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Emetic dose of digitalis in pigeons as an index of the therapeutic dose in man.

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Emesis, as an index of digitaloid action, occurs promptly and characteristically after the intravenous administration of the digitaloid preparations in pigeons whose vomiting mechanism appears to be rather sensitive. The technique of determining the emetic dose is simple.

The digitaloid preparation is injected from an accurately graduated Luer (tuberculin) syringe into the wing vein of a pigeon of about 300 gm. body weight, held conveniently by an assistant. Then the pigeon is at once replaced into a cage for observation of vomiting, which is recognized by downward craning movements of the head preceded, sometimes by salivation and lachrymation and accompanied by ruffling of neck feathers, and, usually, flapping of the wings with occasional expulsion of gravel. Several such vomitings occur at the end of 5 to 10 minutes, depending on the dosage of the preparation used. Since the pigeons recover completely at the end of 2 to 3 days, they may be used over again for confirmation, and apparently as long as the wing veins permit further injections. The digitaloid preparations do not require previous evaporation, as in the case of most bioassay methods; but sodium chloride in isotonic concentration should be added to infusions, and tinctures should be diluted with about an equal part of 0.85 per cent sodium chloride before injection.

With this method the minimal emetic dose (M. E. D.) of a good tincture of digitalis (U. S. P.) is about the same as the full therapeutic or "minor toxicity" dose determined by Eggleston[1] for man, namely, 0.3 cc. (30 mg. digitalis) per kilo of body weight, or about 15 cc. for a 50 kilo man. Hence, it seems that the method should be valuable in determining the probable full therapeutic dose since emesis is one of the earliest signs of digitalis action in man; or, at least, it should be a valuable supple-

[1] Eggleston, *Arch. Int. Med.*, 1915, xvi, 1.

mentary test to bioassays depending on fatal dosage. The M. E. D. of ouabain is about 0.045 mg. per kilo.

Use of this method in bioassaying different tinctures and infusions of digitalis has given results, as good as, and better than the one-hour frog method. It has the following advantages over the official (U. S. P.) frog method, the cat method, and in fact, most bioassays; no operation or anesthesia is required, uniformity, simplicity, convenience, economy of time and material, ease of application, the index is about therapeutic, while all other methods depend on fatal dosage and the accuracy appears to be equal to that of any method. Provisionally it appears that standardization of pigeons will not be necessary. However, the influence of various factors and further details and possibilities of the method are being investigated.

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The occurrence of cysts of Councilmania lafleuri Kofoid and Swezy in the duodenal drainage.

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A case of infection by *Endamoeba dysenteriæ* and *Councilmania lafleuri,* amœbae of the human digestive tract, was treated in May, 1921, for the former, by the emetin-bismuth-iodide method. The results were negative for it on eight stool examinations six to seven months later. Duodenal drainage from this case, examined after treatment, contained a considerable number of cysts of *C. lafleuri* of the characteristic size, shape, number of nuclei, and nuclear structure. There were also some empty cysts, bile-stained, of similar appearance in the fresh drainage.

Duodenal drainage was also examined from a second case of infection by *Councilmania lafleuri* but no *E. dysenteriæ.* In this case 67 stool examinations have been made since November 23, 1922, with 41 positives. In the heavy bile of the first bottle of duodenal drainages a number of typical cysts of *C. lafleuri* have been found on two tests of four made. Upon staining by iron