

rometer spindle causes the spindle to advance a given distance each time the blade makes its section. The axle is a $\frac{3}{8}$ " steel rod that can be made by sawing the valve head from the shaft of an automobile valve. Any sized rod may be used. Springs which fitted the shaft were cut for length and held in place by pins driven tightly into holes drilled in the shafts. Holes were drilled in the head and in the frame where the shafts fitted. This drilling was done on the lathe in order to line up the holes. By putting thirty-two notches in the wheel we could get sections $\frac{1}{1280}$ inch or 19 microns in thickness. Double-edged razor blades are held in place between the jaws of the holder, by a bolt which screws in from behind. The holder is held rigidly to the axle by the same means. The threads were easily tapped with a twenty-five cent tap and holder. The razor holder is composed of two parts carefully filed so that they meet the blade evenly and firmly. A nail serves as the pin which holds both parts together. A clamp was cast to hold the machine at table level. A factory-made clamp could be bolted to the frame.

This machine has been used in the biology class for cutting tissues of various kinds. Some actual photomicrographs of student-made slides are shown in figures 3 and 4. These photographs were taken and processed by students.

The extra teaching value in interest and true understanding on the part of the students more than repay the slight expense and long hours of work necessary in making this machine.

Materials used and money spent are as follows:

1	drill bit $\frac{3}{16}$ "	.10¢
1	drill bit $\frac{1}{8}$ "	.10¢
1	drill bit $\frac{3}{8}$ "	.10¢
10 lb.	potters clay	.15¢
5 lb.	aluminum (pans and car trimming)	

1	steel rod $\frac{3}{8}$ " \times 9" (old automobile valve)	
1	steel rod $\frac{3}{8}$ " \times 3"	
1	metal tap and holder	.25¢
2	bolts $\frac{1}{8}$ " \times 1" (to hold micrometer to frame)	
3	bolts to fit threads of tap (found in laboratory junk box)	
2	bolts $\frac{1}{8}$ " \times $\frac{1}{2}$ " (to hold webb to long axle)	
2	nails (pins to hold springs in place; pin to hold razor holder parts together)	
2	springs (cut from one—donated by student)	
2	bolts $\frac{3}{16}$ " \times 1" (to hold clamp to frame)	
1	1" micrometer	.95¢
3	flat files	.50¢
Total		<u>\$2.15</u>

BIOLOGY LABORATORIES

By "The Old Fossil"

At Lane Tech, Chicago

LIVING LIGHT. Dr. Harvey of Princeton has made an intensive study of living light. Facts listed are in the realm of pure research and have little place in class study, but they might be used to introduce a subject. "Fox Fire" is the name applied to a fungus which grows on decaying wood and glows at night, outlining the shape of the stump or log on which it grows. Robert Boyle three hundred years ago placed a piece of this wood under a vacuum and proved that oxygen was necessary for the glow to be produced. Here is one to introduce a topic on symbiotic relationships: It is a very strange relationship between a fish of the Dutch East Indies and bacteria. Schools of these fish flash winks of light at regular intervals. This is accomplished by drawing a fold of skin down over the light. The light comes from a colony of bacteria growing on the organ. The bacteria derive their food from the fish. Illustrating complicated functional living: The mechanism of the light of the firefly is complex. The setting off of a flash is similar to a muscle movement; but the trigger mechanism that starts the light shining has not been determined. To introduce species variation: each variety of firefly has a character-

istic method of flashing, distinguished by length and rapidity of flashes. Or the "railroad worm" in South America has a row of yellow lights along its sides and a red light on one end. Each may be operated separately or together. Or marine form variations: the squid off Sicily, unlike the other squid, surrounds itself with a brilliant, luminous liquid when disturbed. Such factual introductions tend to get the attention of the student. A biology teacher can not have too many of these attention getters—to be used discretely of course.

DAY VISION vs. NIGHT VISION. Biologically there are two distinct types of vision according to Dr. Hecht of Columbia. With our day vision we are able to detect delicate lights and shadows, colors and forms. This is between sunlight and moonlight. With less intensity than moonlight (night vision) we recognize only coarse shadows, no colors, and we perceive things vaguely. But to compensate for this we are able to pick out the faintest lights. You can see a candle fourteen miles away at night. A good experiment is to have pupils test out these facts. The atmosphere must be clear of haze or mist. City dwellers do not have such an opportunity within their area but must go out many miles. Man has excellent night vision and pilots are trained to take advantage of this ability. Moles, mice, and owls have night vision. Chickens, turtles, and many hawks have only day vision and go to sleep with sundown.

