

ULTRACENTRIFUGE

This apparatus, which whirls solutions with forces equal to 250,000 times the force of gravity, is now in use industrially by the du Pont company. For the photograph, the upper part of the housing has been removed to show the rotor, cell chamber and end of bearing.

ARCHAEOLOGY

Spotlight Focusing on Mayas; Great Discoveries Expected

THE SPOTLIGHT of discovery is focusing on the land of the Mayas. It looks as though news of ancient America's greatest civilization would break there soon.

An expedition is already digging in the very region where the most learned students of America's past have pointed, as the likely birthplace of the magnificent Mayan civilization. And that is in the highlands of Guatemala, south of Mexico.

Expeditions heretofore have unearthed ruined cities of the Mayas in jungles of Yucatan and Guatemala. They have revealed these ancient Indians as master builders, astronomers, mathematicians, and inventors of a writing system. Belated respect is paid the Mayan calendar. It was more accurate than the calendar of Spain, when the Spaniards arrived in America and set about civilizing the benighted savages.

But what has baffled science is to explain when and where so extraordinary a civilization got its start.

So, the expedition of the Carnegie Institution of Washington, which has launched on a campaign to explore mounds in the highland region, in the suburbs of Guatemala City, is being closely watched.

It was in the hill country, by the generally accepted theory, that the Mayas or their forefathers learned to plant corn. And when they became stable farmers, then their star rose and they began to build massive temples to the gods and to practice the arts and sciences.

At the site chosen for digging, discoveries have already been reported by Dr. A. V. Kidder, expedition leader. A stucco pyramid, three times rebuilt, and tombs containing pottery of great interest, are the initial finds. How old will the site turn out to be?

Potsherds found at the same site some years ago were hesitantly pronounced "early." Since then, archaeologists have accumulated more knowledge for establishing the antiquity of Mayan remains, as far back as the history has been pushed. The oldest known Mayan city, Uaxactun, goes back to several centuries before Christ.

Before the present expedition began its work, Dr. Kidder summed up the strategic importance of the highland impressively in these words:

"The significance of the Guatemala highlands can hardly be overestimated, for in the mountain valleys should be found the remains of the early groups whose culture, according to the hypothesis held by most authorities, either through movement of people or by diffusion, fathered that of the Maya."

Science News Letter, April 11, 1936

PHYSICS

Powerful Ultracentrifuge Is Built Commercially

NEW RESEARCH equipment which whirls solutions with such velocities that the centrifugal forces developed are equivalent to 250,000 times the force of gravity has just been installed at the du Pont Experimental Station, Wilmington, Delaware.

The apparatus, known as an ultracentrifuge, works on the same principle as the old-fashioned cream separator. High speeds of revolution, however, make the device capable of creating forces so powerful that molecules and sub-microscopic particles can be separated out of their solutions.

The high-speed rotor of the ultracentrifuge is revolved by a turbine driven by a blast of oil. At the normal operating speed of 60,000 revolutions a minute the tip of the rotor is moving with a velocity of 1,200 miles an hour; this is one and one-half times the muzzle velocity of a 22-caliber rifle bullet.

The device is a commercial adaptation of the apparatus first developed by the Swedish scientist, Prof. Thé Svedberg who won the Nobel Prize in Chemistry in 1926.

Prof. Svedberg has been able, in his laboratory models of the ultracentrifuge, to obtain rotor speeds of 160,000 revolutions a minute and create forces equivalent to 1,100,000 times that of gravity. (*SNL*, Aug. 4, 1934.)

In America at the University of Virginia, Prof. J. W. Beams and his co-

workers have developed small ultracentrifuge mechanisms that are air-driven and create centrifugal forces equal to 7,000,000 times the force of gravity. (SNL, Nov. 30, 1935.)

The du Pont apparatus, built by Dr. J. B. Nichols, who studied under Prof. Svedberg when the Swedish scientist was visiting professor of chemistry at the University of Wisconsin, is the industrial outgrowth of these laboratory developments.

