

ENGINEERING

Fireless Blasting Methods For Coal Protect Miners

➤ FIRELESS, sparkless blasts of compressed air are jarring loose coal in one of America's newest and safest mines. The mine is the New Kathleen mine near Du Quoin, Ill., where more than a million tons of coal a year will be mined with modern safety and efficiency.

In addition to the air blasting, other safety features of the mine include a slope entrance instead of a vertical shaft with a hoist, conveyor belts to carry coal to the tipple and spraying both with rock dust on the walls and ceiling and water during some of the operations to cut down the dust.

Air blasting without fire is more expensive but reduces the possibility of explosions and is less likely to result in cave-ins than conventional blasting powder operations, mine officials declare.

Most of the mining processes use electricity in this mine which is owned and operated by a subsidiary of the Union Electric Company of Missouri. The new \$2,000,000 mine was put into operation this summer in the same Illinois coal field as the original Kathleen mine, which closed down in 1946 after 30 years of operation.

A water spray plays on the coal as bits on a revolving chain cut under the coal. Machines with two drills instead of the conventional one, carve out holes in the coal wall. These holes are sprayed with oil solution to reduce the dust before blasting.

Into these holes goes an airdox shell with a copper tube trailing back to a safe distance from the blasting. Air at a pressure of 10,000 pounds per square inch is shot into the shell through the tube. At a safe distance the operator releases the charge of air at high pressure into the holes.

There is no fire or blast powder, but the rush of compressed air breaks down an average fall of 35 tons of coal. A miner with a safety lamp inspects each fall to detect any methane gas present, but none has been found in the new mine.

After the coal is broken down by the air blast, an electrical car with heavy metal arms scoops in the coal and carries it to the conveyor belt where it is dumped for the ride to the high tipple. At the tipple, small bits of coal are sorted out for use in steam electric plants of the Union Electric Company. Larger coal is sold commercially.

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AIR BLASTING—A new safety feature in mines is this modern air-blast shell which a miner is inserting into a wall of coal. The air shoots into the shell through the copper tube which leads back a safe distance from the site of the blast and will send about 35 tons of coal crashing out of the vein.

OPHTHALMOLOGY

Improve Cataract Surgery

New procedure of cauterizing the leaking area after a cataract has been removed may hasten patient's recovery and increase chances of good vision.

➤ A NEW surgical treatment to stop "leaks" after cataract operations was reported by Dr. Victor A. Byrnes of the Aviation School of Medicine, Randolph Field, Tex., at the third Pan American Congress of Ophthalmology in Havana.

Cases in which the new procedure would help are those in which the fluid filling the front part of the eye leaks out or does not refill the space after the cataracts have been removed. The cornea is left flat against the iris in such cases.

To remedy this, Dr. Byrnes reopens the wound and cauterizes the leaking area. In two of the five cases reported slightly more complicated procedures were used. One 84-year-old woman had to undergo three operations before her eye returned to normal.

Dr. Byrnes emphasized that the procedure had been tried in only a few

cases, but his experience indicated that the patient's recovery was hastened, his comfort was increased and the chance of securing good vision was improved. He expressed the hope that others would try his method so that its value might be determined.

Altitude Affects Eyesight

➤ HIGH altitudes affect eyesight even among permanent inhabitants of mountain regions who have become acclimated to the oxygen-scarce air, it appears from a report by Dr. Jorge Valdeavellano of Lima, Peru.

A fifth of the persons he examined who lived in a town slightly above 15,000 feet in the Andes had only two-thirds the normal visual acuity.

There was no apparent reason for the

deficiency in eyesight and none of the persons mentioned having any difficulty in their work because of their lesser capacity to see. Many were surprised to learn they had such a handicap.

Dr. Valdeavellano's studies are believed to be the first made on the effect of high altitude on permanent residents although a number have been made in persons suffering from acute lack of oxygen in connection with aviation health problems.

The field of vision was reduced in a few of the mountain dwellers and practically all of them had enlarged blood vessels in the eyes.

Color discrimination was apparently not affected, since the percentage of Andean inhabitants with deficient color vision was about the same as in Lima. "After-images" (visual impressions lasting after the actual image has disappeared) were delayed in appearing and lasted longer in more than half of those examined.