VISION FOR AIR FORCE personnel must be at top-flight efficiency at all times. The men are checked for such visual characteristics as depth perception, muscular coordination, astigmatism, and vertical and lateral phoria. The government maintains eye testing equipment for these characteristics where ever air personnel are stationed for active duty. Ground personnel for the same force must have 20-20 vision with lens correction. You are going to be teaching this information to your students in the biology of flight. Write me if you are interested in getting the names of apparatus used for these purposes.

MORE LIGHT and better light is claimed for a new microscope illuminator. It uses an ordinary forty watt bulb. It is also adjustable to any position and has an anti-glare eyeshade to protect the eyes of the operator. Name of the manufacture on request.

ALUMINUM FOIL in rolls is now available in most stores. They have found dozens of uses of this for laboratories. It is especially helpful in wrapping moist materials to be carried on hikes. Get a roll; you will make your own uses without our aid.

GENES, VITAMINS, AND NUTRITION. You might use the following to tie up the three topics which these represent. The genes of our bodies exist in such a condition that our bodies are incapable of manufacturing vitamins. Many plants on the other hand are able to make vitamins because of certain genes which they have. Certain functioning genes control particular chemical formations. It has been found that the red bread mold is able to make all the vitamins of the B group. By exposing these cells to X-rays, ultraviolet light, and other types, their vitamin production capacity can be influenced with the different radiations. Man is defective in ability to manufacture these vitamins and construct amino acids. Our study of bread mold helps us to understand how these substances are made in other organisms. This knowledge is important to us in the study of nutrition.

T.O.F.'s MENTAL NOTEBOOK was replenished with some biological facts as he took a two day turn around Lake Michigan the last week in August. The drive along the north shore is as scenic as the drive along the Pacific. In the dunes area they have established many varieties of the deep rooted evergreens. They also pin down these dunes with a long rooted grass which they plant in clumps about a foot apart. Dunes are on the north, and south-east shores. Many thousands of grass frogs for teaching biologists originate in the commercial collecting areas of Green Bay, Wisconsin. Shallow aquatics and sedges are found in the bays of north-west Lake Michigan. Algae, fungi,

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mosses, liverworts, lycopodia, and other ground pines, are found in the dense floors of the forests. Commercial fishing is at many points, especially Port Washington. Time yourself for a fish dinner in this town; ask any native where to go or consult Duncan Hines. At Easter Tide is the smelt run. In the same area will be found traps for the Lamprey which is invading the entire Great Lakes area.

ACTION BIOLOGICAL: saw one car driving off the road on the berm. Riding on the running board of the car was a man with an extended insect net held close to the ground. A new way of collecting insects.

IDEAL PICTURES is the name of a firm that handles silent and sound pictures and film strips. They have offices extending from Boston to Honolulu. Write them for their 1951 Catalogue. The office located at 58 East South Water Street, Chicago 1, Illinois, will see that your inquiry is placed in the office nearest your home for service.

THE OLD FOSSIL is always glad to hear from readers. You will get an answer, to your troubles, or to your suggestions, or to what ever pops into your mind. The Old Fossil, 5061 North Saint Louis Avenue, Chicago 25.

PREMEDICAL EDUCATION CONFERENCE

Alpha Epsilon Delta, National Premedical Honor Society, announces the celebration of its twenty-fifth anniversary, at the University of Alabama, Tuscaloosa, Ala., March 21-24, 1951.

Alpha Epsilon Delta has always had as its educational objective to stimulate an appreciation of the importance of premedical education in the study of medicine and to promote cooperation between medical and premedical students and educators in developing an adequate program of premedical education. The common ideals which have governed the Society were expressed in the original draft of the first Constitution: "The object of Alpha Epsilon Delta is to encourage excellence in premedical work, to bind together similarly interested students and to act as a force in crystallizing any movements

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for the good of the premedical student." On March 23rd and 24th, medical and premedical students and educators from colleges and medical schools in the southeastern area will join with Society members to participate in the Fourth Regional Conference on Premedical Education.

BIOLOGY INSTITUTE DAY

The Second Biology Institute Day was held at Duquesne University on Saturday, March 3, 1951.

The principal address of the morning session was "Botanical Interpretation of an Aerial Photograph." The afternoon sessions were held in four sections—Genetics, Laboratory Techniques, Ecology, Visual Aids. The president of the Association is Rev. Ulric Thaner, O.S.B., St. Vincent High School, Latrobe, and the secretary is Sister M. Regina, O.S.B., St. Benedict Academy. The chairman of the biology section, who sent the announcement to the American Biology Teacher, is Sister M. Gabriella, O.S.F., St. Vincent High School, Latrobe.