brain antigen. The 3 negative reactions with Lygranum were also negative when mouse material was employed.

The quality of the positive reaction to Lygranum was similar to that produced by mouse brain antigen. The erythematous area and papule were, in most instances, approximately the same size with each antigen in the same person. The papule which was obtained by the use of Lygranum was, however, sometimes a little lower and slightly less erythematous than that given by mouse brain antigen. The duration of persistence of the papules was approximately the same with both antigens in the same person. The exact time taken for a reaction to disappear depended upon the strength of the response —a stronger reaction remaining visible for a longer period than a weaker one.

Conclusions. Lygranum antigen is superior to mouse brain antigen in sensitivity and specificity in the performance of the Frei test for lymphogranuloma venereum. Lygranum control is superior also to mouse brain control in producing non-specific reactions in only 2 of 35 persons as compared with 28 of 36 in the case of mouse brain control. In the group of 36 tested only one individual showed a reaction which could be regarded as resulting from hypersensitivity to chick material.

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Influence of Local Applications of Potassium Chloride on Action Current of the Mammalian Heart.*

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In experiments previously reported, it was found that application to the surface of the heart (cat, dog, rabbit) of squares of filter paper soaked in M/10 or M/5 KCl solutions, produced changes in the electrocardiogram similar to those which follow various types of injury to the heart, except that the potassium effects quickly subsided following removal of the solution.[1] Generally accepted views of the action of potassium ions in the heart and elsewhere suggest that the

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1 Kish, B., Nahum, L. H., and Hoff, H .E., *Am. Heart J.*, 1940, **20**, 174.

electrocardiographic changes produced by the application of potassium to the surface of the heart result from the reversible extinction of the action current at the point of application. Potassium chloride has in fact been employed to abolish electrical activity at selected regions in muscle and thus to permit recording of monophasic action currents.[2]

We have performed a series of experiments to determine whether

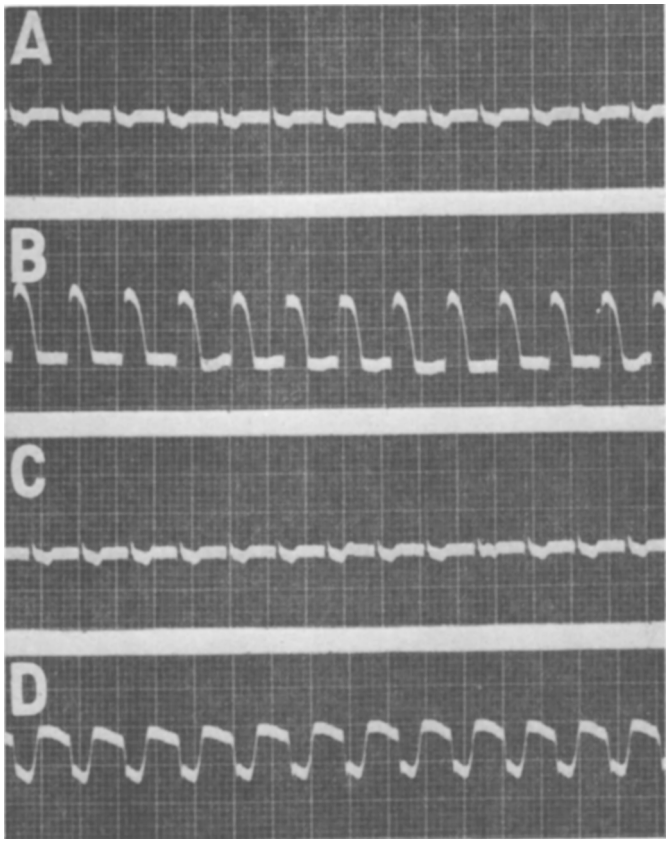

FIG. 1.
Dog 5.5 o, July 15, 1940.

a. Electrogram recorded by electrodes placed on right and left ventricles, anterior surface.

b. Monophasic action current recorded after replacing electrode on left ventricle with wick soaked in M/5 KCl.

c. The potassium electrode on the left ventricle was removed, the surface of the ventricle was washed with Ringer's solution and a new wick soaked in Ringer's solution was replaced.

d. Monophasic curve obtained by replacing lead on right ventricle with wick soaked in M/5 KCl.

2 Buchanan, F., *J. Physiol.*, 1927, **64**, 2.

potassium has a similar effect when applied to the surface of the heart, and found that we could obtain monophasic action currents from the surface of the dog's heart by use of potassium chloride, in M/10, M/5, or isotonic solutions. Electrograms were obtained by wick electrodes soaked in Ringer's solution placed on the anterior surface of the heart, one on the right and one on the left ventricle The wicks led to silver-silver chloride electrodes, and these were connected to a 100,000 ohm potentiometer from which one-fifth of the potential was recorded by an amplifier-type electrocardiograph (Cardiette). Sensitivity was approximately 2 mm per millivolt. After controls were taken, first one and then the other electrode was replaced by a wick soaked in the potassium solution. This procedure yielded monophasic records, and when the leads were arranged so that the spike was upright, the monophasic wave from the right ventricle was upright, while that from the left ventricle was inverted (Fig. 1). Reduction of contact of the heart with surrounding tissues, and slight dryness of the surface of the heart were found to facilitate recording of monophasic waves.

These experiments indicate that potassium chloride solutions of the concentrations employed here create a neutral point at the site of application, and consequently permit recording the monophasic action current indicating the activity at the other electrode. Potassium chloride in proper concentrations, therefore, abolishes electrical activity on the surface of the heart as it is known to do in nerve and other tissues.

Since performing these experiments, we have seen the report of Rothschuh[3] who has obtained similar results.

[3] Rothschuh, K. E., *Z. f. d. ges. exp. Med.*, 1939, **106**, 543.