SCIENCE NEWS

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NATURAL COLOR MOVIES

NATURAL color movies that every one can make and project had their scientific début on July 30 at the home of George Eastman, photographic pioneer and head of the Eastman Kodak Company, Rochester.

Through the utilization of thousands of miniature lenses, invisible to the naked eye, but impressed into the photographic film itself, these new colored motion pictures will come into the American parlor before they are shown in magnificent movie palaces.

By slipping a special color filter into the ordinary amateur movie camera and using the special film, the amateur can take the new color motion pictures. In development the film is changed to a positive but, due to the principle of the process, the film is just black and white, with no color or dyes appearing in the film itself. The process is a result of several years' development by the Eastman Kodak Research Laboratories under the direction of Dr. C. E. K. Mees.

It is a short span of years since the day in 1888 when Eastman introduced the first roll film kodak with the slogan: "You press the button and we'll do the rest." But to-day the achievement of the recreation of a real scene with a camera that any one can operate is nearly complete. Movies brought motion, the development announced recently brings color. Only the addition of sound to the home movie outfit is left for the future.

A remarkable group of inventors, scientists and public men witnessed the first announced demonstration of the amateur natural color movies.

Thomas A. Edison, whose motion pictures have now been made colorful, was a witness. Frederick E. Ives, inventor of the half-tone process, the fundamental principle of which is used in the new color movies, was also present, as was his son, Dr. H. E. Ives, of Bell Telephone Laboratories, who steered the development of telephoned photographs and television demonstrated within the last two years. Dr. Leo H. Baekeland, inventor of Velox photographic paper, as well as the synthetic resin bakelite, was also a guest. Other scientists present were: Dr. E. F. W. Alexanderson, television inventor, and Dr. W. D. Coolidge, inventor of X-ray and cathode-ray tubes that bear his name; Dr. Michael I. Pupin, the physicist who made long-distance telephony possible; Hiram Percy Maxim, inventor; Dr. G. K. Burgess, director of the U. S. Bureau of Standards; Sir James Irvine, Scottish chemist, and Dr. Henry Fairfield Osborn, of the American Museum of Natural History. The following public leaders were also guests: General John J. Pershing; Owen D. Young, General Electric Company head; Major-General James G. Harbord, president of the Radio Corporation; Dr. John J. Tigert, U. S. Commissioner of Education; Frank David Boynton, Ithaca superintendent of schools; Karl A. Bickel, president of the United Press Association; Kent Cooper, general manager of the Associated Press; Roy Howard, of the Scripps-Howard Newspapers; Adolph S. Ochs, publisher of the New York *Times;* David Lawrence, publisher of the *U. S. Daily,* and Dr. Edwin E. Slosson, director of Science Service.

QUARTZ AND EARTHQUAKES

CROSSING earthquakes with quartz pebbles to raise a number of speculations about the inside of the earth is the feat performed by Professor R. A. Daly, of Harvard University. Linking the fact that the common substance, quartz, changes its physical properties when heated with other seemingly totally foreign facts about earthquake waves, Professor Daly has discovered relationships that may lead to our finding out the real nature of the foundations of our continent.

Quartz is a material found nearly everywhere on the surface of the earth. As white pebbles on beaches, crystals in cavities, or sand grains in sandstone, it is known to many. No one knows, however, if quartz is as abundant inside the earth as it is on the surface. Indeed, it may not exist there at all, at depths of many miles.

Neither mines nor oil-wells can tell us much about the deep insides of the earth. Professor Daly's information is based on the study of earthquakes. Earthquake shocks send out earth-waves which are received on seismographs all over the globe. It is known that the deeper these waves penetrate the faster they travel. But the increase of speed is not uniform. On the contrary, there are two sharp jumps, at depths estimated by European computers to be about twenty and forty miles below the surface.

Returning to the subject of quartz, Professor Daly points out that its physical properties change when it is heated. Again, this change is not uniform. There is a sharp jump at a certain temperature. Vibrations would spread more rapidly in quartz above this temperature than in quartz below this temperature. The earth gets hotter as we burrow down into it. At a depth of twenty miles it may well be hot enough to change low-quartz into high-quartz, and this change would readily explain the change in speed of the earthquake waves. As for the second jump in speed, the discontinuity at forty miles, Professor Daly suggests that below this depth there may be no quartz in the rocks at all. In a recent number of the *American Journal of Science,* Professor Daly has elaborated his views and has brought many lines of scientific thought to a focus on that unknown territory, the inside of the earth.

THE CABBAGE PLANT AND TEMPERATURE

A CABBAGE plant that produced six cabbage heads in turn, one above the other, and has finally ended its career with a crop of viable seed at the top of the eight-foot "stalk" is an unusual occurrence that is likely to go down in botanical history.

