

reduction of atmospheric dust as a result of using the water spray drills is reported to be 80 per cent on a weight basis and 75 per cent on a count basis, with a water consumption of about 1 per cent by weight of the coal mined.

In spite of this high degree of dust suppression, difficulties such as inadequate distribution of water in the stope and unsatisfactory connections which supported the flexible hoses from the mine wall, constituted mechanical problems still to be solved.

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Radioactive Substances and X-Ray

LEUKEMIA IN RADIOLOGISTS IN TWENTY YEAR PERIOD. H. C. MARCH, *Am. J. M. Sc.* **220**:282 (Sept.) 1950.

In the United States the incidence of leukemia in physicians who were not radiologists in the period from 1944 to 1948, inclusive, was 113 in 15,637 (0.72 per cent). The incidence in radiologists during the same period was 6 in 124 (4.84 per cent). These percentages approximate those reported for the previous 15 year period, 0.44 per cent and 4.57 per cent, respectively. The combined figures for physicians for the two decades 1929 to 1948, inclusive, are as follows: 65,922 nonradiologists died, 334 of whom died of leukemia. During this same period 299 radiologists died, 14 of whom had leukemia. The over-all incidence is 0.51 per cent for nonradiologists and 4.68 per cent for radiologists. Thus it is seen that the incidence of leukemia in radiologists is more than nine times as great as in nonradiologists. This difference has statistical significance. It is suggested that the increased incidence of leukemia in physicians as a whole as compared with the white adult male population might be due to the same factor of exposure of ionizing radiation.

FROM J. A. M. A.

THE BIOLOGICAL SIGNIFICANCE OF THE ROENTGEN. A. MUTSCHELLER, *J. Invest. Dermat.* **14**:471 (June) 1950.

Experiments were performed on the depth of penetration of x-rays into human tissue, and the resulting erythema was noted. By placing a layer of ground beef of known thickness in contact with the skin and applying a known sufficiently large radiation quantity to the surface of the ground beef to produce a distinctly visible erythema, the skin becomes a reagent for, or an indicator of, biological radiation effects. The radiation penetrating through the superimposed ground beef and through the skin produces photo rays and scattered components of secondary rays which are propagated in all directions, except that the scattered secondary rays have a larger forward than backward component. If the skin is covered with a rather large thickness of ground beef, which has the same effect on the incident radiation as the skin and the subcutaneous tissues, or if the biological effectiveness is determined at a locus sufficiently deep in the volume of the irradiated tissues, the secondary components in the forward and the backward direction are equal, and it is then that secondary ray equilibrium exists. Determinations were also made on the radiation dose on the skin on the exit side. The analysis of the biological utilization of primary and secondary x-rays leads to the concept that a secondary ray equilibrium exists in a centrally located region of an exposed tissue volume, wherein the secondary radiation from other cells reaching a small volume or a cell is equal to the secondary ray quantity emitted from this small volume or cell.

FROM NUCLEAR SCIENCE ABSTRACTS.

SOME MEASUREMENTS OF GAMMA-RAY DOSE RECEIVED BY A RADIOTHERAPIST DURING RADIUM OPERATIONS. J. L. HOWORTH, H. MILLER and J. WALTER, *Brit. J. Radiol.* **23**:245 (April) 1950.

The authors present experimental measurements of the gamma ray radiation received by a radiologist during the course of his routine duties. The data were obtained by insertion of a small "air wall" condenser chambers within the rubber gloves over the hands and fingers and by distributing ionization chambers over the body. Results are presented in the form of