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(For possible corrections in any of the following abstracts see the June issue)

### Blood pressure measurements and changes in peripheral vascular bed of unanesthetized mice.

GLENN H. ALGIRE. *National Cancer Inst., Bethesda, Md.* The transparent chamber technique as adapted to a skin flap in mice makes accessible for microscopic observation a layer of subcutaneous and muscular tissue approximately 0.5 mm. thick, and having a surface area of 150 sq. mm. Microscopic observations, photographs and quantitative measurements may be made at magnifications up to 500X. An indirect method has been devised for blood pressure measurements of any vascular component within the chamber during direct microscopic examination by transmitted light. Measurements may be made on the same vessel intermittently throughout the day, and repeatedly for the duration of the preparation (approx. 30 days). The apparatus consists of a mercury sphygmomanometer system and air reservoir connected to a glass tube having a thin rubber membrane across the end. A micromanipulator is used to bring the membrane into contact with the under surface of the skin. Pressure applied using the sphygmomanometer bulb results in slight bulging of the membrane. As the entire field is visualized under the microscope one can obtain arterial systolic and diastolic pressure, and venous pressure. The pulse wave can be seen at maximum amplitude approximately midway between systolic and diastolic pressures. Parallel observations and measurements may be made of correlated vascular phenomena such as changes in caliber of vessels, rates of flow, vasomotion, and intravascular agglutination.

**Radiation effects on tissues studied with C<sup>14</sup>-labeled glycine.** KURT I. ALTMAN, GEORGE W. CASARETT, THOMAS R. NOONAN and KURT SALOMON (introduced by F. S. ROBSCHKEIT-ROBBINS). *Dept. of Radiation Biology, Univ. of Rochester, Rochester, N. Y.* Young adult male rats were exposed to 300 or 600 R total-body Roentgen radiation. Glycine labeled with C<sup>14</sup> in the  $\alpha$ -carbon atom (specific activity of 1.83  $\mu$ c/mg.) was administered by stomach tube or intravenously at varying intervals after irradiation. The most striking feature observed in rats given 2  $\mu$ c by stomach tube immediately after irradiation and killed 24 hours later was the high C<sup>14</sup>-activity of the gastrointestinal tract contents. With a dose of 300 R 16.7% and with

600 R 32.8% of the total activity administered were found in the gastrointestinal tract contents, as compared with 0.82% in the control animal. In order to eliminate possible malabsorption, glycine (1  $\mu$ c.) was injected intravenously and rats were sacrificed 5 hours later. It was found that the uptake of labeled glycine by muscle was definitely lowered in all irradiated rats, particularly when glycine was given immediately after irradiation. Definite changes were also observed in brain when glycine was injected 48 hours after irradiation. In this case the total C<sup>14</sup>-activity of the brain was approximately 3 times that of the control. This increase was due to an increase in the C<sup>14</sup>-activity of the phospholipid fraction. Radiation effects are also demonstrable in other organs, such as testes, kidney, and liver. When glycine was injected 48 hours after exposure to X-rays a striking increase in the C<sup>14</sup> activity of the expired CO<sub>2</sub> was observed.

**Ovarian hormones and uterine pigmentation in vitamin E-deficiency.** W. B. ATKINSON (by invitation), H. KAUNITZ and C. A. SLANETZ (by invitation). *Depts. of Anatomy, Pathology and Animal Care, College of Physicians and Surgeons, Columbia Univ., New York City.* One of the most constant findings in intact vitamin E-deficient rats is a chocolate brown discoloration of the uterus which is characterized histologically by the accumulation of acid-fast pigment granules in the cells of the myometrium and, to a lesser extent, the endometrial stroma. The role of the ovary in the development of this condition has not been elucidated. In the present experiments, rats were ovariectomized at 21 days of age and were maintained on a vitamin E-deficient diet which contained 10% commercial lard and which limited the tocopherol intake to about 30 micrograms daily. The animals were divided into 4 groups; the first receiving no further treatment, the remaining 3 being injected once weekly with 5 micrograms of estradiol (Roche-Organon), 4 mg. of progesterone (Ciba) or both hormones together, respectively. The uteri were examined macroscopically and histologically after 5 to 11 months. Pigmentation was almost completely absent in the untreated ovariectomized animals. The animals receiving estrogen alone showed slight uterine pigmentation



in the areas characteristic of the unspayed deficient rat. Concurrent treatment with progesterone seemed to intensify the response. Treatment with progesterone alone evoked slight pigment deposition limited almost entirely to the circular layer of the myometrium. These observations clearly demonstrate that the ovarian hormones are involved in the accumulation of pigment in the uterus of the vitamin E-deficient rat.

