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SURFACE MOTION OF WATER INDUCED BY WIND

By Dr. IRVING LANGMUIR

RESEARCH LABORATORY, GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y.

ON August 7, 1927, when about 600 miles from New York on an Atlantic crossing to England I noticed that there were large quantities of floating seaweed, most of which was arranged in parallel lines with a somewhat irregular spacing ranging from 100 to 200 meters. These lines, parallel to the wind direction, which I shall call streaks, often had lengths as great as 500 m. Between these larger streaks, which contained vast quantities of seaweed forming continuous bands 2 to 6 m wide, there were smaller streaks which were made up of detached masses of seaweed along nearly straight lines. At this time the wind was from the north with a velocity of approximately 10 m/sec (22 miles/hr) and the waves roughly 4 m high.

A day later the waves were larger and the streaks of seaweed were still abundant. On the afternoon of this day a sudden change of wind direction occurred (of about 90°); within 20 min all the seaweed was arranged in new streaks parallel to the new wind direction, although the waves continued to move in the old direction.

It was clearly not cohesion between masses of seaweed that held them together in the streaks. At that time it seemed to me that the only reasonable hypothesis was that the seaweed accumulated in streaks because of transverse surface currents converging toward the streaks. The water in these converging currents descends under these streaks. Between the streaks rising currents, upon reaching the surface, flow out laterally toward the streaks.

The action of the wind on the water sets up longitudinal surface currents in the direction of the wind. The effect of the wind is thus to produce a series of alternating right and left helical vortices in the water ing pure lines for use in the experimental work, for earthworm nematodes have been shown[2,3,5] to vary extremely in their reproductive behavior. There are bisexual types, parthenogenetic types, hermaphroditic types and merospermic types. Workers will wish to consult the work of Spek[4] and Bělăr[5] both for their subject-matter and for their bibliography.

ALLAN C. SCOTT

UNION COLLEGE,
SCHENECTADY, N. Y.

A USEFUL METHOD FOR MOUNTING INSECTS

THE most common method employed in making permanent insect mounts for the classroom entails the use of riker mounts. However, the expense involved, the inability to see more than one side of the specimen, the tendency of the cotton to obscure important parts and the necessity for careful protection against insect destruction makes their use of questionable value for small insects. A modification of the usual slide mounting method involving the use of thick celluloid cells for hermetically sealed dry mounts has proved much more satisfactory in this laboratory for insects the size of a honeybee or less.

The cells are prepared by marking off the celluloid (Gardiner Brothers, San Francisco, 30/1000 to 90/1000 inch) into 22 mm squares with the aid of a sharp knife and breaking it into strips the length of the sheet and 22 mm wide. By using a die and punch (Fig. 1) it is possible to punch holes rapidly in squares

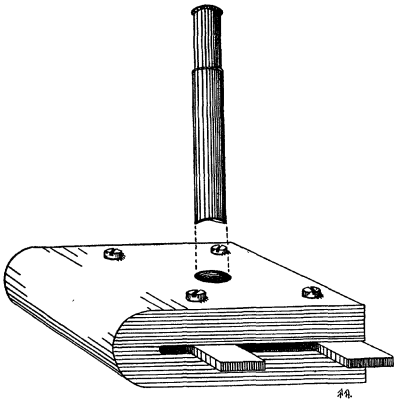

Fig. 1

even of very thick celluloid (90/1000 inch). By the use of various dies or a file it is possible to obtain cells of any desired shape and size to accommodate the insect.

These cells may be fixed to the microscope slide by dipping in butyl acetate and putting in place on the slide or by allowing a drop of butyl acetate or similar solvent to spread by capillary action between the slide and the cell. In a few minutes the cell is firmly fixed to the slide, and the insect may be attached by a very small amount of dissolved celluloid, euparol, and so forth. The mount is completed by covering the cell with a cover glass and allowing a drop of butyl acetate to flow between the slip and the cell. The preparation is ready for use within five minutes and the insects are completely protected until the slide or cover glass is broken.

This method is especially useful for mounting fragile insects such as owl midges, mosquitoes, white flies and other insects bearing delicate scales which might be lost or altered by mounting in other ways. Distortion and shrinkage due to drying seems to be much less in insects mounted in this manner. The cells fixed on slides may be used in three or four minutes as very satisfactory wells for larvae or insects which can not be mounted dry and must be placed in a mounting fluid. Very acceptable life history mounts may be made from celluloid blocks having four holes to accommodate the stages of the insect. These may be mounted dry or in media, depending on the stage (Fig. 2). Larger insects may be mounted in double thickness cells.

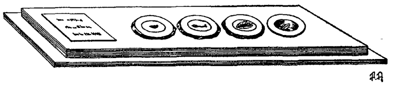

Fig. 2

Slides made in this manner have been used in our laboratory for over two years and have proved very satisfactory. The insects may be viewed from both sides, the mounting is rapid and inexpensive and storage or filing is easily accomplished.

D. E. HOWELL

UNIVERSITY OF CALIFORNIA, BERKELEY

BOOKS RECEIVED

BLACK, NEWTON H., and HARVEY N. DAVIS. *Elementary Practical Physics*. Pp. viii + 710. Illustrated. Macmillan. $2.00.

DUNNE, J. W. *An Experiment with Time*. Fourth edition, revised. Pp. 297. Macmillan. $2.75.

GRUENBERG, BENJAMIN C., and SAMUEL P. UNZICKER. *Science in Our Lives*. Pp. xiv + 750. 411 figures. World Book Company. $1.76.

HERRICK, FRANCIS H. *Audubon, the Naturalist*. Pp. xv + 500. Appleton-Century. $6.00.

HORSBURGH, DAVID B., and JAMES P. HEATH. *Atlas of Cat Anatomy*. Pp. 39. 42 figures. Stanford University Press. $1.00.

RUSSELL, BERTRAND. *Principles of Mathematics*. Second edition. Pp. xxxix + 534. Norton. $5.00.

SHARPE, C. F. STEWART. *Landslides and Related Phenomena: A Study of Mass-Movements of Soil and Rock*. Pp. xii + 135. 16 figures. 9 plates. Columbia University Press. $3.00.

WAUGH, ALBERT E. *Elements of Statistical Method*. Pp. xv + 381. 43 figures. McGraw-Hill. $3,50.

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[4] P. Hertwig, *Arch. Mikro. Anat.*, 94: 303, 1920.
[6] K. Belăr, *Zeit. f. Zell. und Gewebleh.*, 1: 1, 1924.
[5] J. Spek, *Roux's Arch. Entw. Mech.*, 44: 1, 1918.