current and with rapid repetitive stimulation are superimposed. With the abolition of the negative inotropic effect of a contraction on the succeeding one (restitution), a current contracture due to sustained depolarization is approached by the contractile response evoked by a fast train of action potentials. It may be that the restitution phenomenon is brought about by the release of a substance, governed by repolarization or relaxation, which competitively inhibits subsequent calcium entry into the cell.

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PHARMACOLOGY

Quasi-Cholinergic Action of Acetylating Agents

The process by which acetylcholine causes muscle to contract presumably includes an action of acetylcholine on a definite site. The exact nature of this site, whether it is a small molecule, or a protein or enzyme, or a membrane, is still unknown. Although it is still inexactly defined, this substance or structure has acquired the presumably synonymous names 'cholinergic receptor' and 'acetylcholine receptor'[1,2]. This communication offers evidence that the receptor structure of smooth muscle includes a chemical grouping capable of being acetylated, and that this acetylation process is a part of the chain of events that leads to contraction.

The knowledge that *N*-acetoxytrimethylammonium bromide has an action resembling that of acetylcholine[3] and also that this substance can acetylate several sulphydryl compounds, including glutathione, coenzyme A, and mercaptoethanol, led us to test the effect of dilutions of acetic anhydride on conventional guinea pig ileum preparations[4]. It was found that small concentrations of acetic anhydride caused muscular contraction. Because acetic anhydride reacts with water with a considerable speed, its concentration at the time of contact with the ileum cannot be stated exactly, but the dilutions were made in an ice bath and were used within 1 min of mixing. Under these conditions, contractions were regularly observed at concentrations of 0·17 mg/ml. Measurements of *p*H at the end of each experiment showed only small changes: from 7·5 to 6·5, or in some longer experiments to 6·0. In the presence of atropine, the classical acetylcholine blocking agent, addition of acetic anhydride did not cause contraction. Hexamethonium did not prevent the contraction, a fact that suggests that the action is not upon the ganglia. More extensive experiments were performed with isopropenyl acetate, a more tractable acetylating agent[5]. This substance likewise stimulated the ileum, and was not sufficiently hydrolysed during the experiments to alter the *p*H of the medium. This substance likewise did not cause contraction when atropine was present. It will be recalled that Burgen, Burke and Desbarats-Schonbaum[6] showed that isopropenyl acetate is hydrolysed by cholinesterase faster than is acetylcholine. Tests showed that ileum that had been stimulated by isopropenyl acetate was still responsive to subsequent addition of acetylcholine, *N*-acetoxytrimethylammonium, or to additional portions of isopropenyl acetate. Results with acetylimidazole prepared according to Boyer[5] were, in general, similar. Here again we observed stimulation by the substance, and prevention of stimulation by atropine. Stimulation by acetylimidazole did not prevent subsequent stimulation by acetylcholine.

Table 1. Quasi-cholinergic Action of Acetylating Agents

Substance	Stimulatory concentration (mg/ml.)	Concentration of atropine inhibiting (mg/ml.)
Acetic anhydride	0·17	0·00017
Isopropenyl acetate	0·42	0·00017
Acetyl imidazole	0·067	0·00017
N-Acetoxytrimethyl-ammonium bromide	0·001	0·00005
Acetylcholine bromide	0·00002	0·00013

The results are summarized in Table 1. As four of these substances are acetylating agents capable of reacting with sulphydryl groups, the results hint that the receptor site may include a sulphydryl group. This must for the present remain conjectural, since other groups (for example, hydroxy, amino, imidazol) capable of acetylation cannot be excluded.

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Enhancement of the Intestinal Absorption of Glucose by Small Doses of Cetrimide and Sodium Lauryl Sulphate

After the growth-promoting activity of aureomycin was discovered in chicks and piglets, some surface-active germicides were tried as feed-additives, and Ely[1] reported a parallel effect with synthetic detergents such as lauryl ethylene oxide. Stern and McGinnis[2] obtained equal growth responses on the addition of vitamin B_{12}, aureomycin or detergent to Ely's basal diets, so that Ely's results were attributed to supplementation of a dietary deficiency in this vitamin, and not to primary growth stimulation. However, claims that related compounds, such as trimethylhexadecyl-ammonium stearate, possessed primary growth stimulating activity persisted. In attempting to clarify the problem during the present investigation, both trimethyl-hexadecylammonium stearate and its corresponding bromide ester, cetrimide, were tested on three-week old and adult albino