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IX Brazilian Congress of Angiology

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PREFACE

This book is a collectanea of the lectures and papers presented to the VIII International Congress of Angiology and XIX Brazilian Congress of Angiology that was held in Brazil, July 24 to 30th, 1972 sponsored by the International Union of Angiology.

In spite of the zeal of the Editors not all the works discussed on these meetings have been published, because the original texts were not sent by their authors within the term.

Notwithstanding the lectures and papers printed here delineate widely the late advances on any of the features of Angiology, expressing the recent thinking of the best specialists of 38 countries that were convened in Rio de Janeiro.

We are very grateful to the Brazilian Federal Government and to the Government of the State of Guanabara by the financial aid given for the Congresses. We thank also to the industrial and pharmaceutical expositors and especially to all the workers of the Graphic Industrial Service of the Federal University of Rio de Janeiro by their skill and good will during the printing of this book.

Este livro é uma coletânea dos trabalhos apresentados por ocasião do 8º Congresso Internacional e 19º Congresso Brasileiro de Angiologia, realizados no Brasil, de 24 a 30 de julho de 1972, sob os auspícios da "Union Internationale d'Angéiologie" e da "Sociedade Brasileira de Angiologia".

Apesar dos reiterados apelos dos editores, não foi possível publicar todos os trabalhos apresentados, porque os textos originais não foram enviados pelos autores dentro do prazo solicitado.

Apesar disso, os temas aqui reunidos representam os últimos avanços da Angiologia em seus múltiplos aspectos e exprimem o pensamento dos melhores especialistas de 38 países que tiveram a oportunidade de se reunir aqui no Rio de Janeiro.

Queremos significar nossos agradecimentos ao Governo Federal e ao Governo do Estado da Guanabara pelo auxílio financeiro concedido. Agradecemos também a colaboração prestada pelos que participaram da Exposição Industrial e Farmacêutica e, em particular, aos funcionários do Serviço Industrial Gráfico da Universidade Federal do Rio de Janeiro, pela proficiência e boa vontade com que se houveram durante a impressão desta obra.

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LECTURES

CONFERENCIAS

CONCEPT OF BODY FLUID CIRCULATION AND MECHANISM OF PERIPHERAL CIRCULATION

YASUYOSI NISIMARU

PREFACE: — Mr. President and members of the Union, it is a great honour to be allowed to read my paper here today. "A Concept of Body Fluid Circulation" refers to a subject which my coworkers and I have studied for about 40 years at the Tokyo Zikeikai Laboratories of Angiology.

In the field of natural sciences, a person who presents us a concept summarizing the findings up to his time would come out after some interval. A concept with regard to body fluid circulation has also been rewritten one after another.

Since Hippocrates presented his concept, Erasistratus rewrote it on the basis of his anatomical study; Galenus based on vivisections, Harvey using his comparative and quantitative experiments on living animals, and Claude Bernard and others studied using physical and chemical methods.

CONCEPT OF BODY FLUID CIRCULATION: — First let me give you "The Theory of Four Fluids" by Hippocrates, where body fluid in the heart was called blood, yellow bile in the liver, black bile in the spleen, and mucus in the brain. He had no concept of flow in this fluid.

HYPPOCRATES

(BC 460 – 370)

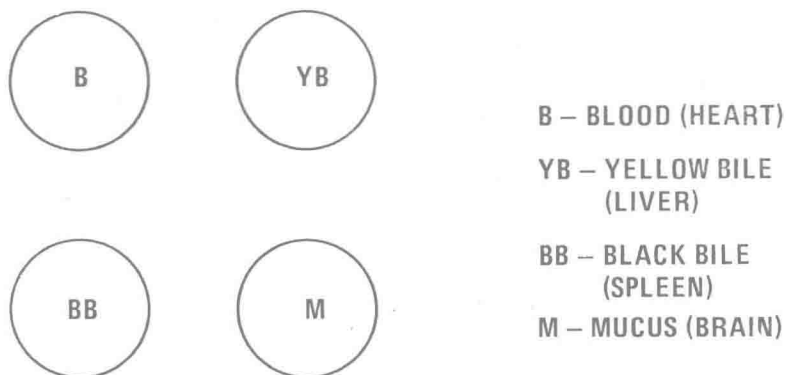


Figure 1

A SCHEME OF THE BODY FLUID CIRCULATION
(ERASISTRATUS)

