



# CYSTOSCOPY AND UROGRAPHY

BY

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AND 15 COLOURED PLATES

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## PREFACE TO THE THIRD EDITION

THE last edition of *Cystoscopy and Urography* appeared in 1936. During the war all the copies of that edition were destroyed by raids on London and all the materials for a reprint suffered a similar fate when Messrs. John Wright's publishing house was bombed. The book has, therefore, been unobtainable for a number of years. As there seems to be a genuine demand for it, a third edition has been prepared and I trust that it includes recent advances and reflects modern thought. The text has been carefully revised and much new material has been incorporated at many places throughout the book.

The chapter on Urinary Tuberculosis has been largely rewritten and is preceded by one on the pathology of that disease. At first sight this may seem a curious intrusion in a book on Cystoscopy and Urography. Its inclusion arose from the difficulty I experienced in discussing the meaning of various tests without sketching in the background against which those tests must be interpreted, and this was so lengthy as to be unmanageable within the chapter itself.

A section on the punch operation for prostatic hypertrophy is contributed by Mr. R. H. O. B. Robinson, this being an operation which I myself have not practised, and I am fortunate to have the co-operation of so able an exponent. I tender him my sincere thanks for his contribution.

The chapter on Bilharzia has been much enlarged and I have drawn freely on recent publications, especially one by Mr. Ogier Ward in the *Proceedings of the Royal Society of Medicine*.

Mr. Schranz, of the Genito-urinary Manufacturing Co., has kindly contributed two valuable paragraphs on some recent improvements in cystoscope lenses and has been ever willing to assist with any technical problems which I have referred to him.

To Mr. J. B. Lloyd, chief pharmacist to the Manchester Royal Infirmary, I am indebted for help in preparing some notes on the chemistry of Diodone and IodoxyI, and to Messrs. Glaxo who have likewise assisted in this.

Notes on the precystoscopic examination of a patient are introduced as an appendix.

*Plate XV* is new and *Plate IX* has been made to include drawings of two additional ureters. Sixteen of the illustrations used in the second edition have disappeared, but 66 new ones find a place. Many of these are radiographs and urograms which should serve to strengthen this section of the volume. Other work from Miss Dorothy Davison's clever hand, additional to that published in the second edition, finds a place, and is much appreciated and admired.

I thank Mr. Garland Fairhurst, F.R.I.B.A., for preparing the plan from which *Fig. 34* was taken.

Dr. J. B. Hartley has kindly made a number of prints from films used in my work at the Christie Hospital and has been helpful in several ways.

I have to thank Dr. Grieve for the use of *Fig. 212 A* and Major Rhys Lewis for *Figs. 81, 83*. To *The Lancet* and the *Liverpool Medical-chirurgical Journal* I am grateful for permission to reproduce *Figs. 269* and *130* respectively. The *British Journal of Surgery* has allowed me to publish *Plate IX* and *Figs. 300-308*, which are all from articles I contributed to that journal in October, 1947.

The figures in Chapter XXVI are all borrowed and they were acknowledged in the previous edition, but courtesy calls for a fresh note. *Figs. 319-323* are from an article by Dr. Traut which appeared in *Surgery, Gynecology and Obstetrics*, and they are charming examples of the work of Max Brödel. *Figs. 324, 325, 329, and 330* are from articles by the late Dr. Lee Brown and are kindly lent by the *British Journal of Urology*, whilst *Fig. 287* from the same journal is from a contribution by Mr. D. Morison.

Once again I have consulted articles in the surgical press, too numerous to be individually mentioned.

Finally, it gives me great pleasure to put on record my indebtedness to my publishers, who have invariably been courteous, co-operative, and attentive to the smallest detail. The high quality of their work is manifest and I accord to them my warmest thanks.

J. B. M.

Manchester,

April, 1949.

## PREFACE TO THE FIRST EDITION

BELIEVING that there is a real need for a book on cystoscopy, I have attempted the task. It is several years since I conceived the idea, and my first care was to provide myself with an artist to draw cystoscopic pictures. Having trained such an artist to the point where he was starting to become useful to me, I lost his services through ill health. A few of his drawings are reproduced herein, and a few more of his less mature efforts have been redrawn by Mr. W. Thornton Shiells, of London. Unable to face the training of a fresh draughtsman, I approached Mr. Thornton Shiells, who kindly consented to travel to Manchester periodically; cases of interest were collected for him, and I have enjoyed a fair amount of fortune in being able to call up suitable material on the occasions of his visits. Though I do not feel that the cystoscopic circles reproduced in this work call for any apology, it is nevertheless certain that if I had been fortunate enough to have my artist within easy call, I should have had a larger selection of drawings from which to choose. I am greatly indebted to Mr. Thornton Shiells for his unfailing cheerfulness in making so many long journeys, and for his capable work.

