fonphthalein to eliminate dichromatism as encountered with bromcresol purple.

The advantages of this comparator are as follows:

1. It minimizes eyestrain, the vertical view arrangement resulting in (a) a flat uniform field of light and (b) the elimination of direct glare from the light source which is often experienced with horizontal view devices, and the reflected glare from white opaque plates used in other microtechniques.

2. Good results may be obtained with twilight that is yet strong enough to read newsprint.

3. By the inclusion of maximum-minimum control standards and the use of partial color filters the entire range of an indicator may be used with good results.

4. It is adaptable to the aseptic technique used by bacteriologists. This minimizes the danger of splattering culture over the field of operation, such as is a hazard with the methods of Brown (*2*) and Felton (*4*).

5. The test cups are disposable in the same manner as are culture tubes, eliminating the hazard of infection from improperly disinfected electrodes when a potentiometer is used.

6. The depth of the test cups allows room for (a) adding enough of a poorly buffered specimen to overcome the buffer effect of the indicator solution, (b) adding a deep layer of oil to protect the test from the atmosphere if so desired, and (c) titration of 1.0 ml or less of a specimen for determination of total acidity or the buffer index (*1*).

7. The accuracy is comparable with that of the Gillespie method (*5*) under optimum conditions.

8. There is provision for a specimen control cup which is not employed in the methods of Brown (*2*), Felton (*4*), and Haas (*6*).

9. Convenience and rapidity of operation result from the mechanical design and from the constant indicator intensity, regardless of the depths of the solutions in the test and standard cups. The apparatus is much simpler to use than to describe.

10. The device is adaptable to other types of colorimetric and turbidometric determinations.

11. The use of reflected light makes possible the use of permanent painted standards.

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Effect of Panparnit on Brain Wave Changes Induced by Diisopropyl Fluorophosphate (DFP)

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The intracarotid injection of the anticholinesterase, diisopropyl fluorophosphate (DFP) in curarized rabbits produces grand mal-like electroencephalographic (EEG) patterns (*2*). These abnormal brain waves are associated with extremely low cholinesterase levels of cerebral cortex, midbrain, cerebellum, and medulla (*4*). We are thus confronted with presumptive evidence that DFP acts as a convulsive agent by permitting the accumulation of acetylcholine. This proposed mechanism receives some support by virtue of the ability of atropine to prevent or abolish the grand mal-like EEG patterns (*2*). However, trimethadione (tridione), sodium pentothal, and phenobarbital, although not anticholinergic drugs, have a similar effect on cerebral convulsive activity induced by DFP (*6*). It is interesting to note that none of these anticonvulsant agents raises the depressed cholinesterase levels in the brain (*6*).

Panparnit, a drug with an imposing and diverse array of pharmacologic actions, has been added to the list of drugs reportedly effectual in treating postencephalitic Parkinsonism (*3*). This drug (diethylaminoethylester of phenylcyclopentane carboxylic acid) is grouped with the synthetic smooth muscle spasmolytics. Panparnit further resembles atropine in producing relatively mild anticholinergic effects on the vegetative nervous system. Domenjoz, who described these Panparnit characteristics, also states that it has a curariform effect on frog skeletal muscle (*1*). Gruber and associates (*3*) report that this agent abolishes decerebrate rigidity in cats by virtue of a central mechanism. Heymans and Estable (*5*) describe Panparnit as being anticonvulsant. These authors also state that Panparnit protects against high doses of acetylcholine, pilocarpine, diisopropyl fluorophosphate (DFP), strychnine, and metrazol. It was decided to test, by electroencephalographic assay, whether the anticonvulsant property and the protective function of Panparnit would combine to make this drug an effective curative for DFP-induced grand mal-like convulsions.

Albino rabbits were prepared under local procaine anesthesia (2%). The trachea was cannulated for artificial respiration, both carotid arteries were exposed for the injection of DFP (1 mg/ml in distilled water), and steel electrodes were pressed through the skull over each cerebral hemisphere. Monopolar corticograms from each side of the brain and an electrocardiogram were recorded simultaneously on a four-channel Grass apparatus. The animals were curarized and placed under artificial respiration. Small doses of atropine (0.02 mg/kg) were used, sufficient to protect the heart until grand mal-type brain waves were obtained. This dose of atropine is too small to abolish cerebral hyperactivity. DFP was injected into one carotid artery at 12-min intervals in doses of 0.5 mg/kg, a little higher than the LD_{50}. Two to three such doses were required to produce bilateral grand mal-like

patterns on the EEG record. After such records were obtained Panparnit was administered intravenously in doses of 2–4 mg/kg. The cholinesterase values in percent of normal were determined in right cortex, left cortex, and right midbrain using Michel's method (7).

