trophied verumontanum, polyps, or tumors may be detected and adequate treatment instituted.

When indicated ejaculatory ducts may be catheterized, thus making radiographic study of the seminal vesicles possible.

SUMMARY

Patients with symptoms referable to the urinary tract should have a complete urologic survey before irreparable damage is done or a malignant lesion becomes surgically incurable. An accurate diagnosis can usually be accomplished by cystoscopy, intravenous urography, and retrograde pyelography. With our present instruments transurethral surgery may be advocated and is attended by the most gratifying end results.

OPHTHALMOSCOPE

A. D. RUEDEMANN, M.D.

Of almost equal importance to the ophthalmologist are the ophthalmoscope, the retinoscope, and the slit-lamp biomicroscope. The anatomy of the eye lends itself to accurate study by direct observation with various types of illumination. The latter limits the magnification here as it does with all other magnifying apparatus.

The opthalmoscope is undoubtedly the most widely known of these scopes because of its value to general medicine. Méry in 1704 accidently held a cat's eye under water and saw the blood vessels and color of the retina. In 1851 von Helmholtz reported an instrument which he called the ophthalmoscope by means of which "all the alterations of the vitreous body and of the retina which, until now, have been found in cadavers, will also permit of recognition in the living eye—a possibility which appears to promise the most remarkable advances for the hitherto undeveloped pathology of this structure." This promise has been more than fulfilled. Now less than 100 years later the examination of the eyegrounds is an important adjunct in the diagnosis of general disease. The ophthalmoscope was a tremendous boost to the medical man's ability to diagnose vascular disease as well as early cerebral lesions.

The ophthalmoscope is a simple instrument with a perforated disk to look through and a light for illuminating the inside of the eye. Since all eyes are not emmetropic, the lens, which is attached in various ways, is necessary to neutralize errors of refraction of patient and observer.

Although early instruments were obviously not as streamlined as those of today, observations made with them were usually without error.

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Many of the best descriptions of the fundus were made by the so-called direct method. A wall light placed behind the patient was used as a source of illumination. To direct the light to the eye a plane or concave mirror was fixed to a handle with a battery of lenses to aid in observation. This was held at a meter's distance. A light collecting lens of 12 diopters was held approximately 4 inches from the eye to bring the light to a focus on the retina of the eye. Candles, oil, gas, sunlight, and electricity all served as sources of light for the examination of the eye. The self-illuminated ophthalmoscope with battery or the cord-handled ophthalmoscope has replaced the old direct reflecting scope for direct observation. Although one could see as well through the early models as the modern ones, Friedenwald made certain refinements in recent instruments to increase accuracy of observation. Better illumination, higher magnification, and daylight and red-free light are among the improvements.

Ease of observation makes the study of the fundus a routine part of every physical examination. The examination is neither difficult nor time consuming. Dilation of the pupil is indicated; although much can be seen through an nondilated pupil, a great deal more can be seen with greater accuracy through the dilated pupil.

The binocular scope permits better study of the depths of the fundus but has limitations because of the size of the instrument and the slight difficulty in manipulation. It is particularly valuable in the study of early edema of the optic disk and other early lesions. The instrument is especially valuable for those specializing in ophthalmology.

The first camerascope to photograph the fundus of the eye was made by Nordenson. Photographs are now made in color and have tremendous educational value. The collection of Arthur J. Bedell now comprises over 100,000 excellent fundus photographs.

The retinoscope makes possible the accurate measurement of errors of refraction. It is the best and an almost totally accurate means of ascertaining whether or not a child has a refractive error. Because refractions may be done accurately without subjective examination, the retinoscope is valuable in the examination of the very young, the very old, the illiterate, and of other persons who are unable to respond. To the oculist the retinoscope is as important as the ophthalmoscope. It makes him independent of the patient in the examination for glasses and gives him an accuracy not obtained by any subjective examination.

As the means of illumination were improved and various types of lenses, prisms, and other means of directing and reflecting light became

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known, the third important eye scope was devised. This was the slit lamp biomicroscope, which permits detailed examination of lesions that could not be seen before. Recent models combine higher powers of magnification with better illumination. By means of special illumination Zeitz perfected the photographing biomicroscope for photographing the capillaries of the conjunctiva. The ocular conjunctiva presents a perfect field for the clinician to study capillaries in the living state, to observe circulation, and to see under high power evidence of the activity of the vascular tree. The physiology and pathology of a large portion of the capillary bed may be observed.

Through the development of the ophthalmoscope and allied instruments examination of the eye has been facilited. The use of these instruments by the general practitioner may further extend his ability to diagnose earlier and more accurately certain general diseases.

BRONCHOSCOPY

HAROLD E. HARRIS, M.D.

Strictly speaking, bronchoscopy is limited to the visual examination of the bronchi and originally was used to remove foreign bodies from the air passages. In its broader connotation it has even greater usefulness in the diagnosis and treatment of diseases of the entire tracheobronchial tree.

Jackson has been largely responsible for developing the technic of bronchoscopy to its present high efficiency. Because bronchoscopy seemed a formidable procedure, the general practitioner was slow to realize that the bronchoscope provided a means for diagnosing obscure pulmonary disease. Recent advances in thoracic surgery have emphasized the importance of bronchoscopy in early diagnosis, and consequently greater responsibility has been placed upon the endoscopist. This paper urges wider application of bronchoscopy to diseases of the tracheobronchial tree, not only obscure ones, but also many of the more common conditions which may be secondary to undiagnosed and more important pathologic conditions.

Bronchoscopy is closely related to the development of direct laryngoscopy and esophagoscopy. In 1897 Killian removed a foreign body from the bronchus through an esophagoscope and demonstrated the feasibility of lower bronchoscopy. The first authentic use of the bronchoscope in the United States was in 1897 by Coolidge, who re-

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