Fig. 1. Section showing cortical and medullary bone from the femur shaft of a laying hen. The specimen was taken shortly after an egg had been laid and prior to the next ovulation. Note the strongly periodic acid–Schiff-positive strands of sulphated mucopolysaccharide incorporated in the medullary bone matrix. (Hæmatoxylin and periodic acid–Schiff)

failing to react at dilutions greater than 1 : 250,000. The significance of this is not understood.

Irving[18], using sudan black following pre-treatment with pyridine, alcohol or benzol, has demonstrated the presence of a line of sudanophil material (calcification line) at the surface of developing intramembranous bone. This substance is periodic acid–Schiff-positive and metachromatic and thus appears to be an acidic mucopolysaccharide. In formalin-fixed material, however, it could not be stained with methylene blue at low pH values (2·5) without pre-treatment in one or other of the foregoing reagents and it is thus distinguished from the mucopolysaccharide of avian medullary bone. Moreover, the sudanophil material described by Irving[18] fails to stain with alcian blue and is, in any event, confined to surfaces at which appositional growth is occurring, being separated from the bone only by a thin layer of pre-osseous matrix. Clearly, therefore, this substance is not identical with the periodic acid–Schiff-positive material of the labile avian medullary bone and, although there is evidence that the latter substance varies in amount and appearance at different stages of the egg-laying cycle, it does not appear to be associated with calcification in the same way as the sudanophil material of developing mammalian bone.

Investigation of the cell picture in the medullary bone (predominance of osteoblasts or osteoclasts) is continuing in an attempt to correlate more accurately the changes in the appearance of the periodic acid–Schiff-positive substance with the phases of shell deposition.

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RADIOBIOLOGY

Alkaline Earths in Heparin

HEPARIN is widely used as a blood anticoagulant. In the determination of calcium, in plasma, for example, it is commonly assumed that heparin has no effect on the assay. We have recently found, however, that the strontium content of heparin could be a very substantial correction in the determination of the strontium content of heparinized plasma. This result stimulated us to determine the calcium, strontium and barium content of five different preparations of heparin which were available here.

The heparin for assay was taken as solid (when possible from an unopened ampoule) prepared by Boots Pure Drug Co., Ltd., or Evans Medical, Ltd. Calcium was determined directly by flame spectrophotometry. Strontium and barium were determined by neutron activation analysis. The results are shown in Table 1.

Table 1. CALCIUM, STRONTIUM AND BARIUM IN HEPARIN IN P.P.M.

Heparin batch No.	Calcium	Strontium	Barium
64373	2,930	92	4
64373/1	2,810	84	—
68424	390	5	2·5
66306	700	7·5	12
D 25200	300	9	8

It will be seen that there was a considerable range in calcium, strontium and barium depending on the particular preparation. If, for example, 20 mg of heparin (batch No. 64373) equivalent to about 2,400 units were added to 100 ml. of human blood, the adventitious calcium would be approximately 60 µg per 50 ml. plasma or 1·2 per cent. The strontium in the heparin would be nearly 2 µg and the barium 0·1 µg or about 100 per cent and 10 per cent respectively of the normal strontium and barium content of the plasma.

The results given in Table 1 are sufficient to show the importance of analysing each preparation of heparin when it is to be used as an anticoagulant for the estimation of alkaline earths in plasma and that the amount of heparin used should not be appreciably greater than that required to prevent clotting of the blood.

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BIOLOGY

Relation between Carcass Composition and Live Weight of Sheep

A RE-EXAMINATION of the work of Hammond[1], Wallace[2,3], Pálsson and Vergés[4,5], and Wardrop[6], suggests that the carcass composition of a sheep, in terms of dissected bone, muscle and fat, is more closely related to its live weight than to its age. Using all the available data from these papers, including ewes and wethers irrespective of breed, age, stage of pregnancy and nutritional history and ram lambs up to the age of 2 weeks, the following regression equations have been computed for estimating the body composition of sheep from empty live weight (that is, the weight of the live animal at slaughter minus the contents of its alimentary tract):

(i) Weight of carcass bone (y_1)
$$\log y_1 = 0.722 \log x - 0.706 \tag{1}$$

(ii) Weight of dissected carcass muscle (y_2)
$$\log y_2 = 1.018 \log x - 0.554 \tag{2}$$

(iii) Weight of dissected carcass fat (y_3)
$$\log y_3 = 1.539 \log x - 1.843 \tag{3}$$