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Edited by W. F. Hendry

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W. F. HENDRY ChM, FRCS

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Recent Advances in

UROLOGY/ANDROLOGY

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Preface

There have been a number of significant advances in urology in recent years. The equipment for endoscopic surgery has been developed, both optically and in its diathermy attachments (Ch. 1), so that very few prostates or bladder tumours should now require open surgery — provided the surgeon has been adequately trained in the use of the equipment (Ch. 14). The radiologist has greatly improved imaging techniques, and can perform operations with needles or catheters where previously open surgery was needed (Ch. 2). Investigation of the dynamics of the upper urinary tract in conditions of stasis, obstruction and reflux have lead to a more rational approach to management (Ch. 3, 4 and 5). Chemotherapy for infection (Ch. 6) and tuberculosis (Ch. 7) has been refined so that relatively short term treatment produces a high incidence of cure, and accurate understanding of the distribution of antibiotics in the body fluids can lead to greater success in the treatment of prostatitis (Ch. 13). Therapy for tropical diseases has made headway both medically and surgically, and there is now a good prospect of cure for the patient with early bilharziasis (Ch. 8 and 9). Bladder dysfunction continues to plague the urologist, but worthwhile correction of bladder instability can be obtained from prolonged distension (Ch. 10); incontinence can be controlled by implanted devices (Ch. 11), and when necessary, excellent results can be obtained from enterocystoplasty or urinary diversion (Ch. 12). In the management of malignant disease, successful combined treatment regimes have markedly increased the survival rates of patients with testicular tumours and Wilms' tumours (Ch. 16 and 17); understanding of prostatic cancer is evolving (Ch. 15) and the diagnosis and significance of carcinoma in situ of the bladder is now clearly recognised (Ch. 18).

Disorders of the male genitalia frequently present to the genitourinary surgeon, who may consider himself an andrologist when he takes on this responsibility. Hypospadias repair has been increasingly refined (Ch. 19). Genital dysfunction including infertility and impotence are very common causes of stress and anxiety, both for the patient and his medical adviser. The background for normal male reproductive function is complex, and the doctor who treats these disorders must have a clear understanding of the basic endocrinological and immunological processes that are involved, which may require investigation and specialist treatment (Ch. 20 and 22). For impotence, the successful implantation of prosthetic devices has provided a challenge for the surgeon (Ch. 21).

Accurate investigation, skilled surgical technique and a willingness to collaborate with and learn from specialists in other disciplines have once again provided most of the really significant advances in urology — and andrology — in the past 5 years since the last volume of Recent Advances in Urology was prepared; it seems highly probable that future advances will come from the same three sources. I am grateful to many people for help in the preparation of this edition, especially the contributors, and also particularly Miss Anthea Minchom, Librarian at the Institute of Urology, for so willingly helping with so much of the work.

London, 1980 W.F.H.

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1. The urologist's armamentarium

J. P. Mitchell

In the last decade major developments have occurred in the endoscopes and in the ancillary equipment used with them in urological surgery. The improvements which have been most marked are due to advances in optical physics which have enhanced the quality of the telescopes, and due to the advances in electronic technology which has resulted in more efficient diathermy generators.

TELESCOPES

At a meeting between the American College of Surgeons and the Royal College of Surgeons of England in April 1979, tribute was paid to Professor Harold Hopkins of Reading University to whom so much is owed by all disciplines involved with endoscopy. Hopkins played a major part in the development of the fibre-optic (image-transmitting) bundle (Hopkins & Kapany, 1954), and he originated the concept of the rod lens system for rigid endoscopes (Hopkins, 1960) in which the air spaces between the lenses were replaced by glass rods (Fig. 1.1). This rod lens system