There are a large number of surgeons whose opportunities for using the cystoscope do not recur with sufficient frequency to make them skilled in its employment. Their mistakes are usually trifling, yet are sufficient to make shipwreck of their attempts. In the hope of helping these I have entered into much detail when describing the technique of cystoscopy, and it is possible that I have been over-anxious to be explicit.

I am indebted to Mr. Cyril Nitch and Mr. Jocelyn Swan for the loan of several pyelograms, and to Drs. Hyman, Gilbert Thomas, and Hinman, of the United States of America, for the use of *Figs.* 64, 66, and 67 respectively. Messrs. Williams and Wilkins have kindly permitted me to copy *Fig.* 66. For the loan of the blocks of *Figs.* 93 and 94 I have to thank Mr. Canny Ryall and Mr. Henry Kimpton. Mr. E. D. McCrea has read through the text carefully,

and has offered helpful criticism. To Mr. Schranz, of the Genito-urinary Manufacturing Co., I have read several chapters on the cystoscope, and from him have received valuable assistance, particularly in the section on the optical apparatus. To him also I am indebted for the drawings from which *Figs. 4 and 117* were prepared. The Genito-urinary Manufacturing Co. have kindly lent me many of the electros appearing in this work, whilst Messrs. Down Bros. have supplied *Figs. 57, 122, and 127*, and Messrs. Allen and Hanburys *Fig. 42*. Finally, to my publishers I gratefully acknowledge my indebtedness for their unfailing courtesy and for the great energy and thoroughness which they have thrown into the production of my book.

In preparing the text I have consulted works on cystoscopy by Nitze, Casper, Ringleb, Pilcher, Marion and Heitz-Boyer, and Papin, and works on pyelography by Braasch and Papin. Articles in various journals, too numerous to be separately acknowledged, have also been referred to.

The historical section derives largely from Nitze's text-book, and the arrangement of Chapter V was suggested by that of the corresponding chapter in Marion and Heitz-Boyer's work.

The first section of Chapter X has previously been published in a slightly different form in the *British Medical Journal*.

J. B. M.

Manchester,

April, 1927.

# CONTENTS

## CYSTOSCOPY

<i>CHAPTER I</i>	PAGES
HISTORICAL	1-4
<i>CHAPTER II</i>	
THE CYSTOSCOPE	
ADVANTAGES OF AN IRRIGATING MODEL. DESCRIPTION OF THE INDIRECT OR PRISMATIC CYSTOSCOPE : THE SHEATH, WITH ITS IRRIGATING AND LIGHTING ARRANGEMENTS ; TELESCOPE AND OPTICAL ARRANGEMENTS. OTHER TYPES OF CYSTOSCOPE. THE CARE AND STERILIZATION OF THE CYSTOSCOPE. THE EXAMINA- TION OF THE CYSTOSCOPE BEFORE USE : TRACING FAULTS. ADJUSTING THE CURRENT. STORE OF LAMPS. SOURCES OF CURRENT                   -           -           -           -           -           -	5-32
<i>CHAPTER III</i>	
EXAMINATION OF A UROLOGICAL PATIENT	
ORDER OF INVESTIGATION. CYSTOSCOPE DEPARTMENT. INDICA- TIONS FOR AND CONTRA-INDICATIONS TO CYSTOSCOPY. ANÆSTHESIA : LOCAL ; SACRAL ; GENERAL ; SPINAL. PREPARATION OF THE BLADDER. THE INTRODUCTION OF THE CYSTOSCOPE. THE EXAMINATION OF THE BLADDER           -           -	33-67
<i>CHAPTER IV</i>	
THE NORMAL BLADDER	
THE MUCOSA. THE BLADDER MUSCULATURE. THE TRIGONE. NOMENCLATURE OF OTHER PORTIONS OF THE BLADDER. URETERIC ORIFICES. MOVEMENTS OF THE BLADDER WALL. THE AIR-BUBBLE                   -           -           -           -           -           -	68-75
<i>CHAPTER V</i>	
CYSTITIS. SIMPLE ULCERATION	
CYSTITIS : SIMPLE CYSTITIS, GENERAL FEATURES ; CYSTITIS DUE TO THE BACILLUS COLI COMMUNIS ; GONORRHEAL CYSTITIS ; ABACTERIAL PYURIA ; RARE FORMS OF CYSTITIS. SIMPLE ULCERATION OF THE BLADDER           -           -           -           -           -	76-101



