THE NAMES OF THE PARTS OF THE STOMACH

Names have been given to the parts of the stomach by anatomists, histologists, radiologists, physiologists, and surgeons. A number of writers have commented upon the lack of uniformity of terms and the ambiguity of some of them.1-3

This comment concerns itself with one aspect of the problem and that is the names of functional divisions of the stomach in terms of secretory activity. It thus presents a physiologic point of view which may not be satisfactory for other purposes.

Regarding secretory function, the stomach has two main parts. The larger, oral portion secretes hydrochloric acid and pepsin as well as mucus. The smaller, caudad portion secretes only mucus in its external juice but also produces the hormone gastrin as an endocrine product. These functional differences have histologic correlates. Thus, the glands of the acid-pepsin secreting portion contain parietal and peptic cells as well as mucoid elements, whereas the glands of the caudad portion which secrete only mucus contain only mucous cells.

When the physiologist refers to parts of the stomach he is usually interested in distinguishing these two major functional areas. The surgeon, too, because the rationale of surgical treatment of peptic ulcer is based on physiologic principles, is often interested in conveying this distinction. A variety of terms are in use for this purpose and their meaning is not always clear.

Because the functional areas of the stomach have identifying histologic features it is appropriate that they should be named in conformity with histologic usage. The histologists, however, are not in agreement about the naming of the gland types. Because the histologists have, to some extent, derived their names for the gastric glands from the names of the gross anatomic parts of the stomach, these must be examined briefly at this point.

Textbooks of gross anatomy4-6 often divide the stomach into two major parts, namely, cardiac and pyloric, according to the orifice of the stomach—cardia or pylorus—to which they are adjacent. The separation between these two parts is marked by the incisura angularis on the lesser curvature but is ill defined on the greater curvature. Even the incisura angularis is subject to some shifting with movements of the muscular walls; thus the line of separation between these two gross anatomic parts of the stomach cannot be precisely located. The cardiac part is usually subdivided into the fundus, or area above the incisura cardiaca, and the corpus, or body. The pyloric portion is variously subdivided into the pyloric vestibule7 or pyloric antrum,4-6,8,9 adjacent to the corpus, and the pyloric canal, adjacent to the pyloric sphincter. Some textbooks of anatomy do not use a term to designate the fundus plus the corpus (or body),8,9 whereas

Submitted for publication July 22, 1957. Accepted for publication November 27, 1957.
one textbook uses the term *body* to include both the fundus and the remainder of the body.

In a rough and distinctly inexact way, the two major gross anatomic divisions of the stomach correspond to the two major histologic ones. One of the earlier systems of histologic designation was simply *cardiac glands* and *pyloric glands*. The latter term is still universally accepted. The former, however, that is, *cardiac glands*, has come to be reserved by histologists to designate a minor subdivision of the glands of the gross anatomic cardiac portion of the stomach. These are the mucoid glands immediately adjacent to the cardia which occupy a very narrow band in most species, including man.

Histologists have referred to the glands containing parietal and peptic cells by a variety of terms, including: *proper gastric glands*, *principal gastric glands*, *gastric glands* and *fundic glands*. Each of these terms carries some objections. *Proper gastric glands*, or *principal gastric glands*, although unambiguous and supported by excellent authority, is unwieldy and has never gained currency outside of histologic works. *Gastric glands* is apparently an abbreviation of *proper gastric glands* and, although it is used by histologists, it has never gained acceptance among physiologists, perhaps because it is likely to give the erroneous notion that these glands occur throughout the stomach. The term *fundic glands*, or *fundus glands*, is very old and enjoys rather wide use, but it is decried by some histologists because it gives the misleading impression that these glands occur only in the fundus whereas they actually occur in both the fundus and the corpus of gross anatomy. Vesalius used the term *fundus* to designate essentially the same area that is now called the cardiac part (fundus plus corpus). It is from this earlier sense of the word that the term *fundic glands* or *fundus glands* arose.

Among physiologists the terms in current use for the designation of functional divisions of the stomach include *fundus* or *corpus* for the portion which secretes acid and pepsin, and *antrum* or *pyloric part* for the mucus-secreting, gastrin-producing portion. All of these terms are objectionable because they refer to poorly delimited gross anatomic zones. The term *fundus* came into wide use to designate to the acid-pepsin secreting area because the histologists frequently referred to the glands performing this function as *fundic glands*. Recognizing the limitations of the term in either form, it would be more correct to speak of the *fundic gland area* than of the *fundus* when the functional-histologic division is intended. In like manner the term *pyloric gland area* is preferable to *pyloric part*.

It is realized that the limits of the histologic zones may not be sharply demarcated because intermediate gland types exist, especially between the proper gastric glands and the pyloric glands. Furthermore, when the surgeon or the experimental physiologist inspects the stomach grossly he usually cannot tell where the borders of the gland areas are located. Nevertheless, it would seem preferable to use terms which indicate that a functional-histologic designation
rather than a gross anatomic one is being made when this is the intention. Many surgeons and physiologists do not appreciate the difference in the extent of the pyloric gland area as contrasted with the "antrum" or "pyloric part of the stomach."19

In general then, the functional (secretory) divisions of the stomach should be named by appropriate histologic terms. Critical examination of current histologic nomenclature indicates that the most satisfactory terms in current use are *proper gastric gland area* and *pyloric gland area*. More important than the selection of the designating name is the use of the phrase *gland area* to indicate that a portion of the stomach containing a characteristic type of gland with a distinctive function is intended rather than a gross anatomic division. The words *region* or *zone* can be used in place of *area*.

The term *proper gastric gland area* is awkward and is unlikely to gain acceptance. The term *oxyntic gland area* would, in my opinion, be a satisfactory replacement. The word "oxyntic" was originally coined by Langley20 to designate the gastric glands which secrete acid. Etymologically the word "oxyntic" means "acid-producing."

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REFERENCES


