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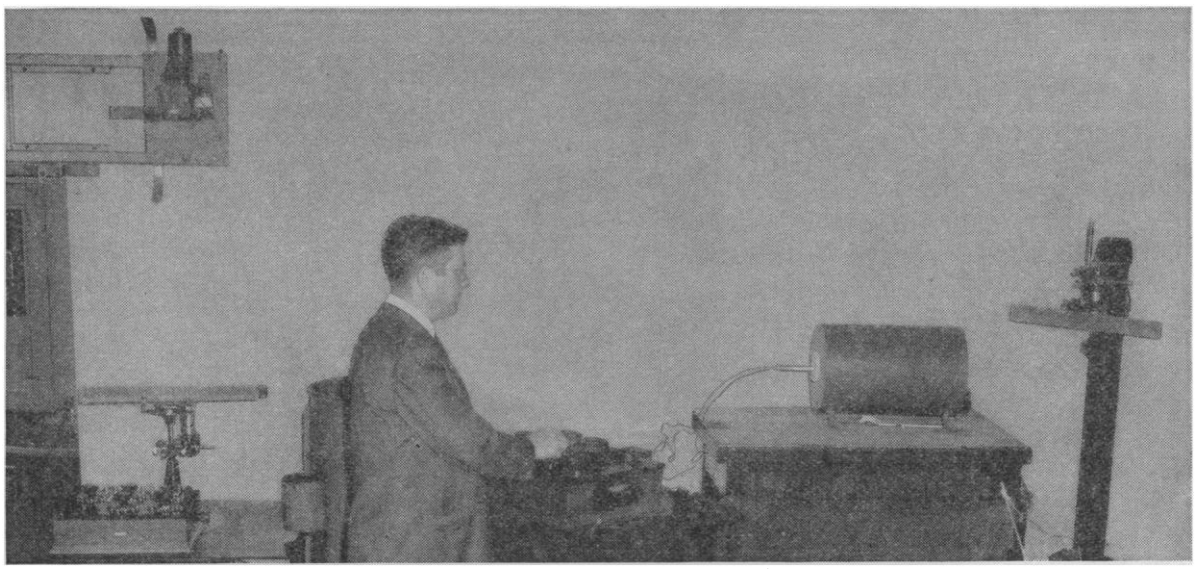


Checking thermocouples in the L&N plant. Inspector is using Wenner Potentiometer; the Mueller Bridge is behind him.

Thermocouple-Checking Setup Uses Wenner Potentiometer; Mueller Bridge

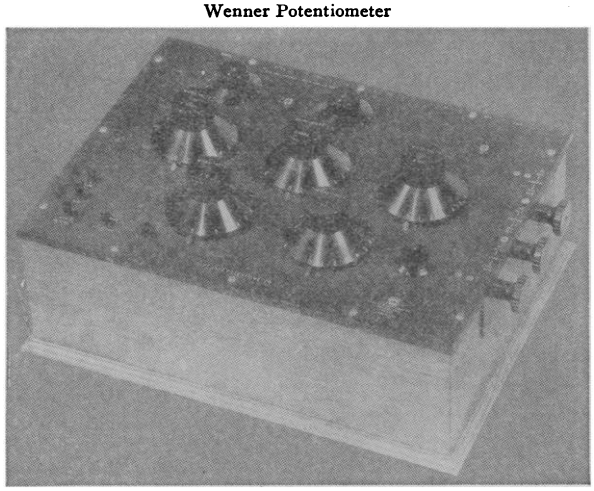
The thermocouple-checking equipment shown above consists of instruments of our own manufacture, used by us in testing substantial quantities daily of wire for the making of thermocouples.

