

measured cases.

This simple method of analyzing radioiron

appearance curve would also be valuable to detect ineffective erythropoiesis.

## Studies on the Release of Blood Cells of Bone Marrow

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The bone marrow functions, especially the release of blood cells, were studied by using female rabbits, weighing about 2500g, under morbid conditions with microautoradiographic technics and liquid scintillation counter.

The femur of one side was irradiated  $^{60}\text{Co}$  or blockaded by indian ink, and then the rabbits were affected by infection or phlebotomy. One week later,  $3\ \mu\text{Ci}$  of  $^3\text{H}$ -thymidine was administered intravenously to the rabbits and one hour later blood samples were obtained from the nutrient veins of the bilateral femur marrows and peripheral artery.

These samples were used partly for radioautographic studies, and partly for liquid scintillator countings of serum.

The mean grain counts in myeloblasts of the rabbits blockaded by indian ink or affected by infection were decreased and those of the

rabbits affected by phlebotomy were increased. Similar results were noted in the granulocytic series.

The mean grain counts in the granulocytic series of the rabbits treated with  $^{60}\text{Co}$  were lower than those of the rabbits blockaded by indian ink, (especially in myeloblasts).

The mean grain counts in the erythroblastic series of the rabbits affected by phlebotomy were increased.

Radioactivity of  $^3\text{H}$ -thymidine in blood plasma of the rabbits affected by phlebotomy showed higher levels.

These results suggest that the proliferative activity of granulocytic cells is decreased by  $^{60}\text{Co}$  irradiation or blockade of bone marrow, and that erythropoiesis is increased by phlebotomy.

## Studies on Bone Marrow Distributions of $^{99\text{m}}\text{Tc}$ Sulfur Colloid with Scintillation Camera

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In normal subjects, the bone marrow figures obtained with  $^{99\text{m}}\text{Tc}$  sulfur colloid were relatively clear and sharp only in larger bone such as skull, pelvis, humerus, and femur. The figures of sternum, foot and hand were hardly obtained. The intensity of the figures were seemed to be well corresponded anatomically to red bone marrow distributions.

In the patients with hypoplastic anemia the bone marrow pictures were able to be classified into two types. One is the islet form with clear and distinctive high density figures in obscure and low density background in skull, pelvis, shoulder, vertebrae, humerus and femur. This type of hypoplastic anemia was considered to be classified as the bone marrow

arrest type of our classification due to myelogram, peripheral blood pictures, our tissue culture pattern and ferrokinetics in which  $^{59}\text{Fe}$  organ uptake, PIDT and red blood cells  $^{59}\text{Fe}$  utilization rate indicated relatively active and cumulative as compared with other types of hypoplastic anemia. The other was the diffuse type with obscure and low density pictures in skull, pelvis, femur and humerus, though the figures of foot and hand could not obtained in both types, indicating low hematopoietic functions.

No defects of figures been attributable to infiltrations of leukemic cells nor osteoclastic areas of bone with myeloma cells were figured out. The patients with acute myelocytic

leukemia, erythremia, and congenital hemolytic anemia showed diffusely dick and solid figures in all bones to foot and hand. The patients with chronic myelocytic leukemia, acute and chronic lymphocytic leukemia, hemochromatosis, Banti's syndrome, hemophilia B, liver cirrhosis, and folic acid deficiency anemia showed diffusely obscure pictures in skull, pelvis, vertebrae, femur, humerus, knee joint and elbow joint.

These findings were not necessarily coincided with the data of ferrokinetics, serum iron levels, peripheral blood pictures, and myelograms, but might be characterized with blood stream supply and active RES cells distributions.

### Iron Binding Capacity of the Milk

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Lactoferrin in the milk has iron binding capacity like the serum, and its unsaturated iron binding capacity was determined by a modified method of Peters. However it took 60 min. to bind ferric ammonium citrate to saturate the capacity. Iron binding capacity was firm in acid to pH 2 and it was lost in alkaline side around pH 9. Therefore the use of  $\text{MgCO}_3$  for the elimination of unbound iron was not suitable, since it extracted lactoferrin bound iron in alkaline pH. However the Amberlite IRA 400 resin beads was suitable for it.

Milk UIBC was determined in more than 30

pregnant and later delivered subjects. Milk UIBC was 1.5 to 2 times larger than serum UIBC, and percent saturation was lower than that of serum.

Whole body counting of mother rat received  $^{59}\text{Fe}$  intraperitoneally and children showed 20% in one case, and more than 50% in other 3 cases of the injected dose was retained in the children.

The large capacity of iron transportation of lactoferrin was demonstrated and its iron showed high absorbability. A large amount of iron was able to transfer to children through the milk.

### The Simplified Method of Determination of UIBC

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One ml serum is added to 1 ml ferric ammonium citrate containing  $\text{FeFe-59 } 5\mu\text{g}$  in the tube with a cap. keep 15 min. in room temperature. Then insert amberlite IRA 400

resin plate into the tube and coverit with the cap. The tube is slowly stirred for 60 min. After the elimination of unbound iron, remove the resin plate and count the tube the tube