Carulla (J. F. P.) [Address to the Nottingham Section of the Society of Chemical Industry.] 8vo. *London* 1895.
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Roscoe (Sir H. E.), F.R.S., and Harden (A.) A New View of the Origin of Dalton's Atomic Theory: a Contribution to Chemical History. 8vo. *London* 1896. The Authors.

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January 30, 1896.

Sir JOSEPH LISTER, Bart., President, in the Chair.

A List of the Presents received was laid on the table, and thanks ordered for them.

The following Papers were read:—

I. "On the Rhythmic Contractility of the Spleen. Preliminary Notice." By E. A. SCHÄFER, F.R.S., and B. MOORE. Received January 10, 1896.

(From the Physiological Laboratory, University College, London.)

The authors have investigated the rhythmic contractility of the spleen, which was discovered by Roy (*Journ. Physiol.*, vol. 3), and the influence of nerves, drugs, and animal extracts upon it. For this purpose the changes in its volume have been studied by aid of a specially constructed plethysmograph, so arranged as to afford the least possible obstruction to the blood-vessels entering and leaving the hilum. Under these circumstances, the spleen exhibits evidence of responding immediately by alterations in volume to every alteration in blood pressure, respiratory and cardiac, and *a fortiori* to such greater changes as are produced by compression of the aorta (contrary to Roy). This is even manifest when the organ is left connected with the rest of the vascular system by one artery and vein only. The

conclusion which Roy arrived at, that the spleen is practically cut off from the arterial system, and that its circulation is maintained by its own contractions, is thus shown to be incorrect.

The rhythmic contractions are independent of the central nervous system, for they will proceed after all the nerves passing to the organ are severed, and they can also be shown in an excised spleen perfused with defibrinated arterial blood.

They are excited to increased activity by intravenous injection of certain drugs and animal extracts which act specifically upon the organ. Prominent amongst these are curare, water extract of suprarenal, and water extract of brain. Suprarenal extract causes an enormous contraction, followed by increased extent of rhythmic waves; curare and brain extract, mainly the latter, without a preliminary contraction. Indifferent fluids, such as normal salt solution, produce in moderate quantity no such effects (contrary to Roy), and the same is the case with many animal extracts.

As was shown by Roy, a condition of dyspnœa causes marked contraction of the spleen. The authors show that this contraction is of central origin, for after severance of all nerves to the organ it is replaced by a passive dilatation, due to the rise of general blood pressure, this being soon followed by an increase in extent of the rhythmic contractions. Temporary cessation of the blood flow through the organ also has the effect of increasing their extent, probably because the splenic tissue is thereby deprived of oxygen and rendered temporarily more excitable.

The splanchnics, both right and left, contain not only nerve fibres which produce contraction of the spleen (Tarchanoff, *Pflüger's Archiv*, vol. 8; Roy, *loc. cit.*), but also others which cause dilatation of the organ.

There is no evidence that the vagi contain any centrifugal fibres which influence the volume of the spleen (contrary to Roy). Provided their inhibitory action upon the heart is neutralised by atropine, even the strongest stimulation of the peripheral end of either cut vagus produces no direct effect upon the spleen.

Stimulation of any of the nerve-twigs which accompany the arterial branches to the spleen causes strong contraction of the whole organ. The contractions which result from splanchnic stimulation are also obtained even when there is only a minute twig left, all other nerves being severed. There is, therefore, probably a very free nervous communication within the organ.

Evidence has been obtained of the existence of numerous afferent (sensory) fibres in the nerves supplying the spleen.