Equipment

The information reported here is obtained from manufacturers and from other sources considered to be reliable. Science *does not assume responsibility for the accuracy of the information. A coupon for use in making inquiries concerning the items listed appears on page 554.*

■ OSCILLOSCOPE CAMERA features a Polaroid back that takes from 1 to 80 pictures with a single loading. A multiple-exposure positioning bar permits up to 10 traces to be photographed on a single frame. The lens aperture is $f/1.9$, and shutter speeds are from 1 to 1/100 sec. (Beattie-Coleman Inc., Dept. 292)

■ PULSED NEUTRON GENERATOR consists of a deuteron source and various electrodes for extraction and acceleration of the beam of ions to 100 kev. Neutrons are produced by a reaction of the deuterons with a deuterium or tritium target. The yield exceeds 6×10^5 neutrons/sec from the $H^2(d,n)He^3$ reaction. Pulse duration is 200 μsec, and repetition rate is 60 cy/sec. Deuteron current is between 1 and 2 ma during the pulse. The vacuum system, in which a mechanical pump and a 4-in. mercury pump are used, forms an integral part of the instrument. (Atomic Laboratories, Inc., Dept. 306)

■ LABORATORY AUTOCLAVE has 1-gal capacity and operates at temperatures up to 350°C. Models are available for use at pressures of 600 and 1200 lb/in^2. Agitation of contents is provided by a flat-blade turbine or by a propeller. Openings are through a body flange so that removal of the cover does not necessitate disturbing equipment connections. Either steam-jacket or electrical heating can be provided. (Pressure Products Industries Inc., Dept. 313)

■ CURRENT INTEGRATOR measures the total quantity of electricity used in quantitatively reducing or oxidizing substances being analyzed. Readings are made directly in millifaradays in three ranges. The voltage developed by the current through a standard resistor is compared with the output of a precision generator. The generator is controlled to maintain the voltages equal to one another. Under this condition, the rate of rotation of the generator is proportional to the current and the generator revolutions are counted by a mechanical counter, which accomplishes integration. Accuracy is better than ±0.1 percent of full scale. (Analytical Instruments Inc., Dept. 304)

■ DEHYDRATION UNIT furnishes gas of dew point −150°F and 5-μ filtration. Diameters range from 2 to 8 in. The dehydrator keeps to desiccant under spring compression to eliminate the voids and fissures which would otherwise develop as the volume changed. (Dehydrators Inc., Dept. 302)

■ DIELECTRIC-TEST CELL is designed for use in the proposed ASTM method for determining the dielectric constant and dissipation factor of polyethylene by displacement of benzene. The gold-plated cell is equipped with an overflow pipe to maintain constant level. The cell's sensitivity is ±0.001 for dielectric constant and ±0.00005 for dissipation factor. Its accuracy is approximately half its sensitivity. (Buck Engineering Co., Inc., Dept. 307)

■ MOVING-COIL INDICATOR is a miniature coremagnet type 7/16 in. in diameter. The instrument is hermetically sealed and designed to withstand severe vibration. It is available with either flag or pointer display and in a variety of electrical sensitivities and functions. (Marion Electrical Instrument Co., Dept. 310)

■ RADIOFREQUENCY VOLTMETER has sensitivity of 300 μv for frequencies from 50-kcy to 600-Mcy/sec. Eight ranges cover from 1 mv to 3 v (full-scale). A 52-ohm adapter facilitates high-frequency measurements on coaxial systems. (Boonton Electronics Corp., Dept. 311)

JOSHUA STERN
National Bureau of Standards

THE SARGENT

Designed and Manufactured by
E. H. SARGENT & CO.

LABORATORY RECORDER

(Patents Pending)

An automatic, self-balancing potentiometric recorder which measures voltages or current and graphically records these variables as a function of time.

