MEDICAL PHYSICS III

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The desire to explore the interior of human body cavities is as old as medicine itself. Attempts to construct instruments to penetrate the depths of such cavities and to illuminate their interiors sufficiently to make them visible extend back well over 150 years. In their simplest form such instruments consisted of a cylindrical tube which was inserted into the cavity and which was equipped with mirrors to throw reflected light from outside sources upon the interior wall of the cavity.

Modern endoscopes are refinements of the earlier instruments. They consist of either rigid or flexible cylindrical tubes. Their length and mechanical construction depend mainly upon the cavity to be explored. Some of them are still simple hollow tubes, some contain ordinary magnifying lenses, and others are equipped with elaborate optical lens systems, permitting either unobstructed visual observation or photographic recording. The latter instruments usually consist of two parts, a tubular sheath and the optical system, which can be inserted into the sheath. The sheath can also receive instruments such as catheters and surgical appliances. The cavity walls may be illuminated by an electric bulb or by reflecting mirrors mounted in the ocular end of the endoscope, or by a tiny light bulb mounted on the tip of the endoscope introduced into the cavity. According to the construction of the endoscope, the cavity to be explored, and the desire of the physician to make visual observations or a photographic record, endoscopic instruments in use today may be classified in three groups:

1. Simple endoscopes with or without magnifying lenses

Anuscope	Otoscope
Bronchoscope	Proctosigmoidoscope
Esophagoscope	Stomatoscope
Laryngoscope	Televentroscope
Nasal and vaginal speculum	Ventriculoscope

2. Modified endoscopes with magnifying optical systems

Colposcope	Ophthalmoscope

3. Elaborate endoscopes with complete telescopic optical system

Antroscope	Nasopharyngoscope
Bronchoscope	Peritoneoscope
Cystoscope	Thoracoscope
Gastroscope	Urethroscope

Although some of these instruments, such as the bronchoscope, may be used either with or without an elaborate optical system and therefore may be listed in two classifications, the grouping as a whole is useful, particularly with regard to making a photographic record of the observation. Photographs may be taken with the endoscopes listed in group 3 by simply attaching a camera to the instrument. However, additional lens systems must be attached to the instruments listed in the other two groups before a camera can be used to record observations photographically.

Endoscopes are among the physician's and surgeon's most important diagnostic tools. Through the collaboration of physician and physicist the construction of the modern endoscope has been greatly advanced and has reached a peak in the flexible gastroscope combining some forty lenses in its optical system with a rather elaborate system of illumination.

BIBLIOGRAPHY

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PROCTOSCOPY

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I wish to pay tribute to the many workers, too numerous to mention, who by clinical observation and development of new equipment have made proctoscopy a safe, relatively easy, and increasingly useful fact-finding procedure in the diagnosis and management of pathologic conditions of the rectum. Owing to refinements in procedure in this phase of endoscopy, diagnosis is more accurate and treatment more intelligent today than at any time in medical history. Indications for proctosigmoidoscopy may be summarized briefly as any rectal complaint. Unfortunately in 25 per cent of all cases treatments or operations for hemorrhoids have preceded the discovery of cancer of the rectum or sigmoid by less than six months. No specific procedure should be done on the rectum without proctosigmoidoscopy. I know of no contraindication except when digital examination shows it to be impossible, in which case plans may be made to make it possible.

Success in obtaining information by endoscopy depends in great measure upon making the examination as painless as possible. This is especially true of proctoscopy. We know from the patients themselves