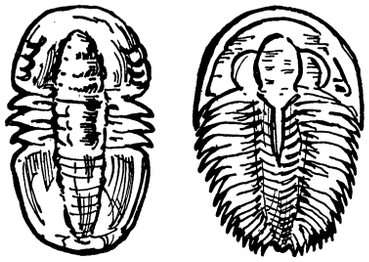
PALEONTOLOGY

NATURE RAMBLINGS by Frank Thone



Multiform Fossils

➤ FOSSILS can be formed in a considerable variety of ways. Broadly speaking, fossils are the relics or remains of ancient animals and plants, no matter how they were formed or how preserved. There are many types of fossils, including among others: petrifactions, impressions, casts, natural mummies.

True petrifactions are fairly common, although they are confined largely to one class of material: petrified wood. This seems to have been formed under rather peculiar circumstances: quick burial, as by fine volcanic ash, followed by very slow decay, with replacement of the decaying wood, molecule by molecule, with hard mineral (usually some form of silica) out of ground water, which was probably hot. These siliceous petrifactions are often beautifully detailed, displaying the minutest details of structure if they are ground thin and polished and examined under a microscope.

Impressions are made when some object like a leaf or an insect, falls upon soft mud or silt and is subsequently pressed flat and covered by another layer of the same material, and the whole is then deeply buried and slowly changed to stone. The fossil of the first known bird, Archaeopteryx, one of the most famous fossils in the world, is an impression, made when one of these strange, half-reptilian creatures fell into a limy silt bed in Germany, many millenia ago. So fine was the grain of the silt that even the barbs of the feathers are faithfully outlined on the slab of lithographic stone.

Akin to impressions, but sculptured in the round as it were, we have casts. These are formed when the process of decay is more rapid, leaving a hollow space, which is filled in with fine mud or silt. The process is very much like the making of plaster-cast sculptures. The great majority of bone fossils are casts, as are also most of the strangely marked tree trunks found in the clay-stone deposits associated with coal beds.

Natural mummies are the actual bodies of the dead animals, preserved by drying, like the ground sloths found in our Southwestern desert caves, or by freezing in permanently frozen ground, like the mammoths dug up in Siberia. One of the most unique of such specimens is an Ice Age rhinoceros found some years ago in a bed of oil-impregnated clay in Poland. The giant beast was literally pickled in oil, like a sardine!

Science News Letter, October 23, 1943

PHOTOGRAPHY

Photographic Dyes

New use of dyes gives science photographic plates that are sensitive to wide range of visible and invisible light.

➤ PHOTOGRAPHIC PLATES that capture any kind of light from the ultraviolet to the farthest reaches of the infrared are now available for scientific use through the use of sensitizing dyes, Dr. C. E. K. Mees, research director of the Eastman Kodak Company, told the American Academy of Arts and Sciences in Boston in accepting that Society's highest award, the Rumford Medals, in recognition of his photographic researches.

"A great variety of photographic plates have been made for the spectroscopist and the astronomer," Dr. Mees reported, "who have made discoveries of considerable importance.

"While the eye is sensitive to the visible spectrum," Dr. Mees explained, "and the brightest colors to the eye are yellow, green and red, photographic materials are in their nature sensitive only to the blue-violet and ultraviolet regions of the spectrum, to which the eye has little or no sensitiveness."

Vogel discovered in 1873 that the addition of dyes to photographic materials would make them sensitive for the region of the spectrum absorbed by the dye. This proved to be the foundation of the change in photography effected by the introduction of orthochromatic and panchromatic materials. In 1904 a series of dyes were made in Germany which sensitized plates for those regions of the spectrum which are bright to the eye. The first commercial panchromatic plates were made in England in 1906 by Wratten and Wainwright, Ltd., of which Dr. Mees was then managing director.

The dyes were derived from quinoline, Dr. Mees explained, but their general structure remained unknown until 1920. It became possible to prepare a great variety of these cyanine dyes, as they are called, many of which were superior for photographic use to those which had previously been available.

By the use of them, supersensitive panchromatic materials were made, and these have effected a great advance in photography, especially in motion pictures. The new dyes made possible fine grain panchromatic film of high speed used in miniature cameras. By the use of the cyanine dyes with especially long chains of carbon atoms, photography by infra-red light has been greatly facilitated.

Science News Letter, October 23, 1943

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