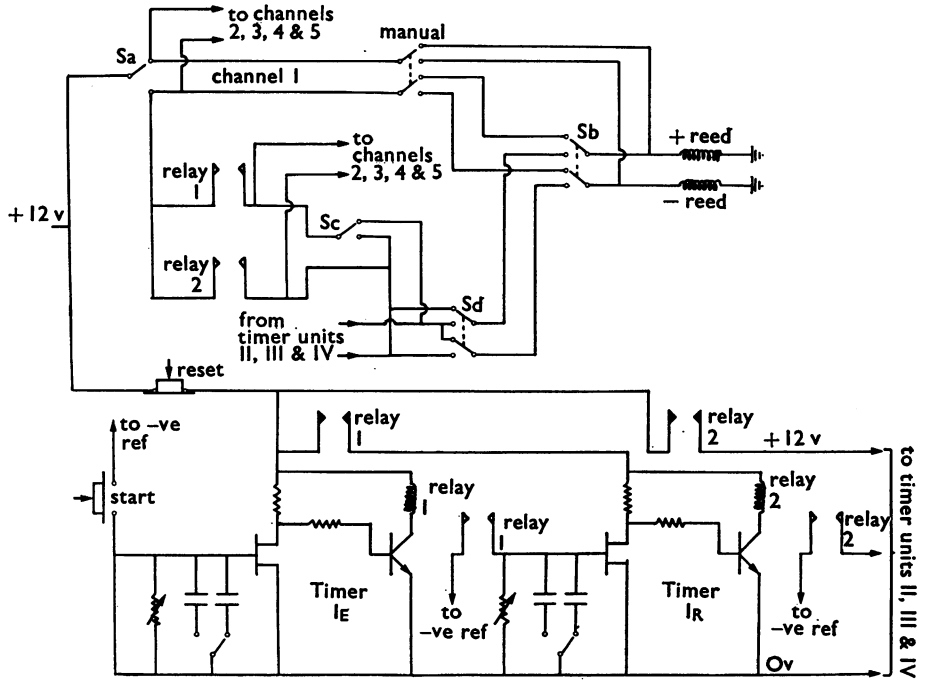

FIG. 1. Timer unit I and one electrophoresis channel.

unit, so that current balancing may be achieved throughout the experiment. The programme is initiated by means of the switch Sa. The inclusion of each channel into the programme is determined by the switches Sb. Each channel may be operated by any of the timer units, as determined by the switches Sc. If any channel is not controlled by a particular timer unit, the retaining current is automatically maintained while that timer unit is in operation. The direction of the current during the ejection period is controlled by the switches Sd; at the start of the retention period, the direction of the current is automatically reversed.

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REFERENCES

BRADSHAW, C. M., ROBERTS, M. H. T. & SZABADI, E. (1973a). A theoretical model of ion-movements in micropipettes occurring during the course of microelectrophoresis experiments. *Br. J. Pharmac.* (in the press).

BRADSHAW, C. M., ROBERTS, M. H. T. & SZABADI, E. (1973b). Relationship between the kinetics of neuronal responses and the release of drugs from micropipettes: effect of retaining currents. *Br. J. Pharmac.* (in the press).

Scintillation counting: channels ratio and external standard channels ratio for the determination of counting efficiency in Triton X-100 based scintillants

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Sheppard & Marlow (1971) described the use of external standard ratios for the determination of counting efficiency in a Triton system but Fox (1968) had reported that this method did not accurately assess counting efficiency in these scintillants, although the channel's ratio was suitable. In this report counting efficiency of aqueous polar samples, similar to those encountered in biology, was determined in two Triton systems by both techniques.

Aqueous samples (0·02–0·05 ml) of ^{3}H-inulin and ^{14}C-3OHphenyltrimethylammonium, previously standardized (dpm/ml) in an homogeneous counting solution (Bray, 1960), were counted in a Triton X-100 scintillant (Toluene:Triton X-100, 2:1 v/v and butyl P.B.D. 6 g/l. containing water 75 ml/l.). The calculated counting efficiency (cpm/dpm) of the polar compounds and hexadecane standards were the same and were predicted by the channels ratio (counting under single labelled conditions) and external standard ratio methods (counting under double labelled conditions). When the water was excluded from the scintillant, different efficiencies for the polar compounds were calculated compared to hexadecane, but these were predicted by the different channels ratio. However, the external ratios were similar and did not detect the difference in efficiency of the ^{14}C isotope. These results are shown in Table 1.

TABLE 1. *The counting efficiencies, channels ratio and external standard channels ratio of two polar compounds and hexadecane in two different triton scintillants*

	Triton-water scintillant		Triton-no water scintillant	
	Efficiency (%)	Channels ratio	Efficiency (%)	Channels ratio
^{14}C-Hexadecane	85	0·31	84	0·23
^{14}C-3OHPTMA*	86	0·30	77	0·30
^{3}H-Hexadecane	31	2·97	39	4·00
^{3}H-Inulin	31	2·92	36	3·66
	Efficiency (%)	External channels ratio	Efficiency (%)	External channels ratio
^{14}C-Hexadecane	60	3·6	57	10·4
^{14}C-3OHPTMA*	60	3·6	47	10·2
^{3}H-Hexadecane	27	3·6	17	10·4
^{3}H-Inulin	27	3·6	16	10·2

* 3-OHPTMA≡3-Hydroxyphenyltrimethylammonium iodide.

The Triton/toluene/water system apparently behaves as a solution (Benson, 1966; Turner, 1968) and both internal and external methods of efficiency determination are suitable. The scintillant without water is apparently heterogeneous and only the internal ratio is satisfactory provided the working standard has the same phase distribution as the compound measured. The homogeneity or heterogeneity of the two scintillants was confirmed by comparison of the pulse height spectra of the polar compounds with the hexadecane standards.

REFERENCES

BENSON, R. H. (1966). Limitations of tritium measurements by liquid scintillation counting of emulsions. *Anal. Chem.*, **38**, 1353–1356.

BRAY, G. A. (1960). A simple efficient liquid scintillator for counting aqueous solutions in a liquid scintillation counter. *Analyt. Biochem.*, **1**, 279–285.

FOX, B. W. (1968). The application of Triton X-100 colloid scintillation counting in biochemistry. *Int. J. Appl. Rad. Isotop.*, **19**, 717–730.

SHEPPARD, G. & MARLOW, C. G. (1971). The simultaneous measurement of ^{51}Cr and ^{14}C by liquid scintillation counting. *Int. J. Appl. Rad. Isotop.*, **22**, 125–127.

TURNER, J. C. (1968). Triton X-100 scintillant for carbon-14 labelled materials. *Int. J. Appl. Rad. Isotop.*, **19**, 557–563.

Screening tests for assessing the relative potency of sensory irritant materials

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Studies on the relative potency of compounds which irritate peripheral nervous elements frequently include, as screening procedures, measurements of threshold concentrations required to produce reflex irritant responses. We have compared the guinea-pig blepharospasm, frog flexor reflex and mouse plethysmography techniques.