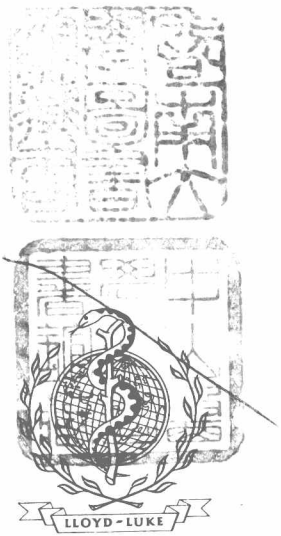
GENERAL PATHOLOGY

based on Lectures delivered at the
Sir William Dunn School of Pathology
University of Oxford

EDITED BY
SIR HOWARD FLOREY
Professor of Pathology

Third Edition



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PREFACE TO THE THIRD EDITION

THE chapters in the second edition have been extensively revised, but only one new subject has been introduced, namely the immunology of tissue transplantation.

The object of the book remains the same as it was in the previous two editions.

H. W. FLOREY

August, 1961

PREFACE TO THE FIRST EDITION

PROGRESS in the medical sciences is now so rapid that even those who confine themselves to relatively narrow specialities find it increasingly difficult to master, or indeed to read, the great volume of literature that appears. Nevertheless, the student must try to grasp what is known of the general principles underlying the pathological changes that he will be called upon to diagnose and treat.

For many years it has been the custom at Oxford for every medical student to spend one year studying for an Honour School; in practice this is usually the Honour School of Physiology, which includes a good deal of biochemistry. The aim in the Honour School is not merely to teach facts, but to encourage students, both in the laboratory and by individual tuition, to think about the principles and problems of physiology and biochemistry, an appreciation of which is unquestionably required for the sound building of future clinical knowledge. Thus, it is hoped to give students early in their medical work some training in the deductive and inductive reasoning associated with experimental methods.

It is primarily for those who have read the Honour School of Physiology that a course in General Pathology and Bacteriology is given in Oxford. At present the course lasts for two terms of eight weeks each, and caters particularly for the better student. It is taken at the same time as the study of pharmacology, and immediately before clinical work begins. The lectures in this book are drawn from this course, but they may be of value to those more advanced in their medical work than the students for whom they were prepared; with increasing specialisation the more general aspects of pathology tend to become lost in the details of the subject.

It is to be emphasised that the lectures do not form a complete survey of General Pathology. For the most part they deal with subjects in which one or other of the authors has had a special interest. In particular they attempt to treat of some of the fundamental changes that take place in the body in response to injury, using this word in a broad sense, and to discuss some present-day views about the nature and causes of such changes.

It is hoped that some students will find sufficient stimulus from the lectures to carry an experimental outlook into clinical medicine and surgery, for these subjects have suffered, and continue to suffer in this country, from an approach that pays too little attention to experimental science. At the present day nearly all significant advances in the diagnosis, treatment and prevention of disease depend on the application of experimental methods.

H. W. FLOREY

December, 1953

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Dr. J. C. F. Poole prepared the index.

Our publisher, Mr. Luke, has again given us every help in the production of the book.

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Chapter 2.—FIGURES 1–3 from Lewis' *The Blood Vessels of the Human Skin*, by courtesy of Shaw & Sons, Ltd.; FIG. 8 by courtesy of the Editor *J. Physiol. (Lond)*.

Chapter 3.—FIGURES 1–4, 32, 36, 47, 48, 57 by courtesy of the Editor *J. Path. Bact.*; FIG. 9 by courtesy of the Editor *Proc. roy. Soc. Med.*; FIGS. 10, 11, 13, 14, 33–35, 37–46, 49–56, 58 by courtesy of the Editor *Quart. J. exp. Physiol.*; FIGS. 17–19 by courtesy of the Editor *J. biophys. biochem. Cytol.*

