57	18.6
" 2.....	.59	.49	17.0
DIGITALIS-FLUIDEXTRACTS.			
Lot 1.....	.90 Neg.	.70	22.3
" 2.....	.60	.50	16.7
DIGITALIN-MERCK. FORMERLY KNOWN AS "GERMAN."			
Lot 1.....	.025	.022'	12.0

Table I summarizes the results. In all cases the intramuscular S.S.S. (systolic standstill) dose has been compared with the lymph sac S.S.S. dose. In no instance has the intramuscular dose been found as large as that by the lymph-sac method.

Tinctures, fluidextracts, digitalin and ouabain have been studied. The last column of the table shows the percentage differences between the lymph sac and the intramuscular S.S.S. doses in corresponding lots of frogs. The effective intramuscular dose of digitalin is 10 per cent. less than by the lymph sac while,

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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III (1858)

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.