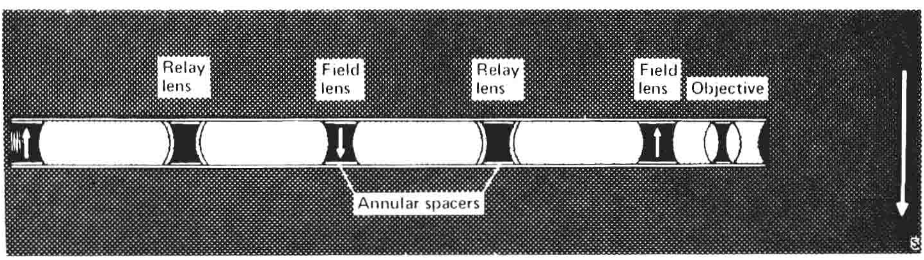

Fig. 1.1 The solid lens system designed by Professor Harold Hopkins.

improved the light transmission, the image resolution and the width of the field for the objective lens, giving a wider angle of view for observation (Fig. 1.2). Hopkins also improved the optics of the K-prism which is essential for reverting the image to the upright (Fig. 1.3) and he developed the triple prism with mirrored surfaces to provide an achromatic image with maximum light transmission for the fore-oblique telescope (Fig. 1.4). Although, at present, the fibre-optic bundle has little application in urology, except for the dual vision teaching attachment and the pyeloscope (see below), the other factors already described have produced a dramatic improvement in the modern rigid telescope.

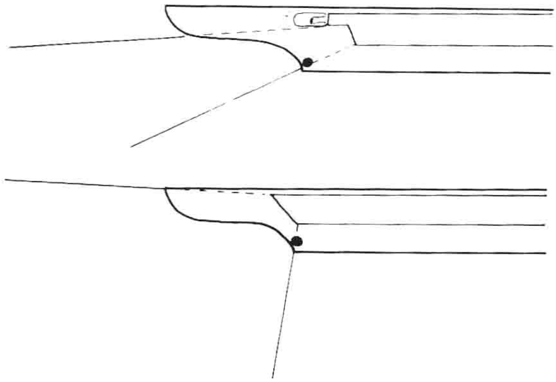

Fig. 1.2 The wider angle of view obtainable in the modern telescope as compared with the narrow field of view in the earlier telescopes illuminated with a conventional bulb.

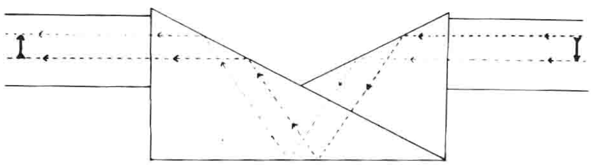

Fig. 1.3 The K prism.

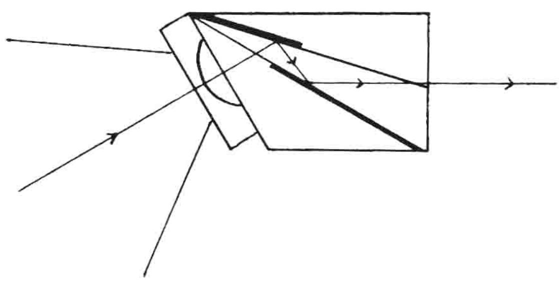

Fig. 1.4 Achromatic prism combination for fore-oblique view, designed by Professor Harold Hopkins.

The angle of view

At the same time as the width of field of view has been increased, so there has been a greater variety of angles of view. Although direct vision endoscopes existed prior to fibre illumination, the view was partially obscured by the terminal light bulb and only a relatively small space was available for the window of the objective lens. A 120° telescope also existed prior to fibre illumination but usually required a specially modified sheath to accommodate the retrograde viewing device. The result was that 20 years ago the only telescopes in routine use were a 90° view for inspection of the bladder and a 30° view for operative endoscopy (transurethral resection). With fibre-illuminated rigid endoscopes the standard set of telescopes available are 0, 30, 70 and 120° and all are readily interchangeable so that the versatility of the instrument has been much improved. In particular, the urethra can now be routinely examined by viewing with a 0° telescope as the instrument is introduced, the urethral wall being inspected before any instrumentation has occurred. In addition, the urologist now should have no problem viewing the anterior wall of the bladder with the 120°

