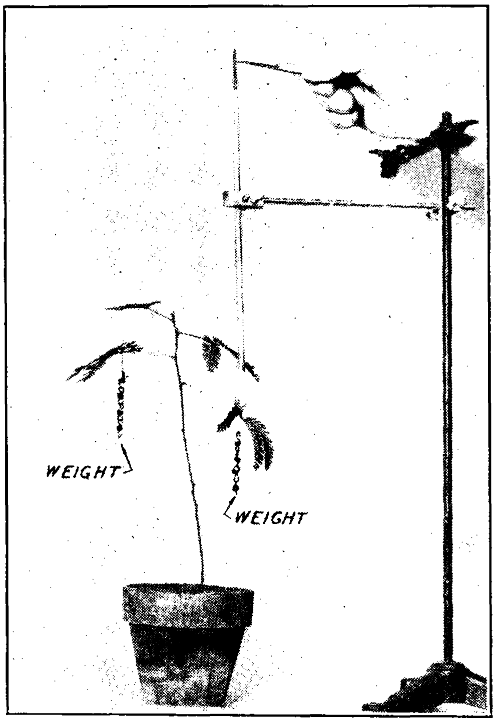

FIG. 1. Shows method of loading and stimulating Mimosa to make the plant perform physical work.

succeeding 15 or 20 minutes the leaves rose and in lifting the weights performed physical work. The weights were permitted to remain suspended to the leaves until the next morning at 9 A. M. when another 115 mg weight was added to each leaf and the same procedure of stimulating and working or exercising the leaves was repeated. This was continued for five days so that at the end of this period each leaf was carrying a 575 mg load, 115 mgs having been added each day for five days. The procedure was then reversed. One 115 mg weight was removed each day and the leaves were stimulated and made to perform physical work for five days while the load was being decreased.

In this manner, the leaves were made to perform physical work or take exercise for three 10-day periods, or 30 days. At the end of this time the following experiments were carried out to determine if the exercised leaves were able to perform more physical work and were less easily fatigued than the unexercised ones of the same plant. A 575 mg weight was suspended to each of the exercised as well as to the unexercised leaves of the same plant, as shown in Fig. 1, and each leaf was then stimulated and caused to drop. During the succeeding 60 minutes the leaves rose, lifted the weights and performed physical work, which was calculated and expressed in ergs. This was done by multiplying the load by lift by 980 to change to absolute units of work. At the end of the 60-minute period, the leaves were stimulated again and caused to drop, and the amount of work performed by raising the weights during the succeeding 60-minute period was also determined. It was found that the average amount of work performed by the exercised leaves was 2,874 ergs and that by the unexercised ones 2,029 ergs. By comparing these figures it will be seen that the exercised leaves performed 41 per cent. more work than the unexercised ones. It was also found that when the leaves were stimulated at several 60-minute intervals, as described above, the unexercised leaves fatigued more quickly than the exercised ones.

From the preceding experiments it may be concluded that the performance of physical work increases the capacity of the leaves of the plant, Mimosa, to do work and renders them more difficult to fatigue, an effect very similar to the action of physical work on the muscles of animals.

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SCIENTIFIC APPARATUS AND LABORATORY METHODS

A NEW MICROCOLORIMETER

THIS instrument was devised primarily for bromsulphalein liver function tests in experiments in which but small quantities of blood were available. The apparatus consists of the following principal parts: telescope and prism of an ordinary colorimeter, microcells, microcell holder, round rotating carrier for standards, base and electric bulb, reflector and screen.

In the figure, the microcell holder is shown below the prism, in working position. The diagram of the holder represents the two separable parts, three microcell cups, the two vertical windows and the offset for accommodating the standard carrier. A standard microcell, *d*, and a microcell, *e*, holding the solution to be assayed, are shown mounted for observation in microcell cups. The cups, *f* and *g*, are each to be occupied by a microcell containing an appropriate blank which is used in order to provide the same media in both pathways of light. The vertical windows, including the portion of the window represented in the movable carrier for the standards, are slightly larger in cross-section than the corresponding cavities of the microcells. However, the central vertical axes of the cylindrical cells and windows are in perfect alignment.

Brass afforded a satisfactory material for the construction of the standard carrier, the holder and the cells. The microcells were made with precision by drilling through the centers of the parallel surfaces on small identical brass disks. One of the parallel surfaces of the microcells was countersunk to hold the lower cover glass. By placing a cover glass over each parallel surface of the drilled disks, a microcell was provided with a fluid capacity of 0.06 cc. A cross-section of a microcell is indicated at *c*, in the diagram. A complete series of standards with any desired gradations may be distributed in the carrier. An automatic ball and spring stop, *h*, in the drawing, allows any standard to be stopped in the path of illumination.

The colored solutions and the blanks may, therefore, be interposed in the two light paths. The prism brings the light to a common axis. Looking into the telescope, the eye sees the divided field of the ordinary

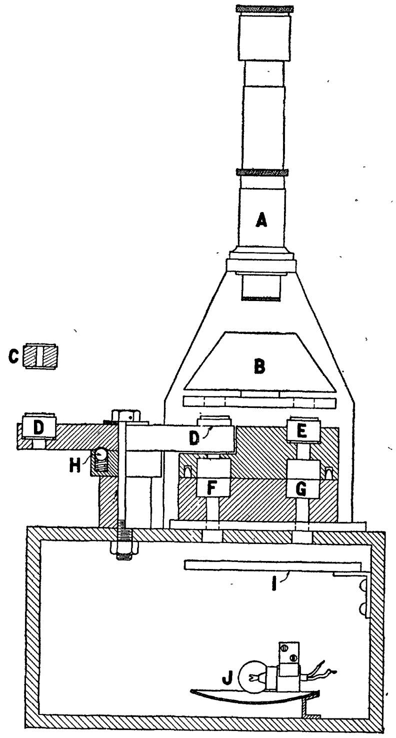

FIG. 1

colorimeter, and sharp color differentiation is possible. By moving the standard carrier, the value of the unknown solution may be approximated or matched with considerable accuracy.

Obviously, glass or bakelite cells, similarly constructed, may lend themselves to better adaptation for general colorimetric analysis than cells constructed from metal.

The arrangement of four cells in two combinations which allows the transmitted light to pass through parallel surfaces is, so far as we are aware, a new application in colorimetry. Simplicity of construction, ease of operation, wide possible application and reasonable accuracy when dealing with small quantities of solution justify the use of the new colorimeter. It is felt that the sacrifice of the usual vernier graduations is compensated for by the applicability to exceedingly small volumes of solutions.

The authors wish to give acknowledgment to J. S. Hipple, mechanician of the Medical School, University of Wisconsin, who designed and constructed the mechanical features of the instrument.

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AN EASY WAY TO REDUCE ELECTRIFICATION OF PARAFFIN RIBBONS[1]

IN cutting very thin sections with the microtome difficulty is often experienced with forces due to static electricity generated at the knife edge. Paraffin is such a poor conductor of electricity that the problem is one of leakage to the air from the general surface rather than of grounding. When the air is damp enough the leakage is rapid and no trouble results. For more than a year it has been the practice in this laboratory to produce "artificial weather" by boiling water in the room in which sectioning is being done. With sufficiently high humidity created in this manner, it is possible to cut ribbons as thin as 2 μ in any weather.

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