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RADIOACTIVE POISONING

Measurement of the normal body burden of radioactive material was one of the subjects discussed at a recent conference at Leeds University. The normal body burden is mostly due to K^{40} . Since naturally occurring potassium, of which 0.112 per cent is the radioactive isotope K^{40} , constitutes 0.25 per cent of the lean body weight, a 70-kg man contains about 135 grams of potassium and consequently about 10^{-8} curie of gamma-activity.

Measurements of this type have been made over a period of several years, but recently measurements have been made with novel apparatus comprising scintillation counter equipment in association with pulse-amplitude analysers, which allow identification of the nuclides present as an activity determination. At the Leeds Conference it was disclosed that measurements made both in America (at the Argonne National Laboratory) and in this country (at Harwell) had revealed that all persons tested had contained about the expected amount of K^{40} , and in addition a small amount of Cs^{137} . This caesium isotope is produced in fission, and it could be that the Cs^{137} is from radioactive "fall-out" from weapon trials. The amount found was very minute, about 4×10^{-9} curie, but is nevertheless significant. The maximum permissible body burden as laid down by the ICRP is 90 microcuries, or 2500 times this amount. It may be wondered, if the Cs^{137} really originated from "fall-out", why this isotope and apparently none of the other fission products have been found. A reason can be advanced-- it is that the human body selectively absorbs caesium and essentially enhances its abundance by a very large factor. However, whilst the sensitive body monitors now in use at the Argonne and at Harwell have not so far revealed the existence of minute quantities of other materials, it is understood that surprising results have been obtained by subjecting dirt from domestic vacuum cleaners from ordinary houses to gamma-ray spectrometer analysis. Activities of the order of 10^{-8} curie have been measured and identified as Ca^{41} , Ru^{106} - Rh^{106} , and Zr^{95} - Nb^{95} .

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