The therapeutic influence of Panparnit upon both brain waves and heart is shown in Fig. 1. This drug effectively abolished the grand mal-like patterns produced by DFP in each of ten instances. Panparnit was given in doses of 4.0 mg/kg in seven cases, 3.0 mg/kg in one case and

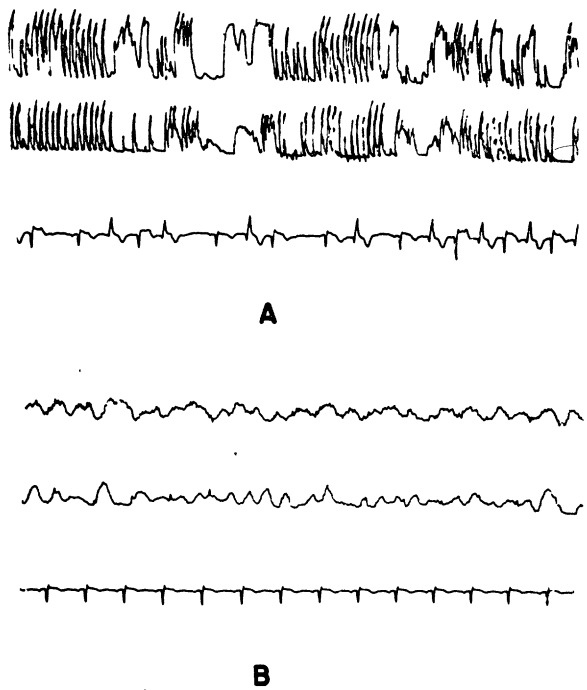

FIG. 1. Effect of Panparnit in abnormalities of brain and heart. A—After intracarotid injection of DFP (1.5 mg/kg). Grand mal-like electroencephalogram and profound disturbances of cardiac function. Top tracing from right cerebral cortex. Middle tracing from left cerebral cortex. Lowest tracing electrocardiogram. B—After intravenous injection of Panparnit (4.0 mg/kg). Elimination of abnormalities in electroencephalograph and electrocardiograph. Same order of tracings.

2.0 mg/kg in two cases. All spiking ceased within 3–4 min and was supplanted by patterns characterized either by delta-like waves or somewhat low potential aperiodic activity, resembling the control EEG. Although Panparnit abolished the abnormal EEG activity the cholinesterase levels of both cerebral cortices and right midbrain remained depressed. The cholinesterase values varied from 0.4% to 2.9% of normal, which is the expected range following the administration of DFP in doses of 1.0–1.5 mg/kg. The influence of Panparnit on the heart was manifested in those instances where the cholinergic action of DFP produced bradycardia and altered electrocardiogram (ECG) patterns concomitantly with convulsive-type EEG records. Panparnit appears capable of restoring such ECG records to normal pattern and rate.

Because Panparnit resembles atropine pharmacodynamically, in some respects, additional therapeutic explorations should be made to determine the influence of Panparnit in conditions associated with overactivity of the parasympathetic system, as well as on the convulsions produced by anticholinesterase drugs.

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Development and Viability of *Drosophila melanogaster* on a Medium Containing DDT

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It has been reported (*1, 3*) that the wild *Musca domestica* L. have become resistant to DDT in certain localities. With this in mind the author has attempted to increase the DDT resistance of *Drosophila melanogaster* by selection. The experiment is still in progress, but the incidental observations described here seem sufficiently interesting to warrant separate publication.

Technical DDT was dissolved in CCl_4 (C. P. Baker's Analyzed) and mixed thoroughly with a boiling cornmeal-agar-molasses medium. To insure evaporation of the solvent the resultant medium was boiled 5 min. The concentration used in these experiments was DDT 5 ppm of culture medium. Controls were cultured in normal medium for each experiment. In addition, a series of tests were conducted to ascertain the effects, if any, of CCl_4 added to normal medium. These cultures developed at the same rate and in the same manner as did the normal controls.

Wild-type adult flies 4–6 days old were introduced into 4-oz. bottles containing the experimental medium. All cultures were kept at 24° ± 1° C. Frequent comparisons were made of the experimental and control bottles. Altogether, 11 experiments of this type were run.

All controls were normal, the adults emerging in 10 days. The adults of the DDT cultures were unaffected by the altered food. Egg production, hatching, larval development, and the early stages of pupation were normal, but development was somewhat slower than in the control bottles. The later stages of pupal development, however, were abnormal, since the imagoes usually failed to emerge; in some cases, however, adults did emerge but immediately exhibited symptoms of DDT poisoning.

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