**Electron microscope studies on virus-cell relationships.** F. B. BANG and G. O. GEY. *Depts. of Medicine and Surgery, Johns Hopkins Medical School, Baltimore, Md.* Newcastle and mumps viruses freshly prepared from allantoic fluid and saline show characteristic morphologies in the electron microscope. The shape of Newcastle virus when fixed by osmic acid is determined by the concentration of saline in which the virus is fixed. The absorption of both of these viruses on the ghosts of chicken red cells may be demonstrated by fixation with osmic acid in solution at intervals after exposure of the red cell ghosts to the virus, and drying the mixture on formvar screens. The effect of Newcastle virus on chick fibroblasts and macrophages and on rat fibroblasts has been studied by infecting the cells either in roller tube cultures before transfer to formvar coated coverslip preparations or at the time of transfer. A similar morphological effect has been demonstrated on all 3 cell types.

**Cytochrome oxidase, succinoxidase and phosphatase activities of tissue of rats on protein-deficient diets.** E. P. BENDITT, C. H. STEFFEE (by invitation), T. HILL (by invitation) and T. L. JOHNSTON (by invitation). *Dept. of Pathology, Univ. of Chicago, Chicago, Ill.* Protein-deficient but otherwise adequate diets when fed to animals result in loss of protein from many vital organs including the liver and kidneys. In an effort to elucidate the nature of this protein loss rats were sacrificed after varying periods on protein deficient diets. Cytochrome oxidase, succinoxidase and alkaline phosphatase were assayed in liver homogenates and alkaline phosphatase determined in kidney homogenates. Cytochrome oxidase and succinoxidase decreased progressively with time and somewhat faster than the liver protein. Liver phosphatase, on the other hand, increased in concentration as the liver shrank. The total liver phosphatase remained approximately constant. Kidney phosphatase after several months of protein depletion was reduced in proportion to the kidney protein. The difference in behavior of the liver phosphatase from the kidney enzyme and from the other liver enzymes studied is apparently related to the fact that the liver enzyme is not present to a significant extent in the hepatic parenchymal cells but is associated with the vascular bed and bile ducts. This work substantiates that

of others who assayed under similar conditions other enzymes including catalase, xanthine dehydrogenase, cathepsin and arginase (Miller, *Fed. Proc.* 7: 174, 1948) d-amino acid oxidase (Seifter et al. *Fed. Proc.* 7: 187, 1948). It appears from the evidence that at least a part of the 'reserve' protein lost from vital organs such as the liver and kidney by animals on protein deficient diets is not inert material but is part of the actively functioning cytoplasmic protein constituents, i.e. enzymes.

**Effect of acute x-radiation on distribution and excretion of radio sodium in the rat.** L. R. BENNETT, VERA C. BENNETT and JOE W. HOWLAND (introduced by F. S. Robschey-ROBBINS). *Dept. of Radiation Biology, Univ. of Rochester School of Medicine and Dentistry, Rochester, N. Y.* Radiated rats have been shown to have an increased thiocyanate space for 2 weeks following a mid-lethal dose of x-radiation. A study of the sodium distribution and excretion of similar animals using radio sodium has been made. In rats during the first 4 days post radiation a marked retention of radio sodium occurs. Tissue distribution studies show a shift into the intestinal tract which may exceed that observed in control animals by as much as 2% of the total dose administered. Smaller shifts of radio sodium into the kidney and spleen are noted. There is an increased radio sodium content in the liver which appears to be definitely related to the increased serum level to which it holds a constant relationship. The serum sodium content increases, the maximum levels (up to 5-8 mEq.) being observed at the end of 3-4 days after irradiation. Urinary radio sodium excretion may be reduced to one half that observed in control animals. Studies on dehydrated rats indicate that the urinary retention and elevated blood sodium level are not accounted for on the basis of dehydration alone.

**Lipids in the lymph of rats.** J. L. BOLLMAN and E. V. FLOCK. *Mayo Foundation, Rochester, Minn.* Lymph from the lymphatic draining the small intestine and lymph from the liver and lymph from the thoracic duct was obtained in different rats after recovery from the operation during which a small plastic tube was inserted into the respective lymphatic and brought through the abdominal wall. The concentration of neutral fat of the intestinal (and thoracic duct) lymph of the fasting rat was considerably greater than that of the plasma. The phospholipid but not the cholesterol content of this lymph was also higher than that of plasma. The feeding of a lipid free meal did not alter these values. Following the feeding of a meal containing fat but devoid of phospholipid or cholesterol there was a marked increase in the neutral fat and phospholipid but not the cholesterol content of the intestinal lymph. The feeding of phospholipid produced only the increase in the phos-