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ENGINEERING

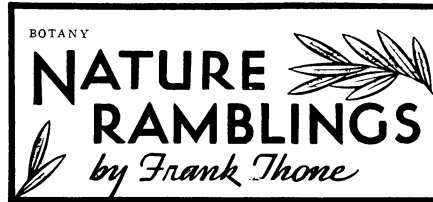
One-Man Can Operate Motion Picture Theater

A ONE-MAN motion picture theater, which could be completely operated by a single attendant, including ticket selling, the making of change, taking the admission fee, and working the projecting machine is described in a patent (No. 2,032,410) granted to A. N. Goldsmith, of New York City.

By a novel arrangement, the conventional ticket booth would also become the projecting room in which one person could run the whole "show." Use of fire-proof film would eliminate the fire hazard. The film would be of small size so that a complete two-hour show would be contained on a single reel. This eliminates the need for two or more projecting machines usually required where larger film is used, says the inventor.

The two-in-one booth is for use only in the "little theater" or small theater of restricted seating capacity, which charges but a small admission fee. It apparently is not intended to compete with or replace the regular motion picture theaters. The patent has been assigned to the Radio Corporation of America.

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Hoarders of Life

See Front Cover

VIOLETS, buttercups, spring beauties, trilliums, Jack-in-the-Pulpit, Solomon's seal, May-apple, Lily-of-the-valley, bloodroot, blue-eyed grass, Dutchman's breeches—these and a host of other lovely blossoms we instantly hail as gifts of spring. In a way they are, for they come to us in April and May—a few of the most daring in late March—and may therefore be called the gifts of spring as justly as Christmas presents or birthday presents are assigned to their particular anniversaries.

But Christmas and birthday gifts are prepared in advance of their presentation, and so also are the spring flowers. With hardly an exception, the flowers that star the woods just before and after Easter were prepared for our present delight during the summer that is past. They were paid for out of savings thriftily laid by during a former time of abundance. Their resurrection from seeming death is really just a continuation of a life that is, in a wholly

simple and natural sense, everlasting.

Examine the underground parts of any one of the flowers named, or of almost any other spring flower you can find, and you will see a thickened root, or rootstock, or bulb, or corm, or some other form of "storage organ," filled with starch like a potato or with sugar like an onion. This was formed out of the surplus food manufactured by the plant last summer—sometimes during several summers—when no flowers were in sight or immediate prospect. All winter through it lay under ground, compact energy of the sun fixed and hidden away, ready to be liquidated when the returning warmth and light of that same sun should give the word this spring.

Summer flowers, many of them, will be different. There will, of course, be plenty of perennials, long-lived and food-storing plants, among them, but summer plants also include many annuals, plants that grow during one season from seed, form seed for the next year, and then die when frost comes. The longer time they have before their flowers become mature gives opportunity for this short life cycle to complete itself and still leave next year's generation provided for in the scattered seeds.

Of course, the perennials par excellence are the trees, for these store their food in the exceedingly tough and long-lived wood of trunk and roots. It is for this reason, presumably, that most trees—alder and willow, maple and oak, dogwood and redbud, magnolia and tulip-tree and a host of others—are as truly spring flowers as are violets and buttercups.

The enlarged photograph of lily-of-the-valley that appears on the cover of this issue of the SCIENCE NEWS LETTER is by Cornelia Clarke.

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Complete architecture of a pharaoh's palace in Egypt is laid bare for the first time by excavations at Thebes by the Oriental Institute of Chicago.

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CRIME LABORATORIES—Dr. Wilmer Souder of the National Bureau of Standards.

April 21, 3:15 p.m., E.S.T.

THE TB GERM—POISON FACTORY—Dr. William Charles White, National Institute of Health of the U. S. Public Health Service.

In the Science Service series of radio discussions led by Watson Davis, Director, over the Columbia Broadcasting System.