the kidney of living monkeys without causing manifest injury. When cultured, however, cells from the infected kidney are subsequently destroyed(17).

From a practical point of view, these results indicate that in the study of viral agents whose behavior in tissue culture is uncertain, disregard of the effects of cultural age and agitation may be misleading.

Summary. 1) The cytopathic response of primary human amnion cell cultures to chick embryo adapted Type II poliovirus was absent in stationary cultures inoculated at 5-10 days of age. In stationary cultures inoculated when 30 or more days of age, complete destruction of cells followed. Multiplication of virus in young cultures occurred in the absence of recognizable cytopathic change. Cytopathic response of cultures of approximately 14 days was markedly enhanced by rolling after inoculation. The effect of rolling was not clearly apparent when other strains of poliovirus including attenuated strains were tested. 2) Frequently the cytopathic response of amnion cultures to Sindbis virus was reduced or absent in young as compared with old cultures, but response of young cultures was variable. No effect of rolling on cytopathic response could be demonstrated. Viral multiplication was greater in older cultures.

I am grateful to Dr. J. F. Enders for guidance.

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Received December 8, 1958. P.S.E.B.M., 1959, v100.

A Micrometer Plunger Adaptation to the Stern-Kirk Microrespirometer. (24678)

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The Stern-Kirk microrespirometer(1) has a number of features which make it well suited for studies of respiration in small samples of tissue. It is sturdy, easy to operate and sensitive. The respiration chamber and thermobarometer compensation chamber consist of 2 recesses drilled in a metal block base. The metal quickly equilibrates temperature differences between the 2 chambers, so that accuracy of the apparatus is not affected by small changes in surrounding temperature. Since the chambers are closed during experiments, repeated thermobarometer corrections are unnecessary. In this respect, the Stern-Kirk respirometer resembles volumetric respirometers of similar construction(2-5). Unlike them, however, it requires time-consuming calibration procedures. To overcome this

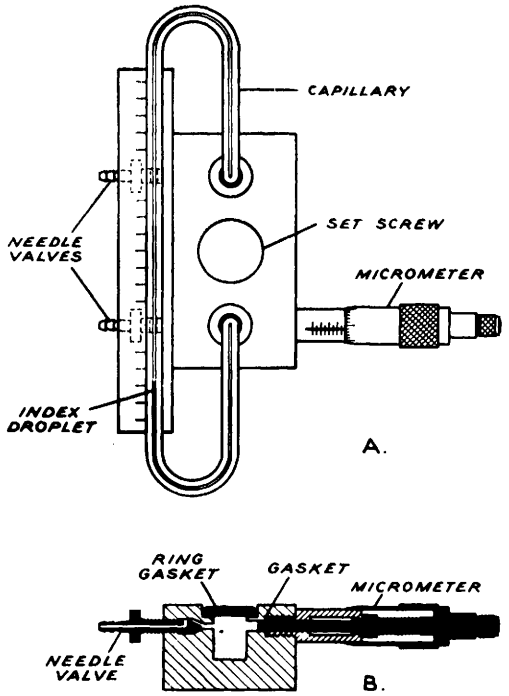

FIG. 1. Stern-Kirk microrespirometer with micrometer plunger adaptation. A. Top view, completely assembled. B. Cross-section of lower part with plunger attached.

drawback, the respiration chamber was provided with a micrometer plunger which gives the apparatus the ease of calibration and operation of certain volumetric respirometers(3-6), without sacrificing its own advantageous features.

Methods. A stainless steel plunger is inserted into the respiration chamber through an opening drilled in the metal block base. The entry is made airtight with a gasket. Any alteration in volume of gases in the respiration chamber is reflected by change in position of the index droplet in the capillary which connects respiration chamber with compensation chamber. At intervals the plunger is moved until the droplet has been returned to its original position at beginning of experiment. Readings of alterations in gas volume are made by determining the change in plunger's position. This can be done accurately with a variety of devices, such as a micrometer scale, revolution counter(6) or dial micrometer gauge(7). Measurement of the plunger's diameter with a micrometer caliper, is the only calibration required. The sensitivity and range of instrument can be extended by using interchangeable plungers of various diameters in combination with capillaries of different dimensions. The apparatus is shown in Fig. 1; a commercal micrometer caliper head provides the plunger and reading device. The plunger has a diameter of ⅛ inch. The micrometer permits ½-inch longitudinal displacement divided into 500 scale units. This corresponds to total volume displacement of 100.4 mm^3 or 0.201 mm^3/scale unit. In Fig. 1A respirometer and micrometer head is seen from above. In Fig. 1B a cross section of bottom part of instrument shows point of entry of plunger into the respiration chamber opposite the hole of the needle valve. The latter allows gassing of chambers and prevents loss of index droplet during opening and closing of respirometer (1). The gasket around plunger is made of Teflon.

