

the three hypotheses for which we have obtained partial experimental proof.

Heretofore I have not tried to assign priority to any one with respect to speculative ideas, since we have considered it our problem to show how far our experimental results were of significance to these now familiar ideas. We made a small step forward in giving a quantitative proof for the cosmic origin of the radiation in 1925, in that the longest wave-length observed, according to our method of calculation, agreed with the Einstein equation corresponding to the building of helium out of hydrogen; and last winter (February, 1927) we found clear and authentic

proof that this and other atom building processes are actually the source of the cosmic radiation. We proved further, contrary to all previous assumptions, aside, perhaps, from the assumption of MacMillan, that the atom building process does not occur in the stars, but in the depths of interstellar space.

If there is any one besides Einstein who was a pioneer in the development of the theoretical ideas for which we have found experimental proof it is W. D. MacMillan. Any one who since 1918 may have sought to write the history of the atom building processes should have given him a deserved recognition.

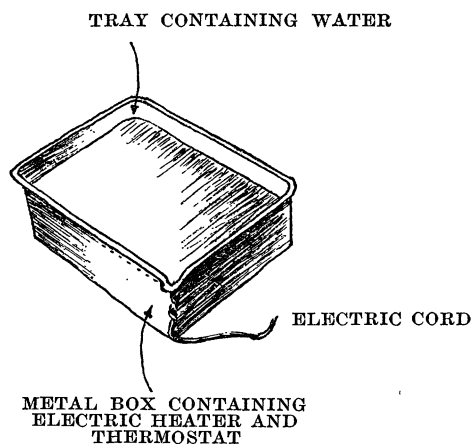
ROBERT A. MILLIKAN

## SCIENTIFIC APPARATUS AND LABORATORY METHODS

### AN APPARATUS FOR HANDLING PARAFFIN RIBBONS

THE need for a convenient means of handling several paraffin ribbons at one time was the incentive for contriving the following piece of apparatus.

A good-sized photographic tray was fitted into the top of a metal box containing an electric heater and a thermostat. The tray was filled about half full of water. Water at a temperature of approximately 30° C. spreads the ribbon out smoothly yet is not so hot as to make the paraffin soft enough to be inconvenient to cut with small scissors.



The paraffin ribbons are cut to about the length of the tray and transferred to the water with a pair of tweezers. The bath is large enough so that several long ribbons can be spread out side by side. With the aid of a strong light and a hand lens the unwanted parts of the ribbon can be detected and removed from the bath. Then the ribbon is cut to proper lengths, the fixative-covered slide is slipped under the section and the piece of paraffin ribbon floated to the exact position.

The tray may be removed and a plate placed on top or the whole box turned over, resulting in an ordinary constant temperature embedding table, which can be used for drying slides and for softening the paraffin before dissolving the ribbon in xylol.

Briefly summed up, this piece of apparatus does the following: (1) Spreads the paraffin ribbon out flat and smooth. (2) Holds several long ribbons. (3) Undesirable parts of the ribbon can be detected and removed. (4) The paraffin ribbon can be easily cut to desired lengths. (5) Provides a convenient method for placing the piece of ribbon on the slide. (6) Turned over it functions as a large embedding table.

THOMAS J. HARROLD

DEPARTMENT OF HORTICULTURE,  
GEORGIA STATE COLLEGE  
OF AGRICULTURE

## SPECIAL ARTICLES

### THE METABOLISM OF THE LOCAL EXCITATORY PROCESS AND OF THE PROPAGATED DISTURBANCE IN NERVOUS TISSUES<sup>1</sup>

In an earlier paper I tried to show that the chemical changes produced in a tissue by means of an

<sup>1</sup> Some of these results have been communicated in an evening lecture at Woods Hole and published in the *Collecting Net*, Vol. IV, No. 8.

electrical stimulation differ from those caused by the physiological conduction of excitation waves. I was at first brought to this opinion by the following facts. Nearly all investigations of the metabolism of the excitatory process in the nervous system were carried out in such a manner that the part to be investigated was stimulated directly. Parker alone for methodical reasons stimulated the nerve outside of