The characteristic regular tension changes of the Finkleman preparation were shown by this isolated muscle strip. These tension changes were associated with slow depolarizations leading to bursts of spike activity (Fig. 1).

We thank Professor W. Bowman, Dr. E. Bülbring and Mr. O. B. Saxby for advice in the construction of the sucrose-gap apparatus.

REFERENCES

AMBACHE, N. (1954). Separation of the longitudinal muscle of the rabbit's ileum as a broad sheet *J. Physiol., Lond.*, **125**, 53–55*P*.

BÜLBRING, E. & BURNSTOCK, G. (1960). Membrane potential changes associated with tachyphyllaxis and potentiation of the response to stimulating drugs in smooth muscle. *Br. J. Pharmac. Chemother.*, **15**, 611–624.

The estimation of amylobarbitone and hydroxyamylobarbitone in serum by gas liquid chromatography

K. BALASUBRAMANIAM, G. E. MAWER and E. MARGARET RODGERS, *Department of Pharmacology, University of Manchester, Manchester* 13

A sensitive method has been developed for the estimation of amylobarbitone in human blood serum after sedative or hypnotic doses. The threshold was about 0·2 μg/ml.

Quinalbarbitone (4·0 μg) was added to 2·0 ml. samples of serum as an internal standard. The samples were acidified, saturated with ammonium sulphate and extracted with 20 ml. of diethylether.

The ether extracts were concentrated to about 100 μl. and transferred to activated thin layer plates (Kieselgel, H., Merck; 0·24 mm). The plates were developed first

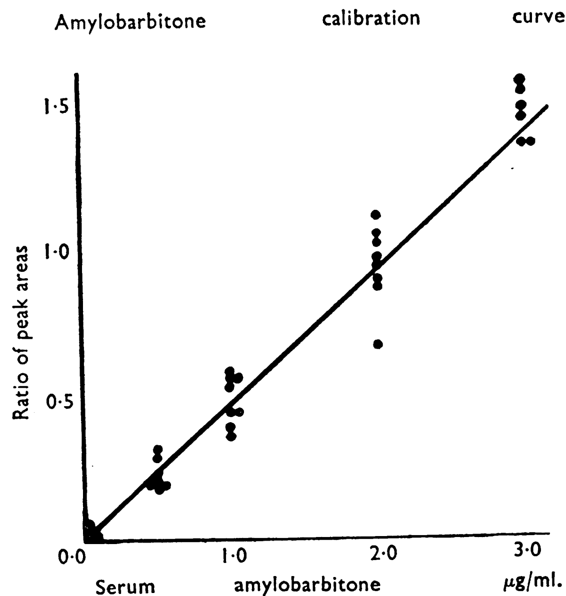

FIG 1.

with chloroform and then in the same direction with chloroform/acetone, 97/3, v/v. The barbiturates were located by staining a marker strip and extracted from the gel into 10 ml. acetone.

The purified extracts were concentrated to 100 μl. and 10 μl. aliquots were evaporated on stainless steel gauzes for gas chromatography. Amylobarbitone and quinalbarbitone were retained for 12 min and 15 min respectively under the following conditions: chromatograph Pye 104, model 24; N_2 50 ml./min; Chromosorb *W*, AW, DCMS, 80–100 mesh, NPGA 3% w/w, trimer acid 0·75% w/w, Perkin-Elmer Ltd.; solid injection preheater 230°; oven 180°; flame ionization detector. The ratio of the peak areas for amylobarbitone and quinalbarbitone gave a direct measure of the concentration of amylobarbitone in the sample. Fig. 1 shows a calibration curve prepared from serum to which known amounts of amylobarbitone had been added.

With the following modifications the same method has been used to measure hydroxyamylobarbitone (5 ethyl, 5(3′hydroxyisoamyl) barbituric acid) in serum and urine: internal standard cyclobarbitone: thin layer solvents chloroform/acetone, 9/1, v/v and 5/7, v/v; gas chromatograph preheater 255°; oven 205°; retention time for cyclobarbitone 15 min and hydroxyamylobarbitone 19 min.

Beta-receptors in human isolated smooth muscle

ANNMARIE HEDGES and P. TURNER, *Division of Clinical Pharmacology, Medical Professorial Unit, St. Bartholomew's Hospital, London, E.C.*1

Although the actions of catecholamines on smooth muscle from animal tissues have been extensively studied for their α- and β-receptor activity, little is known about the receptor populations in human smooth muscle. Bucknell & Whitney (1964) showed that α- and β-receptor stimulation caused relaxation of the human isolated taenia coli. Similar results were obtained with human isolated ileum (Bennett, 1965), longitudinal jejunal muscle (Whitney, 1965) and longitudinal and circular strips of stomach (Bennett & Whitney, 1966).

TABLE 1. *Potencies of isoprenaline (ISO), adrenaline (A), phenylephrine (PE) and salbutamol (S) relative to noradrenaline (N) as free bases on isolated human smooth muscle*

Tissue and number of specimens		Mean relative potencies					ED_{50} value for A (molar conc.)	
		ISO	A	N	PE	S	α-receptor activity*	β-receptor activity
Bronchus	Circular muscle (1)	140	110	1		30		$4·4\times10^{-6}$
Oesophagus	Lower third circular muscle (1)	≫1	>1	1	<1		$3·0\times10^{-7}$	$7·6\times10^{-7}$
Stomach	Lower body longitudinal muscle (4)	3·75	2·66	1	0·07	0·03	$6·0\times10^{-7}$	$2·0\times10^{-6}$
Duodenum	Longitudinal muscle (1)	3	0·6	1	0·001	—	$7·0\times10^{-8}$	$3·5\times10^{-6}$
Jejunum	Longitudinal muscle (1)	<1	>1	1	<1			$1·0\times10^{-5}$
Ileum	Longitudinal muscle (4)	<1	>1	1			$1·0\times10^{-7}$	$4·5\times10^{-6}$
	Circular muscle (3)	10	5	1				$2·0\times10^{-6}$
Colon	Longitudinal muscle (4)	5	3	1	0·08	—	$4·25\times10^{-7}$	$6·0\times10^{-6}$
	Circular muscle (4)	2	6	1	0·2			$2·0\times10^{-5}$
Rectum	Longitudinal muscle (1)	≫1	>1	1			$4·0\times10^{-6}$	$5·0\times10^{-6}$
	Circular muscle (2)	0·4	22·5	1				$6·5\times10^{-5}$
Appendix	Longitudinal muscle (2)	7	2·25	1	—	0·06		$7·0\times10^{-6}$

—, 50% maximum relaxation not reached in concentrations used.
* Coupar, I. M., 1969 (personal communication).