Introduction

“The Concept of Normality

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Introduction

“There are more things in heaven and earth, Horatio, than are dreamt of in your philosophy.”


One cannot deny the fundamental interdependence of structure and function in biology and medicine. This is now a hoary and possibly boring adage. But is it also recognized that structure and function determine the characteristics of disease? Is it understood that diseases are experienced, measured, and classified as they are mainly because of the anatomic parts affected? The history of quackery depends largely on the lack of this perception. How else would anyone accept an elixir not only as a panacea—a cure for countless ills of all sorts—but also as a preventive against any disease? Yet, a little sensible reflection on the complexity and detailed specificity (that is, the fine anatomy and physiology) of the human body can prevent the frauds of quackery. Severed nerve fibers are not induced to regrow and to function normally again by the action of an odoriferous nostrum. Metastatic cancer will not be overcome by an extract of fruit pits. There is no advantage in overdosage with vitamins. The only likely victory over disease lies in seeing it for what it is and this means looking at it, possibly with old and simple tools or perhaps with new and subtle tricks. But look at it we must; otherwise we are only charlatans whether we admit it or not.

There is one more reason to study histology, a purely hedonistic reason—the beauty of it. If museums and art collections can be devoted largely or entirely to the external human
form, which is so readily accessible to exa
mination by anyone, how much greater is the
value in the internal components of the body,
particularly when magnified. Of course pro-
cessing and staining also help in the study
of tissues. The world of histology is truly a
magnificent one. So let us consider it not as
an ugly or maleficent ogre whose shadow, the
final exam, darkens our lives and causes our
subsequent and often permanent revulsion.
Let us accept it as a valuable aid that may
make our lives, and in them the science and
the practice of medicine, more enjoyable as
well as better understood.

We present these ideas at the end of our
book rather than at the beginning because
we think they may be an incentive to applica-
tion and further study of this subject after
completion of the course in histology. We in-
tend them only to introduce concepts which
extend from our basic subject of histology and
which may play leading roles in subsequent
courses.

The Concept of Normality

The physician should first identify and then
treat disease. In order for one to make a diag-
nosis he or she must hold a clear concept of
normality and of its range. It is not enough
to know that the apex beat of the heart is
normally most forceful to the left of the ster-
num. The doctor should be able to state how
far to the left is acceptable; also in which in-
tercostal space(s) the beat should be; and how
forceful it should be and how different physio-
logic conditions may affect it. And regarding
physical stature, is one man less normal than
his brother because he is fatter? or shorter?
or less muscular or less athletic? Clearly rigid
limitations present some disadvantages. In
histology, just as in physical examination, we
are obliged to present not simply the single
ideal normal but some range of what is accept-
able.

The traditional concept of normal human
biology ignores many variations in form and
substance. Problems arise because there is no
satisfactory definition of normal. When does
one cross the border into disease? Students
often recognize and appreciate this confusion.
They can openly discuss such questions as:
"Isn't baldness (or pulmonary anthracosis, sol-
ar tanning of skin, pregnancy, menopause)
normal?; "Is this about the usual degree of
arteriosclerosis for a 70-year-old man?"; "Why
do some children outgrow their hyper-
sensitivities?"; "What is the prevalence of in-
cidental malignancy or tuberculous Gohn
complex?"; and ultimately, "What is normal,
anyway?" (Fig. 20.1).

Aging

As histology represents structure in life we
are obliged to recognize that this structure

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Fig. 20.1. Histogram. Frequency distribution of hematocrit values in adult white
females in the United States (1960–62). (From Miale, John B: Laboratory medicine:
hematology, ed. 6, St Louis, 1982, The C. V. Mosby Co.; data from National Center
for Health Statistics, 1967.)

Fig. 20.2. Carcinoma of the prostate. This is formed of small irregular glands. It
was an incidental finding at the autopsy of a 66-year-old man. Concretions in non-
malignant glands are visible at left. ×85. (Courtesy of K. Schmidt.)

Fig. 20.3. Arteriosclerosis with near occlusion of the common iliac artery, a lesion
often present in the elderly. ×7.5.

Fig. 20.4. Lymph node in youth is full, complete, and cellular and has germinal
centers. ×20.

Fig. 20.5. Lymph node in old age is largely replaced with fat and has few and
indistinct germinal centers. ×10.