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Chapter 1

THE HISTORY AND SCOPE OF PATHOLOGY

By H. W. FLOREY

TO-DAY we are perhaps more conscious than ever before of our debt to our predecessors, and not only to those of the immediate past but to those also of relatively remote times. The study of medical history is both interesting in itself, and may help to modify the view sometimes expressed that medical students and doctors are lacking in culture of any sort. Moreover some historical perspective is often advantageous when one is considering the multitude of advances that are now taking place in the theory and practice of medicine. I do not therefore consider it a waste of time to bring before you what seem to me to be some of the more important events in the development of pathology. Krumbhaar[1] when writing on the history of pathology remarked that "when we consider one of the broader definitions of Pathology—such as 'The study of the causes of and the effects (both structural and functional) produced by disease', we at once realise that a consideration of its history might properly be almost co-terminous with that of medicine."

Early Studies

The study of disease has no doubt been going on since the time that mankind emerged as a thinking animal, for many of its manifestations are easily seen and felt. There is evidence from mummies, bones, carvings and paintings of antiquity that pathological lesions similar to those of to-day existed, and certain ancient literary fragments contain recognisable descriptions of disease.[2] An Egyptian papyrus of about 2160 to 1788 B.C. notes diseases of women and cattle, and the Edwin Smith papyrus of 1600 B.C. describes fractures, dislocations, infections of wounds, tumours and a number of other conditions. The Ebers papyrus of about 1550 B.C. mentions "coryza, dysentery, mastoiditis, diseases of bones and joints, tumours, cysts, parasitic diseases, abscess, many diseases of the eye, gastro-intestinal tract and female genitalia". It is perhaps surprising that the Egyptians did not construct a firm foundation of anatomical knowledge, for their practice of embalming might be thought to have given them great opportunities for observation of the viscera. The internal organs were, however, apparently removed through small incisions and the Egyptians did not, in fact, contribute anything substantial to the knowledge of human anatomy. There are many references to disease in other ancient writings, for instance those of the Jews, the Assyrians, the Indians and the Chinese.

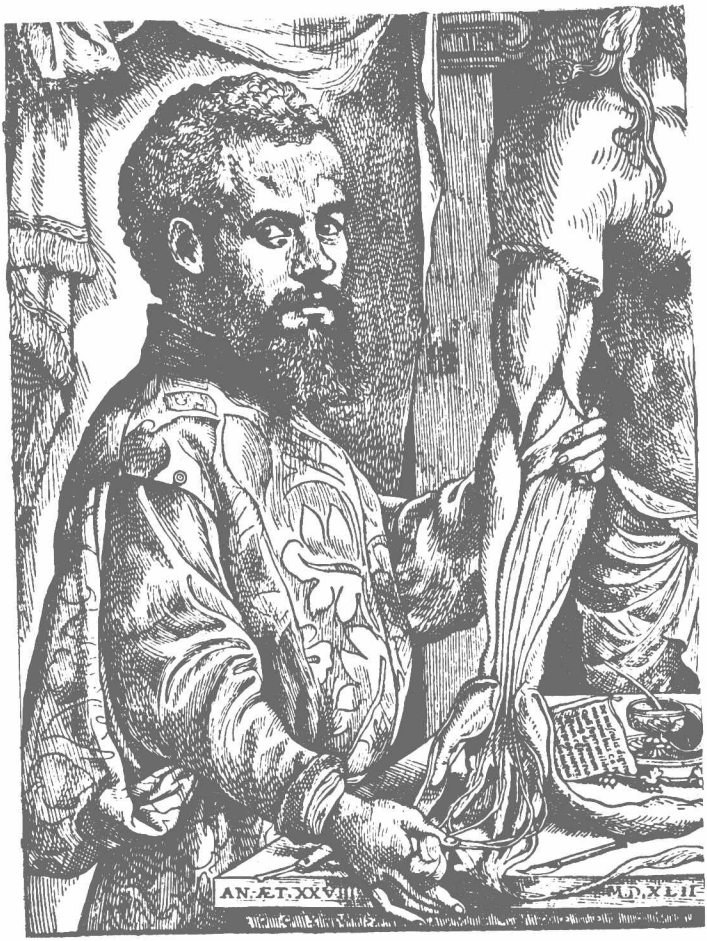
Though some cultures had well-developed pathological theories which to a certain extent controlled ancient medical practice, it was the Greeks who most profoundly influenced Western medicine. They invaded Greece and Asia Minor from the north, conquering the preceding Minoan civilisation, and not only came into contact with the medicine of their conquered subjects, but in