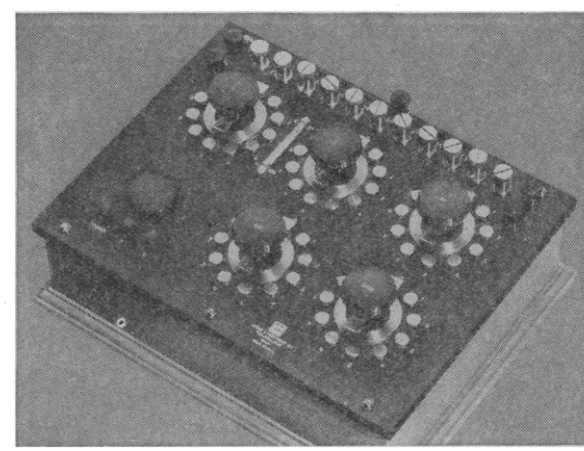
The furnace supplies check temperatures of 150 C to 1000 C; the constant-temperature bath is for lower temperatures. Both are adaptations of our similar catalog-listed equipments.

The Wenner Potentiometer is our No. 7559, for precise measurements of low voltages; primarily for thermocouple work; features are wide range, high accuracy and extremely low parasitic emfs, and special protection against effects of humidity on the resistors. Resistance in galvanometer circuit is 13 ohms. The potentiometer has 2 ranges; 0 to 0.11111 volt in steps of 1 μv, with limit of error of ±0.01% + 0.5 μv; and 0 - 0.011111 volt in steps of 0.1 μv, with limit of error of ±0.01% + 0.1 μv. The price of No. 7559 is $1245.00.

The galvanometer used with this potentiometer has a sensitivity of 0.0019 μa per mm at 1 meter, a period of 6.2 sec., and a critical damping resistance of 73 ohms. It is our No. 2285-x, price $115.00.

Wenner Potentiometer





Mueller Bridge, Type G-1

To measure the temperature of the oil bath, we use the Mueller Bridge, Type G-1. Its range is 0-51.111 ohms in steps of 0.0001 ohm; its limit of error ±0.02% or ±0.0001 ohm, whichever is greater. With it, we use a No. 8163 Platinum Resistance Thermometer, having a resistance change of about 0.1 ohm per degree C. The Bridge is $340.00. The thermometer is $150.00, plus Bureau of Standards calibration charge.

An interesting accessory is the Pinch-type Switch, our No. 3294, which is practically thermal-free. Its price is $3.00.

Further details regarding the above instruments will be sent on request.

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THE NEXT FIFTY YEARS[1]

By President ROBERT M. HUTCHINS

UNIVERSITY OF CHICAGO

THE task which Mr. Harper and his associates set themselves fifty years ago was that of organizing a university. To them a university was, like the German university of that time, an institution dominated by the spirit of inquiry. The characteristic activity of its professors was research.

The task involved selecting men qualified for research, giving them facilities for it, assembling students who could take part in it, and erecting that protection of academic freedom about it which, in the bad old imperial days, guaranteed the independence of the teaching and investigations of the German professor.

[1] An address delivered at the Fiftieth Anniversary Convocation of the University of Chicago on September 29.

The University of Chicago was a university the day it opened. We are now so used to universities that we are apt to think that this achievement, though doubtless unusual, was not very remarkable. We are apt to think that all it required was money and that anybody could have done it if he had had the money that was available to the organizers of the University of Chicago.

But the money was not available. Mr. Rockefeller's original pledge was for $600,000, and it was conditional on the raising of $400,000 more. We later became so used to great gifts for universities that we now suppose that all the participants, including Mr. Rockefeller, must have expected him to give the enormous sum of $35,000,000 which he did give by 1910. But

a square window cut into this tube immediately adjacent to the solid portion. This window is of such a size as to correspond with the area in which the holes are drilled in the outer jacket (*A*). The edge of the square window (or windows) is filed to form a cutting knife or knives if more than one window is made as in the larger units. This tubular knife fits snugly within the outer jacket and rotates freely when activated by the pin *E*. (*3*) The brass plunger (*C*) which telescopes snugly into the open end of the hollow knife is able to rotate with it since it operates freely on the bearing at *F*, thus preventing the maceration of tissues which would occur if the plunger were fixed. The outer jacket and the knife can be made more economically of seamless steel tubing fitted into brass parts to form the shank, thus reducing the amount of machine work necessary. These three mincing parts are readily interchangeable and may be removed quickly from the activating mechanism for loading and cleaning either by retracting the bearing *F* after loosening the thumbscrew *G* or by removing the supporting bar *H* from the threaded rods.

