BOTANY

NATURE RAMBLINGS by Frank Thone

Sizes of Seeds

THERE is little relation between the size of seeds and the size of plants that grow from them.

True, oaks are big trees that grow from big seeds. The same holds for walnuts. But elms are just as big and they grow from little seeds. Cottonwoods are even bigger and they grow from seeds as small as the "grain of mustard seed" famed in Biblical parable.

The same disparity holds among conifers. Probably the largest conifer seeds are the pine seeds sold as pinyon nuts. The trees that bear them are usually stunted, gnarled things 15 or 20 feet high—at most 40 or 50 feet. On the other hand, the California Big Trees and coast redwoods, most massive and tallest of all things that grow, have rather ordinary-sized seeds. Redwood seeds are only about a sixteenth of an inch long, Big Tree seeds about twice that size.

Coconuts are seeds, and they are almost the largest of seeds. Largest of known seeds are fairly closely related to them, the twin coconuts that grow in the Seychelles Islands, in the Indian Ocean. They always come in pairs, and they are about as big as footballs.

There are plenty of seeds that are smaller than the mustard seed of the parable, although this seed really is small—probably about the smallest seed with which the hearers of Jesus were familiar. Incidentally, if the statement that a "great tree" with birds nesting in the branches grows from this seed seems a trifle exaggerated to dwellers in the eastern states, Californians can reassure them. A wild mustard thicket in California can be really respectable jungle.

Smaller than mustard seed, however, are the seeds of such plant groups as the orchids, many members of the nightshade family (potato, petunia and tobacco, for instance) poppies, portulacas and pinks.

Seeds of the mistletoe are so small and so well hidden by the sticky flesh of the berries that the Druids, to whom the plant was sacred, thought that it had no seeds at all, and considered its propagation to be supernatural.

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GENERAL SCIENCE

Defense Requires Knowledge, Organized and Implemented

PRIMARILY we need proved weapons, men, planes and ships to make America safe from attack by military forces.

We need good will, good propaganda, intercontinental understanding and effective economic measures to knit our peoples, both of the United States and our neighbor American nations, into a self-contained, determined and democratically-controlled whole, safe against ideological and material invasion.

Back of these defense lines lies knowledge, organized and implemented by the scarchings of human minds and hands.

Knowledge properly applied through research by competent individuals brings forth strength in times like these.

Science's genius and sweat is being directed toward new mechanisms and devices of warfare by the newly created National Defense Research Committee, upon which sit together military men and scientists. This mobilization of science for our military protection may very well bring forth new and decisive weapons, if there is time to achieve results before actual war comes.

Coincident with the direct and practical application of science to immediate problems, there is a determination to keep active those long-time "theoretical" searches that are often the most productive. The possibility of atomic power from within the uranium atom arose out of atomic physics experiments. If feverishly-working investigators translate this possibility into reality, we may have a powerful new means of defense.

Backing up the active laboratories and the mapping out of research possibilities are the storehouses of information, the books and journals of our scientific libraries. Now as never before the scientist and engineer needs to use the accumulated knowledge and facts and use them fast.

Fortunately there has been developed during the past decade a method of delivering to the desk or laboratory table of any scientist anything that is written or pictured. Little strips of what appear to be motion picture film, called microfilm, putting the page of a book or a journal into the space of about an inch square, serve as the means of multiplying as needed the precious research information wherever it may be. They are easily read by optical enlargement. Special cameras are installed in leading libraries to render this service speedily and cheaply.

If for this emergency and for the future these microfilm services can be federated into a nation-wide intelligence service, research for defense as well as for better living will have a powerful ally.

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