



Insect Log Cabins

► THERE is rejoicing at the Smithsonian Institution these days. For the Division of Insects has just added to its shelves what is probably the most complete collection in the world of those astounding home-building insects, the bag-worm moths.

The collection is the product of a half century's searching by a remarkable "full-time amateur," Dr. Frank Morton Jones of Wilmington, Del. Nominally an industrialist, Dr. Jones is recognized as one of the nation's top insect experts. Now well past 80, Dr. Jones has turned over his world-wide collection and invaluable library on bag-worm moths to the Smithsonian.

Though his interests range to many other kinds of insects, Dr. Jones could have hardly picked a more fascinating group than the bag-worm moths (Psychidae) to center his attention on for 50 busy years. These are the insects that build the familiar "log cabin" bags seen hanging from the branches of cedar, arbor vitae and other trees.

When the eggs of these insects hatch in

the spring, each caterpillar spins a bag of silk, to which it attaches twigs or leaves of the tree it feeds on, making the typical shelter. During early life, the caterpillar lives in this open bag, carrying it about as it feeds.

When the time comes for it to pupate, the bag-worm attaches the bag to a branch, crawls into it and seals up the open end. In a few weeks, during which time it metamorphoses into an adult, the now-winged male bag-worm emerges from the case to search for a mate. The female is wingless and in some species lack eyes, mouth parts and legs. The female only partly emerges, and having mated, crawls back into the shelter where she deposits eggs in the old pupal case.

The eggs remain in the pupal skin in the "log cabin" until spring, when they hatch, ready to begin the new cycle of life.

You can witness this whole exciting process yourself. Next spring look closely in a cedar or arbor vitae tree for some of the crawling caterpillars with their mobile houses. Keep these in a cage and furnish with fresh leaves for food. You can then watch them fasten their cases, retreat into them, then emerge as mating adults.

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MEDICINE

Horizontal Tissue Slices

► A HORIZONTAL slicing method is giving scientists at Washington University, St. Louis, Mo., a speed-up for their studies of possible cancer-causing chemicals in cigarette tar and other substances.

The method has confirmed previous findings by scientists at Washington University that oil glands in the skin of mice are quickly destroyed by chemicals that cause cancer. The method also showed that cigarette tar destroys the mouse oil glands as effectively as methylcholanthrene, one of the most potent cancer-causing compounds tested.

When applied to the shaved skin of a mouse, cancer-causing chemicals rapidly penetrate the skin chiefly through the oil glands. Within two days, the glands shrink in size. Within four days most of them disappear completely.

The scientists found that by slicing the painted tissues horizontally, rather than vertically, as has been done by other scientists, they could visualize clearly under the microscope the early ravages of the chemicals on oil gland cells and tissues.

The technique suggests a rapid method of evaluating the possible cancer-causing potential of a substance. Ordinarily, one must wait many months for the cancers to appear after applying chemicals; this system shows a change that may forecast cancer-causing properties.

The horizontal slicing exposes a broad field of oil glands under the microscope; and it permits the scientists to make precise quantitative measurements of the

TECHNOLOGY

Australians Building Permanent Atomic Site

► THE BRITISH COMMONWEALTH will spend \$12,000,000 to make Maralinga, South Australia, its permanent atomic testing center.

One of the major works will be construction of an 8,000-foot runway, suitable for the world's largest bombers. The runway will have large overruns at each end for safety.

About 75 miles of roadway will be built at the site, including 50 miles of heavy duty road surface connecting the nerve center of the test site with the Watson siding on the Transcontinental railway.

During atomic tests the population of the base will grow to about 1,000. The new base will not be ready until late next year.

Two atomic tests will be held in 1956, the first at the Monte Bello Islands, Western Australia, in February or March, and the second at Maralinga, about November. (Maralinga in aboriginal language means "Field of Thunder.")

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gland-destroying power of chemicals based on the percentage of glands destroyed. Conventional vertical slicing exposes only a few glands and leads to less exact determinations.

The new method was developed by Drs. Valentina Suntzeff and A. Croninger working under the direction of Dr. E. V. Cowdry. Their research, supported by the American Cancer Society and the Charles F. Kettering Foundation, is reported in *Cancer Research*.

Science News Letter, January 21, 1956

MATH IS FUN

By Joseph Degrazia, Ph.D.

Here is a treasury of brain-teasers. You need not be a mathematical genius to solve these problems and puzzles. What you need is to know how to THINK LOGICALLY—how to REASON. This is practically a "course" in applied logic and reasoning—besides being an immense amount of fun that will keep you absorbed for many hours. You will find not only that MATH IS FUN, but also that learning math can be fun!

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