*CHAPTER VI*

## INTERLUDE ON THE PATHOLOGY OF RENAL TUBERCULOSIS

POST-MORTEM INVESTIGATIONS. CLINICAL INVESTIGATIONS. SPEED	PAGES
OF EVOLUTION. BILATERAL AND UNILATERAL DISEASE.	
EXPLANATION OF DIFFERENCES IN MILIARY AND SURGICAL	
TYPES - - - - -	102-112

*CHAPTER VII*

## TUBERCULOSIS OF THE URINARY TRACT

IMPORTANCE OF THE PRELIMINARY DIAGNOSIS BY CLINICAL AND	
PATHOLOGICAL MEANS. PREPARATION OF THE PATIENT.	
OBJECT OF THE CYSTOSCOPIC EXAMINATION. BLADDER APPEAR-	
ANCES IN URINARY TUBERCULOSIS. DIAGNOSIS OF THE KIDNEY	
PRIMARILY AFFECTED. EXAMINATION OF THE OPPOSITE	
KIDNEY. HEALING OF THE BLADDER. UROGRAPHY IN RENAL	
TUBERCULOSIS. THE PYELOGRAPHIC PICTURE - - -	113-138

*CHAPTER VIII*

## SYPHILIS OF THE BLADDER

139-141

*CHAPTER IX*

## BILHARZIASIS OF THE BLADDER

DISTRIBUTION. NATURAL HISTORY OF INFECTING TREMATODE.	
CYSTOSCOPIC MANIFESTATIONS. URETERAL BILHARZIASIS.	
VALUE OF CYSTOSCOPY. RADIOGRAPHY - - -	142-149

*CHAPTER X*

## TRABECULATION AND DIVERTICULA

TRABECULATION. TRABECULATION OCCURRING IN DISEASE OF THE	
CENTRAL NERVOUS SYSTEM. FALSE DIVERTICULA. TRUE	
DIVERTICULA - - - - -	150-164

*CHAPTER XI*

## TUMOURS OF THE BLADDER

THE SIGNIFICANCE OF SYMPTOMLESS HÆMATURIA AND THE NECES-	
SITY FOR ITS EARLY CYSTOSCOPIC INVESTIGATION. THE EXAM-	
INATION OF VESICAL NEOPLASMS: INDICATIONS FOR CYSTOS-	
COPY; CONDITIONS COMPLICATING TECHNIQUE. TUMOURS OF	
CONNECTIVE-TISSUE ORIGIN. TUMOURS OF EPITHELIAL ORIGIN:	
VILLOUS PAPILLOMA; NODULAR CARCINOMA. NEOPLASMS	
INVADING THE BLADDER SECONDARILY. CYSTOGRAPHY.	
INDICATIONS FOR TREATMENT. THE PERURETHRAL TREATMENT	
OF SIMPLE PAPILLOMA OF THE BLADDER. CHEMICAL COAGULA-	
TION OF BLADDER TUMOURS. ENDOMETRIOMA. BLADDER	
CONDITIONS SUBSEQUENT TO IRRADIATION - - -	165-216

## CHAPTER XII VESICAL CALCULUS

INDICATIONS FOR CYSTOSCOPY.    TECHNIQUE :    EXAMINATION OF	PAGES
THE BLADDER : LITHOTRITY    -    -    -    -    -	217-227

## CHAPTER XIII

### FOREIGN BODIES IN THE BLADDER

MODES OF ENTRY.    CYSTOSCOPIC EXAMINATION.    TREATMENT    -	228-233
---	---------

## CHAPTER XIV

### URETEROCELE. URETERIC PROLAPSE

URETEROCELE. FALSE URETEROCELE. PROLAPSE OF THE URETER    -	234-242
---	---------

## CHAPTER XV

### FISTULA OF THE BLADDER

INDICATIONS FOR CYSTOSCOPY.    FISTULÆ TO INTRAPERITONEAL ORGANS. SUPRAPUBIC AND VESICO-VAGINAL FISTULÆ    -	243-249
---	---------

