On the basis of this conception, several series of experiments were carried out to determine, if possible, whether sensitization by the serum affected the vagus endings in the bronchial muscles, the muscles directly, or both structures. The experiments were carried out by sectioning one vagus in the neck, for according to Dixon and Brodie, the vagus of one side supplies the lung of that side only; moreover there is no evidence of a cell station between the pulmonary vagus fibers in the neck and bronchial muscle.

This report deals with only a part of the investigation. In one series of guinea-pigs, one vagus was resected in the neck thirteen days after the sensitizing dose of horse serum had been injected. The toxic dose was given intravenously from 30 to 57 days after vagus section. All of the nine pigs died with typical symptoms within five minutes after injection of the toxic dose. The lungs showed the characteristic picture of inspiratory immobilization on excision, and there was no characteristic difference between the innervated and non-innervated side.

In another series, one vagus was resected fifty-five days after the sensitizing dose, and the toxic dose was injected intravenously from 6 to 14 days after vagus section. These animals differed in no way from those of the other series.

In a final series one vagus was resected in normal animals. These experiments are not yet completed and will be reported later.

From the data given above it seems clear that the bronchial muscles themselves are sensitized by the horse serum in anaphylaxis.

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Notes on the vaso-reaction in dogs produced by injections of extracts of the tubercle bacillus.

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This paper is a report of results in continuation of those read at the February meeting. Of especial interest are the results obtained with the blood serum of three tubercular calves which showed very slight lesions at autopsy. We obtained results

several months ago which led us to believe that dogs sensitized with tuberculin would show an arterial depression if injected upon the following day with tuberculin.

We have tested several "crude" tuberculins which have been heated in the autoclave at from 7 to 10 lbs. pressure for 30 minutes. The temperatures at these pressures varied approximately from 110° C. to 115° C. We have also tested the unconcentrated filtrate from he tubercular culture when it has reached a condition ready for concentration into "crude" tuberculin. Dogs sensitized with some of the samples of tuberculin which have been heated in the autoclave do not produce the reaction if injected upon the following day with the same tuberculin. Serum of dogs sensitized with the unconcentrated filtrate from the culture of *B. tuberculosis* of six weeks growth did produce a well marked reaction when injected into the dog on the following day.

A temperature of 105° C. was found to practically destroy the depressor substance in the unconcentrated filtrate.

The following are the experiments in detail as they were conducted:

Protocol of March 9.— Bull dog, 35 lbs., sensitized March 8, with 5 c.c. of a fresh preparation of crude tuberculin which had been heated in the autoclave for 30 minutes from 110° C. to 115° C.

1. 1 and 2 drops injected as usual, gave no results.

2. 2 drops of an older preparation of crude tuberculin used in January for sensitizing in experiments with tubercular serum gave a well marked depressor reaction.

3. 3 and 5 drops of the fresh tuberculin gave no reaction.

4. 6 drops of the January tuberculin gave a sharp reaction.

Protocol of March 11.— Dog, mongrel collie, 50 lbs., sensitized March 10, 1910, with 5 c.c. crude tuberculin which was heated in the autoclave for 30 minutes from 110° to 115° C.

1. 1, 3 and 10 drops of the tuberculin with which the dog was sensitized produced no reaction.

2. 10 drops of the same tuberculin after further concentration on the water bath produced a marked reaction.

3. 3 drops of the January tuberculin gave a slight reaction and 10 drops gave a sharp reaction.

4. 10 drops of the tuberculin used in the experiment of March 9 did not give a reaction.

Protocol of March 16.— Dog, 20 lbs., sensitized March 15, 1910, with 5 c.c. of an unconcentrated, unheated filtrate from the culture of B. tuberculosis ready for concentration.

1. 2 drops and 0.5 c.c. (10 drops) of this unconcentrated filtrate failed to give a reaction.

2. 3 c.c. of this unconcentrated filtrate gave a marked reaction.

3. 10 drops of the crude tuberculin used on March 11 gave a marked reaction, but 10 drops of crude tuberculin used on March 9 were inactive.

4. 1 drop of the tuberculin of January gave a very marked reaction.

5. 5 c.c. of this unconcentrated filtrate finally gave a marked reaction.

