and desquamated epithelial cells of skin in countings more than 60 days.

Radioiron loss in urine was 1/20 of radioiron in stool in normal subjects, therefore the most of radioiron was lost into the gastrointestinal tract.

The cumulative curve of radioiron loss was constituted from two slopes.

The first slope represents the exfoliation of intestinal epithelial cells and the second slope means the loss of blood in normal subject. Iron loss by exfoliation of this subject was 0.033 mg/day and that by bleeding was 0.0065%/day (0.32 ml as blood, 0.17 mg as iron). Therefore the ratio of iron loss by bleeding to that by exfoliation was 86:14.

In iron deficiency anemia, iron loss by bleeding was 1.30%/day (65 ml as blood, 16.5 mg as iron).

In hemosiderosis, iron loss by exfoliation was 0.36 mg/day and that by bleeding was 0.030%/day (1.5 ml as blood, 0.43 mg as iron).

In polycythemia vera, iron loss by exfoliation was 0.11 mg/day, and that by bleeding was 0.004%/day (0.10 ml as blood, 0.064 mg as iron). In myelofibrosis, the cumulative radioiron loss curve was straight, implying the virtually complete mixing of radioiron with body iron by hemolysis. In this case, iron loss was 0.37%/day (3.50 mg as iron).

The calculation of loss of blood, iron by exfoliation was done by using cumulative radioiron loss curve in stool, radioiron disappearance rate, blood volume, and plasma iron value.

X. Metabolic Tracer I.

Albumin Metabolism after Experimental Laparotomy
(Incorporation of $^{14}$C-Algal Protein Hydrolysate)

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In the 4th Annual Meeting of the Japanese Association of Nuclear Medicine, we had reported that $^{32}$P-incorporation into the s-RNA and r-RNA of mice liver was increased markedly in response to surgical stress. To evaluate the role of these accentuated nucleic acid metabolism to the postoperative protein biosynthesis, we have studied the effect of the experimental laparotomy upon the incorporation of $^{14}$C-labelled amino acids compound both into the liver and plasma protein.

$^{14}$C-incorporation in vivo of liver ribosome, during the period from 3 to 12 hours after laparotomy, was investigated as follows: 3 microcuries of $^{14}$C-algal protein acid hydrolysate per 20g body weight of mouse was injected intraperitoneally 2 hours after operation. From these mice liver the ribosomal fraction was separated and purified after Takanami's procedure. The ribosomal protein nitrogen was measured by Folin's procedure. After adding the Hyamine-10X-OH to these ribosomal fraction and warming, $^{14}$C-radioactivity was measured by the liquid scintillation spectrometer (the composition of scintillator PPO 4g, POPOP 0.1g in 1 litre of toluen). Then the specific activity of the liver ribosome after laparotomy was compared to the corresponding specific activity in the control non-operated group at several stages from 3 to 12 hours after injection. Consequently, the $^{14}$C-specific activity of the ribosomal fraction was markedly increased in the liver of the operated mice compared with the control group from 6 until 12 hours after injection. These results seemed to be correlated with the before-mentioned increased $^{32}$P-incorporation of r-RNA of the mice liver under surgical stress.

Next, the relation between the increased
incorporation liver ribosome and albumin biosynthesis was investigated in the operated mice. The liver protein fraction, which was soluble in 96% ethanol including 1% TCA, was extracted by Korner’s procedure. The specific activity of these fraction showed biphasic peaks, the initial peak was situated between 1 and 3 hours, and the second peak between 6 and 10 hours after injection. The second peak might be the liver albumin. Although Korner described that the procedure might be the liver albumin. Although Korner described that the procedure might be the simple method of liver albumin extraction, it is still doubtful whether these ethanol fraction is purely composed of albumin or not. Therefore, 14C-specific activity of albumin was studied chiefly in plasma protein of the venous blood which was collected from vena cava under ether anaesthesia. Plasma protein fraction of mice, separated by cellulose acetate membrane electrophoresis, was composed of albumin in 52%, alpha-globulin in 14%, beta-globulin in 34%. In mice plasma the separation between beta- and gamma-globulin was difficult in this procedure. Albumin fraction was slightly decreased after operation. 14C-specific activity of plasma protein fraction, separated by the filter paper electrophoresis, was measured by the paper strip counting method using the liquid scintillator. The composition of the scintillator was similar as mentioned in the ribosome (the counting efficiency was between 60 and 70%). It has been recognized that, the peak labelling of plasma protein was between 6 and 8 hours after injection both in albumin and globulin fraction in the control group. On the other hand the rapid increase of incorporation into globulin and the gradual increase of albumin incorporation were revealed in the early stage after operation. The meaning of the difference in the labelling speed, observed between albumin and globulin in operated mice, should be solved by the further investigation. However, it is interesting in that in the durabolin-treated mice the rapid incorporation of globulin after operation was moderately suppressed and the more definite increase of albumin incorporation has been recognized in this series of our experiment.

Studies on Protein Metabolism by RI

II. The Albumin Metabolism in Liver Diseases

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By administering 131I RISA to 10 cases of the control group, 35 cases of chronic hepatitis, and 18 cases of liver cirrhosis a study was carried out on the albumin metabolism. As for the methods decription is omitted as they were mentioned in the first report. The results of this study are briefly summarized as follows.

In contrast to the control group, in the cases of liver cirrhosis the half-life (T1/2) is prolonged to 16.8 ± 2.49; the serum albumin concentration (SA) is decreased to 3.58 g ± 0.712 (P<0.01); and the total albumin contents (TEA/kg) decline to 5.25g+2.0 (P<0.01), indicating a high direct correlation (r=t) between SA and the amount of metabolites (Deg). In the cases of ascites of non-compensatory liver cirrhosis, when SA is decreased to 2.98 g/dl and TEA to 2.65g/kg, there is found a mechanism working to maintain the level of SA by lowering the amount of metabolites (Deg). In the liver cirrhosis of ABA' type there is a slight tendency of the decrease in TEA to 4.92 mg ±0.74 and Deg to 243 mg ±29.9 and also a similar tendency can be observed in B and B' types of liver cirrhosis, but there is no significant difference between the two types.

In our study on the albumin metabolism in chronic hepatitis of various types following the type classification established by Kosaka and Ohta, there can be recognized not any appreciable differences among the control groups and among various types themselves.