extravascular antipyrine space (PEV) was computed from the difference (Δt) in pulmonary transit time of two indicators multiplied by cardiac output.

Results
The difference in pulmonary circulation time in normal subjects showed, on the average, 0.4 sec in Δtp and 1.0 sec in Δtm. Δt in patients was more prolonged. Δtm was larger than Δtp and relationship between tp and Δtm showed a close linear correlation. Normal values of PEVm was within 100 ml/m², PEVm in some patients with cardiac diseases was highly elevated to 268 ml/m². There was also a close linear correlation between PEVp and PEVm. PEV was evidenced to dominantly depend upon Δt. In mitral stenosis, PEV was roughly correlated to PBV. The role of PEV in the field of pulmonary circulation concerning the matters of a resistance mechanism of pulmonary vessels should be studied.

Discussion
Although several studies have been reported for estimating pulmonary extravascular water space, no simple and rapid technique has been generally available. The current study was undertaken to estimate pulmonary extravascular water volume utilizing 131I-labeled antipyrine. This method has an advantage over radioactive antipyrine in that the determination can be carried out by the external scanning at the right and left heart over radioactive antipyrine in that the determination can be carried out by the external scanning at the right and left heart over precordium. The study reported here was done to evaluate the indicator dilution method using 131I-labeled 4-iodo-antipyrine which is desirable for estimating pulmonary extravascular water volume by precordial counting.

The Pathophysiological Studies on Tracheo-bronchi
— studies on mechanism of tracheal and bronchial wall using RI —

T. HAGIHARA, I. HIRAMA, S. NAKAJIMA, Y. KINUHATA, S.UEDA, H. INOUE,
K. HIROHARA, T. ABE and H. ISONOE
The First Department of Internal Medicine, Nihon University
School of Medicine, Tokyo

The pathophysiological aspects of tracheo-bronchi were studied from the standpoint of the absorptive capacity. Present report showed the absorptive capacity of bronchial wall in various respiratory diseases. The following results were obtained.

Method:
The absorptive capacity, as mentioned before, was assessed in terms of introducing RI (32P) into a certain bronchial lumen and analyzing its blood radioactivity curves.
The absorptive capacity of bronchial wall was proved experimentally by the method of double block, and the differences of absorptive capacity due to the changes of concentration of introduced fluid into bronchial lumen and the transition of intracellular RI on its autodiagram were identified.

Results:
1. The absorptive capacity of bronchial wall showed the highest and fastest in the normals, but it showed tendency of reduction in orders of bronchial asthma, chronic bronchitis, lung cancer, pulmonary tuberculosis and bronchiectasis.
2. In bronchial asthma, it differed from the time of attack and non-attack. It was correlated with the viscosity. The higher the viscosity, the lower did the absorptive capacity tend to decrease.
3. The absorptive capacity in both of tracheo and bronchial wall showed good tendency, but in broncho-periphery, it tended lower value compared with them.
4. There was seen clear difference in the absorptive capacity due to the concentration of RI solution. High viscosity made the absorptive capacity tend to decrease and 25% glucose made it good. It was ranged as high viscosity<25% glucose<dionosil aqueous in order.
5. Under the influence of vague on the ab-
sorptive capacity, the absorptive capacity tended to decrease in vagotomized and stimulated groups, compared with the normals.

6. On the autoradiogram of tracheo and bronchial wall, introduction of RI into cells in tracheo and bronchial wall was comparatively clear. The autoradiogram and electronmicroscopic findings showed a character of the absorptive capacity.

VIII. Kidney

A Basic Study of Radioisotope Renogram by Autoradiography

T. MINAMI, T. MACHIDA, A. ISHIBASHI and M. MIKI

Department of Urology, Jikei University School of Medicine, Tokyo

O. MATSUOKA and M. KASHIMA

Division of radiation hazards, National Institute of Radiological Sciences, Chiba

Radioisotope Renography is now a routine individual kidney function test. But each segment of the renogram is not explained clearly. As autoradiographic study gave us a direct view on the distribution of the $^{131}$I-Hippuran, we tried to analyze each segment by this method.

For this study, we used 23 rabbits weighing about 2kg and 13 male mice which were 3 month old and weighed about 35 gram.

On macroautoradiography we used the freezing method according to Ulberg and Matsuoka, and on microautoradiography stripping method using the films, Sakura NRMI.

In the macroradioautogram of rabbit kidney and whole mice body which is taken within the time corresponding to the segment b, Hippuran is mostly distributed in the renal cortex and not in the urinary bladder. In the time corresponding to the segment c, Hippuran gradually shifts to the renal medulla and the urinary bladder.

On rabbits within a short time such as 20 second after injection, $^{131}$I-Hippuran shows the same distribution as $^{131}$I-PVP which does not excrete from the kidney. It might be supposed that segment a represents renal circulation or vascularity chiefly.

A Clinical Study on the Correlation between the Radioisotope Renogram, Renal Function Tests and Renovascular Diseases

S. IYORI, T. MASUOKA and J. YAMADA

Nippon Kokan Hospital

Among the radioisotope renograms on 250 patients recorded so far at this hospital, 165 tracings on the patients with medical kidney diseases (hypertension, nephritis etc.) were analyzed.

The patients were given 300 ml. of tap water by mouth. Thirty minutes later 0.5 microcuries/kg. of $^{131}$I-Hippuran was injected intravenously and the renogram was taken in the sitting position.

The 165 renograms were divided into 5 types. The patients whose renograms were of the normal type (Type N) in which the gradient of the $\beta$-segment (tan $\theta$) was larger than 1.0 and the half life value (Ht) was less than 6 minutes showed normal PSP, PRF and GFR. The delayed excretion type (Type MIN) in which tan $\theta$ was larger than 1.0 and Ht was...