measured are: *Sodium* (twelve studies). Tissue fluid sodium was lower in ten of the instances than in the plasma. The average over-all difference was 3.0 mEq./L. (1 to 7 mEq./L.). In the two exceptions the tissue fluid excess was 2 and 5 mEq., respectively. *Chloride* (eleven studies). Tissue fluid chlorides were higher than the plasma chlorides in all instances. The average difference was 9.3 mEq./L. (4 to 14 mEq./L.). *Carbon dioxide combining power* (nine studies). Tissue fluid values were higher than plasma values in all instances. The average difference was 13.7 volumes per cent (1.9 to 23.2 volumes per cent). *Potassium* (two studies). The respective values were the same. *Protein* (twelve studies). The average plasma total protein was 6.2 gm. per cent (4.6 to 8.6 gm. per cent); average albumin was 3.70 gm. per cent (2.3 to 5.1 gm. per cent; average globulin was 2.47 gm. per cent (1.7 to 3.8 gm. per cent). Tissue fluid total protein averaged 0.63 gm. per cent (0.33 to 1.10 gm. per cent); average albumin was 0.48 gm. per cent (0.17 to 0.86 gm. per cent); average globulin was 0.15 gm. per cent (0.01 to 0.39 gm. per cent). The plasma A/G ratio for the group was 1.5 while for tissue fluid it was 3.2. *Specific gravity* (twelve studies). The average plasma value was 1.0265 (1.0216 to 1.0298). Average tissue fluid value was 1.0092 (1.0076 to 1.0144). *Urea* (seven studies). In six instances the tissue fluid urea was higher than the plasma urea. In the remaining instance the values were the same. The over-all average difference was 6.6 mg. per cent (0 to 14 mg. per cent). *Non-protein nitrogen* (eight studies). Tissue fluid levels were lower than plasma levels in six, and identical in two. The average over-all difference was 8.2 mg. per cent (0 to 16 mg. per cent). *Cholesterol* (seven studies). Tissue fluid values were all recorded as less than 25 mg. per cent. Average plasma values were 177 mg. per cent (136 to 230 mg. per cent). *Direct and total reacting bilirubins* (eight studies). Tissue fluid direct values averaged 0.03 mg. per cent (0 to 0.1 mg. per cent), while the total bilirubin values averaged 0.09 mg. per cent (0 to 0.20 mg. per cent). Direct plasma bilirubin averaged 0.3 mg. per cent (0.1 to 0.8 mg. per cent), and the total values averaged 0.65 mg. per cent (0.1 to 1.8 mg. per cent).

ARTHRITIC SYNDROME IN DASF GUINEA PIGS. *Hugo Krueger, Rosalind Wulzen, Darrell Davis and Alice B. Plympton,* Oregon State College, Corvallis, Ore.

Guinea pigs on diets deficient in the antistiffness factor (DASF) develop an accumulation of calcium disturbances having marked similarities to arthritis in man. Roentgenologic examination shows thickening of the ribs, calcification of many cartilages and unusual depositions of calcium in bone and cartilage areas as well as in the soft tissues. For example, in guinea pig No. 1170 there were fifty-eight countable isolated areas of unusual x-ray absorption in the soft tissues. These areas were sharply delineated but of irregular outline and varied in diameter from 1 to 4 mm. Many of the areas represented irregular concretions lying under the skin and for some there was definite evidence of erosion toward the exterior. The areas of calcium deposition vary from animal to animal but the regions of the foot pads, knees, scapulae and retro-occipital areas are frequently involved. The foot pads of DASF guinea pigs usually become swollen and red and the position of the animal and the type of muscular movements are indicative of pain and an attempt to protect the pads from external stimulation. Roentgenograms indicate diffuse calcium depositions around and between the digits. In DASF guinea pigs many of the bones are altered by thickening, thinning or the development of exostoses. Very often the thickenings or the exostoses involve an alteration of the contour of foramina. Thus frequently the shape of the foramen ovale of the sphenoid is altered and its area reduced. This suggests the possibility of nerve compression and subsequent interference with sensory and motor nerve function.

CARDIAC CATHETERIZATION STUDIES IN PATIENTS WITH TRANSPOSED PULMONARY VEINS. *David C. Levinson, George C. Griffith,* Richard S. Cosby and Willard J. Zinn,* Department of Medicine, University of Southern California School of Medicine, Los Angeles, Calif.

Diagnosis of transposition of pulmonary veins has been established in four patients by direct passage of the catheter into a pulmonary vein from either the superior vena cava or right atrium. Two of the patients were acyanotic and had partial transposition. The third patient had complete transposition, and an operation anastomosing the left pulmonary to the left auricular appendage was performed. The fourth patient was cyanotic, had partial transposition of the pulmonary veins and was diagnosed as tricuspid atresia.

Oxygen studies and pressure determinations in the various chambers and great vessels are described.