can give us no hint of the probable course of a similar event in the future. Experimentally, also, this position is untenable, since a number of the fundamental biological processes (photosynthesis in wheat and other plants, the phototropisms of certain plants and animals, etc.) have been shown to be accurately reproducible, and a number of other fundamental processes (photosynthesis of sugars, the photodecomposition of CO_2 by chlorophyll[1]) have been isolated and repeated in inorganic systems of known reproducibility. On the other hand, it appears definitely impossible to interpret biological phenomena in terms of the now known processes in inorganic systems, and the question must be regarded as unsettled. It may be, as von Uexküll has maintained, that the production of identical biological systems is fundamentally impossible. Certainly it is impossible to the experimental technique of the present day: synthetic men with interchangeable parts are still a dramatist's dream.

Many vitalists cite the apparently purposive actions of organisms in support of their contentions. This is logically justifiable only if it can be shown that identical organisms under identical conditions exhibit diverse purposes which are not even statistically reproducible. If the reactions, though purposive, are reproducible, they are not fundamentally different from the reproducible reactions of inorganic systems, and we may suspect hitherto unrecognized natural laws, of universal application, but illustrated only by the exceedingly complex systems which constitute organisms (precisely as the laws of electrostatics are illustrated only by electrified bodies). The view-point which considers biological processes to be reproducible, and controlled by natural laws of universal validity but limited illustration, is often called "vitalism," but the name "organicism" has been proposed to distinguish it from that vitalism which sees supernatural intervention in every action of a living thing.

It is interesting to note that Professor Niels Bohr, in his latest study of the foundations of the quantum mechanics, has proposed the introduction of teleological elements into the structure of the inorganic sciences.

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"A RARE PUBLICATION"

UNDER this title Mr. Wm. J. Fox[1] has given some notes on the "Transactions of the Natural History Society of Queensland, Vol. 1, 1892–94."

Such notices as this usually invite the making of a search and often result in the valuable disclosure of copies in unexpected places. Attention is therefore called here to the fact that the journal is to be found in several libraries in Australia.

In a late catalogue by E. R. Pitt[2] copies are listed for the following:

The Commonwealth Parliament, Canberra.
Australian Museum, Sydney.
Linnaean Society of New South Wales, Sydney.
Mitchell Library, Sydney.
Royal Society of New South Wales, Sydney.
Royal Society of Queensland, Brisbane.
Public Library, Adelaide.
Royal Society of Tasmania, Hobart.
Field Naturalists' Club, Melbourne.
National Museum, Melbourne.
Royal Society of Victoria, Melbourne.
Public Library, Perth.

Evidently only one volume of *Transactions* was issued.

VERONICA J. SEXTON
LIBRARY, CALIFORNIA ACADEMY OF SCIENCES

SCIENTIFIC APPARATUS AND LABORATORY METHODS

MANIPULATION OF THE RESEARCH MICROSCOPE

WHEN examining a smear preparation on a slide with the highest powers of the microscope (especially oil immersion) one makes a rather systematic exploration by starting at the top (or bottom) of the slide and working across in definite bands or areas.

In going from one band to another, the following procedure is usually taken: The operator selects a distinguishing or characteristic bit of material on the limit of one band and, using this object as a guide by continually keeping his eyes fixed upon it, turns the one knurled knob of the mechanical stage until another area of sufficient width (next band) comes into view. When he believes he has about the right width which his lenses will enable him to study at one time, he then uses the other knob of the mechanical stage to move said band left to right (or the reverse) for the exploration. This operation must be repeated until the entire slide is, of course, completely studied.

Such a procedure of slide examination after many hours becomes extremely tedious and rather subjec-

[1] According to a private communication from Dr. K. Meyer, of the University of Zurich.

[1] SCIENCE, n. s., 77: 1997, pp. 351–352, April 7, 1933.
[2] "Catalogue of the Scientific and Technical Periodicals in the Libraries of Australia," edited by E. R. Pitt, Melbourne, 1930, p. 707.

