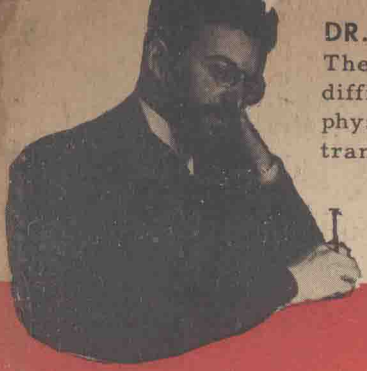

DR. ALEXANDER SPITZER, Late Professor of Anatomy, The University of Vienna, wrote this original work in very difficult German, and it is for that reason the American physician has not found it sufficiently available to him. This translation is an attempt to make Spitzer's theory better known to the American cardiologist.

With a Foreword by
OTTO SAPHIR, M.D.
Pathologist, Michael Reese Hospital
Clinical Professor of Pathology
University of Illinois
College of Medicine

DR. ALEXANDER SPITZER'S

THE ARCHITECTURE OF NORMAL AND MALFORMED HEARTS

A Phylogenetic Theory of Their Development

With a Summary and Analysis of the Theory

By

MAURICE LEV, M.D.
Associate Professor of Pathology
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and

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CHARLES C THOMAS • PUBLISHER
Springfield • Illinois

In order to have a broad concept of congenital malformations of the heart, clinicians, surgeons, pathologists and embryologists cannot afford to overlook Spitzer's work.

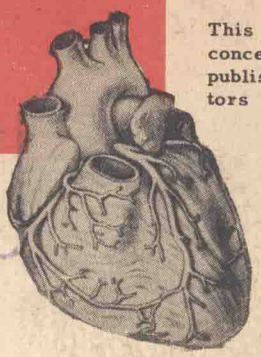
Spitzer's theory basically is that the definitive architecture of the mammalian heart is related to phylogenetic forces operating by hydrodynamic means and catalyzed by the development of pulmonary respiration. Thus, Spitzer gives a rational dynamic explanation of the embryologic development of the mammalian heart.

At the same time, Spitzer's approach contains many faults, and his theory in some respects does not conform to later embryologic research. Hence, changes are necessary, and a suggested modification is offered by the translators. These modifications and criticisms, however, do not detract from the brilliant, all-pervading dynamic approach of Spitzer.

This great man died in a concentration camp. The publisher and the translators present this book in memoriam.

176 pages

50 illustrations



This translation was undertaken to make available to American cardiologists, pathologists, and anatomists the classical theory of Spitzer on the development of the normal heart, and the heart in transposition complexes.

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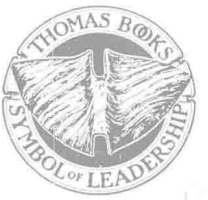

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Michael Reese Hospital

Chicago, Illinois

From the Article

ÜBER DEN BAUPLAN DES NORMALEN UND MISSBILDETEN HERZENS. VERSUCH EINER PHYLOGENETISCHEN THEORIE

Virchows Arch. f. path. Anat., *243*:81-201, 1923

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FOREWORD

THE MONUMENTAL Volume II on the *Pathology of the Heart and Blood Vessels of the Handbook of Special Pathologic Anatomy and Histology* edited by Henke and Lubarsch appeared in 1924. It is significant that Mönckeberg who had written the 183 page chapter on Malformations of the Heart with no mention of Spitzer's concept, had added a special chapter at the end of this volume as "appendix" which was devoted in its entirety to the discussion of Spitzer's phylogenetic explanation of cardiac malformations. Mönckeberg felt that he could not let this volume appear without taking cognizance of Spitzer.

We had been interested in congenital anomalies of the heart for many years. Accordingly Drs. Lev and Vass, in 1936, working in our laboratory at Michael Reese Hospital, had translated Spitzer's monograph to aid in the understanding of transposition complexes. In 1937, Dr. Maude E. Abbott visited our laboratory. During the course of discussion, Spitzer's phylogenetic theory was somehow brought up. Dr. Abbott, though familiar with Spitzer's work remarked that she had not read the original text, because of the exceptionally intricate medical German idiom used. The translation was offered Dr. Abbott, who acknowledged it in her atlas.

Though Haeckel, many years before Spitzer, had established the recapitulation theory, or biogenetic law (the *Fundamental Law of Biogenesis*), it was Spitzer who applied it to the development of the human heart. As often is the case in the biologic sciences, he arrived at the principles of the development of the normal heart by studies of pathologic formations, the malformed heart in this case.

Spitzer's theory is not and was not generally accepted. Mönckeberg, though keenly interested in Spitzer's theory, clung to the strict ontogenetic embryologic thesis. Interestingly also, 11 years

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later Pernkopf and Wirtinger, representatives of the same University in which Spitzer, a disciple of Tandler, worked and studied, tried to show in extensive monographs that the essential factors in transposition lie in an ontogenetic embryologic malformation. Also, Dr. Lev and I, while believing Spitzer's theory to be correct from an anatomic point of view, had occasion to question the mode of its accomplishment.

Twenty-seven years have elapsed since Spitzer's publication. The more one studies congenital malformations of the heart, the greater one's respect for Spitzer's genius. Today, these anomalies are not exclusively confined to the domain of the morphologist. Inroads have been made in this field by clinicians and surgeons, who have removed congenital anomalies of the heart from the realm of purely academic interest and placed them among the curable disease entities, susceptible to correction by ingenious shunt operations.