Protocol of March 18. — Dog, mongrel collie, 75 lbs., sensitized March 17, with 5 c.c. of the unconcentrated filtrate used March 16.

1. 10 drops of crude tuberculin used March 11 gave no reaction.

2. 5 c.c. unconcentrated tuberculin used to sensitize the dog failed to react.

3. 1½ drops of crude tuberculin of January gave a marked reaction.

Protocol of March 23. — Bull dog, 25 lbs., sensitized March 22, with 5 c.c. of the unconcentrated filtrate.

In this series of injections the unconcentrated filtrate was heated at different temperatures for one hour and water added afterwards to make the volume equal to the original volume.

The following temperatures were used:

35° C. original incubator temperature.
50° C. — 2 hours.
60° C. — 1 "
70° C. — 1 "
80° C. — 1 "
100° C. — 1 "
105° C. — 1 "

These heated preparations were made by Mr. Banzhaf; 5 c.c. were given at each injection. The injections were begun with the preparations which had been heated to 105° C. and given in order down to the original incubator filtrate. The 105° C. heated preparation gave only an indication of a reaction. The other preparations down to the original gave marked reactions.

The original unconcentrated filtrate gave a reaction which was not so marked as the heated preparations, but a later injection gave just as good a reaction. This dog which received these injections was used to test the sera of three calves which had been given intravenous injections of virulent cultures of B. tuberculosis, bovine.

These calves were killed and autopsied with results as follows: Calf No. 24. Strain 377. Injected Oct. 6, '09. Killed Mar. 22, '10. Small ¼ inch nodule with caseous center at site of injection.

Calf No. 17. Strain 96. Injected Aug. 12, '09. Killed Mar. 22, '10. ¼ inch, tubercle in prepectoral node.

Calf, No. 25. Strain 558. Injected June 10, '09. Killed Mar. 22, '10. Fibrous area at site of injection, small amount of caseous material. Calcification.

These calves gave practically no physical signs of tuberculosis. The injection of 4 c.c. of serum of each of these calves produced the characteristic reaction which we have described. Serum drawn from a normal calf did not give a reaction. This calf was kept in the same stable and under the same conditions as the three injected calves.

Protocol of March 25. — Bull dog, 35 lbs., sensitized with 10 c.c. of the unconcentrated filtrate. Primarily used to test a normal calf kept with and under the same conditions as the three previous calves.

1. 3 and 4 c.c. respectively of this normal calf serum failed to give a reaction.

2. Injections of 4 c.c. from each of the tubercular calves failed to react.

3. 5 c.c. of unconcentrated filtrate, which had been heated to 60° C. and tested on March 23, gave a marked reaction.

CONCLUSIONS.

1. Dogs injected with 5 c.c. of tuberculin or of the unconcentrated filtrate become sensitized to tuberculin, and an injection of tuberlin (1 drop in some cases) given the following day produces a drop in arterial pressure.

2. The depressor substance is not affected by heat up to and including 100° C. during a period of one hour.

3. If the tuberculin is kept at 105° C. for one hour the depressor may be lost or greatly diminished.

4. The results of the serum of tubercular calves injected into the sensitized dog seem to indicate that the method outlined in our previous paper can be used for the early diagnosis of tuberculosis.

5. This depressor substance seems to be different from the depressor substance of tuberculin in that the tuberculin depressor substance is much more stable; while the depressor substance of tubercular serum may be lost when the serum is kept in the ice box.

6. These experiments possibly give us a method for standardizing tuberculin by noting the minimal quantity which will cause a reaction in blood pressure.

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Immunity to the growth of cancer induced in rats by treatment with mouse tissue.[1]

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The opinion prevails among investigators that resistance to growth of tumor can be induced only by treatment with tumor or normal tissue of the same animal species. In the course of a study on different phases of atreptic immunity, a series of experiments was undertaken with the aim in view to find the means whereby mouse tumor may be made to grow on a rat and *vice versa*. Ehrlich, in his so-called zig-zag transplantations, has shown that such a tumor of a mouse inoculated into a rat grows normally for eight or ten days and then ceases its growth and be-

[1] This research is conducted at the expense of the George Crocker Special Research Fund.