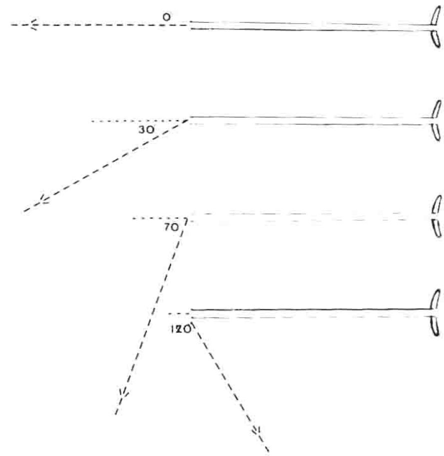

Fig. 1.5 The four angles of telescope manufactured by Karl Storz Limited of Tuttlingen, Germany.

telescope where, in the past, the occasional tumour could escape at inspection (Fig. 1.5). This retrograde viewing telescope is also helpful for examining the pouch behind an enlarged prostate.

Fibre illumination

The fibre-optic bundle transmits an image because the fibres are coherent — in other words, the pattern of the fibres at the receiving end of the bundle corresponds exactly with the pattern of the fibres as they leave the bundle at the eyepiece end. For simple light transmission, however, no coherence of fibres is required and the only important feature is that the glass from which the fibres are constructed should be reasonably flexible and should give maximal internal reflection with minimal light loss. Although theoretically any light bundle should transmit an adequate amount of illumination for any fibre-light telescope, in practice the best illumination is obtained by ensuring that the fibre bundle matches in size the port of entry of the fibres on the telescope, which can vary considerably (Fig. 1.6).

Although fibre illumination has produced marked increase in the intensity of light that can be transmitted to the objective, sufficient in many instances for reasonable colour photography, and although it has provided a reliable light, as opposed to the uncertainty of electrical contact as well as frequent filament failure of the old wheatear bulbs, at the same time it has introduced one major problem: the fixed light pillar, which cannot be rotated (Mitchell, 1974). At least with conventional electric illumination the contacts could be rotated around the telescope. With fibre illumi-

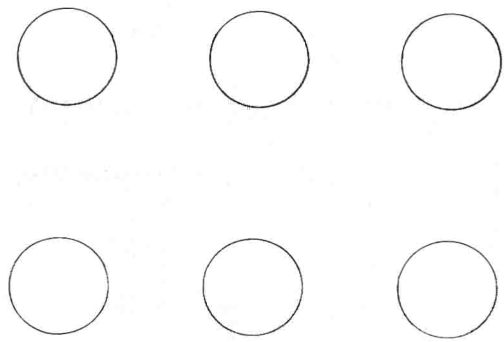

Fig. 1.6 The variety of areas of illumination using different cables on a particular manufacture of telescope.

nation a rotatable collar would inevitably mean light loss in the region of 38 to 50 per cent consequent upon the need to have a second fibre interface. With the customary position for endoscopy, a fixed pillar with the light plug attached can limit the lateral movement of the endoscope which is liable to foul the thigh (Fig. 1.7). Repeated

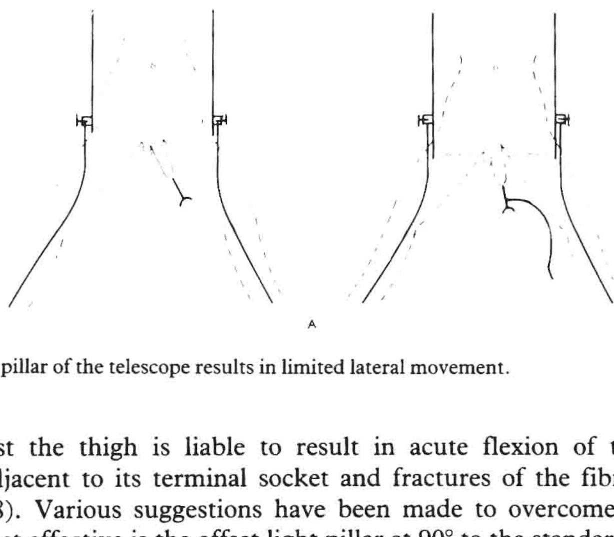

Fig. 1.7 The fixed pillar of the telescope results in limited lateral movement.