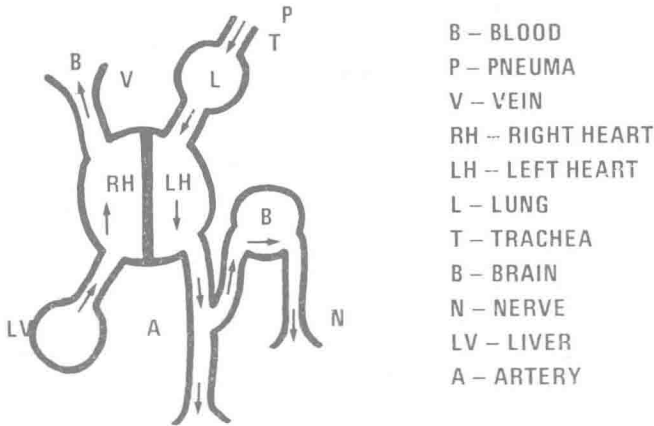


Figure 2

Around B.C. 300, Erasistratus of Alexandria found, from his anatomical study of the dead, a great amount of blood in the liver, the right ventricle and the veins, but a little if any in the left ventricle and arteries. He therefore thought that blood was produced in the liver and flowed through the veins, and that something which he called pneuma flowed into arteries from the trachea and reached the brain.

About 500 years later, Galenus, as an official doctor of gladiatorial amphitheatre of Pergamon, found by vivisection that when a blood vessel is cut, then in the case of the vein, blood flows out evenly, but rushed out in spurts from artery. So he modified the concept of Erasistratus as follows. The chyle absorbed by the intestines reaches the liver throught the portal vein being transformed into blood in the liver. From the liver the blood is distributed to the whole body via veins supplying nutritions and other

A SCHEME OF THE BODY FLUID CIRCULATION (GALEN)

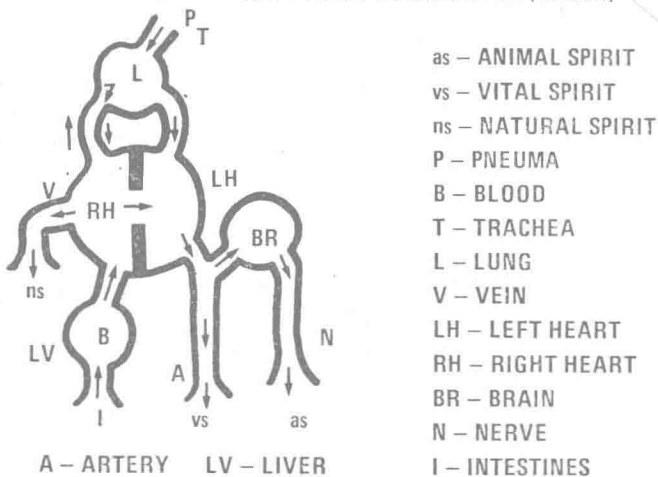


Figure 3

substances. Then, the blood that has entered the left ventricle through the invisible pores of the ventricular septum is mixed together with pneuma from trachea. This blood containing pneuma flows along the arteries as a source of life. And a part of this blood containing pneuma flows into the nervous system as a source of motion and perception. He did not understand the mechanism of this flow but believed that it ebbed and flowed like the tides of sea.

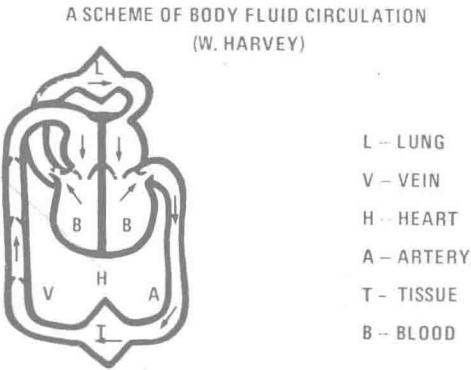


Figure 4

In 1628, W. Harvey published his famous book "Exercitatio anatomica de Motu cordis et Sanguinis in Animalibus", in which he stated that only the blood circulates the whole body.

For his concept, he gave the following three points as its proof, where he believe the truth would necessarily follow and be disclosed clearly.

HISTORICAL REPRESENTATION OF THE CHANGING CONCEPTS
OF BODY FLUID FLOW IN THE ORIENTAL MEDICINE
東洋医学における体液循環の概念の推移

Sanki Tashiro
田代三喜
(1465-1537)

Konzan Goto
後藤艮山
(1629-1696)

Todo Yoshimasu, Nangai Yoshimasu
吉益東洞 吉益南涯
(1702-1773) (1749-1813)

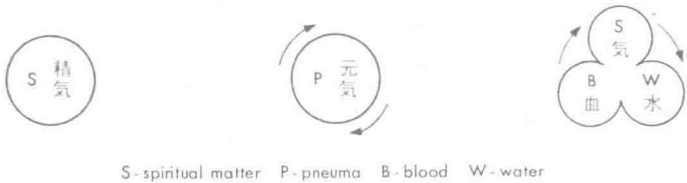


Fig. 5 — In Tashiro's concept, spiritual matter was produced in the spleen; in Goto's concept, pneuma came from air through the trachea.