Suspending medium, alkali and tissue are introduced as usual, and respiration chamber is oxygenated. The respirometer cover is secured with the set screw, and needle valves are closed. Location of the index droplet in the capillary is noted after temperature equilibration. Position of the plunger is then read on the micrometer scale. Starting point of the droplet can be adjusted by tilting instrument prior to closing the needle valves(1). In studies of oxygen consumption, droplet will slowly advance toward respiration chamber. At regular intervals it is returned to its starting point by moving plunger deeper into the chamber. The specimen can be shaken, if re-

TABLE I. Cumulative Oxygen Uptake in 60 Min. by 7.28 mg Wet Weight of Human Gingival Tissue Using the Stern-Kirk Microrespirometer with the Micrometer Plunger Adaptation.

Time (min.)	Position of plunger on micrometer scale	Plunger displacement in micrometer units	mm^3 O_2 consumed (displ. × 0.201)
0	387	0	0
9	379.5	7.5	1.5
17	373.5	13.5	2.7
25	368	19	3.8
30	365	22	4.4
40	360	27	5.4
60	351.5	35.5	7.1

The Q_{O_2} (wet wt) = 0.97; Q_{O_2} (nitrogen) = 31.8 38°C.

quired, by placing the respirometer on any commercial shaker or vibrator with adequate speed of motion.

Example of use. The adapted instrument was used to measure oxygen uptake of human gingiva obtained by surgical excision(8). Position of micrometer plunger at various time intervals and cumulative oxygen uptake at 38°C are shown in Table I. Wet weight of the respiring sample was 7.28 mg or 0.223 mg nitrogen as determined by Kjeldahl nesslerization.

Summary. A Stern-Kirk microrespirometer was provided with a plunger adaptation which obviates the need of prior calibration of volumes of respiration and compensation chambers. By combining interchangeable plungers of different diameters with various available capillary manometer tubes, the range of the instrument can be extended. Use of the instrument in measuring the oxygen uptake of human gingival tissue is described.

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Received December 8, 1958. P.S.E.B.M., 1959, v100.

Reversal of Inhibitory Activity of Chlorpromazine by Calcium.* (24679)

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Since the use of microorganisms has been a valuable aid in discovery of new and the elucidation of known metabolic reactions, a program has been initiated in which bacteria were used to obtain information as to possible mode of action of various drugs affecting the central nervous system. The present report concerns inhibition of growth of *E. coli* by chlorpromazine, a "tranquilizer," and its reversal by calcium.

Methods. *E. coli* A.T.C.C. #9723 was maintained and the inoculum prepared essentially by a previously described method(1). All assays were performed at 37° for 17 hours in final volume of 10 ml, using Dunn's(1) modification of Anderson's salts, ammonium chloride and glucose medium(2).

Results. As shown in Fig. 1, 0.075 μmole of chlorpromazine/ml of medium produces 50% inhibition of maximum growth of this organism, whereas 0.14 μmole of promazine, a less active "tranquilizer" for humans, is necessary for 50% inhibition of growth. Since these 2 drugs also possess antihistaminic activity, tripelennamine (a commonly used antihistaminic) was tested and found devoid of significant inhibitory activity under our conditions.

Various compounds, either metabolites similar in structure, neurohumoral agents or substituents of coenzymes, when used in concentrations that alone were not inhibitory for this strain of *E. coli*, did not reverse inhibitory activity of chlorpromazine or promazine. Examples of such compounds are histamine, histidine, acetylcholine, epinephrine, norepinephrine, 5-hydroxy-tryptamine, nicotinic acid, nicotinamide, thiamine, riboflavin, biotin, pyridoxine, pyridoxal phosphate, or pyridoxamine.

Calcium-d-pantothenate, however, reversed the inhibitory activity of chlorpromazine. Since the amount of pantothenate required for reversal was greater than that expected to be

* This study was supported in part by Nat. Cancer Inst.