- **MULTI-RANGE—40 ranges.**
- **MULTI-SPEED—9 standard chart speeds with provision for optional 1-5 range multiplication or 5-1 range reduction.**
- **VOLTAGE OR CURRENT RECORDING—for measurement of voltage or current or any other variable which can be translated to voltage or current signals.**
- **FLEXIBILITY OF APPLICATION**
- **DESIGNED FOR BENCH OPERATION**

Style: Vertical strip chart recorder, designed for laboratory bench operation. Assembly of three individual, separable, and self contained units; viz., control panel assembly, amplifier and power supply chassis, and chart and pen drive chassis unit.

Automatic null balancing potentiometric system with standard cell standardization by panel control, conventional chopper-amplifier method with special Sargent high gain amplifier and high stability Sargent bridge power supply using combined or alternate dry cells and mercury cells. Use of the latter obviates need for standardization over very long periods.

Ranges: Multiple full scale ranges selected by panel range switch as follows: 1.25, 2.5, 5, 12.5, 25, 50, 125, 250, 500, 1250, 2500. All ranges are made direct reading as full scale deflection in millivolts, milliamperes, or microamperes by use of an associated units selector switch. All 33 scales provide true potentiometric measurement. An additional series of the same eleven ranges in terms of volts is provided by an additional selector switch position, this series using a divider input with an impedance of one megohm.

True potentiometric measurements are thus provided to a maximum of 2.5 volts, higher voltages only being measured through a divider.

Accuracy: 0.1% or 20 microvolts, whichever is greater.

Chart: Width, 250 mm; length, 120 feet. Ruling rational with all ranges on a decimal basis. Indexed for reference. Graduated steel scale provides for any necessary correction of calibration. Two-position writing plate, 15° or 40° from vertical.

Chart Drive: Forward drive recording, reverse drive recording, magnetic brake eliminating coasting when stopped and free clutch position with separate provision for rapid non-synchronous drive.

Recording speeds of ⅓, ½, 1, 1½, 2, 2⅔, 4, 8, and 12 inches per minute, selected by interchange of two gears on end of chassis.

Free clutch or neutral drive at the rate of approximately 20 feet per minute in either direction for rapid scanning of recorded information, chart reroll, or chart positioning.

Recording either by automatic take-up on roll or with free end chart and tear off.

Synchronous switching outlet for automatic synchronization of external devices with recording.

Pen Speed: 1.8 seconds full scale. Other speeds can be provided on special order with change of motors.

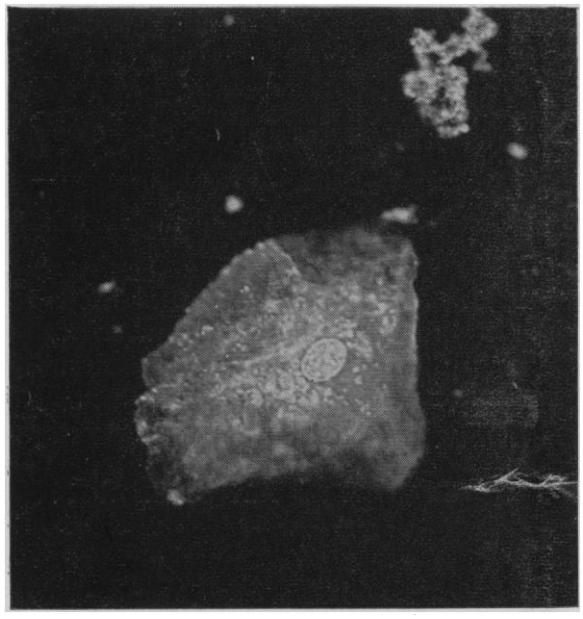
Bridge: Special Sargent specification, ganged Helipot with resolution several times common commercial practice. Provision for coupled transmitting potentiometer for output to integrating circuits, etc.

Damping: Dynamics controlled with single panel knob adjustment of amplifier gain.