Although some investigators have found an elevated tension, or pressure, within the eye during research on effects

of altitude, the tension in these Peruvian residents of mountainous areas was within normal limits.

Worms Invade Eyes

➤ SEEING worms before the eyes is a reality and not an alcoholic or other hallucination for patients with the tropical disease, onchocercosis.

The worms are in the eyes and seeing them is one symptom peculiar to the disease, Dr. M. Puig Solanes reported.

Onchocercosis is an infection caused by one of the species of threadlike worms known as filariae. It occurs only in Mexico and Guatemala in the Western Hemisphere, and in two-thirds of the cases the worms invade the eyes.

The worms look like black or colored threads moving about in the visual field, the patients say. The eye specialist can see them, too, when he looks through the electric ophthalmoscope to examine the eyes.

There is no specific treatment for the eye manifestations, Dr. Puig Solanes said.

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MEDICINE

Navy Doctors Join Safari

They will go along with the University of California African Expedition to study native tropical diseases and protect other scientists.

➤ MICROSCOPES will supplement rifles on the new sort of safari expected to be undertaken soon by Naval medical scientists. When contract negotiations now pending are completed the scientists will accompany the University of California African Expedition, which proposes to turn the light of scientific research on the darkest continent.

The Navy medical group, latest planning to join the African Expedition, will have a two-fold duty. First, it will provide medical service to the top paleontological and anthropological scientists who, under the sponsorship of the University of California, will cover most of Africa this year seeking traces of primitive man and apes.

Second, the Navy, already well-known for its research in tropical diseases, will study such native diseases as African sleeping sickness, Bilharzia or snail fever, plague, scrub typhus, yellow fever and malaria. There are also a host of parasites in human beings concerning

which the Navy scientists are exceedingly curious, such as the particular form of hookworm in Mozambique, Portuguese East Africa.

To pursue their studies of these diseases, the Navy medical group will have to trap and shoot animals which are disease carriers. Among these are the rodents which are known carriers of bubonic plague; the zebras which are attacked by ticks and may carry relapsing fever; the deer, gazelles, eland, and possibly lions, tigers and leopards thought to be reservoirs of African sleeping sickness; and a large group of insect-eaters such as the shrew which may be a carrier of plague and malaria.

Most of these animals have not been used in research by American medical scientists before because animals which are potential disease carriers are not allowed to be imported. If they should escape captivity they might introduce a whole new series of diseases into the United States.

There are particular regulations against the fruit bat, a known malaria carrier, which if once established here would destroy citrus fruits. This fruit bat, however, is highly regarded by medical scientists as a good laboratory animal because it is easily raised in captivity. It may be that certain phases of the malaria cycle, not yet entirely understood, could be worked out through study of it.

The leader of the Navy group, Comdr. Julius M. Amberson, USNR (MC), says his party will not take restricted game such as the gorilla, elephant or giraffe unless necessary. They are more interested in small game concerning which there is less scientific knowledge.

All information discovered will be made available to research and public health authorities in Africa, and their respective governments.

Among the more interesting sections to be visited by the medical scientists are the Nubian desert, which has not been studied by a scientific group for over 100 years, the Sudan proper and the great central lake regions of Africa.

Assisting Comdr. Amberson will be Dr. Ernst Schwarz, zoologist and an authority on African mammals; Comdr. Trenton Ruebusch, University of Virginia parasitologist; and Capt. Harry Hoogstaal, former Army medical officer and entomologist from Chicago's Field Museum.

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AGRICULTURE

Spent Brewery Hops Form Good Mulch for Plants

➤ WASTE hops from breweries can be used to protect valuable plants from weather, weeds and fire.

Used as a mulch on the famed plants of the Arnold Arboretum of Harvard University, the spent hops were found to be a better protecting material than leaves, hay or straw which are commonly used. These mulches may be set on fire by a carelessly discarded cigarette. The waste hops, even when dried out, do not blaze up, and a flame will quickly go out unless exposed to other material.

Many mulches have been tried to protect the plants for the Arnold collection from this hazard. Some of the materials include wood shavings mixed with horse manure, ground coconut hulls, vermiculite, buckwheat hulls, ground banana stalks, peat moss and glass fibers. But the beer byproduct is the best one yet found.