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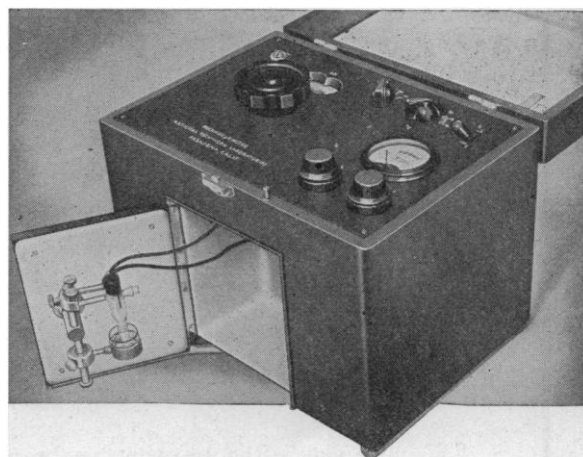
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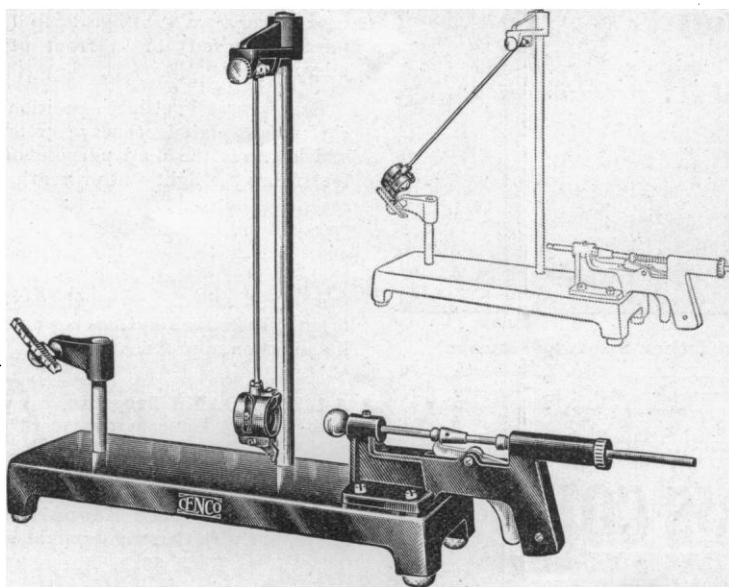
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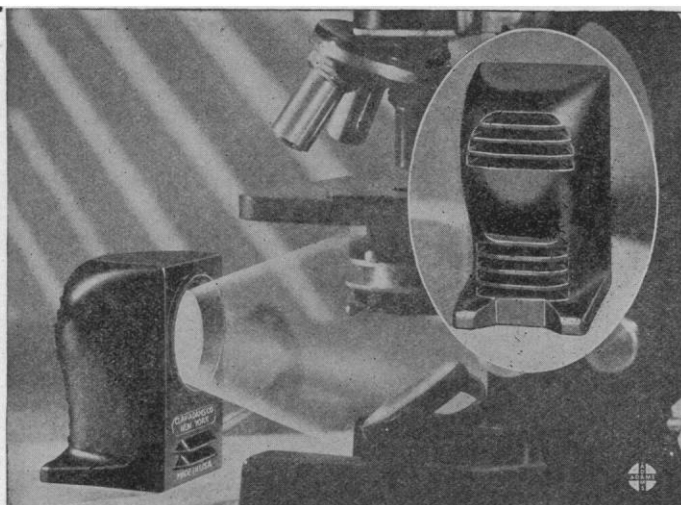
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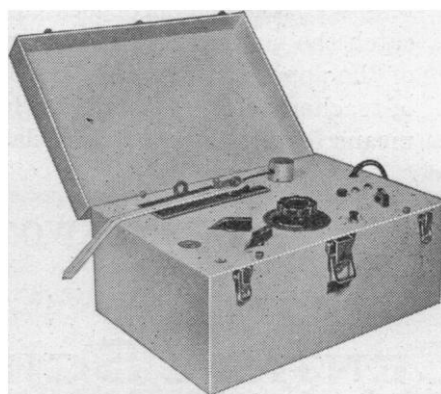
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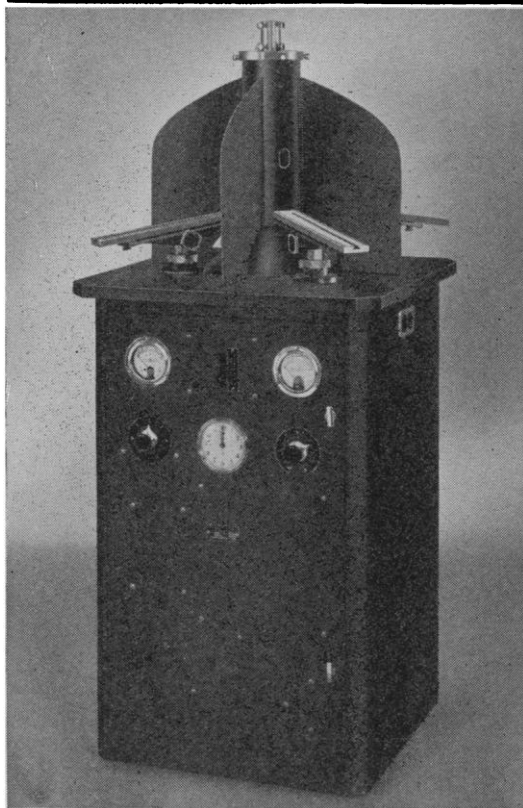


