

## DEVELOPMENTAL MALFORMATION IN MAN AND OTHER ANIMALS

A Bibliography with Introduction

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In the more primitive stages of man's cultural origins, it was more generally believed than not, that disease and structural malformation, congenital or of later appearance, represented forms of divine visitation – evidence in some instances of a supernatural curse, and in others, as marks of special preference or purification.

With the philosophically disturbing discovery in the late 17th century of a microscopic world of living organisms, whose existence hitherto had not been even so much as suspected, came novel interpretations of pathology based on material rather than on transcendental considerations, the former being amenable to rational testing. The activities of fermentation, putrefaction and decay were soon laid at the door of microorganisms, and a simple step of the mind suspected rightly that disease processes may be of the order of such microorganismal functions, or at least related to and associated therewith.

In retrospect, the seeds of thought relating to symbiotic virus of facultative pathogenesis were sown about 4000 B.C. by the Egyptian father of medicine, Imhotep, later identified as the Greek Aesculapius, when he spoke of "the intrusion of something from within, not coming from the outside." In the 19th century, Pidoux stated that "Disease is borne of us and in us."

Thus, for the first time in history, was born the first rational explanation of a disease condition or process. This principle represents nothing more than a realistic discovery of a principle laid down about 400 B.C., probably by Hippocrates II, in the Book on the Sacred Disease. This disease considered in the light of modern knowledge, was very likely epilepsy. The book set forth the cardinal scientific method or principle of assuming natural explanations for all observable events. This principle was restated in the 16th century by Paracelsus in these words; "Ere the world perishes, many arts now ascribed to the work of the devil will become public, and we shall then see that the most of these effects depend upon natural forces."

Joseph Lister (1827-1912) observed that carbolic acid solution sprayed in garbage cans would stop decay and the breeding of flies. Another simple mental transfer created the material chemotherapeutic approach to diseases which now, for the most part, are considered to be of microorganismal origin. Thus was born chemotherapeutics which crystallized in two schools of thought, one centering about the virtues of the massive dose, the other championing the cause of the minimal or homeopathic dose.

Much energy soon became expended in the elaboration and application of divers and sundry chemicals and compounds, designed to be effective specifics for this or that ailment, until some 30,000 or more drugs were created to cover a spectrum of some 20,000 or more of classified human ailments.

The thought that yet other important factors or agencies might be causative in pathology was not born until the latter part of the 18th century which saw the birth of heredity and genetics. One hastens to add however, that the 16th century Paracelsus had emphasized

hereditary factors in disease. The newer knowledge made it possible to explain the origin and perpetuation of certain types of disease, inborn errors of metabolism and malformations as manifestations of genic combination and mutation. This continues to be a fruitful area of active and profitable investigation.

Rational explanations of disease were appearing from other quarters also. In 1911 Casimir Funk discovered the beri-beri preventive vitamin, and from this humble beginning arose a gigantic literature, still on the increase, calling attention to and attesting to the fact that many diseases are purely diseases of malnutrition, and that by and large, many other pathologies are in one way or another, tied up with specialized metabolic deficiencies of nutritional origin.

The modern doctrine relating to health and disease, emphasizes that pathology and malformation have their roots in either pure genic conditions and composition, or in environmental factors operating from without, or as many would have it for nearly all instances, not in either of these alone, but in a combination of interacting genetic and environmental factors. It is self-evident, that no matter how "perfect" genes may be, their "normal" effects cannot be made manifest in the absence of those material ingredients to be gleaned by the organism from its environment, even as a master mason would fail in building without suitable brick and mortar.

The subject of fetal malformation in man and other animals is of increasing interest and importance, especially since we now know some of the causes, remedies and preventives for these problems. It is in behalf of this area in modern biology and medicine, that the attending bibliography is prepared. A bibliography such as this has a two-fold function. First, it calls attention to the fact that there are many environmental factors now recognized to be responsible for deviations from the normal and preferred state, not the least of which is inappropriate nutrition. Proper nutrition is the most important single factor in the prevention of disease or in the recovery therefrom.

To peruse the categories and titles of the papers in such a bibliography is impressively educational in itself. The second more obvious function is to provide an immediate and ready reference for those who wish to begin a more intensive study of the literature, gaining thereby, a basic and extensive understanding of the subject at hand.

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## X. VITAMIN ANTAGONISTS AND ANALOGS

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