

NEW APPARATUS

AN AUTOMATIC SYRINGE FOR USE WITH ISOLATED ORGAN BATHS*

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Received January 3, 1961

SINCE the introduction of Post Office selector switches and relays by Schild (1946) for controlling cyclical operations in isolated organ bath techniques, many variations and extensions of the original invention have been devised. The addition of doses of drug in the form of the ultimate dilutions required to affect the isolated organ, as used in some types of apparatus, presents difficulties; for example if the responses markedly

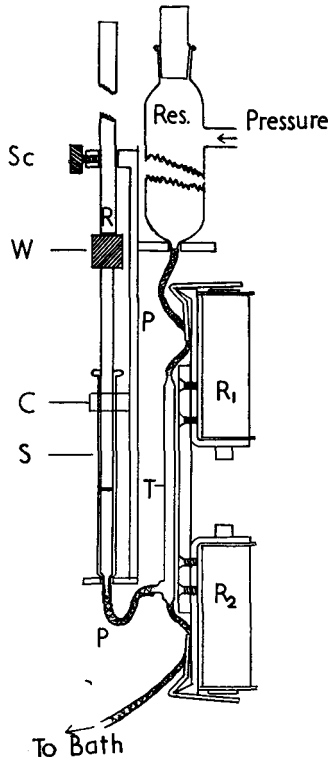


FIG. 1. The automatic syringe

Res., Drug reservoir; W, 15 g. weight recessed and cemented to plunger; S, 1 ml. glass syringe graduated in hundredths; T, Glass t-piece; R₁ and R₂, P.O. relays; P, P.V.C. tubing; C, Perspex clip to retain syringe; R, Adjustable rod to limit filling of syringe; Sc, Set screw to fix rod at required position.

* Demonstrated before the British Pharmacological Society, January, 1955.

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 change to the first set of doses, time may be lost in preparing further sets of dilutions. This and other difficulties were noted by Burn and Dale (1922), long before Schild's invention was announced.

The automatic syringe described below has been found useful in that doses of concentrated drug delivered automatically to the bath may be rapidly changed at will. Reference to Fig. 1 shows the working of the device.

The body is constructed of Perspex. Gas pressure, at about 5 lb./in.², conveniently taken from the supply to the organ bath, is applied to the surface of the drug solution in the reservoir.

On opening relay R₁, drug solution passes down the t-piece T, and drives the plunger up to the level limited by the rod R, held in place by the set screw Sc. R₁ is then closed, and at the appropriate time in the

TABLE I
 THE VOLUMES (DETERMINED BY WEIGHT) OF SUCCESSIVE DELIVERIES FROM ONE SYRINGE WORKING AUTOMATICALLY

Dose number	Approximate setting in ml.		
	1.0	0.5	0.25
1	1.006	0.5156	0.2603
2	1.008	0.5150	0.2603
3	1.0083	0.5130	0.2609
4	1.0078	0.5156	0.2612
5	1.0076	0.5036	0.2632
6	1.008	0.5093	0.2571
7	1.0076	0.5132	0.2623
8	1.0073	0.5038	0.2606
9	1.0075	0.5141	0.2605
10	1.007	0.5134	0.2606
Means	1.00751	0.51166	0.26070
Standard deviation	0.0002	0.0011	0.0038

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cycle relay R₂ is opened; the drug solution then passes into the bath, driven by the weight W. R₂ then closes. Springs, applied to the relay to keep the tubing closed when the relays are not energised, are not shown for the sake of clarity. The syringe may conveniently be filled by drawing the top out of the clip C. The plunger may then be withdrawn after opening R₁.

Table I shows the constancy of repeated doses delivered from a single syringe.

In the present arrangement 5 syringe units are incorporated and driven from an electronically controlled device similar to that of Bourra, Mongar and Schild (1954). Switch arrangements are included so that any one syringe may be used repetitively, or any number in a preselected order.

The apparatus has proved to be consistent and reliable over the course of several years.

REFERENCES

- Bourra, A., Mongar, J. L., and Schild, H. O. (1954). *Brit. J. Pharmacol.*, **9**, 24-30.
 Burn, J. H., and Dale, H. G. (1922). M.R.C. Report on Biological Standardisations. I. Pituitary Standards. London: H. M. Stationery Office.
 Schild, H. O. (1946). *Brit. J. Pharmacol.*, **1**, 135-138.