

upon details: we shall merely state that the result was strikingly positive. While the morphin frogs, which were kept with hearts intact, remained normal, all the frogs which received proper doses of morphin and had their hearts removed at different intervals, developed tetanic convulsions, which in many cases had to be characterized as very violent. With doses of 0.25 mg. per gram frog, convulsions developed in practically every case, no matter how soon or how late the heart was removed. After intervals of 60 minutes and longer the result was positive practically with every dose between 0.2 and 0.5 mg. per gram frog. (The essential points were demonstrated before the Society.)

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Intravascular foreign bodies.

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Experiments were performed by introducing sterilized (1) untreated, (2) oiled silk, and (3) human hair into arteries and veins and observing the results. Twelve common carotid arteries and twelve external jugular veins were employed. The number of silk strands varied from the smallest single strands used in blood vessel suture to twenty-four such strands. Where a number were used they were threaded into suitably large needles and were not twisted. Cambric needles were used.

The experiments were performed by exposing the vessels of anesthetized dogs, transversely piercing the vessel with the needle as near the mid-line as possible, drawing the ligatures through and loosely tying the free ends together. Three weeks later specimens were taken and examined.

In no instance was there occlusion of the lumen nor was there any evidence to indicate that the vessels would have subsequently become occluded through thrombus formation. In general the ligatures were found dividing the lumen and coated with a substance closely resembling the intima in gross appearance.

In the case of one artery and one vein, an ordinary occluding ligature was first tied about the vessel, after which a transverse suture was introduced about one centimeter on each side of the ligature. The results in these cases did not materially differ from those observed on the non-occluded vessels. No marked differences were observed with different kinds or sizes of sutures.

Microscopical results, particularly as regards the character of the deposit on the foreign surfaces and the presence or absence of intimal covering, will be reported later.

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On tumor-immunity in rats (with demonstrations).

By **RICHARD WEIL.**

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It is the intention of the present paper to summarize briefly experiments bearing on the problem of the acquired immunity of rats to the implantation of tumors. In rats, as indeed in practically all the other species of animals in which similar experiments have been practicable, it has been found that the absorption of an implanted tumor is succeeded by a period during which the animal is refractory to further implantations. The same refractory condition can be induced by the injection of tumor autolysates (Levin), or by the injection of suspensions of normal tissue, or even of blood. The relative specificity and effectiveness of these procedures vary in their details; the underlying principle has been thought to be the same throughout.

In a series of experiments with the Flexner-Jobling rat tumor, I have observed certain phenomena which seem in a measure to support the belief that the mechanism of immunity to the tumor is identical in its biological manifestations with that found in infectious disease, and is therefore mediated by immune substances carried by the serum. These observations may be summarized as follows:

1. Inoculation of the Flexner-Jobling adeno-carcinoma into normals rats is not followed by any macroscopic evidence of