V_b/F are time constants of four blood vessels of right heart, pulmonary, left heart and body systems, and $(V_p+F\tau_p)$ and $(V_b+F\tau_b)$ represent pulmonary and body blood volumes.

A generalized mathematical model of cases where are a shunt of left heart to right heart and an inverse shunt of right heart to left heart was developed and a generalized hemodynamics simulation circuit was constructed by using an analog computer on the basis of the above model.

Simulated rdaiocardiograms obtained from the simulation circuit showed good coincidence with measured ones and calculation cardiac outputs for 20 patients were almost equal to measured cardiac outputs by Fick method.

5) Liver

Dynamic Study on the Liver Functions

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In this symposium three dynamic radioisotope studies on the liver function will be discussed. That is (1) Hepatic Reticuloendothelial Function (2) Hepatic Parenchymal Cell Function and (3) Cupper metabolism of the liver.

The first subject has been studied since 1961, using ^{131}I and ^{125}I labelled Aggregated Albumin (AA). With the increasing dose of AA, clarance dose of AA per minutes is increased and approaching to the Maximum clearance capacity of RES. This value was measured by Benacerraf et al. in animal experint using a big dose (D) of colloid and found the relationship of $D \times k =$ constant. The maximal clearance capacity (Vmax), which equales $D \times k$, of the RES was found to be determined with the analytical method of Michaelis and Menten. Previously author made the report which revealed increased RES function in bacterial infections and decreased RES function in certain viral infections. In 8 viral hepatitis, however, increased RES capacity was observed ranging from 15% to 150% increase during acute stage of the illness. Among 12 chronic hepatitis 1 case show marked increase of RES function, however, 4 liver cirrhosis and 1 obstructive jaundice show normal RES function.

Parenchymal cell function of the liver was evaluated using ^{35}S labelled BSP. Forty one cases were studied with the different dosis of BSP. In spite of the more complex model than AA, maximal clearance capacity (Vmax) was found to be obtained by Michaelis-Menten equation. The Vmax value of normal cases was found to be 0.88 mg/kg/min. Vmax vaules in various hepatic disorders indicated the marked decrease in hepatitis, liver cirrhosis and in Roter's Jaundice, however the