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Production of an Extracutaneous Kidney.*

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The information gained from observations on the extracutaneous spleen (Barcroft¹) has been one of the important factors in advancing our knowledge of the physiology of that organ. A careful review of the literature does not reveal a similar method for the study of the kidney. The spleen is peculiarly adapted to such a study because it is so easily mobilized and is composed histologically of considerable muscular tissue. The kidney, however, is available for a similar investigation despite its more highly specialized character and vast structural differences.

The experimental animals in all instances have been female dogs weighing about 10 to 12 kilograms. A very simple procedure to exteriorize the kidney has been employed. An oblique lumbar incision is carried through the skin and subcutaneous tissue to the muscle layer. The muscles are separated by blunt dissection and the kidney fossa exposed. This technique gives sufficient space to lift the intact kidney to the surface of the body where it may be fixed by suturing to the skin edges with silk. Silk has been found to be preferable in this work. In order to prevent self-afflicted

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¹ Barcroft, J., and Stephens, J. G., *J. Physiol.*, 1927, **64**, 1.

trauma to the exposed organ, it has been found advisable to mould a light plaster cast collar on the animal immediately before operation; postoperative injury incident to the awakening is obviated by suturing a wire meshed basket around the exposed kidney for 24 to 48 hours. A mild inflammatory reaction almost invariably occurs within 48 hours following operation, but it is controlled easily by the usual antiseptic measures. Also it has been found desirable to carefully remove crusts that form on the skin about the exteriorized organ.



FIG. 1.

Appearance of extracutaneous kidney 5 months postoperative. The epithelial line can be seen distinctly and at present, 8 months postoperative, is completely covered.

A very moderate swelling of the exposed kidney is observed within the first 24 hours after operation, and this increased size persists during the life of the animal. The kidney surface retains its normal color and appearance until it is covered by a thin layer of epithelial tissue that has grown from the healed skin edges.

This procedure has been carried out on a small series of animals (15 dogs) with one kidney exposed and the opposite organ removed and the animals are still living 8 months later with normal kidney function as determined by blood chemistry and intramuscular phenolsulphonephthalein tests.