profoundly and the extraction ratio of PAH changes with PaO_2. This suggests that the clearance of creatinine and PAH may not measure glomerular filtration rate and effective renal plasma flow, respectively, under these circumstances and that the change in total renal blood flow may be secondary to metabolic effects which alter sodium transport. On the other hand, the primary effect may be a direct action of oxygen on blood vessels. Two further series of experiments will thus be presented in an attempt to distinguish between these effects. In the first case the effect of oxygen on the regulation of isolated sodium transport in the standard frog skin preparation will be shown and in the second place the effect of oxygen on the blood flow through the isolated blood vessels of the dog mesentery will be demonstrated. On the basis of these results a hypothesis will be presented on the mechanism by which oxygen affects renal perfusion.

Address: Dept. of Surgery, University of Aberdeen, *Aberdeen*, Scotland.

95 W. Olszewski, E. Rosnowska, J. Alexander and N. Couch

Biochemical Deficit of Preserved and Transplanted Liver

During removal, preservation and early posttransplantation period profound biochemical changes can be observed in the liver. The degree of these changes bears upon the survival rate. Purpose of this study was to measure the biochemical deficit of excised, preserved and transplanted liver. Livers were washed out with 1500 ml of Ringer's solution, pH 7.4, temp. 4°, washout fluid collected. They were then removed, perfused for 8 h with plasma without phospholipids, temp. 10°, flow 0.2 ml/g/min, *membrane oxygenator* to avoid plasma denaturation, all biochemical parameters and *surface pH* monitored. Orthotopic transplantation was followed by biochemical studies of peripheral blood for 24 h. Liver biopsy specimens were taken for histochemistry. Ringer's solution used for washout and cooling turned out to be extremely damaging. Glucose level in washout went up to 600 mg%, K^+ to 5.7–9.3, SGOT to 40, lactate to 4–6 mEq/l, LDH to 150, glycogen content of liver went down by 20%. 30 min after start of perfusion glucose level of perfusate went up by 200 mg%, K^+ by 2–3, SGOT 300–700, lactate 4–5 mEq/l. After 8 h of perfusion K^+ level increased to 7, SGOT to 800, liver glycogen decreased to 65%. Xe^{133} *washout studies* revealed lacking perfusion of liver periphery, surface pH was lower than pH of perfusate. After transplant there was profound hypoglycaemia, hypokalaemia (1–2 mEq/l), liver glycogen dropped to 7%. Long-term survival was 55%, and correlated well with improved biochemistry. These data indicate the inefficiency of contemporary preservation methods. Another method of cooling and preservation livers *in situ* with autologous, cold, oxygenated blood, imitating hibernation process will be presented.

Addresses: Dept. of Surgery, Medical School, *Warsaw*, Poland and Surgical Research Laboratory, Harvard Medical School, *Boston*, *MA*, USA. W. Olszewski, 12 Dubois, *Warsaw*, Poland.

96 J. B. Otte, L. Piret, C. Cocito, P. Maldague and J. J. Haxhe

Atraumatic Control of Function and Rejection in Bilateral Renal Homotransplantation by Simultaneous Scintiphotography and Nephrography

So far, complementary surgical procedures are required to study individually bilateral renal homografts in the same recipient. We describe an atraumatic technique for separate evaluation of function and rejection of each homograft. To achieve this goal, at 3 to 4 days intervals after bilateral pelvic kidney homotransplantation, the recipient is intra-

European Surgical Research, 1970, 2