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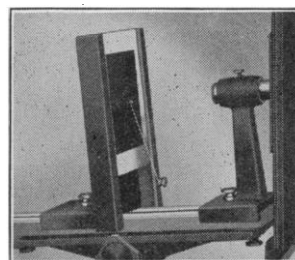


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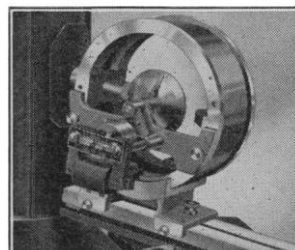
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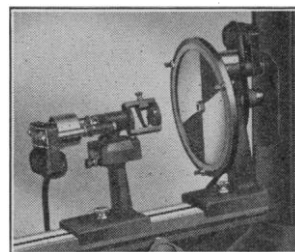
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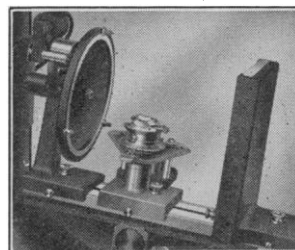
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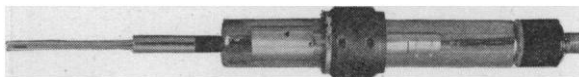
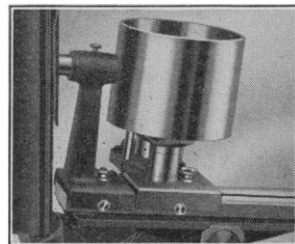
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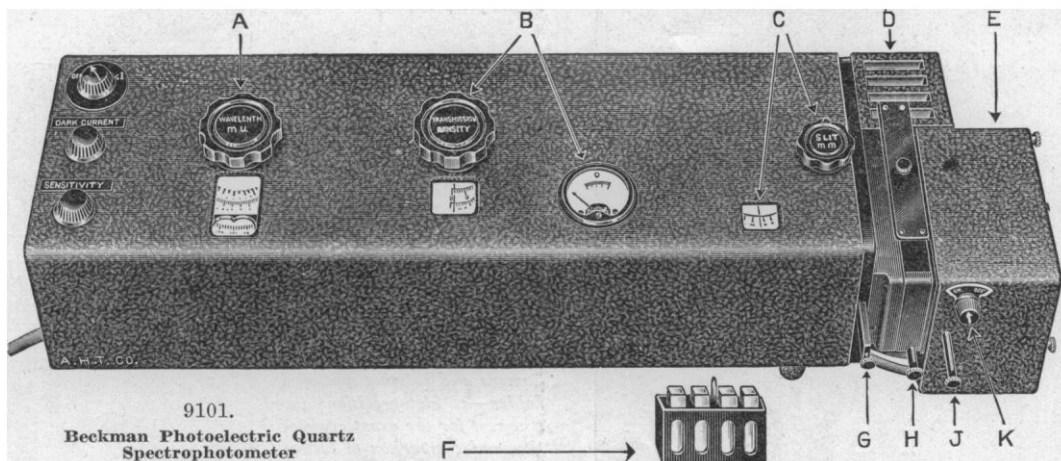
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9101. Quartz Spectrophotometer, Beckman Photoelectric, Model D, as above described, consisting of monochromator with quartz prism and two slits, built-in electronic meter, 6-volt tungsten light source for the range 320 mμ to 1000 mμ, Cesium Oxide phototube for the red range, Blue-Sensitive phototube for the blue range, shielded cables for use between the phototubes and the electronic meter, and holder with four glass absorption cells for 10 mm length of liquid. With dry cells for operating the meter but without 6-volt storage battery as required for operating the tungsten lamp and electronic tube filaments **750.00**

