1. "*Spontaneous*" *behaviour:* apparatus for testing the effects of drugs and of other factors on different aspects of unlearned behaviour, which can be used for analysing: responses to novelty, emotionality, fear, aggression, memory, learning and habituation. Specific pieces of equipment include:

(*a*) Y-mazes
(*b*) Hole boards
(*c*) Open fields
(*d*) Cages for observing aggressive and other behaviour
(*e*) Apparatus for measuring ataxia.

2. *Learned behaviour*: an example of apparatus which may be used to measure precisely the effects of drugs on learned "operant" responses and concurrent electrophysiological changes forms a separate demonstration (Gartside & Harrison-Read, 1970).

3. *Drug dependence:* a simple method for demonstrating a withdrawal syndrome in mice which have been chronically treated with morphine and for objectively measuring changes in its intensity.

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Recording evoked potentials in the conscious rat: the maintenance of a constant behavioural baseline

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Mass potentials evoked in the brain by sensory stimulation show large moment to moment variation. Some of this random variability can be averaged out by electronic techniques, but the resulting averages also show systematic changes during the course of the long recording sessions which are needed for studying drugs or other treatments (for example cortical polarization). Although factors such as habituation or specific attention to the stimuli may contribute to evoked potential variability, recent carefully controlled experiments have put more emphasis on the indirect influences of, for example, body movements, changes in the effective stimulus strength, or the animal's overall state of "arousal" (Horn, 1965; Worden, 1966).

We have attempted to stabilize these factors by recording from animals engaged in a task which induces constant amounts of movement and a constant orientation towards a source of sensory stimulation. Furthermore, it seems that this behaviour may remain fairly constant even in the presence of some drugs which can affect the evoked response directly.

Hungry rats have been trained to press a translucent panel with their snouts in order to obtain food. To make sure that a rat will work for long periods without becoming sated, rewards are delivered infrequently. Thus on average the animal must press the panel about 40 times for a single reward. This is called a ratio schedule of reinforcement, and since the ratio of presses to rewards is arranged to vary randomly about a mean value of 40, it is in this case called a variable ratio

(VR40). Variable ratio schedules typically produce very high baseline rates of responding (Ferster & Skinner, 1957). In the present study, since the pellet is delivered into a tray below the panel, the rat keeps its head and eyes, but not necessarily its attention, directed towards the panel, with a minimum of irrelevant movements apart from those involved in eating the occasional pellet. Therefore photic stimuli for evoking visual responses are in this demonstration produced by a flash unit (1 J/flash) delivered to the rat through the translucent panel. Ratio schedules have another property: once established they are relatively insensitive to treatments which do not produce motor impairment (Dews, 1956). This is an advantage because the rate of responding is not intended to reflect treatment-induced changes in behaviour, but to yield a constant behavioural output against which electrophysiological effects of treatments can be assessed. Without this control, drug effects might be indistinguishable from the changes observed in the untreated animal when similar gross behaviour changes occur naturally (Herz, Fraling, Nieder & Farber, 1967).

We have implanted the rats with various kinds of electrodes in cortical and subcortical areas. The electrode leads are soldered to an 8-pin miniature socket (TO5 transistor base) which is secured to the skull with stainless steel screws and dental acrylic cement. A multi-channel mercury swivel commutator prevents twisting of the cable which leads from the animal to the amplifiers and recording apparatus. Potentials time-locked to the stimulus are electronically stored and summated using an averaging computer (Biomac 1000). This procedure in effect increases the signal to noise ratio of the evoked potentials, which are comparatively small relative to the background electrical activity of the conscious brain.

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Evidence for interaction between chlorpromazine and aldolase

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Chlorpromazine is known to inhibit rabbit muscle aldolase (Chowdhury, Rogers, Skinner, Spector & Watts, 1969) and these authors suggest that inhibition may be due to a conformational change of the enzyme. Chlorpromazine acts as a fluorescent probe: in aqueous solution a small fluorescence spectrum is produced which is greatly enhanced in the presence of aldolase. Also, shifts in the fluorescence spectrum of aldolase–chlorpromazine mixtures are consistent with a conformational change