slowing up of the growth rate of tumors, with complete regression in 4 out of 34 animals; (2) an increase in the survival time of the mouse after the onset of cancer, and (3) gross and histological alterations in the tumors themselves. These changes in the tumors themselves were (1) softening and in some cases, (2) complete liquefaction. The action of the low fraction appeared to be more pronounced than the action of the true oil of wintergreen.

Since heptyl aldehyde is an ingredient of the low fraction, it was decided to put mice bearing spontaneous tumors of the mammary gland on a diet containing this chemical. The heptyl aldehyde was purchased from the Eastman Kodak Company and redistilled. Only that part which distilled at 152° C. was used in this experiment. A very pronounced softening and liquefaction of the tumors occurred in the mice receiving heptyl aldehyde in an otherwise normal or standard diet. Liquefaction was so extensive that drainage through a hypodermic needle under sterile conditions was easily accomplished. Six of the first twenty-five mice placed on the heptyl aldehyde treatment completely regressed their tumors. Liquefaction and regression of tumors never occurred in 120 individuals which served as controls. Samples of the drained-off liquid were tested by Dr. C. G. Burn and found to be sterile.

The present investigation is of interest, since it opens up the question that spontaneous tumors, in mice at least, may eventually be controlled by chemotherapy.

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SCIENTIFIC APPARATUS AND LABORATORY METHODS

CLEAVING NEMATODE EGGS AS RESEARCH AND CLASSROOM MATERIAL

WHILE any number of marine forms supply living cleavage material during the summer months, it has been difficult to find material which can be used for either research or teaching purposes during the other seasons. One of the most favorable of plant materials is the stamen hairs of Tradescantia, but Tradescantia presents the difficulty of not flowering consistently through the winter months. The work of Rugh[1] on the induction of ovulation in amphibia now offers a source of cleaving eggs during the entire school year and has become an invaluable addition to many embryology courses. But amphibian eggs, because of their dense pigmentation, are not well adapted to the study of many features of the division process. These disadvantages may be overcome by the use of the eggs of small nematodes. American workers have so far neglected the nematodes as material for cytological and embryological research.[2] A search for a suitable material on which to study the effect of heat shock on the division mechanism showed nematode eggs to have many advantages. Since the eggs are about 45 microns in length and relatively transparent many details of pronuclear fusion, spindle formation, aster formation, spindle elongation and cell cleavage may be readily observed with the 4 mm objective. Their potentialities as living material for class use became apparent, and a two-year trial has proved their value.

Any earthworm will serve as a source of nematodes, where they may be found in the body cavity or in the nephridia. A convenient method of starting a culture is to allow bits of the body wall of the earthworm (nephridial region) to decay on 2 per cent. water agar in a Syracuse watch glass. After four days at 18° the nematodes are mature. I maintain subcultures at 18° on 2 per cent. agar, using bits of beef (3 cu mm) as food. The worms are prolific, and great numbers can be cultured with ease. Worms four days old are the best for eggs, since older worms usually have few cleaving eggs (although many older embryos are present) in the uterus. It is best to make subcultures every day so that worms of a proper age will always be available. Temperature control is essential —very few eggs are found if worms are reared at room temperatures of 22° or above.

In order that the cleavage process may be studied by students it is necessary to pick out ten or fifteen mature females from the culture dish, using a binocular and a fine curved needle (a number 12 sewing needle serves admirably). The worms are put in a drop of tap water on a depression slide and torn part with a straight pair of number 12 needles. The eggs are sucked up into a micropipette and are distributed to depression slides containing tap water. They may of course be studied on an ordinary slide, providing the following precautions are taken: (1) that they are not crushed; (2) that they get adequate oxygen; (3) that they do not dry.

The rapidity of development must be considered when class study is contemplated. Fortunately, the entire sequence of events from pronuclear fusion through the second cleavage occurs within a two-hour interval at average temperatures.

Attention is called to the absolute necessity of isolat-

[1] R. Rugh, SCIENCE, 85: 588, 1937.

[2] Beamis and King, *Biol. Bull.*, 73: 99, 1937, are one exception to this generalization for they have recently published the results of ultracentrifugal experiments on Ascaris eggs.

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.

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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

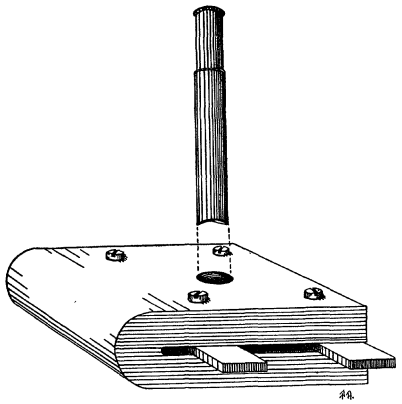

Fig. 1

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 satisfatory 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.

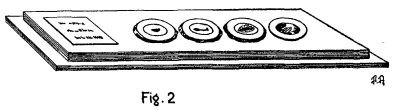

Fig. 2

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.

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[3] E. Kruger, *Zeit. Wiss. Zool.*, 105: 87, 1913.
[4] P. Hertwig, *Arch. Mikro. Anat.*, 94: 303, 1920.
[5] K. Belăr, *Zeit. f. Zell. und Gewebleh.*, 1: 1, 1924.
[6] J. Spek, *Roux's Arch. Entw. Mech.*, 44: 1, 1918.

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