Asia Minor were influenced by doctrines coming from Mesopotamia and from Egypt. The nimble-witted Greeks absorbed other people's ideas and, as in all they did, added greatly to them by accurate observation and by a new philosophical outlook. They recorded the appearances of many disease conditions that can be recognised by careful clinical examination and such descriptions are still valid, but their studies of pathology were severely handicapped since, except for a short period in Alexandria, they made no systematic examinations of the body after death. The Alexandrian writings have apparently all been lost. With the lack of background founded on post-mortem observation there flourished physiological and pathological theories that had little foundation in ascertained fact. These theories, which may have originated with the Hindus before 2000 B.C., dominated physiological and pathological thought in Europe until the re-awakening of inquiry during the Renaissance began to make its effects felt in the fifteenth and sixteenth centuries.

The Greek views on pathology, based on "humours", to which "spirits" and other elaborations were later added, cannot detain us now, but as they dominated medical thought and paralysed rational progress in western medicine for at least 1500 years, they can rightly be deemed of great importance, perhaps historically the most important pathological theories yet propounded. Greek medicine came down to mediæval times partly through the works of the non-medical patrician Roman, Cornelius Celsus (about 30 B.C. to A.D. 38), who collated much of the knowledge of the time. But it was a Greek, Galen (A.D. 130–200) from Pergamum in Asia Minor, who, besides making many original observations, some of an experimental nature, put the pathological doctrines of the time into a form that was treated as authoritative until well after the Renaissance. It was not until the sixteenth century that a serious breach was made in the teachings of Galen, which had been erected into a dogma which no one challenged by further observation.

The ancient humoral theories still persist in some of the words that we commonly use, indeed much of medical terminology is of Greek origin. The humour, or fluid, that predominated was thought to govern, amongst other things, a man's temperament. Thus one was *sanguine* (from predominance of blood which was hot), another *phlegmatic* (phlegm was thought to be a product of the brain), another *jaundiced* (yellow bile from the liver) and a fourth *melancholic* (black bile from the spleen). Certain expressions such as "to vent one's spleen" come from the same era.

Though the theories that underlay the use of these words have gone, certain aspects of Greek medical thought survive to this day. In particular the oath of dedication that was taken by the followers of Hippocrates set a high standard of moral behaviour for the medical man towards his patients and their relatives. The fact that all medical practitioners to-day are expected, in addition to having professional skill, to adhere to a code of ethics in their practice is a continuance of the ideal that was first clearly formulated by Hippocrates. Though some of the original Hippocratic oath to which Greek medical men subscribed seems outmoded to-day, medical schools given to symbolistic rites still use it, and at the present time an attempt is being made to formulate an "international oath" for medical practitioners that would bear a close resemblance to the oath of the Greeks.



1/FIG. 1.—Vesalius (1514–64), from *De humani corporis fabrica*, 1543.

The Rise of Morbid Anatomy

With the Renaissance the scientific and medical atmosphere altered completely. The great sixteenth-century anatomists who worked for the most part in Italy, among whom the Belgian Vesalius stands supreme, founded the modern study of anatomy by their careful dissections and observations, their work often being illustrated by engravings of the greatest beauty (FIGS. 1–3). It was largely through their work that a beginning was made in challenging Galenic dogmatism.

As the quincentenary of the birth of Leonardo da Vinci (1452–1519) has recently been commemorated, it is worth recalling that that great man dissected some thirty corpses and made remarkable drawings of his observations. Unfortunately his great collection of drawings and notes, which he never published, passed into private hands at his death and was not seen for the next fifty years.