region is caused by nucleic acid impurities or whether it constitutes an essential part of the antigen spectrum. A stock solution containing 3 mgm./ml. of the fraction fixes complement in dilutions as high as 1:6,400 with sera of cattle naturally infected or immunized with Johne's bacilli. As an antigen for routine diagnostic tests it shows less tendency to produce non-specific reactions, but is still strongly reactive with antisera containing antibodies from avian tubercle bacilli².

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Calcium Exchanges of Ehrlich Ascites Tumour Cells of Mice

SINCE changes in cell calcium content and metabolism have been invoked hypothetically as contributory factors, both in the irradiation syndrome¹ and in the appearance of malignancy², it seemed of interest to make a detailed study of calcium exchanges in the favourable material provided by the Ehrlich ascites tumours of mice.

In preliminary experiments with 8 mice bearing 9-day tumours, the mean calcium content was found to be $12.0 \pm 1.3 \mu\text{gm.}$ (standard error) per 100 mgm. wet weight of packed tumour cells. This value is close to that obtained by Lansing *et al.*³ for mouse epidermal carcinoma ($9 \mu\text{gm.}$ per 100 mgm.).

When doses of about 20 $\mu\text{c.}$ of a sample of calcium-45 of high specific activity were injected into the peritoneal cavity, the tumour cells rapidly became 'labelled'. Within a few minutes the radioactivity per unit wet weight of cells and fluid were approximately equal. Since no significant difference was found between calcium concentration in cells and fluid, the specific activities also must have been similar. This result indicates complete exchangeability of the cell calcium, and contrasts sharply with the results obtained by Harris⁴, who studied muscles *in vitro*.

Further work in progress includes the comparative study of calcium exchanges of freely suspended non-tumour cells, and of irradiated normal and malignant cells. Details of this investigation will be published elsewhere.

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Thermal Decomposition of Some Antibiotics

As part of our programme on the thermal decomposition of antibiotics¹, additional studies have been made to include the antibiotics, aureomycin (chlorotetracycline), terramycin and tetracycline.

The thermal decomposition of the antibiotics was studied by means of an automatic recording thermobalance². Sample sizes ranged from 40 to 60 mgm. and were subjected to a linear heating-rate of 5.4 deg. C. per min. During the pyrolysis, a slow stream of air was passed over the sample to remove the decomposition products from the furnace.

The resulting thermograms of aureomycin, aureomycin hydrochloride, terramycin and tetracycline hydrochloride are given in Fig. 1. In general, the antibiotics studied were surprisingly stable. The thermobalance, of course, can only detect decomposition if a resulting loss in weight occurs. Using this as a criteria for establishing decomposition, the antibiotics were stable up to the 145–170° C. temperature-range.

Fig. 1. Thermograms of antibiotics. A, Tetracycline hydrochloride; B, terramycin; C, aureomycin; D, aureomycin hydrochloride

Tetracycline hydrochloride (Fig. 1, curve A) began gradually to lose weight beginning at 85° C. From 120° to 145° C. a horizontal weight-level was observed which probably corresponded to the anhydrous antibiotic. This first loss in weight is thought to be due to loosely bound water. Beyond 145° C., total disruption and oxidation of the organic material occurred, resulting in an empty thermobalance pan at 525° C.

Terramycin (curve B) lost a small amount of water at a little above room temperature, giving a horizontal weight-level from 70° to 115° C. which corresponded to the anhydrous antibiotic. Rapid disruption and oxidation took place above 165° C., resulting in an empty thermobalance pan at 475° C.

Aureomycin (curve C) was thermally stable up to 175° C. According to Broschard *et al.*³, the melting point of the antibiotic is 168–69° C. (uncorr.), just a little below the temperature where rapid weight loss began. Above 175° C. the antibiotic decomposed