measure motor activity even when the animal was still—grooming itself, feeding or just twitching; or when the animal was anaesthetized. For anaesthetized preparations the problem was resolved by placing the animal in a plastic container suspended by a stiff piece of wire from a semiconductor strain gauge (Devices Ltd., type 2STO2, Fig. 1a). For unanaesthetized animals the problem was more difficult because the activity had to be measured no matter where the animal was in its cage. Suspending a whole cage from a semiconductor strain gauge posed problems mainly concerned with the weight of the cage. The problem was finally overcome by resting the cage on a continuous length of silicone rubber tube filled with a mercury and supported between two Perspex bars (Fig. 1b). The strain gauges formed part of a d.c. bridge circuit the output from which was led to an operational amplifier for amplification. This amplified signal was then half wave rectified and a.c. coupled into another operational amplifier connected to form an integrator. The integrator was reset to zero at fixed time intervals and its output displayed on a pen recorder. The signal was a.c. coupled into the integrator so that the bridge need only be balanced at the beginning of an experimental run; any drift in the bridge amplifier or bridge can then be disregarded. Records taken from each activity " meter " are shown in Fig. 1c, d.

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The vesicle population of rat ganglionic synapses and the effects of some drugs

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The " local vesicle population " (l.v.p.) in synapses of isolated rat superior cervical ganglia have been estimated by counting the number of vesicles within 0·25 μm of the pre-synaptic membrane in preparations after 1 h in a modified McEwen's (1956) solution at 37° C. A mean value of $120 \pm 3{\cdot}88$ (S.E.) vesicles/μm^2 was obtained ($n=107$ synapses in five ganglia).

In drug experiments, unstimulated isolated ganglia were bathed in our McEwen's solution for 30 min. Then the solution was replaced by fresh solution (controls) or one containing the test drug for 30 min, after which ganglia were fixed overnight in phosphate-buffered osmium tetroxide and sections about 500 μm prepared for electron-microscopy. With hexamethonium, the drug treatment period was for only the final 10 min of the hour *in vitro*. Vesicles in at least sixty synapses were counted in three preparations with each drug.

Hexamethonium bromide (0·275 mM) significantly increased ($P<0{\cdot}001$) the l.v.p. from control values to $146 \pm 5{\cdot}2$ (S.E.) vesicles/μm^2, while methylpentynol carbamate (MPC, 13·86 mM) elevated the l.v.p. to $152 \pm 4{\cdot}9$ (S.E.) vesicles/μm^2: $P<0{\cdot}001$. These two increases were significantly ($P<0{\cdot}005$) less than the l.v.p. value of $179 \pm 7{\cdot}3$ (S.E.) vesicles/μm^2 with amylobarbitone sodium (AMY, 4·02 mM). The concentrations of MPC and AMY were at least five times greater than those which blocked ganglionic transmission and impaired acetylcholine (ACh) release from preganglionic nerve stimulation in perfused cat superior cervical ganglia (Matthews & Quilliam, 1964).

Chlorpromazine (0·0314 mM) raised the l.v.p. to $175 \pm 4{\cdot}9$ vesicles/μm^2, which might reflect decreased release of quanta of ACh in the treated ganglion or the initial stimulant action of the drug observed by Elliott & Quilliam (1964) in the isolated rabbit ganglion.

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The expansor secundariorum of the domestic fowl: a smooth muscle-nerve preparation without cholinergic receptors

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The expansor secundariorum (ESM) is smooth muscle present in most birds and has the function of controlling the secondary and tertiary feathers during flight. The muscle is embedded in subcutaneous connective tissue at the elbow joint. The nerve supplying the ESM is a branch of the radial nerve. It runs parallel with the radial nerve, becoming more superficial as it approaches the distal end of the humerus.

Some of the properties of the isolated ESM of domestic fowl have been described by Buckley & Wheater (1968), who suggested that the muscle may be innervated only by postganglionic adrenergic fibres. This report describes briefly the use of the ESM indirectly, *in vivo* and *in vitro*.

For *in vivo* studies fowls were anaesthetized and the nerve supply to the ESM dissected free, transected at the mid-point of the humerus and placed over shielded bipolar platinum electrodes. The humerus was drilled and clamped in a vertical position. A cotton thread passing through the bases of the secondary feathers inserted into the ESM was connected to a lightly sprung lever writing on a smoked drum. Stimulation was by supramaximal square wave pulses of 2 ms duration and a frequency of 15 Hz.

For *in vitro* studies, the birds were anaesthetized with ether and the muscle and nerve dissected free. The preparation was bathed with Tyrode's solution in an 80 ml tissue bath at 21° C. Stimulation was similar to that used *in vivo*.

The height of contractions was not affected by 10^{-5}M hexamethonium bromide or 2×10^{-5}M tubocurarine chloride but was reduced by 10^{-6}M phentolamine mesylate.

The isolated expansor secundariorum nerve-muscle preparation and some of its properties will be demonstrated.

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