

chelating agents and their stressing the contraindication of dimercaprol (BAL) in acute poisoning are welcomed.

This excellent bulletin includes an account of the strange environmental Japanese 'itai-itai' disease. These are cases of bone and joint pain occurring in a proportion of elderly women living in the vicinity of old mine workings where cadmium, lead, and zinc have been mined. Rightly or wrongly, this disease has been ascribed to exposure to cadmium.

This publication would be very useful to any industrial medical officer or industrial hygienist concerned with the protection of persons exposed to cadmium or its compounds in their work.

J. A. BONNELL

ICRU Report 19. Radiation Quantities and Units. (Pp. 21; \$2.50). ICRU Publications, P.O. Box 30165, Washington, D.C. 20014, U.S.A. 1971.

In aspects of occupational medicine which involve radiation the physical quantities and units used must be chosen with extreme care. An international body concerned with units (ICRU) had to be established (1925) before progress could be made in setting acceptable levels of exposure to radiation. Any system of radiation units must serve many purposes. It must be useful in relating quantities measurable external to a worker or patient, to quantities resulting from his interaction with the radiation; and it must also provide a language which is useful for discussing the biological mechanism of radiation effects in man. For many years the roentgen was used both as the unit of environmental exposures and as the unit of dose received by a man exposed to that environment. In the last 20 years the distinction between the environment and the absorbed dose has been clarified and additional physical concepts (such as kerma and dose equivalent) have been introduced.

By 1962 the family of units was essentially complete, and the last ICRU report issued in 1968 contained only limited modifications. It provided a self-consistent set of concepts for adding the effects of different sorts of radiation, and even for adding the effects of inhaled or ingested radioactivity to those of external irradiations.

The present report retains the same fundamental units without altering their meaning or range of applicability. However, some of the formal definitions have been made more rigorous and, although this will not affect their use in industrial hygiene, it will avoid ambiguity in theoretical studies. The most valuable additions in the present report are those concerned with microdosimetry, a growing subject which is proving important in radiobiology. To accommodate differences between stochastic processes and the mean (or expectation) value when many such processes occur in a finite volume, it has been necessary to introduce very precise language. Some of the consequential changes in nomenclature will be noted with regret, for example, Integral Dose becomes Mean Energy Imparted.

A departure from previous Reports is the publication of a separate section, Part II, dealing specifically with Quantities and Units for Use in Radiation Protection. This part of the Report introduces two new quantities, Absorbed Dose Index and Dose Equivalent Index. These indices are maximum values in a tissue equivalent sphere of 30 cm diameter. Many physicists will question the

need for introducing further quantities into an apparently complete family, and it is certain that many industrial doctors will suspect that the study of 30 cm spheres may divert effort from the main objective of protecting workers. There is an urgent need to examine the quantities used in radiological protection, some of which are so poorly defined that several interpretations are possible. The present Report gives little hope that ICRU intends to perfect a self-consistent set of units which can be unambiguously applied to radiological protection. The new quantities, Absorbed Dose Index and Dose Equivalent Index, are unlikely to find general acceptance, and it seems improbable that the Report will have any impact on the operational aspects of radiation protection. However, the clarification of fundamental quantities and units, which provide the language for advancing the physical and radiobiological basis of health physics, is well done and welcome.

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Digest of Pneumoconiosis Statistics 1970. (Pp. 17; 11 tables; 41p). London: H.M.S.O. 1972.

This annual report appears in a slightly changed format but the contents are essentially the same. The overall figures for pneumoconiosis give no reason for satisfaction and appear to have been more or less static over the last few years. In coal mining, for example, boardings at which the disease was first diagnosed have not significantly decreased since 1966. The situation in the coal mining industry is further illustrated by the rate of boarding in Doncaster, which in 1970 was 4.6 per 1 000 wage earners overall compared with 1.8 in 1968, and in East Wales, which was 6.2 per 1 000 in 1970 and 3.2 in 1968.

In industries other than coal mining the number of boardings shows the same tendency to remain static during this period with the exception of asbestos working in which the numbers diagnosed are higher than in the previous two years. Coal mining still accounts for over 65% of the new pneumoconiosis cases diagnosed, and pottery manufacture, slate mining and quarrying, iron foundries, and work with asbestos stand out as the problem industries.

In the year under review, 44 men (4%) were given a 100% disablement assessment but the great majority of boardings were less than 40%. Most men in whom pneumoconiosis was first diagnosed were over 45 years of age, but it is significant that 21 men in the coal industry and 9 men who had worked with asbestos who were accepted at boardings during 1970 were under 40 years of age. The number of deaths also appears to be rather static and 870 death benefits were awarded in 1970, the average over the preceding four years being 867. The total number of men who are in receipt of disablement benefit is falling very slowly year by year but there are still over 46 000 of them. These include 150 coal miners and 80 men from other industries who are all under the age of 40 years.

For coal miner's pneumoconiosis the overall rate per 1 000 of all wage earners employed is 2.7, the range being from 0.4 (Northumberland) to 6.2 (East Wales). In 1964 this overall figure was 2.4 per 1 000.

The slow improvement in eradicating the dust diseases is disappointing, particularly where the effort has been



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