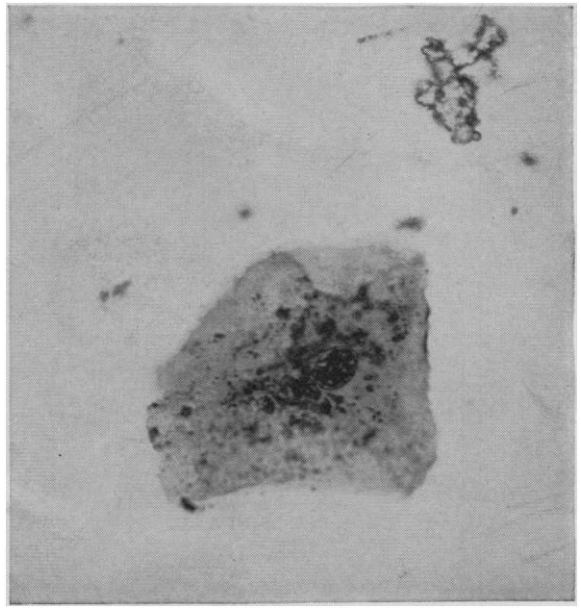
Dimensions: Width, 21½ inches; depth, 13 inches; height, 24 inches; weight, about 75 pounds.

S-72150 RECORDER — Potentiometric, Sargent. Complete with two S-72165 chart rolls; two each S-72175 pens; red, blue and green; input cable assembly; synchronous switch cable assembly; plastic dust cover; spare ring for take-up mechanism; spare pen drive cable assembly; and fuses. For operation from 115 volt, A.C. single phase, 60 cycle circuits..... **$1725.00**

Here's how you can
MEASURE OPTICAL PATH DIFFERENCE
with the AO-Baker Interference Microscope



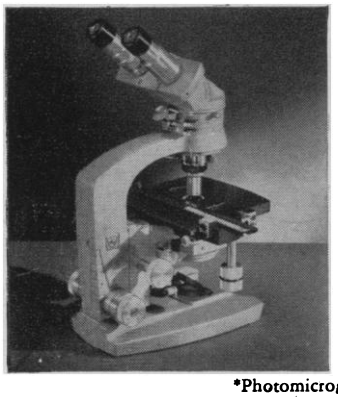
1. First, as shown in the photomicrograph* above, the microscope analyzer was rotated until the background was brought to extinction. Readings were taken directly from the analyzer scale. Averaged settings resulted in reading of 70.4°.



2. Next, the analyzer was rotated until the nucleus of the cell was brought to extinction. Averaged settings resulted in reading of 138.2°.

3. The Optical Path Difference, in degrees, is *twice* the difference between the two readings:

$$\text{OPD} = 2\,(138.2° - 70.4°) = 135.6°, \text{ or } \text{OPD} = \left(\frac{135.6°}{360°}\right).546 = .206 \text{ Microns.}$$



Optical path difference measurements can be made to an optimum accuracy of 1/300 wavelength. This unique ability to measure optical path thicknesses is in itself of great importance. But even more important, these measurements can be converted into a variety of quantitative information of great potential value. Water and protein content of a cell, for example, may be measured. Materials such as glass, plastics, emulsions, textiles can be examined.

While the AO-Baker Interference Microscope is primarily a quantitative instrument, it also offers unique advantages for qualitative observations through variable intensity contrast and dramatically effective variable color contrast.

*Photomicrographs taken by Mr. Lynn C. Wall, Medical Division, Eastman Kodak Co. Data: Epithelial Cell. AO-Baker Interference Microscope, 40X Shearing objective, 10X eyepieces. Corning filter CS4-120 with AO Model 630 Pulsarc Illuminator to transmit monochromatic light at .546 microns.

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American Optical Company

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INSTRUMENT DIVISION, BUFFALO 15, NEW YORK

Dept. I-1

Please Send me your NEW COLOR BROCHURE SB7 on the AO-BAKER INTERFERENCE MICROSCOPE.

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