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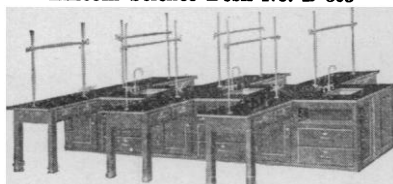
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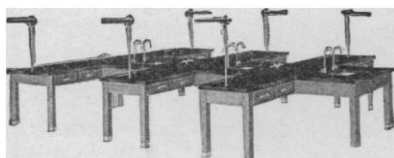
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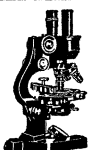
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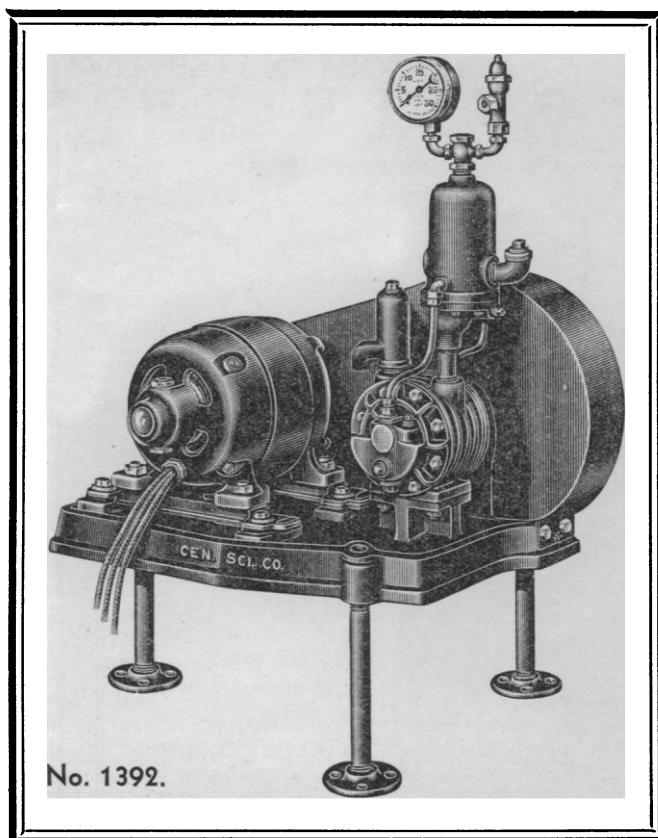


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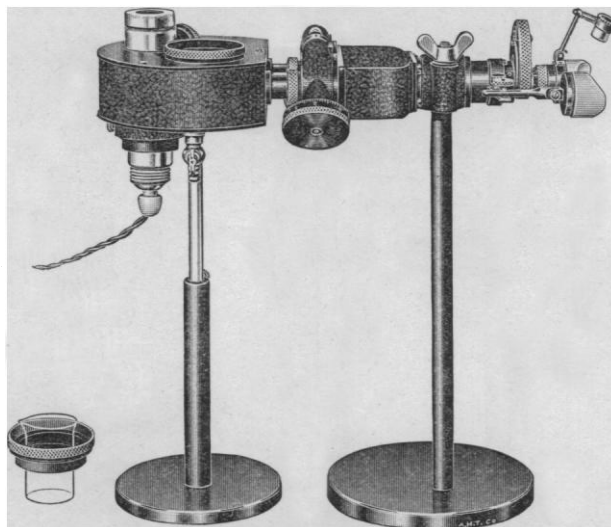
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PULFRICH PHOTOMETER

FOR NEPHELOMETRY



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THE PULFRICH PHOTOMETER is used for Nephelometry in conjunction with an attachment for the observation of the measurable properties of the so-called Tyndall light, i.e. light scattered within imperfectly transparent media. By this means it is practicable to demonstrate the presence of very small traces of a substance in disperse phase in such media. The method is of great value in micro-chemical analysis, as in the determination of phosphorus, arsenic, aluminum, etc., and for the control and numerical identification of all reactions involving clouding effects and the formation of precipitates.

Reference standards may be either standard solutions with a known degree of turbidity or a translucent glass prism supplied with the instrument which, because of permanence, is to be preferred to standard solutions. These translucent prisms are numbered serially and calibrated in terms of absolute units, so that results may be compared with those carried out elsewhere.

The advantages resulting from the use of the Pulfrich Photometer in combination with the Nephelometer Attachment, also designated as the Zeiss Turbidity Gauge, are as follows:

Absolute Turbidity Numbers. The calibrated translucent prism is of constant turbidity. Measurements at different times, under different arrangements, or at different places, are therefore directly and numerically comparable.

For Rotational and Serial Tests. The use of ordinary beakers as test cups simplifies procedure. In serial tests each solution is examined in the beaker in which it has been prepared, thus greatly increasing the speed of determinations.

Turbidity may be induced or intensified during observation. Burettes and stirring devices can be readily arranged above the beaker while in position for reading.

High Sensitivity. Very minute degrees of turbidity can be measured by means of the intense light of the Nitra lamp with the relatively great aperture of the illuminating lenses used.

Wide Range. Diluting densely clouded solutions sometimes causes undesirable changes in the relation of the disperse phases. In such instances, the use of the thin, flat cells with 2.5 mm strata makes readings possible without dilution.

Elimination of fluorescence. Fluorescence occasionally produces effects similar to intensified clouding. It is eliminated by means of a special red filter supplied with each instrument and introduced in the path of the primary radiation.