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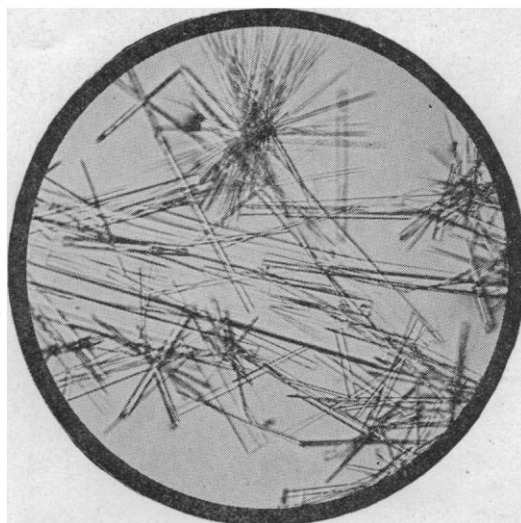
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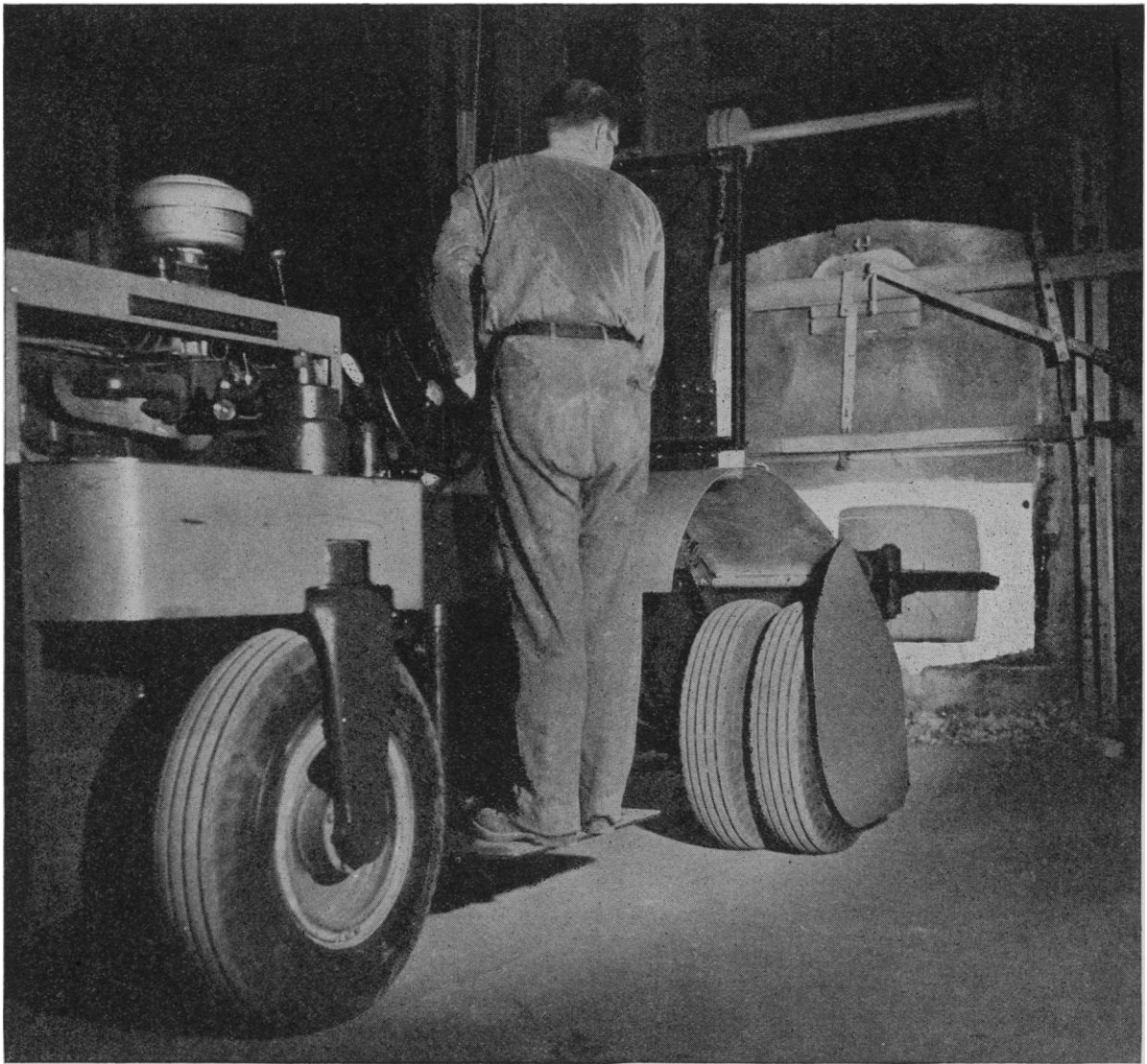
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SCIENCE