This plant was produced by keeping it at a high temperature of 70 degrees Fahrenheit and above steadily for

over two years, according to Julian C. Miller, of Cornell University, who conducted the experiment. Seeds were produced only when the plant was removed last November to a cooler greenhouse where the temperature averaged from fifty-five degrees to sixty degrees Fahrenheit.

This cabbage is one product of a series of experiments that show that controlled temperature has an important effect on crops such as cabbage or beets that normally require two years to complete the cycle of fruit and seed. Vegetative growth continues so long as the plant is kept at the higher temperature, Mr. Miller has found. Seeds are not produced until the temperature is lowered, bringing about the necessary changes within the plant.

Ordinarily, farmers and seed-growers put cabbage plants in storage through the winter and set them out the second spring to produce seed. Recent experiments at Cornell show that the cabbage plant requires only a two-months' rest period in storage at thirty-five degrees to forty degrees Fahrenheit, after which the plants can be transplanted to a greenhouse for seed production. In this manner the two-year cycle can be compressed into one year. This method is particularly desirable for growing the first and second generation seed of any cross or selection.

Experiments on annual plants by W. W. Garner and H. A. Allard, of the U. S. Department of Agriculture, proved the importance of length of day in the maturing of annual crops. In the case of the cabbage, Mr. Miller has found that increasing the amount of light had no effect, but temperature appears to be a controlling factor of great importance.

THE BIOLOGICAL EFFECTS OF RED AND YELLOW RAYS

THE red and yellow light rays of long wave-lengths are just as important as the shorter violet or ultra-violet rays for normal growth and development, according to Dr. Charles Sheard, of the Mayo Clinic.

Dr. Sheard and associates experimented with chickens, exposing different groups of them to sunlight from which the ultra-violet, red-yellow and green-blue rays, respectively, had been removed by special glass filters. At the same time, all the chickens were fed a diet rich in everything except vitamin D.

When either the red-yellow or the green-blue light was filtered out, the parathyroid glands, which play an important part in the process by which food is transposed into tissue and energy, increased greatly in size in order to maintain normal growth and development.

During the first two months the rate of growth of the chicks was greater under all filters when a small amount of cod-liver oil was added to the diet. At the end of six months' time it was found that the weights of chicks under both the amber and blue filters was much less than under the whole of sunlight except in the cases where cod-liver oil was fed. This small amount of cod-liver oil is apparently able to induce normal growth and development irrespective of the presence or absence of any portion of either ultra-violet or visible solar energy.

Without cod-liver oil and on a standard ration, experiments showed that normal growth did not take place unless both the ultra-violet and visible rays of sunlight were admitted.

MEMORY FROM INFANCY

AN adult who relates strange things that happened to him in the first year, or even the first days, of his life may be remembering the actual facts, in the opinion of J. A. Hadfield, psychologist at London University.

People who apparently recall events out of a supposedly blank babyhood are noted from time to time by psychoanalysts, as they probe into the early years of life in search of the root causes of maladjustments. Such stories have often been taken with a grain of salt by the individual's family, who believe that these must be merely imaginative memories that have come to seem real to the individual. It is also possible that the individual's "memory" of an event was gained in perhaps his third or fourth year of age, from hearing some one else recount an incident of his babyhood.

Describing a number of cases in the British medical journal, *Lancet*, Mr. Hadfield tells of a doctor who remembered a fire that occurred when he was eight months old. The fire completely destroyed the house and no pictures of the home were preserved. The doctor described the circular staircase and a colored glass window at the landing, and the flames licking at the glass panels. When he was about seven years old, he had told his parents about this memory, and gave so many details that they accepted the story, incredible as it seemed to them.

A more remarkable instance cited by Mr. Hadfield is that of a woman under hypnosis who vividly described the terrifying infantile experience of being slapped, held upside down and shaken harshly. The psychologist inquired if she did not know how they revived infants when they do not breathe after birth. She answered that she had no idea, and was surprised to hear that she had described the usual procedure.

Undoubtedly young children are too young to understand the whole significance of their experiences, Mr. Hadfield comments. But they "are not too young to feel, and experiences that are not in the least understood by a child may produce violent commotion in its soul."

Studies of anatomy, he states, show that in the year-old child the brain center for emotion is active, though the center for more discriminative thought is probably not in full function.

The young child, he suggests, can hold in its memory the feeling of a scene, and later when he can use language, he puts the feeling into words more or less accurately as the case may be.

LARCH CANKER IN THE UNITED STATES

AMERICA'S dwindling timber supply is threatened by a new tree disease, similar to chestnut blight, which is capable of wiping out stands valued at approximately $3,150,000,000, says Dr. Haven Metcalf, in charge of

the Office of Forest Pathology, U. S. Department of Agriculture.