## CHAPTER XVI

### A MISCELLANY OF BLADDER CONDITIONS

LEUCOPLAKIA. PURPURA OF THE URINARY TRACT. VARIX. MALAKOPLAKIA    -    -    -    -    -    -	250-256
---	---------

## CHAPTER XVII

### FUNNEL-NECK DEFORMITY OF THE BLADDER

ANATOMY OF BLADDER CLOSURE. IMPORTANCE AND FREQUENCY OF THE SIGN    -    -    -    -    -    -	257-264
---	---------

## CHAPTER XVIII

### PROSTATIC HYPERTROPHY AND OTHER DISEASES OF THE PROSTATE. ENDOSCOPIC PROSTATIC SURGERY

INDICATIONS FOR CYSTOSCOPY. THE DANGERS OF CYSTOSCOPY IN PROSTATIC ENLARGEMENT. PATHOLOGICAL ANATOMY. TECH- NIQUE OF CYSTOSCOPY. THE VESICAL COMPLICATIONS OF PROSTATIC HYPERTROPHY. MISCELLANEOUS DISEASES OF THE PROSTATE. ENDOSCOPIC PROSTATIC SURGERY : INSTRU- MENTS USING THE HIGH-FREQUENCY CUTTING CURRENT : PUNCH PROSTATECTOMY    -    -    -    -    -	265-300
---	---------

## CHAPTER XIX

### ALTERATIONS IN THE BLADDER RESULTING FROM PHYSIO- LOGICAL AND PATHOLOGICAL CHANGES IN THE UTERUS

ALTERATIONS DUE TO PREGNANCY.    UTERINE DISPLACEMENTS. TUMOURS OF THE UTERUS    -    -    -    -    -	301-311
---	---------

*CHAPTER XX*

## URETERIC CATHETERIZATION

THE CATHETERIZING CYSTOSCOPE. URETERIC CATHETERS AND BOUGIES. THE TECHNIQUE OF URETERIC CATHETERIZATION. DIFFICULTIES OF URETERIC CATHETERIZATION. DANGERS OF URETERIC CATHETERIZATION	PAGES - - - - 312-333
--	--------------------------

*CHAPTER XXI*

## STONE IN THE URETER

DIAGNOSIS: RADIOLOGY; URETERIC MEATOSCOPY; URETERIC CATHETERIZATION; UROGRAPHY. TREATMENT: TECHNIQUE OF VARIOUS PROCEDURES. CALCULOUS ANURIA. SULPHONAMIDE ANURIA. RENAL COLIC	- - - - 334-363
--	-----------------

*CHAPTER XXII*

## DISEASES OF THE KIDNEY

URETERIC MEATOSCOPY IN RENAL DISEASE: CHANGES IN THE MEATUS; CHANGES IN THE EFFLUX. URETERIC CATHETERIZATION IN DIAGNOSIS OF RENAL DISEASE	- - - - 364-372
--	-----------------

*CHAPTER XXIII*

## CONGENITAL ABNORMALITIES OF THE KIDNEY AND URETER

GENERAL EMBRYOLOGY. MALFORMATIONS OF THE KIDNEY: HORSE-SHOE KIDNEY; UNILATERAL FUSED KIDNEY; ECTOPIC KIDNEY; CONGENITALLY UNDERDEVELOPED KIDNEYS; ABSENCE OF BOTH KIDNEYS; THE SUPRARENAL GLAND IN CONGENITAL UNDERDEVELOPMENT OF THE KIDNEY; SUPERNUMERARY KIDNEY. CONGENITAL MALFORMATIONS AND DISPLACEMENTS OF THE URETER: ASSOCIATED WITH A MISPLACED KIDNEY; DUPLICATION AND BIFIDITY OF THE URETER; ERRORS OF IMPLANTATION OF THE URETER	- - - - 373-417
--	-----------------

*CHAPTER XXIV*

## RENAL FUNCTION TESTS

EXCRETION TESTS: THE UREA-CONCENTRATION TEST; DYE OR COLOUR TESTS—INDIGO-CARMINE TEST, PHENOLSULPHONE-PHTHALEIN TEST; EXCRETION UROGRAPHY. RETENTION TEST: THE BLOOD-UREA TEST. VALUE OF SEPARATE RENAL FUNCTION TESTS	- - - - 418-430
--	-----------------

