an alteration in the rate of antibody production, then the net result would be either an accentuation of the immune response, if antibody production was affected in the opposite direction, or perhaps no observable difference, if a change in antibody decay was offset by a change in antibody production in the same direction, that is, an increase in antibody decay compensated by an increase in antibody production. Further study on the influence of the thyroid on the immune response is indicated, and experiments on active antibody production are now in progress.

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Balance Trials with Magnesium-28 in Sheep

FÆCAL magnesium comprises two fractions, an endogenous fraction originating from the body and excreted into the gut and an exogenous fraction representing unabsorbed dietary magnesium. Once the relative proportions of these two fractions are known, it is possible to calculate both the endogenous fæcal magnesium and the true availability of dietary magnesium. A method for determining these proportions would seem to be the comparative balance technique[1], since this could be adapted for magnesium-28 provided the quantity of this isotope in a single dose was sufficient for accurate determination of the total eliminated in the fæces after either oral or intravenous administration. As the cost of magnesium-28 is very high the size of dose for economic reasons must be small, but this communication describes experiments which would appear to be satisfactory from both points of view.

Cyclotron-produced 'carrier-free' magnesium-28 was used, and initially the doses contained 80 µc., but after chemical separation and transit, only about 30–40 µc. remained for administration into the sheep. The cost of each dose was £30.

Trials were carried out with one sheep, an adult North Country Cheviot wether, which received a constant diet of hay supplying 0·77 gm. of magnesium a day throughout the experiment. Single doses of magnesium-28 were given at 8.40 a.m., either into the rumen through a fistula, or into the jugular vein by means of a nylon catheter. The fæces and urine were collected twice daily at 8.40 a.m. and 4.40 p.m. and their radioactivity determined in a modified ring counter[2].

After ruminal administration it was found that magnesium-28 could be followed in the fæces for 5 days only. Nevertheless, it was possible to calculate the magnesium-28 still to be eliminated in the fæces since the ratio of magnesium-28 to dry matter in the fæces declined exponentially after reaching a peak on the second day after administration. This can be expressed by the following equation :

$$R = 0{\cdot}304 \exp{(-0{\cdot}0306t)}$$

where R is magnesium-28 recovered in fæces/magnesium-28 administered $\times$ 100/fæcal dry matter and t is time after administration (hr.).

Of the original dose, 62·6 per cent was recovered from the fæces within the period 2–5 days after administration, and it was calculated by integration of the above formula that a further 3·4 per cent would be eliminated by the same route after 5 days. These, together with the 13·2 per cent passed out on the first day, make a total of 79·2 per cent of the ruminal dose eliminated in the fæces. In the first 5 days, 0·07 per cent was excreted in the urine. Over the same period the fæcal non-radioactive magnesium represented 100·8 per cent of the dietary intake.

Following intravenous injection, urinary magnesium-28 could be followed for 5 days and fæcal magnesium-28 for 4 days 8 hr., and over this period 11·9 and 19·4 per cent of the given dose were excreted by the separate routes. The value for urinary magnesium-28 is much greater than those reported for calcium-45 in cattle[3], suggesting that the urinary route of excretion is more important for magnesium than it is for calcium.

The calculated values for the endogenous fæcal magnesium and the availability to the sheep of the magnesium present in hay were 205 mgm./day and 25·8 per cent respectively. These values are in good agreement with those determined for similar sheep by Field et al.[4] using indirect methods.

The evidence presented here shows that the true availability of dietary magnesium can be determined with magnesium-28, but its use will be limited by its high cost and its short half-life, which results in a severe reduction of its radioactivity in transit.

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Metabolism of Benzene Hexachloride by Resistant Houseflies *Musca domestica*

OUR previous work on the metabolism of isomers of benzene hexachloride by a resistant strain of houseflies showed that the α- and γ-isomers are rapidly converted to water-soluble metabolites[1-3], and in the course of the reaction chloride ions are formed in the proportion of four or more per molecule of benzene hexachloride metabolized[4]. We have now found that alkaline hydrolysis of the metabolic products produces dichlorothiophenols.

The method of isotopic dilution was used for identifying the thiophenols, which have not yet been