test, and was especially remarkable in the group of slight hepatic functional disturbances. Such being the case, after loading of non-radioactive BSP (3 mg/Kg) intravenously, $^{131}$I-BSP hepatic function test was carried out, and usefulness of differential diagnosis between the group of slight hepatic disturbances and of normal subjects were discussed in comparison with transaminase.

Results.
1) Disappearance rate in blood of $^{131}$I-BSP after loading BSP and transaminase were mutually related.
2) Judging from the disappearance rate in blood of $^{131}$I-BSP after loading BSP, acute hepatitis and chronic hepatitis were separated from those slight hepatitis group of GOT 50 unit or thereabout.

Quantitative Analysis with Computer-aid I-131 Roes Bengal Hepatogram

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The hepato-biliary system under investigations, is usually a 'Black Box'. To clarify the structure of the system, the computational kinetic model was employed as an aid, and the quantitative analysis of I-131 Rose Bengal hepatogram was performed in various liver diseases.

A total of 102 observations were made. Included were 15 chronic hepatitis, 5 acute hepatitis, 17 cirrhosis, 11 obstructive jaundice, 15 gall stones, 17 cholecystitis, 4 hepatoma, 10 miscellaneous liver diseases and 8 normal subjects.

Patients in the fasting state were examined in the supine position after receiving an intravenous injection of 300 $\mu$Ci of I-131 Rose Bengal. Hepatic uptake and excretion of radioactivity were measured for 90 minutes using a Gamma camera. All data from the detector were recorded and stored on video-tape. During playback two regions of interest, one over the right lobe and the other one the gallbladder, were selected for this study.

On the other hand, I-131 Rose Bengal peripheral retention ratio was also measured using the conventional method (20/5 min.).

We have attempted to apply a 3 compartment analysis to I-131 Rose Bengal hepatogram, and the digital simulation program was written in Fortran IV (NEAC 2200–150), which was processed as follows: 1. Measured I-131 Rose Bengal hepatogram was printed out on line printer with curve pattern indices, i.e. T (50%), T (Max), T (80%). 2. Assumed rate constants and relative volume indices were placed on punch cards. 3. Computer-aid simulated hepatograms were printed out on a line printer with curve pattern indices. 4. Comparative study was performed between the measured hepatogram and the simulated hepatogram. 5. Finally, the blood flow index, the hepatocellular function index and the intrahepatic biliary excretion index were obtained with the schematic presentation of the curves.
The rate constants obtained from the kinetic model were well correlated with the results of routine liver function tests in the cases of normal liver, cirrhosis and obstructive jaundice. The combined use of the I-131 Rose Bengal conventional peripheral retention ratio and hepatogram rate constants made it possible to differentiate between the cases of minimal changes such as chronic hepatitis and cirrhosis.

In conclusion, I-131 Rose Bengal curve analysis over the liver region using the Digital simulation technique is a very useful method for the determination of hepatobiliary dysfunction.