A recommended assembly for general use in Nephelometry without a standard solution, the components of which are sold separately under their respective catalogue numbers, is as follows:

		Code Word
7971.	Pulfrich Photometer, Zeiss Model II, for horizontal use only. In case	246.00
7973.	Nephelometer Attachment, Zeiss, with translucent prism with calibration value, beaker holder, paired objectives 30 mm e.f., connecting tubes, and transformer for either 110 or 220 volts a.c.	159.00
7974.	Nitra Lamp Bulb, 8-volt 50 c.p. (spare bulb for replacement)	1.50
7979.	Complete Outfit, as above described, for use on either 110 or 220 volts, a.c.	406.50
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See overleaf for description of the Zeiss Pulfrich Photometer for Colorimetry

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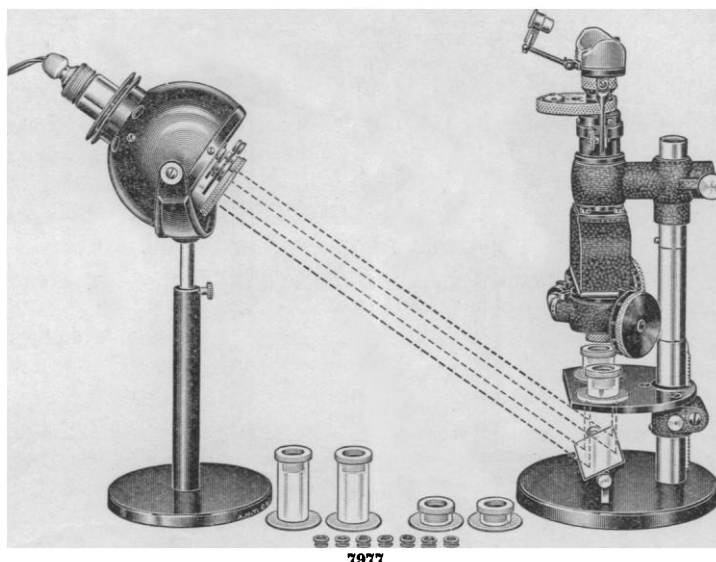
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Setting for equal intensity. The spectrum filters, each with a narrow range of transmission, make this possible without reference to any identity of color impression. Readings are, therefore, independent of differences in the personal color equation in different observers.

Great Precision is possible because the differences in the absorption of light occasioned by solutions of different concentrations are most pronounced at those values where the absorption reaches a maximum. Also with the spectrum filters greater sensitivity, with corresponding precision of setting, is obtained than is possible in color matching only.

Readings are independent of inherent color or turbidity of the solution under test.

Photometric match of the two fields is obtained by varying the area of the aperture through which the light enters one field while the area of the aperture of the other field and the depth of the stratum of liquid under investigation both remain fixed. As this is accomplished without immediate comparison with a standard solution, this procedure is designated "colorimetry without a standard solution."

Colorimetry by the conventional method, i.e. by variable strata in comparison with a standard solution, is possible with the Pulfrich Photometer by means of an absorption cell adjustable for depth as listed among the optional accessories.

A recommended assembly for general use in Colorimetry without a standard solution, the components of which are sold separately under their respective catalogue numbers, is as follows:

		Code Word
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7972.	Photometer Lamp, Zeiss, with daylight filters and transformer for either 110 or 220 volts a.c.	76.00 <i>Maafd</i>
7975.	Vertical Absorption Cells, of glass, for stratum depths of 1, 10 and 50 mm (two sets of three each)	60.00 <i>Maars</i>
7974-C.	Spectrum Filters, set of seven, in case	15.00 <i>Maawy</i>
7974.	Nitra Lamp Bulb, 8-volt, 50 c.p. (spare bulb for replacement)	1.50 <i>Maapi</i>
7977.	Complete Outfit, as above described, for use on either 110 or 220 volts a.c.	483.50 <i>Maced</i>
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NOTE—If colorimetry is to be undertaken by comparison with standard solution, No. 7975-B Adjustable Vertical Absorption Cell must be added to the above assembly.

See overleaf for description of the Zeiss Pulfrich Photometer for Nephelometry.

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CANCER RESEARCH AND THE SCIENTIFIC METHOD¹

By Dr. ELLICE McDONALD

CANCER RESEARCH LABORATORIES, GRADUATE SCHOOL OF MEDICINE, UNIVERSITY OF PENNSYLVANIA

CANCER is the most important problem of our time, for two reasons: first, because it kills people more than any other single disease (heart disease, which is higher in the mortality records, is a combination of heart and kidney and other diseases); second, because it has increased so greatly in incidence in recent times—62 per cent. more deaths in Pennsylvania in twenty-five years, 40.5 per cent. in Australia in ten years, 58.2 per cent. increase in 50 American cities with more than thirty million total population in twenty-five years, and in somewhat lesser degree in all civilized communities. In Great Britain in 1928, more than 12 per cent. of all deaths were from cancer, and a great insurance company has estimated the yearly loss from

¹ Address before the American Pharmaceutical Association, Philadelphia, April 14, 1931.

cancer in the United States to be about eight hundred million dollars.

Obviously the disease is a subject to warrant careful consideration and organized effort, for it touches the life of a great number of people. What has been done about it? A devoted group of medical men in a number of countries have studied the disease in man and in animals for many years, with the result that the treatment of cancer has improved in two directions—improved surgical treatment and treatment by radiation, x-rays and radium.

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Are We Neglecting the Elementary School? L. E. LEAVER. *The Unit Test:* J. H. McCLOSKEY.

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The Present Status of Instruction in Social Psychology: FLORA M. FEARING and F. FEARING.

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Educational Research and Statistics:

A Method of Forecasting College Success: C. F. ROSS.

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