Larch canker, as the disease is called, has been known in Europe for about a century and is believed to have been brought here on seedlings from Great Britain, prior to enactment of the plant quarantine law. It was recently discovered attacking trees in two New England states.

Dr. Metcalf characterizes the disease as "far and away the most potentially serious tree disease that has ever struck the United States." Its danger, he explains, lies not in the fact that it is attacking and killing the native larch, or tamarack, a tree not commercially important, but that it has proved contagious to the Douglas fir and the yellow pine, the two most important timber species in North America.

Drastic measures will be necessary to stamp out the disease before it gets beyond control and, in Dr. Metcalf's opinion, it may be too late now. Three thousand diseased trees in Massachusetts and Rhode Island will be burned out this summer. It is not known whether other areas have been affected, but larch canker is equipped to spread rapidly.

Fear is expressed that the great Douglas fir forests of the West may become infected because the larch forest, ranging in a continuous broad belt from New England to the Pacific coast, interlaces with the fir forest near British Columbia, forming a bridge upon which the disease could cross. Little is known about the disease, but imported diseases and imported pests, it is stated, are frequently far more virulent in countries they adopt than in their native habitat.

THE EAGLES AT VERMILION, OHIO

A DUAL tragedy at the aerie of the pair of American eagles which have nested for many years three miles east of Vermilion, Ohio, probably will make this season the last for the observations of Dr. Francis H. Herrick, of Western Reserve University, and C. H. Shipman, a naturalist, of Willoughby, Ohio.

Dr. Herrick and his associate have been studying the great American bird at first hand for several weeks each summer for the past seven years. They have a specially built 125-foot steel observation tower overlooking the aerie. Here they have spent the greater part of each day during the nesting season.

Early this season they reported the disappearance of the male eagle. Since the eagle mates for life and has never been known to desert its mate, it is probable that the bird was either killed or driven away in a territorial warfare. Both the naturalists and residents of the town are greatly interested in finding out its fate. As a result of this misfortune the two baby eaglets hatched this season were somewhat neglected during their infancy because of the mother bird's tendency to do only her own share of the work of rearing her family. The smaller eaglet, through lack of food and abuse from its brother, died several weeks ago. From that time on the mother cared assiduously for the remaining baby until early this week, when it was large enough to leave the aerie and look out for itself.

ITEMS

VINEGAR made by the old-fashioned fermentation process is far superior to synthetic acetic acid, German scientists have found. While all vinegars vary greatly in their vitamin content, the synthetic variety is lacking in vitamin D, the important food factor that prevents rickets in children, report Dr. A. Janke and H. Lacroix.

CHINESE boys and girls of Kwangtung ancestry living in Hawaii grow faster and more regularly than boys and girls of the same age living in China, investigations made by Vivia B. Appleton have shown. This is credited to the better living conditions in Hawaii, which present an environment more favorable to normal growth. Chinese children living there grow more like European children. Those measured were between 6 and 20 years. The differences between the sexes is more marked among this group than among those studied in China. Racial differences between the two groups were present before adolescence but were more decided after.

THE northern coast of Peru, near the scene of a severe earthquake on May 14, was again shaken on July 18. Seismic waves from the center of the disturbance, relayed to Science Service from eight seismograph observatories, permitted the experts of the U. S. Coast and Geodetic Survey to locate it at seven degrees south latitude and 79.7 degrees west longitude. It happened at 2:05 eastern standard time. The observatories reporting the disturbance were located at Manila, P. I.; Sitka, Alaska; Honolulu, T. H.; Tucson, Arizona, and Chicago, Ill.; all of which are operated by the Coast and Geodetic Survey, and at Georgetown University, Washington; St. Louis University, St. Louis, and the Dominion Observatory, Ottawa, Canada.

THE division of anthropology and psychology of the National Research Council is turning a searchlight on the problems of the deaf and hard of hearing, to determine the most practical methods of rendering aid. Ten subcommittees have been appointed, composed of specialists in medical, psychological and educational aspects of deafness, Dr. Knight Dunlap, chairman of the division, has announced. One subcommittee, headed by Dr. F. Lyman Wells, of Boston, will report on the emotional and social difficulties among the deaf and hard of hearing. Another of the ten subcommittees will suggest what most needs to be done in teaching those with defective hearing. After the subcommittees have worked out a practicable program of research, the problems involved in carrying out the needed work will be considered. But until a sane, comprehensive and practical research program has been developed, the attempt to finance or initiate research would be unwise, and probably unfortunate, Dr. Dunlap stated.