

The Action of Pituitary Extracts upon the Kidney.

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(Abstract.)

Intravenous injections of saline extract of the infundibular part of the pituitary body produce dilatation of kidney vessels accompanied by increased flow of urine; *i.e.*, the extract has a diuretic action.*

With the first injection this result is accompanied by the rise of blood-pressure and contraction of systemic arteries described originally by Oliver and Schäfer,† and since confirmed by various observers.

With subsequent injections (if the first injection were not too small in amount) administered within a certain interval of time after the first one, the diuresis is usually attended not by a rise of blood-pressure,‡ but by a fall (depressor effect).§ This fact furnishes evidence that the diuresis is independent of the effects upon blood-pressure and leads one to suppose that it is produced by a special constituent of the extract.

This conjecture is confirmed by the result of treating the extract with a peptic digestive fluid or with hydrogen peroxide. These agents tend to abolish the rise of blood-pressure which is produced by a first injection, but leave the diuretic effect of the extract unaltered. Reducing agents and the action of tryptic digestive fluid leave all the active constituents of the extract apparently unaffected.

The diuretic as well as the pressor and depressor constituents of the extract are not destroyed by boiling. They dialyse through parchment paper. They are insoluble in absolute alcohol and ether.

Occasionally, especially with large doses of the extract, the diuretic effect fails to show itself. This appears to be due to the kidney vessels participating in the general vascular constriction which is caused by the extract. More often such constriction of renal vessels is only temporary, and gives place to dilatation with free flow of urine.

Hypodermic injections produce effects similar to those caused by intra-

* See Schäfer and Magnus, 'Physiol. Soc. Proc.', p. ix, in 'Journ. Physiol.', vol. 27, 1901.

† 'Journ. Physiol.', 1895, vol. 18.

‡ W. H. Howell, 'Journ. Exp. Medicine,' vol. 3, 1898.

§ Schäfer and Vincent, 'Journ. Physiol.', 1899, vol. 25.

venous injection, but of a far less marked character and coming on only gradually and after a long interval. Introduction of the extract into the stomach is followed by even less noticeable effects. It is inferred that the active constituents are not absorbed by the gastric mucous membrane with sufficient rapidity to produce the usual symptoms.

Intravenous injections of extracts from the anterior or epithelial lobe of the pituitary body do not produce diuresis: these extracts exhibit no physiological activity.

It is concluded that the infundibular part of the gland produces an internal secretion which passes into the blood and which, both indirectly owing to its general action upon the vascular system and directly by its special action on the renal vessels and renal epithelium, assists in promoting and regulating the secretion of urine; in other words, the internal secretion of the gland is ancillary to the renal functions.

Finally the relations of the pituitary body to the functions of the supra-renal and thyroid glands and to the production of acromegaly are briefly discussed.
