

course contained a very small proportion of serum, gave no measurable rise.

3. Similar results were obtained (with dog's blood to which adrenalin had been added) on segments of rabbit's intestine and uterus. The sediment gave a small inhibition of the intestine and a small increase of tone of the uterus as compared with the serum. The effect of the adrenalin blood was intermediate in amount.

4. The distribution of the naturally secreted epinephrin in the blood from the adrenal veins (of the dog) was also investigated with the same result. Only the rabbit intestine and uterus were employed, the other methods not being sufficiently sensitive for the small concentrations found in blood. In one experiment the concentration of epinephrin in the blood was assayed at 1 : 8,000,000, in the serum at 1 : 3,000,000. The sediment gave practically nothing. It so happened that the blood used was extremely rich in corpuscles, a circumstance favorable rather than otherwise for testing the point in question, as the serum would be more than ordinarily rich in epinephrin as compared with the blood, if all the epinephrin is contained in the plasma. The proportion of serum by volume in the blood was 36 per cent. On the hypothesis that all the epinephrin was in the serum, this would give $1 : 100/36 \times 3,000,000$, *i. e.*, 1 : 8,300,000 as the concentration in the blood.

5. When search is being made for the minute quantities of epinephrin present in blood, serum (or plasma) should, in general, be preferred to blood in making the tests.

51 (1229)

The influence of intravenous inoculations of cholesterin upon blood cells.

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Some years ago (1907) Talquist believed that he had found the harmful substance present in the *Bothriocephalus latus* leading to progressive anemia. The substance which he isolated from these

worms was a cholesterinester present in greatest proportion as cholesterin oleate. He found that a synthetic cholesterin oleate did not have such active hemolyzing properties as the extracts from the worm, but on his general findings he believed that this substance was the cause of the anemia and suggested the possibility of other anemias arising through the action of similar substances. Since this time cholesterin in various forms has been used to a considerable extent for other experimental purposes. In some of these experiments the materials were fed to animals while in others they were introduced by inoculation. Depending upon the dosage there was a variable increase in the cholesterin content of the blood. This cholesterin was present in combination with fats or lipoids. Even with the development of a continued hypercholesterinemia amounting to several times the normal blood content, none of the authors have remarked upon the production of a progressive anemia. In our own feeding experiments no anemia was apparent, although the cholesterin of the blood was often very high.

Recently we have studied the effect of the direct introduction of cholesterin combinations into the blood. An emulsion of a cholesterin combination with sodium oleate, containing 7.5 per cent. of cholesterin and 5 per cent. of sodium oleate, was used. The cholesterin in these materials forms a combination with sodium oleate so that colloid globules remain in suspension and are readily introduced into the circulation of animals. The cholesterin in this form does not give rise to a foreign body reaction as when the pure cholesterin is used. Furthermore, this mixture does not show the active hemolysis in the test tube, as is demonstrated by the same quantities of sodium oleate.

Two rabbits were treated every second day by intravenous inoculation of 2 c.c. of the emulsion for a period of two weeks, while a third received from $\frac{1}{2}$ to 1 c.c. during a similar period. Counts were made prior to the initial inoculation to determine the normal for each animal. Counts were also continued for ten days after the last treatment. In none of the animals were we able to observe any effect of the inoculated material upon the red blood cells. In the normal rabbit we have found a fluctuation between six and seven and a half million red cells and at no time in the ex-

periments was there any appreciable decrease below the normal minimum. There was no alteration in the morphology or staining qualities of the red cells. Furthermore, it was found that but slight reactions occurred in the white cells of the blood. Immediately following the inoculation there was a temporary rise in the number of white cells amounting in its greatest extent to 2,000 cells above the normal maximum (10,000). This increase remained only for twenty-four hours and then the count declined to normal. The increase was not confined to any particular type of cell, though the response in the polymorphonuclear neutrophils was more common. The experiments indicate that for the amount of the cholesterol mixture used intravenously, there is no particular reaction in the blood cells of this animal. There was no evidence that the cholesterol macrophages appearing in organ lesions during hypercholesterinemia, migrate by the blood stream.

52 (1230)

The physical state of antigen as related to the specificity of the Wassermann reaction.

(Preliminary Communication.)

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The shortcomings in the diagnostic value of the Wassermann reaction have been demonstrated by many authors. Of late, however, in addition to errors inherent to this reaction on account of its very nature, different investigators called attention to discrepancies arising from the use of various modifications. There is a definite tendency among the serologists to standardize the Wassermann test as a whole and thus make the results obtained by different workers comparable. In view of facilitating this standardization, we wish to call attention to certain qualities of antigen which have not been described thus far.

So far as the chemical composition of antigen is concerned, the