As far as the analgesic activity of these drugs in man is concerned, it is worth noting that Keats & Telford (personal communication) recently found that 8 mg of levallorphan and 10 mg of morphine produced similar relief of post-operative pain. By the same method, nalorphine was equiactive with morphine (Lasagna & Beecher, 1954).

Our data confirm the validity of the phenylquinone test for prediction of analgesic activity from animal to man (Collier, 1964), and suggest that inflammatory pain reproduces in animals a situation nearer to the corresponding human pathology than non-inflammatory pain.

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Relationship between calcium-45, N-acetylneuraminic acid and some drugs on the isolated rat fundus strip preparation

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The role of gangliosides and N-acetylneuraminic acid (NANA) in the 5-hydroxytryptamine (5-HT) receptor has recently been outlined by several authors. Further it was suggested that during 5-HT induced muscular contraction, a 5-HT-gangliosides complex acts as carrier for calcium through the lipoidal cell membrane to the contractile structures.

The present experiments were carried out to find whether NANA acts as a specific or non-specific carrier for the calcium ions. Rat fundic strips were incubated for 8 min with ^{45}Ca (5 μc/ml.) in 10 ml. of oxygenated Tyrode medium. The total tissue radioactivity was determined by liquid scintillation counting (Humphreys, 1965). The calcium uptake was measured in the presence of 5-HT, (+)-amphetamine or furtrethonium (HFUR): amphetamine acts on the same receptor as 5-HT, and the cholinergic drug on a different one (Vane, 1960 ; Innes, 1963).

The experiments were performed on normal tissues and after destruction of NANA with neuraminidase plus EDTA (Woolley & Gommi, 1966). In normal tissue, 5-HT and HFUR significantly increase the concentration of ^{45}Ca in the tissue ; (+)-amphetamine does not influence calcium uptake, in comparison with the controls.

When endogenous NANA is destroyed, the uptake of radioactivity into the tissue is not affected by the drugs: in particular the 5-HT-induced increase of the tissue radioactivity is reduced to control values.

The present data emphasize the importance of NANA in the drug-induced calcium transfer in isolated rat stomach, and raise the question of whether amphetamine acts on the same receptor of 5-HT.

TABLE 1. *Total radioactivity after incubation for 8 min with ^{45}Ca. Effects of (+)-amphetamine (D-A), serotonin (5-HT) and furtrethonium (HFUR)*

Drugs	*n*	Radioactivity (d.p.m./mg of fresh tissue)	Significance tests* Source of variation	*F*	*P*
Controls (C)	6	5,325·5±902·5	C vs D-A C vs 5-HT C vs HFUR	6·30	<0·025
D-A 10^{-1} mM	5	4,750·8±1,049·2	C vs D-A	2·62	n.s.
5-HT 10^{-4} mM	6	9,282·8±1,395·6	C vs 5-HT	10·15	<0·025
			C vs HFUR	16·63	<0·001
HFUR 10^{-3} mM	6	10,110·2±2,725·3	D-A vs 5-HT	21·67	<0·001
			D-A vs HFUR	30·31	<0·001
			5-HT vs HFUR	<1	n.s.

The controls were taken from strips incubated with ^{45}Ca only. The mean values are reported with 95% confidence limits. *n*=Total number of experiments. * Fischer's *F*-test. Doses are expressed as base.

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The action of Tris(3,5,6,8-tetramethyl-1,10-phenanthroline) ruthenium (II) chloride (RTMP) on the cholinergic receptor of the rat intestine and guinea-pig ileum

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Fully co-ordinated metal chelates of ruthenium (II) and 1,10-phenanthroline bases have widespread biological effects including (+)-tubocurare-like action (Schulman & Dwyer, 1964). Such compounds are highly stable and inert and contain no specifically active groups. The charge is diffusely spread over the components of the cation, which generally has considerable lipophilia and a redox potential outside that commonly found in biological tissues. The biological actions of such chelates are a function of the cation as a whole and probably result from functional derangement of responsive biological surfaces by weak Coulombic and shorter range forces.

The action of RTMP has been investigated on the isolated rat intestine and guinea-pig ileum by the techniques described by van Rossum and van den Brink (1963); van Rossum (1963) and Henderson, Ariëns and Simonis (1968). RTMP ($1–3 \times 10^{-4}$M) occasionally produces a small contraction of the rat intestine but