obtained.

1. The pursuit of ^{32}P (injected into varied pulmonary inflammatory diseases—tuberculosis, suppuration and candidiasis), transferred into blood flow, reveals that any tissues of those diseases has presented higher values (prompt type) than those of normal lung tissues but that in such noninflammatory diseases as Brown-Pearce pulmonary cancer and pulmonary edema values obtained have been lower (delayed type) than those of normal lung tissues.

2. The ^{32}P transfer from experimental cavities of pulmonary tuberculosis, suppuration and candidiasis, into blood flow, has formed gentle reductive curves with peaks around the 10th to the 25th minute, the pulmonary suppurative cavities showing the fastest permeability and in decreasing order of the pulmonary candida cavities and pulmonary tuberculous ones. Compared with cases in which ^{32}P injections were made into lesions, cases in which that were made into cavities has produced delayed transfer into blood flow; a marked difference has been observed between the two.

3. In reduction half time ($T\frac{1}{2}$), derived from the analysis of blood radioactivity curves, differences have been obtained between various diseases and cavities: in pulmonary suppurative lesions its average is 2′ 55″ which is the shortest, in Brown-Pearce pulmonary cancer 5′ 42″ which is the longest.

4. Correlationship has been observed to a considerably large extent between characters of each lesion and cavity, and the ^{32}P transfer into blood flow. Cases of fresh lesion and cavity and of thin wall cavity have presented rapid permeability and absorption, especially in pulmonary suppuration the difference has been conspicuous. The $T\frac{1}{2}$ also has showed the similar result.

5. Difference in the category of ^{32}P solvent has produced difference in the rate of ^{32}P transfer into the blood flow, giving varied blood radioactivity curves. Hypotonic solvents (distilled water, 5% glucose solution, physiological NaCl solution) have presented curves of reductive type with peaks at early parts of the period, while hypertonic solvents (25% and 50% glucose solution) produced curves of gradual increase type in which the blood radioactivity is seen to rise gradually.

6. Examination of the route of liquid absorption from the lung tissues, through the lymphatic vessel has shown a marked difference in lymph radioactivity between normal lung tissues and pulmonary edema, the later giving a marked transfer of ^{32}P in the lymph and presenting higher values than those of the blood radioactivity.

7. In macroautoradiogram ^{32}P activity has been found out from the intracavity to the pericavity lesion through the cavity wall, and in microautoradiogram gradual decrease of ^{32}P uptake has been observed in decreasing order of the internal layer of the cavity wall, the external layer of the cavity wall, the surrounding lesion and then to normal lung tissues. This observation has substantiated the permeability of the cavity wall, and a cytological characteristic of intracellular uptake of ^{32}P has been seen though to a slight degree.

Distribution of Cerebral Blood Flow in Dogs During CO_2 Inhalation Measured by the Use of ^{131}I and ^{125}I Macroaggregated Alubumin

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Distribution of cerebral blood flow was estimated using autoradiography after infusion of ^{131}I monojod methane by Kety et al. and also using ^{85}Kr or ^{133}Xe clearance method by Lassen et al. It is well known that CO_2 increases cerebral blood flow. However, by these techniques, little is known whether the response to CO_2 is different in various cerebral tissue components or not. Regional distribution of myocardial blood flow was measured using ^{131}I macroaggregated albumin (MAA) by Ueda et al. This method was

applied to the study of the regional difference of the response to CO_2.

Ten adult mongrel dogs were anesthetized with nembutal (25 mg/kg i.v.) and the chest was opened under artificial respiration. ^{131}I MAA (15 μCi/kg) was injected into the left auricle. After 10 minutes of 5.5% CO_2 inhalation, ^{125}I MAA (15 μCi/kg) was injected similarly in 4 dogs. Then animals were immediately sacrificed and the brain was taken out. The brain was separated into various regions macroscopically and radioactivity of the samples from these regions and also that of the samples from the cranial bone and muscle were measured using a well type scintillation counter with a pulse height analyzer, and it was expressed by relative percentage of radioactivity in unit weight. Since the amount of regionally carried MAA is proportional to the regional blood flow, percentage radioactivity of a region indicates regional blood flow. The mean radioactivity of a whole hemisphere was used as the standard indicating 100%. Before and after CO_2 inhalation, other standard was used. Assuming a condition, where total injected MAA was evenly distributed throughout the animal, the mean radioactivity per unit weight was calculated and was used as the standard.

Normal distribution of cerebral blood flow in 6 dogs was as follows: (Mean of a cerebral hemisphere 100.0). Cerebral cortex 97.3±7.5, cerebral white matter 52.1±13.2, thalamus 114.5±17.8, caudate nucleus 137.3±26.7, dura 88.3±33.7, fornix and corpus callosum 27.6±9.8, choroid plexus 2387.3±2060, cranial bone 18.1±14.8 and cranical muscle 18.6±12.0.

Distribution of cerebral blood flow before and during 5.5% CO_2 inhalation in 4 dogs was as follows: (Calculated mean when MAA was evenly distributed 100—100). Cerebral cortex 97.5±31.3—270.7±63.5, cerebral white matter 36.8±6.0—84.2±26.1, caudate nucleus 103.3±61.6—230.9±128.4, fornix and corpus callosum 25.5±7.1—40.2±22.5, dura 113.3±54.8—99.2±9.6, choroid plexus 1381±657—3555±2460, cranial bone 22.8±11.7—32.3±37.1, and cranical muscle 62.1±65.8—35.6±18.2.

These results are summarized as follows:

Cerebral cortex and basal ganglia were perfused with about 3 times as much blood as that perfused cerebral white matter, corpus callosum and fornix. After 10 minutes of 5.5% CO_2 inhalation, rate of increase in blood flow was not equal among various cerebral tissues. Rate of increase was highest in the cerebral cortex and was 178%. In caudate nucleus and white matter, it was 123% and 129% respectively. In fornix and corpus callosum, it was 58%. In chorioid plexus, flow rate per tissue weight was very high, however, owing to very small tissue mass, total blood perfusion was small. Bone and muscle were perfused with lower blood flow and after CO_2 inhalation, blood flow increased slightly or decreased.

Body Potassium Concentration in Patients with Progressive Muscular Dystrophy and Their Family Members

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Human whole body counters have important clinical applications in the measurement of body potassium. Natural potassium contains ^{40}K which is natural radioisotope and has 1.25×10^9 years half life. Since ^{40}K emits 1.46 Mev gamma ray and it is present at a fixed percentage, potassium content can be calculated from the ^{40}K measurement with a whole body counter.

Up to the present whole body counters in