Spitzer's article is written in a difficult, cumbersome German, composed of lengthy sentences replete with idiomatic, though picturesque expressions. Translation proved difficult, especially since it was to be kept as literal as possible. For this reason the construction may sometimes appear unduly complicated — but more complicated is Spitzer's original text as I am sure Dr. Maude E. Abbott realized. Some of the paragraphs may require re-reading for clarification.

The publication of this translation was principally undertaken to provide a broader concept of the underlying malformations and to unfold Spitzer's phylogenetic theory for those who diagnose, those who cure and those who study morphologically, malformations of the heart.

Otto Saphir, M.D.

TRANSLATORS' PREFACE

THE TRANSLATION of Spitzer's theory of the development of the normal and of the abnormal heart was originally made in 1936 to aid in the study of congenital cardiac malformations. At that time it was of interest only to Maude Abbott who considered Spitzer's work the most outstanding since Rokitansky. With the recent work of Taussig, Gibson, Blalock, Gross, Potts, Cournand, Bing, Dry, Gasul and others on the clinical and surgical aspects of congenital heart disease, there has been a renewed interest in the pathology of this subject. Thus we have had numerous requests for the translation, and so we are having it published.

In the translation we have tried as far as possible to keep close to Spitzer's original writing, especially as concerns the various and numerous subdivisions of his work. The numerical or letter designation of these subdivisions is not always logical. Yet they have been retained to facilitate the reader in referring back to the original.

Since the appearance of Spitzer's theory in 1923, there has been considerable criticism of the theory, especially by Pernkopf and Wirtinger. Likewise the advances in the knowledge of the embryology and comparative anatomy of the heart made by the above authors prompted Lev and Saphir (1945) to suggest certain modifications of Spitzer's theory. We have therefore added a summary and analysis of the work, which we hope will bring the latter up to date.

We wish to thank Dr. Otto Saphir and Dr. Granville A. Bennett for reviewing the translation. We are especially indebted to Dr. Harry Sicher, Dr. Emil Schwarz, Dr. Felix Fuchs and Dr. H. Schur for their kindness in making available to us the facts embodied in the biographic note, and the photographs of Dr. Spitzer. We are likewise thankful to Mrs. Martha Forman for her painstaking typographic help.

Maurice Lev, M.D.
Aloysius Vass, M.D.

ALEXANDER SPITZER - A BIOGRAPHIC NOTE

Alexander Spitzer was born in Miskolc, Hungary on October 22, 1868. He was graduated from the University of Vienna Medical School in 1892. He was connected with Krafft-Ebing's Psychiatric Clinic from 1893-1901. Thereafter he worked independently until 1914 when he became an assistant to Tandler, at the First Institute of Anatomy at the University of Vienna. In 1919 he left Tandler and became associated with Marburg at the Institute of Neurology in Vienna. In 1924 he became Professor of Anatomy and Pathology of the nervous system. The following year he retired from active teaching to devote the remainder of his life to research.

Early in his career, Dr. Spitzer became interested in neurology and psychiatry. In this period he published works on (1) the function of the posterior longitudinal bundle (1899); (2) migraine (1901); (3) an abnormal tract in the human brain stem (1904 — with Karplus); and, (4) the genesis of the crossing of the pyramidal tracts in vertebrates (1910). Upon his association with Tandler he became interested in the circulation. This reached fruition in his monumental work on the ontogenetic and phylogenetic development of the human heart, and later on the abnormal development of the heart in transposition of the arterial trunks. It is this work which is translated in the present volume. His papers on this subject extend throughout his entire professional life (1919, 1921, 1922, 1923, 1924, 1927, 1928, 1929, 1933). At the time of his death he left an unpublished manuscript summarizing his whole theory. This is now being translated by the authors, and will be published by Charles C Thomas, Publisher in the near future.

With his return to the field of neuroanatomy he renewed his earlier interest in equilibration. He thus wrote considerable treatises on the anatomy and physiology of the central tracts of the vestibular apparatus (1924), and on the function of the semi-

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circular canals of the labyrinth (1925). In addition, his general interest in embryology and comparative anatomy lead him to a work on the phylogenetic significance of the embryonic membranes (1929) and was extended into a treatise on the metagenesis of vertebrates and its phylogenetic significance (1933).

We thus see that Dr. Spitzer interested himself in a considerable number of unrelated and related subjects. Each of these subjects was tackled in a brilliant, profound, original and omnivorous manner. Whether it was a simple case report or a theory of the development of the heart, the author brought to bear upon the subject a vast store of broad philosophic, mathematical and biologic knowledge. It is this mixture of approaches which perhaps accounts for both the weakness and the strength of his work. In his molding of philosophy with science, the latter often suffered. But the weakness of his work can be overlooked in the brilliant all-pervading approach.

In his personal life, Dr. Spitzer was a reticent, unassuming man, who was completely devoted to scientific endeavor. He lived on a small inherited fortune, working independently, until the inflation of the First World War wiped out his funds. Only then did he take to teaching. Even so he prepared his lectures with great industry, and they were well received by the students. To his friends he was kind, considerate, affable with a fine sense of humor. But to those who disagreed with him he was caustic, belligerent and vindictive. Thus a considerable amount of his work is polemic, against the critics of his theory of transposition, and especially against Pernkopf.

In 1943, Dr. Spitzer was sent by the Nazis to Theresienstadt, Bohemia, a city of exile for Jews. Already suffering from heart disease, he succumbed a few weeks later. Dr. Spitzer is mourned by all the friends who knew him personally, and by those friends, who like the authors were inspired by the brilliance of his approach.

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SPITZER'S ARCHITECTURE OF NORMAL AND MALFORMED HEARTS

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