pressure against the thigh is liable to result in acute flexion of the fibre cable immediately adjacent to its terminal socket and fractures of the fibres will readily occur (Fig. 1.8). Various suggestions have been made to overcome this problem. Perhaps the most effective is the offset light pillar at 90° to the standard vertical pillar (Fig. 1.9) (Mitchell, 1976). With this design the pillar projects vertically upwards when approaching the right side of the bladder and vertically downwards when viewing the left side of the bladder.

Standardisation
All telescopes made by British, American and German manufacturers are now standardised to 4 mm diameter and, in this respect, they are all interchangeable. However, the length of the telescopes vary from those manufactured by Storz, which

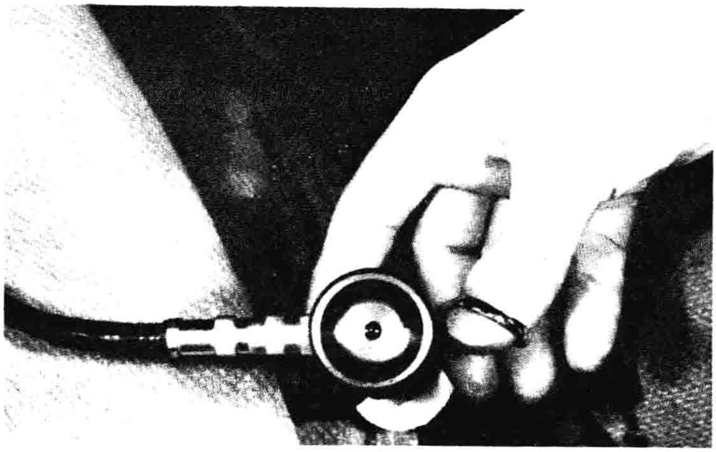

Fig. 1.8 Pressure of the cable against the thigh results in acute flexion of the fibres.

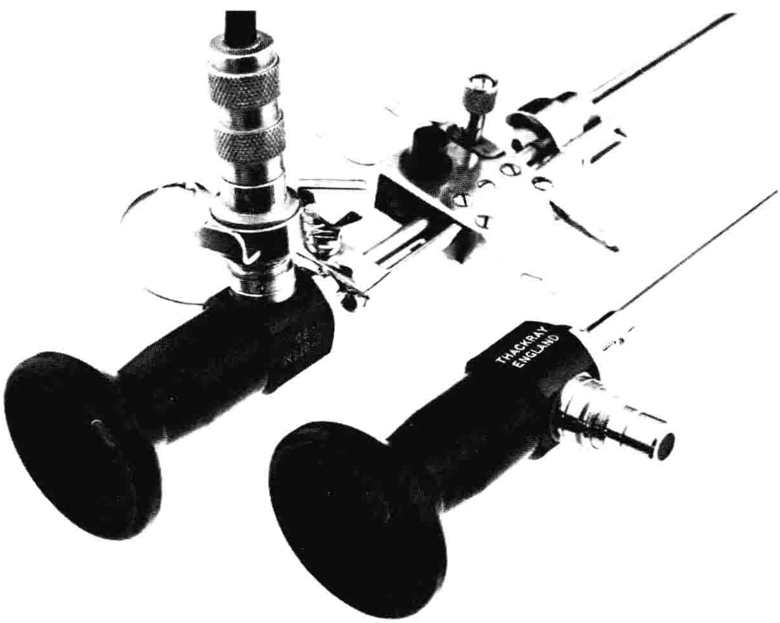

Fig. 1.9 The offset pillar of a telescope used for resection, as compared with the conventional pillar above.