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SCIENCE is the official organ of the American Association for the Advancement of Science. Information regarding membership in the Association may be secured from the office of the permanent secretary in the Smithsonian Institution Building, Washington, D. C.

THE METAL CARBONYLS^{1,2}

By Professor ARTHUR A. BLANCHARD

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

THIS meeting is to do honor to a man who was a great scientist, who was later, also, a great administrator, and who, when he reached the age when he could surrender his administrative duties and could enjoy the leisure and rest which he had so fully earned, chose to devote his great energy to the cause of the orderly development of the science of chemistry he loved. Edgar Fahs Smith exemplified the most truly scientific attitude towards chemistry. He championed the importance of accurate finding and recording of facts, and he encouraged the use of theories only as

they helped to clarify and classify the facts. A favorite remark of his was to the effect that theories come and theories go, but facts live on forever.

It is, I think, entirely fitting that I should do honor to Professor Smith in telling you the facts about an unusual class of substances, the metal carbonyls, in which I have taken a particular interest, and to show how certain generalizations have helped to some extent to classify and define the relationship among the carbonyls.

NICKEL CARBONYL

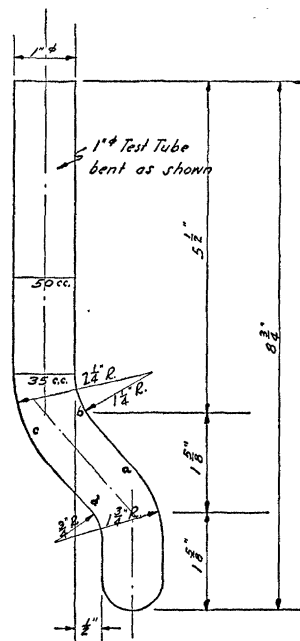
Nickel carbonyl was discovered by Mond in 1890, and iron pentacarbonyl was discovered shortly thereafter. These strange substances were a challenge to

¹ Edgar Fahs Smith Memorial Lecture at the University of Pennsylvania May 23, 1941.