The activating mechanism is mounted on a heavy board by supporting arms attached to the gear box at such a height that the crank may be turned readily. Rotation of the knife and the advancement of the plunger occur simultaneously when the crank is turned. The two threaded rods are geared to the crank and engage the crossbar *H*. By means of this mechanism, the plunger is advanced one sixteenth of an inch for each ten turns of the knife, thus assuring the same uniform rate of tissue advancement and cutting irrespective of the speed at which the crank is turned. This is an absolute essential if a uniform particle size of tissue is to be obtained. Since the plunger can not be advanced without simultaneous operation of the knives it is impossible to squeeze tissues through the openings in the outer jacket without this material being cut, an occurrence common to the Latapie type mincer. The activating mechanism could be improved mechanically by making it possible to alter as desired the ratio of tissue advancement to knife speed. Other modifications, such as a mechanical drive and a lathe-bed type of arrangement for supporting the mincing unit, would add to the convenience but also increase the cost.

By constructing several sizes of the three essential mincing parts, all having uniform dimensions at the shank end, and by using interchangeable casings and knives, we have found it convenient to mince quantities of tissue from 0.25 to 30 grams. Dr. A. E. Axelrod, of the Department of Biochemistry, is using a small mincing unit of 4 mm plunger diameter which will deliver 200 milligrams of tissue from a 250-milligram rat heart. The efficiency of delivery is much greater with larger units, although a small waste of tissue is inevitable because of the small dead space between the knives.

Values for Q_{O_2} obtained on tissues minced with this apparatus compare very favorably with those obtained from the larger Latapie mincer. This mincer will cut soft tissues like brain or liver into discrete particles. Dr. V. R. Potter[2] has found that this apparatus yields a liver mince of "the critical particle size needed to permit adequate inward diffusion of oxygen with minimum loss of cytochrome due to outward diffusion." Fibrous mammary tumors, cartilage and even soft bone, which are refractory to mincing with the Latapie or simple pressure mincers, are reduced readily in the apparatus as described.

The mechanical features were designed by J. S. Hipple, Medical School mechanician, who also constructed the apparatus.

M. H. SEEVERS
F. E. SHIDEMAN

UNIVERSITY OF WISCONSIN

A COMBINED FIXATIVE AND STAIN FOR THE CILIA AND TRICHOCYSTS OF PARAMECIUM

THE combined fixative and stain described here offers numerous advantages over the methods now used for the demonstration of trichocysts and cilia. The structures are stained instantaneously and the normal contour of the animals is faithfully preserved. The trichocyst stain is prepared as follows: Copper sulphate, 5 per cent., 50 cc; hydrochloric acid, 0.1N, 12 drops; blue ink, 5 drops.

If it is desired to stain the cilia only, the hydrochloric acid is omitted from the formula. To use the stain, add two drops to the culture on the slide, place cover glass and examine. The best preparations are usually found around the edges.

JAMES SUMNER LEE

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DURHAM

[2] V. R. Potter, *Jour. Biol. Chem.* (in press).

BOOKS RECEIVED

BAKST, AARON. *Mathematics—Its Magic and Mastery.* Pp. xiv + 790. Illustrated. Van Nostrand. $3.95.

BARRER, RICHARD M. *Diffusion in and through Solids.* Pp. xiii + 464. Illustrated. Cambridge University Press, Macmillan. $6.50.

FUSON, REYNOLD C., RALPH CONNOR, CHARLES C. PRICE and H. E. SNYDER. *A Brief Course in Organic Chemistry.* Pp. x + 248. 24 figures. Wiley. $2.50.

HALL, WILLIAM T. *Textbook of Quantitative Analysis.* Third edition, revised. Pp. xiv + 364. 51 figures. Wiley. $3.00.

KNOTT, JAMES E. *Vegetable Growing.* Third edition, revised. Pp. 356. 80 figures. Lea and Febiger. $3.25.

SAMPSON, H. C. *Work Book in General Botany.* Loose-leaf. Pp. vi + 242. Illustrated. Harper.