



IR SYSTEM

To take this picture, a new system of lighting control, invented by Dr. Alfred N. Goldsmith, Harry R. Mennefee, William Mayer and Fritz Kastilan, of New York City, was used. Instead of lighting the entire set continuously, first the foreground is illuminated, then the middle distance, and then the background. By means of a series of compensating plates that revolve behind the camera lens, the focus is kept in step with the lighting, so that whichever part is lit is in focus. For each picture of the movie film, the entire set is lighted. The illumination may be divided into four or even more areas if necessary, while in some cases two might suffice. With this system, in the hands of an expert director, it is expected that many dramatic effects can be introduced into the movies.

CHEMISTRY

Mystery Explosive Plant May Be Effort To Avoid Bottleneck

Any Carbon-Containing Compound To Which Extra Atoms Of Nitrogen Can Be Attached May Replace Toluene

THE NAVY'S plans for a \$70,000,000 "mystery" plant for producing a new explosive may represent an effort to get away from a bottleneck in production of TNT in the unprecedented quantities that will be necessary when the great fleets of super-bombers now building are ready to receive their loads of deadly "eggs"—some of them weighing as much as two tons each.

Toluene, or toluol, basis of TNT, is normally produced from a light oil distilled out of coal tar. But a ton of tar will yield only about six pounds of toluene—and when toluene is demanded in thousands of tons, a bottleneck can very easily develop.

Recently several new methods have been announced for the production of toluene, or other substances "just as good" for high-explosive manufacture, out of petroleum and natural gas. It is within the field of legitimate conjecture that the proposed new plant described by Rear Admiral W. H. P. Blandy before the House Naval Committee might be for the production and processing of toluene or its equivalent from such fluid fuels.

The exact nature of the explosive is simply impossible to guess. In any case, such guessing might not be in the best interests of national defense. Any carbon-containing compound to which

extra atoms (usually three) of nitrogen can be attached is capable of becoming a high explosive. Toluene became the favorite about a generation ago because it is a solid at ordinary temperatures, is easy to handle, and yields a stable, "safe" explosive that doesn't go off until it is told to. But with literally thousands of other carbon-containing compounds available, a wholly new, perhaps more desirable explosive could be worked out and kept safely under wraps of military secrecy until ready for large-scale use.

Science News Letter, July 26, 1941

MEDICINE

Epilepsy and Migraine Are Related Diseases

A GREAT many people, even in this day of free popular discussion of medical topics, illnesses and symptoms, have a prejudice against epilepsy which makes them go far to avoid persons suffering from this disorder and even, perhaps, to hesitate about using the word. These same people, however, are likely to have considerable interest in and sympathy for persons with migraine and the word itself has long had an aristocratic sound. It may surprise such people as well as many migraine and epilepsy sufferers themselves to learn that the two ailments are kin—some sort of cousins, according to Dr. William G. Lennox, of Harvard Medical School. He explains the relationship in his book, *Science and Seizures* (Reviewed, SNL, this issue), as follows:

"Epilepsy and migraine are both disorders of the nervous system, but epilepsy involves primarily the brain, and migraine the vegetative (or autonomic) nervous system, that part of the nervous system which is not under the conscious control of the individual. Therefore, if the superficial nature of names is remembered, migraine may be spoken of as an epilepsy of the vegetative nervous system or epilepsy may be called a migraine of the brain."

The same person may have both epilepsy and migraine, as did Julius Caesar. In a study of more than 2,000 patients, more than nine out of every 100 had had attacks of both epilepsy and migraine. Neither epilepsy nor migraine occurred so frequently in 1,000 medical students, nurses and other patients selected for comparison as being representative of the general population. Family histories of patients with epilepsy and migraine also

showed evidence of the relation between the two conditions.

Patients and relatives of patients with either condition will find in Dr. Lennox's book a clear statement of the latest knowledge of causes, diagnosis, prevention and treatment of both conditions.

Science News Letter, July 26, 1941

ICHTHYOLOGY

New Hall of Fishes Opened at Field Museum

VISITORS to the Field Museum of Natural History will henceforth be able to get a mermaid's-eye view of the sub-sea world in the new Hall of Fishes, just opened to the public. In preparing the new exhibits, museum workers went to the sea bottom in diving bells and submarine tubes, to study and sketch the life of the sea "in place."

Three typical habitants are depicted: a coral reef in the Bahamas, the Gulf bottom off the Texas coast, and a deep tide pool among the rocks of Maine. Special attention has been paid to sharks: specimens range from a "small" whale shark 25 feet long, through the really dangerous man-eating white shark, to bizarre forms like the hammerhead shark and the whip-tail eagle ray.

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BENEATH TEXAS WATERS

This undersea habitat group is in the new Hall of Fishes opened at the Field Museum of Natural History. The photograph shows "oyster lumps"—rounded masses to which the oysters attach themselves to a firm base on the sea bottom and then in turn furnish attachment for other oysters until progressively the oyster lump is formed. Only the outer layer of oysters remains alive.

PALEONTOLOGY

Half-Billion Years Represented By Three Small Specimens

Cardboard Box Mailed To Each Recipient of "Things" Contains Remnants of Ancient Plant and Animal Life

HALF a billion years of geological antiquity are summed up by three specimens in a little cardboard box, mailed out by Science Service to each of the participants in a new idea in scientific information distribution, called "Things of Science." Instead of words and pictures, actual samples of the materials themselves are circulated. The idea has taken hold especially well in schools, as well as with private persons who want the "Things" for their own collections.

The three specimens in the geological "Things" unit are a brachiopod shell, a fragment of dinosaur bone and a bit of lignitized wood collected near Washington, D. C.

The brachiopod shell in itself accounts for nearly a third of a billion years of earth history. It came from a limestone

deposit of upper Devonian age. This was the period when the first air-breathing vertebrates ventured ashore, to found the long line of descent that led to the dinosaurs—and ourselves. Brachiopods are creatures that look rather like clams or scallops, but belong to a different group of animals. The ones now living have changed very little from those of the earliest days—they are among the world's champion conservatives.

Second chunk of antiquity in the little box is the piece of dinosaur bone, perhaps about 150 million years old. This came from a lot of spare parts left over after the assembly of some skeletons of Jurassic age at the American Museum of Natural History. They came from a place in Wyoming called Bone Cabin Quarry, because dinosaur bones are so abundant there that sheep-herders once built a shack out of them, as if they were ordinary field stones. Part of the mineral in this fossil fragment is from the original bone substance, but changed and rearranged by the slow chemistry of the centuries.

Most recent of the specimens is the piece of lignitized wood. This shows the original structure of the old conifer tree that fell into a bog, something over 55 million years ago in Cretaceous time and slowly gave up all its chemical constituents except its carbon and minerals. It looks like a shiny bit of coal, but it is actually crude jet—the same kind of stuff that is used in the familiar beads and ornaments.

Participants receive "Things of Science" monthly, for \$4 a year, which permits operation on a non-profit basis.

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● RADIO

Thursday, July 31, 2:45 p.m., EST

On "Adventures in Science," with Watson Davis, director of Science Service, over Columbia Broadcasting System.

Charles W. Gilmore, paleontologist at the National Museum, will describe expeditions that go hunting dinosaurs.

Listen in each Thursday.