² Fairly complete literature references may be found in *Chemical Reviews*, 21: 3, 1937, and 26: 409, 1940.

This is especially true of the protein determination of cerebrospinal fluid, a process associated with so much foaming and bumping that, for clinical purposes, the results are often not as acceptable as they should be. The Kjeldahl method is exact, but its use necessitates a nitrogen distillation system and accurate burettes for back-titrations. The apparatus is expensive and the technique time-consuming.

We have designed and constructed a new digestion tube by means of which the loss of material due to foaming and bumping can be eliminated. The tube



DIGESTION TUBE
FIG. 1

is designed so that a drop of boiling solution can not be shot directly outwards. When thrown upwards, it must necessarily strike the wall of the tube along the lines "a" and "b" and flow back into the solution. Foam also will rise up between the points "a" and "b" and descend by points "c" and "d." Seldom does it rise beyond the point "b."

By the use of the tube described, the more difficult types of digestion can be performed with ease and accuracy. There is no loss of solution and much saving of time. The most ordinary technique will furnish exact results. The new digestion tube is especially suitable for those methods for which the N.P.N. tube is, at present, used.

JOSEPH BENOTTI
NORBERT BENOTTI

THE PRATT DIAGNOSTIC HOSPITAL,
BOSTON, MASS.

ETHAN ALLAN BROWN

THE NEW ENGLAND MEDICAL CENTRE,
BOSTON, MASS.

A TECHNIQUE FOR CONTINUOUS OR INTERMITTENT OBSERVATION OF THE CONTRACTILE VACUOLES OF THE PARAMECIUM

THE methods commonly used for demonstrating and studying the contractile vacuoles of *Paramecium* have the serious disadvantage of not permitting the observer to view the animals intermittently over a period of several days. In the technique described below, continuous observation is made possible by studying the animals on the surfaces of agar plates.

PREPARATION AND USE OF THE AGAR PLATES

Filter 1,000 cc of culture medium which has supported a vigorous growth of *Paramecium* through coarse filter paper. The medium should be clear and transparent. Bring the filtrate to a boil and add, while stirring, 10 gms of agar-agar. Boil slowly until all the agar is dissolved. The agar is then poured, while hot, into Syracuse watch glasses to a depth of approximately 5 mm. The agar is then allowed to cool, without agitation, until it is firmly set.

When the agar is set, one drop of a rich culture of *Paramecium* is placed in the center of the dish, which is then tilted from side to side to spread the drop. Within a few minutes enough water has evaporated from the surface to impede locomotion. The animals may then be studied at leisure.

For prolonged observation of the same preparation it is necessary to prevent undue evaporation from the surface of the agar. This is best accomplished by inverting the dish over another watch glass partly filled with water. In this way we have kept and observed animals in the same preparation for as long as ten days. Temporary preparations may be made with distilled water, but the animals do not survive on the surface of agar so prepared.

JAMES SUMNER LEE

NORTH CAROLINA COLLEGE FOR NEGROES,
DURHAM, N. C.

BOOKS RECEIVED

- CHAMPION, F. C. *University Physics; Light*. (Part Three of a Five-part Course.) Pp. 172. Illustrated. Interscience Publishers. \$1.50.
- COHEN, I. BERNARD, Editor. *Benjamin Franklin's Experiments*. Pp. xxviii + 451. Illustrated. Harvard University Press. \$4.00.
- FRENCH, SIDNEY J. *Torch and Crucible; the Life and Death of Antoine Lavoisier*. Pp. ix + 285. \$3.50.
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