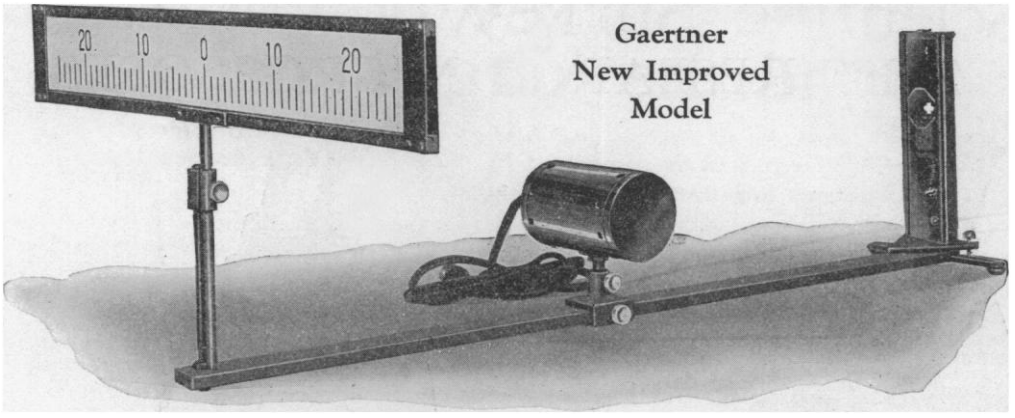
Lecture Room Projection Galvanometer



E1540. Lecture Room Projection Galvanometer. The apparatus is principally intended for lecture demonstration but will also be found very useful in the laboratory. A simple D'Arsonval Type Galvanometer, suitable projecting lamp and celluloid scale are mounted adjustably on a light metal base. The galvanometer is of simple construction but sensitive enough to give sufficiently large deflections which are easy to read on the scale. A cylindrical lens is mounted on the glass cover in front of the galvanometer mirror and serves to form an image of the slit in the lamp housing on the scale. The lamp is mounted in a double walled case to prevent heat radiation, and is adjustable on the base in order to allow focusing of the image of the slit on the scale. The lamp operates on 110 volts. The scale is adjustable for heights and can be shifted sideways in order to set the image accurately at the zero mark. The graduations of the scale are 1 cm apart and are easy to read in an undarkened room.

The galvanometer is sufficiently sensitive to serve in all elementary work and for experiments in connection with E1270 Rowland's Apparatus for studying the induction of magnetism, E1450 Dynamo Analysis Apparatus for studying the induction curves of the dynamo, and for many other similar experiments. The apparatus being self-contained is easy to adjust and easy to keep adjustable. Detailed instructions are supplied with the apparatus **$36.00**

E1270: Rowland's Apparatus for Distribution of Magnetism. The apparatus consists of a nickeled brass tube 15 mm in diameter, 41 cm long, of which 40 cm are graduated in 1 mm divisions. A bar magnet 15 cm long is rigidly fixed within the tube with its ends visible through two holes drilled transversely through the tube. A test coil with about 1,200 turns of wire (Res. about 160 ohms) wound on a bakelite bobbin, with binding posts securely attached, slides freely along the tube between two adjustable non-magnetic stops. These stops can be set for a definite travel of the test coil and clamped on any part of the tube without disturbing the relative distance of the two stops.

Millikan and Mills experiment 12-B, Page 139, complete with instructions **$20.00**

E1450. Dynamo Analysis Apparatus. The outstanding features of this apparatus are its simplicity and the extreme ease with which it can be operated by the student. It enables the student to obtain the complete curve of induction in a dynamo. An ideal apparatus for introducing and studying the subject of dynamos. It will satisfactorily operate with E1540 Projection Galvanometer.

Millikan and Mills experiment 12-A, Page 139, complete with instructions **$40.00**

IMMEDIATE SHIPMENT FROM STOCK
Write for Bulletin 114 S

Development and Manufacturing Physical Laboratory Apparatus Is the Most Important Part of Our Business.

The
GAERTNER SCIENTIFIC CORPORATION

SUCCESSOR TO WM. GAERTNER & CO.,

1201 Wrightwood Ave. TRADE MARK GAERTNER REG. U.S. PAT. OFF. Chicago, Illinois

Our catalogs listing High Grade Scientific Instruments sent on request

SCIENCE

VOL. LXVI DECEMBER 23, 1927 No. 1721

CONTENTS

SCIENCE: A Weekly Journal devoted to the Advancement of Science, edited by J. McKeen Cattell and published every Friday by

THE SCIENCE PRESS

New York City: Grand Central Terminal.

Lancaster, Pa. Garrison, N. Y.

Annual Subscription, $6.00. Single Copies, 15 Cts.

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.

Entered as second-class matter July 18, 1923, at the Post Office at Lancaster, Pa., under the Act of March 8, 1879.

SOME APPLICATIONS OF PHYSICAL CHEMISTRY TO MEDICINE[1]

THE growth of knowledge, like most processes of growth, is autocatalytic. It is self stimulating. The discovery of fact, principle or idea speeds the discovery of new facts, principles and ideas. Progress is thereby self accelerating, although the acceleration is not constant, but increases for a time after each discovery only to slow up or to come to a constant velocity until some new catalyst is discovered. A remarkable feature of this growth of science, a feature which shows that knowledge is indeed an organic whole, is that an idea or fact discovered in one branch of science often serves as a catalyst to a very remote and apparently unrelated branch.

Nowhere is this illustrated better than in the repercussions between physics, chemistry, biology and medicine. The study of what is going on in an evacuated glass tube provided with electrodes, when there is a strong difference of potential between those electrodes, results in the discovery by a physicist, Crooks, of the so-called "cathode ray"; study of this ray by another physicist, Röntgen, leads to the discovery of the X-rays set up when the cathode rays impinge on glass, metal or other solid surface, and as a result the physician is provided with a means of seeing the bones, the stomach, intestines, heart, ureters, and gall-bladder of a living man; of learning whether these are normal or not; and he is in addition provided with a means of treating successfully many hitherto hopeless conditions.

But the effects of this discovery do not stop here; even more important to physiology and medicine is the resulting study of the mechanism by which the X-rays act upon the body. For it is clear that if substances are opaque to X-rays, they must absorb such rays. And when they absorb such rays the energy in the ray is passed to some substances in the tissues, or to substances which have been introduced into the cavities of the body to make their outlines visible. Now molecules of substances which have absorbed energy are in a quite different condition from molecules of the same substance which have not. Energy is that which gives the power of acting. So substances which have absorbed energy are thereby rendered far more reactive than they were before.

[1] Lecture given at the University of Buffalo, April 12, 1927, on the Harrington Foundation.