The addition of Ba^{++} ions to normal or Ca^{++} ion deficient perfusate favoured the production of tyramine responses. Although the responses obtained in these conditions to nerve stimulation were seen to be diminished when calcium ions were deficient, the responses to noradrenaline were not significantly altered.

The results indicate that although tyramine on its own is unable to initiate a rise in perfusion pressure during perfusion with normal Krebs, an inherent activity can be demonstrated in conditions of altered membrane stability produced by changes in the ionic composition of the solution.

E. C. Z. is supported by a Commonwealth Scholarship.

REFERENCES

McGregor, D. D. (1965). The effect of sympathetic nerve stimulation on vasoconstrictor responses in perfused mesenteric blood vessels of the rat. *J. Physiol., Lond.*, **177**, 21–30.

Thoenen, H. & Tranzer, J. P. (1968). Chemical sympathectomy by selective destruction of adrenergic nerve endings with 6-hydroxydopamine. *Naunyn-Schmiedeberg's Arch. Pharmak. exp. Path.*, **261**, 271–288.

Perfusion of the cerebral ventricular system in the conscious rabbit

R. C. Dow and A. T. B. Moir (introduced by T. B. B. Crawford), *Medical Research Council Unit for Research in Brain Metabolism, Department of Pharmacology, University of Edinburgh*

Under general anaesthesia stainless steel screws (5BA) 4 mm in length with a central hole (0·52 mm diameter) were inserted in the vault of the rabbit's skull so that they were directed towards the bodies of the lateral ventricles. In their final position the tips of the screws were approximately 2 mm above the lumen of the ventricles. The guide tube to the cisterna magna (Fig. 1) was inserted through a

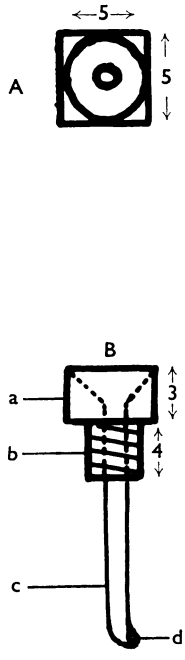

FIG. 1. Guide tube to cisterna magna. All measurements in mm. A, Plan view. B, lateral view: (a) hub, (b) roughened collar, (c) shaft, gauge 19, length 12–16 mm, (d) lateral opening at tip of shaft.

hole drilled in the occipital protuberance so that the lumen at its tip was in close apposition to the rostral edge of the atlanto-occipital membrane. The hub of the guide tube was then firmly fixed to the occipital protuberance with a small stainless steel anchoring screw (BA 10) and acrylic resin (Simplex, Dental Fillings Limited).

Two weeks postoperatively, ventricular perfusion experiments were performed with the rabbit fully conscious. A 25 gauge needle, 16 mm in length, was inserted percutaneously into one of the guide tubes to the lateral ventricles. A huber pointed 25 gauge needle, 32 mm in length, was inserted percutaneously into the guide tube to cisterna magna and advanced cautiously round the curve at the tip of the guide tube by gentle tapping. Following successful punctures of the ventricular system, the needles were connected either to a " closed " perfusion system with a volume of 0·3 ml. for recirculatory perfusion (Ashcroft, Dow & Moir, 1968a, b; Ashcroft, Crawford, Dow & Moir, 1969) or to an " open-ended " system.

Perfusions of the ventricular system have been performed with a balanced salt solution at a rate of 0·08 ml./min for up to 5 hr without the animals showing signs of distress.

REFERENCES

ASHCROFT, G. W., DOW, R. C. & MOIR, A. T. B. (1968a). Perfusion of the cerebral ventricles in the conscious dog. *Br. J. Pharmac.*, **34**, 230–231.

ASHCROFT, G. W., DOW, R. C. & MOIR, A. T. B. (1968b). The active transport of 5-hydroxyindol-3-ylacetic acid and 3-methoxy-4-hydroxyphenylacetic acid from a recirculatory perfusion system of the cerebral ventricles of the unanaesthetised dog. *J. Physiol., Lond.*, **199**, 397–425.

ASHCROFT, G. W., CRAWFORD, T. B. B., DOW, R. C. & MOIR, A. T. B. (1969). Release of amine metabolite into ventricular perfusion fluid as an index of turnover. *Br. J. Pharmac.*, in the Press.

A smoking simulator for the controlled presentation of tobacco smoke to laboratory animals

A. K. ARMITAGE, G. H. HALL and E. HENEAGE, *Tobacco Research Council Laboratories, Harrogate*

The smoking simulator illustrated in Fig. 1 allows the presentation of tobacco smoke to an experimental animal, in conditions similar to those described by Armitage, Hall & Morrison (1968). Smoke can be introduced into the lungs or mouth.

Smoke is introduced into the lungs of a cat, artificially ventilated with an oscillating pump (A). Air leaving port *a* passes across the face of port *z*, through tube G and tracheal cannula H to the lungs. Expired air is exhausted at port *b*. Cam B controls smoking pump C and cam D operates slide valve E. The presence or absence of a small plate, placed in one of two recesses cut in cam B, allows smoking to occur at 1 min or 30 sec intervals. In stage one of the smoking cycle, slide valve E is moved by cam D so that port *x* opens into chamber C. The piston in C operated by cam B sucks air through a lighted cigarette placed in port *x*, and 25 ml. smoke is drawn into chamber C. Slide valve E moves again so that port *y* opens into C (stage 2) and excess smoke is exhausted through F. Smoke retained (1 to 5 ml.) depends on a star wheel attached to cam B, controlling the exhaust stroke of piston in C. In stage three, slide valve E is moved so that port *z* opens into C, and the