A SIMPLE STABILIMETER

T. WORD AND J.A. STERN

Washington University Medical School,
Department of Psychiatry and Neurology

The device to be described, when used in conjunction with an EEG machine or other suitable amplifiers, will detect movement in small animals with extreme sensitivity. Figure 1 shows the apparatus, as constructed in our laboratory, for use with the rat. The total cost of materials was less than \$15.00. Outside dimensions of the apparatus are 14 3/4 inches high, 11 1/2 inches wide, and 12 inches deep.

The principle of operation is simple. The cage floor is a sheet of 30-gauge galvanized steel. It is rigid enough to support the animal and flexible enough to act as a diaphragm. Movement of the animal causes the cage floor (or diaphragm) to vibrate, producing pressure changes within the sound chamber. The PM speaker (Jensen 5J6), acting as a microphone, produces an electrical output which varies with the changes in pressure. This output is fed to an EEG machine, where it is amplified and recorded in the conventional manner.

A grid floor was added in some of our experiments, since it was necessary to shock the animal. This grid floor rests on the diaphragm. Sensitivity is somewhat reduced, but operation is otherwise unaffected.

This stabilimeter has several advantages: it is cheap and simple; operation is foolproof; and it is extremely sensitive. With EEG gain (Gilson EEG) at two-thirds, all visually observable animal movement-- excepting certain head movements-- will be detected. With EEG gain at maximum, the device responds to changes in the animal not visually observable. Figure 2 illustrates some typical responses obtained during a conditioning experiment.

Experiments involving conditioning procedures have proven highly feasible with this apparatus. Conditioned "movement" responses not observable with the naked eye are recorded and greatly simplify the evaluation of conditioned responses both during conditioning and extinction. We are presently using this apparatus to evaluate the development of conditioned "emotional" responses and the effect of various experimental procedures on their development and extinction. The difficulties inherent in recording these "emotional" responses necessitating the use of such gross measures of "emotional" behavior as "freezing," defecation, and urination are obviated with this instrument.

Fig. 1. Diagram of the apparatus.

CONDITIONING STABILIMETER

CONDITIONING

TRIAL 7

TRIAL 20

EXTINCTION

TRIAL 19

Fig. 2. Typical responses.