

LESSONS IN PATHOLOGICAL HISTOLOGY

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BY

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TO THE
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PREFACE.

THIS interesting and intensely practical little book is novel in almost every particular and has no parallel among the books offered to students of medicine.

It bears the same relation to pathologic histology that a "dissector" does to anatomy; it is a self-instructor, teaching the salient features of the tissues studied. It is not a text-book of pathology, nor can the student possibly suppose that it can take the place of one; it is not a hand-book of technic. It is a guide, and a very intelligible one, to the microscopic study of morbid tissues. It may not contain all of the sections that the student is called upon to study—they differ in different institutions—but it contains enough to teach him the correct method, and gives the most important facts, after which new material may be approached without hesitation and with full confidence that the same methods applied will yield the same satisfactory results.

The approach to the diagnosis is always systematically made: The student is first told what should be seen with the naked eye, then what is to be seen with the low-power lens, and finally, if necessary, what with the high-power lens.

Particular fields for examination with the higher powers are frequently indicated upon the drawing by lines inclosing small squares.

When the book is opened, the right-hand pages are found to show the beautiful drawings of M. Bessin, to which in this American edition have been added additional ones by Mr. Erwin Faber, so drawn as to correspond with the originals, from which it is impossible for one not in possession of the French copy to differentiate them. On the left-hand page is a text correlated with the illustration, and telling how one should proceed in studying it. Although brief, this text is descriptive, critical and diagnostic, and transforms the book from an atlas to a guide by being of a value equal to the illustrations.

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J. McF.

LESSONS IN PATHOLOGICAL HISTOLOGY.

INTRODUCTION.

At the beginning of this little book, intended to direct the student in his first steps in the study of pathological histology, are brought together a few elementary facts about practical microscopy. It is done as briefly as possible, in the hope that it will be appreciated by these for whom it is intended.

Certain details of histological technic are important in the successful interpretation of microscopic preparations.

Only the most important of them will be mentioned, especially as nearly all of the sections have been fixed and stained in the same manner.

It is indispensable to follow certain rules in the interpretation of histological slides, and it is through lack of knowing and observing them that beginners, too soon employing high-power lenses, lose themselves in the reading of the sections and commit the grossest errors of interpretation.

A histological diagnosis ought to be conducted much as a clinical diagnosis at the bedside. It is only after having exposed the patient and examined him in his entirety, that the clinician goes on to the successive methods of inspection, palpation, auscultation, etc.

Methods of Using the Microscope and Interpreting the Section.—A microscope consists of a stand, an optical system (objectives and oculars), and an illuminating apparatus comprising an Abbé parabolic condenser, a mirror and an iris diaphragm.

The *Abbé condenser* should not be employed with very low-power lenses whose magnification does not exceed that of a hand lens. Besides the diminution of the light that results

from its employment in such cases, images of the window, the wall and other objects are apt to appear in the field of vision. The condenser is, therefore, to be removed from the optical axis with such powers. It is, however, necessary with middle- and high-power lenses, but it ought to be placed at some distance from the object in order that the best illumination be obtained and distinctness of vision secured. The higher the magnification, the nearer the condenser must be brought to the stage; with an oil-immersion lens it should be in immediate contact with the slide.

The *mirror* has plane and concave sides, each of which subserves a special purpose. The concave side should be used when the source of light is small, as in artificial light; the plane side for natural light.

The *iris diaphragm* serves to cut out the excessively oblique rays of light when high-power lenses are used. How widely it should be open or how tightly closed is a matter that can only be learned by experience. As a matter of fact, the student should open and close it more or less with each change of magnification and with each different object examined, as with different degrees of light different structural details are brought out.

The Objectives and Oculars.—The microscopes used by students vary in different laboratories, some being provided with two, some with three objectives, according to the different character of the work to be done. When this is histological only, two objectives—a low power and a high power—are all that are required; if bacteriological or cytological work is to be included it may be necessary to add another—higher power—or even an oil-immersion lens. It will be supposed that the student using this manual finds his equipment to consist of two objectives—a low power and a high power. He usually also receives two oculars by which to reach the extremes of high and low powers within the range of his objectives. In general, however, it is best to work only with the low-power ocular as it affords the best definition.

The Low-power Objective.—It is with this magnification that the study of every microscopic section ought to be begun. It gives a general, that is, a topographical view of the whole section, and enables the different component tissues and their

relations to be determined, and the parts requiring further examination to be recognized. For example, in a section of a uniform structure, such as the pulmonary tissue, the low power enables sections of the bronchi and bloodvessels quickly to be found, and if there be any deeply-colored masses, such as bronchopneumonic areas or tubercles present, they quickly catch the eye. Again, in sections of any part of the wall of the alimentary tract it easily discovers any breach of surface continuity such as constitutes an ulceration.

The examination with the low-power lens ought, therefore, be continued for some time as it enables the trained eye not only to discover the organ concerned, but also to make a presumptive diagnosis of its principal lesions.

The Medium-power Objective.—Should there be a medium-power lens, its use will in most cases suffice to complete the diagnosis.

The High-power Objective.—This should only be employed to complete the observation. It shows but a very circumscribed field of the section, and its chief uses are for defining the cytological and nuclear structural details—protoplasmic granules, vibratory cilia, mitotic figures, etc.

THE ELEMENTARY PRINCIPLES OF HISTOLOGICAL TECHNIC.

Only the methods of fixing and staining indispensable to the interpretation of the sections described in this manual will be mentioned.

1. **Fixation.**—Pieces of tissue selected for histological examination should be immersed in a preserving fluid for the purpose of *fixing* their structure by coagulating the albumins with the least possible modification of their cells. According to the size and fixation of the blocks of tissue will their cellular characteristics be well preserved.

(a) Pieces of tissue obtained from surgical operations and fixed upon the spot may be regarded as in a state of perfect preservation.

(b) Pieces of tissue taken from autopsies made twenty-four hours after death will be found in a very unequal state of preservation. They have not only been subjected to the