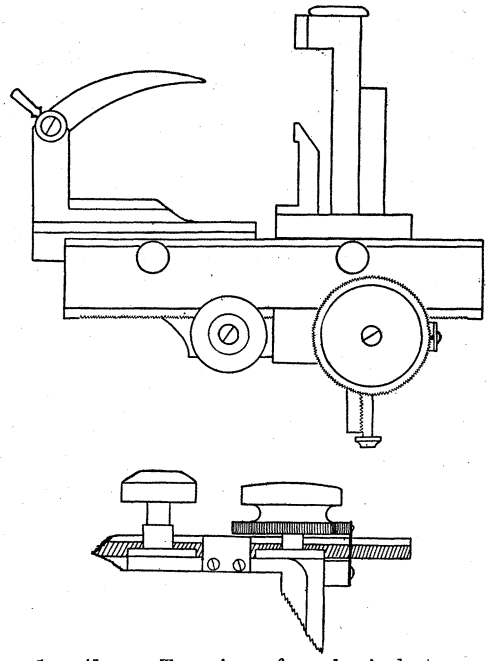

FIG. 1. *Above*—Top view of mechanical stage, showing "clicking" device. *Below*—Side view of part of mechanical stage, showing "clicking" device.

tive, especially when the material is a more or less uniform smear preparation of blood cells, bacteria, protozoa, etc., or of any objects of very small size. Some investigators use the vernier on the mechanical stage for slide exploration but this is an inconvenient and painstaking task and in a great many cases can not be used to advantage. The vernier is usually used by investigators in recording valuable data found on the slides.

This is essentially a "clicking" device placed slightly above and built into the mechanical stage. It is controlled by the knurled knob of the stage which moves the slide up and down. The device consists mainly of a finely made notched wheel with a metal tongue that fits snugly into the notches. The notched wheel is so calibrated that by using a 10x ocular and a 1.8 mm objective, one slight turn of the knob results in a definite click which indicates that one band has come into view. The operator then turns the other knob of the mechanical stage to move the slide left to right, as the case may be, to complete studying the one band. This, of course, is repeated until the entire slide is thus systematically studied.

Such a device should be a great aid to the investigator who must use the research microscope constantly. It enables him to examine a slide, scientifically and accurately, without any subjective approximations of his own. It also saves a considerable amount of time in slide study. An important item in its favor is that the strain on the operator's eyes is lessened. In fact, it can even afford him a second's relaxation after studying each band until the next click is heard. The device should prove to be invaluable in studying smear preparations of blood, blood diseases, bacteria, protozoa, etc., where the smear is more or less uniform and calls for very close and accurate exploration of the slide.

The writer uses the device in conjunction with a 10x ocular and 1.8 mm oil immersion objective for studying protozoa.

This device on the mechanical stage can be secured from the Spencer Lens Company, Buffalo, New York. They are also able to install the "clicking" device on their ordinary mechanical stage.

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MICRO MOUNTS FOR REVERSE VIEWS

IN a recent number of SCIENCE,[1] Professor Jacot mentions the use of a special objective for the examination of the reverse side of micro mounts, especially for Acarina. It may interest him and others having the same problem to state that the use of Cellophane for mounts as described in SCIENCE last June[2] can be used with balsam or other media, although my description in SCIENCE referred especially to dry mounts.

I have balsam mounts of Acarina, thrips and Mallophaga, now six months old, with every appearance of indefinite preservation and with all the convenience of glass slides along with the advantage of high power microscopic use from either side, very compact storage and safety from breakage.

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THE letter of Dr. Arthur Paul Jacot in No. 2015 of SCIENCE relative to the examination of the reverse side of micro mounts prompts me to describe a somewhat unconventional technique I have used for a similar purpose.

A strip of tin, aluminum or bakelite of micro slide size (one by three inches) and of thickness suitable to the material to be mounted and the mounting medium (usually .3 to .8 millimeter) has a one-half-inch hole pierced in its center; a No. 2 cover glass three quarters of an inch square is then cemented in the center of one side, forming a cell. A strip of ordinary writing-paper one inch wide is then wrapped three times around each end and cemented down, the combined thickness equaling or slightly exceeding that of the cover glass.

The specimen to be examined is now mounted as usual and covered with a second cover glass similar

[1] SCIENCE, 78: 2015, 128, August 11, 1933.
[2] SCIENCE, 77: 2007, 587, June 16, 1933.