## COLOURED PLATES

PLATE	FACING PAGE
I.—THE NORMAL BLADDER - - - - -	68
II.—THE NORMAL URETER - - - - -	72
III.—SIMPLE CYSTITIS - - - - -	80
IV.—TUBERCULOSIS OF THE BLADDER - - - - -	122
V.—RENAL TUBERCULOSIS - - - - -	128
VI.—MISCELLANEOUS BLADDER CONDITIONS - - - - -	152
VII.—BENIGN TUMOURS OF THE BLADDER - - - - -	172
VIII.—MALIGNANT GROWTHS OF THE BLADDER - - - - -	180
IX.—THREE PAPILLOMATOUS URETERS - - - - -	192
X.—PERURETHRAL TREATMENT OF VESICAL PAPILLOMA - - - - -	202
XI.—VESICAL CALCULI - - - - -	222
XII.—PROSTATIC HYPERTROPHY. URETEROCELE. PYONEPHROSIS	272
XIII.—STONES DESCENDING THE URETER. FOREIGN BODIES IN THE BLADDER - - - - -	338
XIV.—THE URETER IN VARIOUS CONDITIONS - - - - -	368
XV.—HYDRONEPHROSIS - - - - -	448

## UROGRAPHY

## CHAPTER XXV

## INSTRUMENTAL PYELOGRAPHY AND URETEROGRAPHY

DATA SUPPLIED BY PYELOGRAPHY. TECHNIQUE OF ASCENDING UROGRAPHY. THE NORMAL RENAL PELVIS. MOVABLE KIDNEY. HYDRONEPHROSIS. HYDRO-URETER. CONGENITAL DILATATION OF THE URETER (MEGALO-URETER). SIMPLE INFLAMMATORY CHANGES IN THE KIDNEY; CARBUNCLE OF THE KIDNEY. POLYCYSTIC KIDNEY. RENAL TUMOURS (PARENCHYMAL AND PELVIC). RENAL CALCULUS	PAGES
- - - - -	433-482

## CHAPTER XXVI

## PELVIC RESORPTION

PYELOVENOUS BACKFLOW: HISTORICAL; ANATOMY; METHODS OF STUDY. OTHER ROUTES OF RESORPTION. PRACTICAL APPLICATION	
- - - - -	483-497

## CHAPTER XXVII

## EXCRETION UROGRAPHY

HISTORICAL. AVAILABLE DRUGS. TECHNIQUE OF INJECTION. FATE OF THE DRUG IN THE BODY. RADIOLOGICAL RESULTS. PHYSIOLOGY OF THE URINARY TRACT. INDICATIONS FOR AND CONTRA-INDICATIONS TO EXCRETION UROGRAPHY. APPRAISEMENT. RENAL FUNCTION TESTING. EXCRETION UROGRAPHY IN SPECIAL CONDITIONS	
- - - - -	498-523

## CHAPTER XXVIII

## PYELOSCOPY. CINEMATOGRAPHIC PYELOGRAPHY

PYELOSCOPY: TECHNIQUE; ADVANTAGES AND DISADVANTAGES. CINEMATOGRAPHIC PYELOGRAPHY	
- - - - -	524-528

## APPENDIX

PYURIA, THREE-GLASS TEST. HÆMATURIA. FREQUENCY OF MICTURITION	
- - - - -	529-534

## INDEX

# CYSTOSCOPY

## CHAPTER I

### HISTORICAL

“EVEN from earliest times clinicians have been dissatisfied with the simple examination of the body surface, and have been ambitious to inspect those hollow viscera which are accessible. For this purpose special instruments became necessary. To the ancient Hebrews the use of vaginal specula was known, whilst expanding rectal specula were amongst the surgical instruments discovered in Pompeii. Nevertheless, for a long time such examinations remained limited to cavities communicating with the exterior of the body by wide orifices, such as the mouth, vagina, and rectum. In no case does one find any reference to an attempt to inspect deep-lying cavities like the bladder until comparatively modern times.”\*

The first attempts at the illumination of the bladder date back as far as 1804, when Bozzini (1773–1809), of Frankfurt, constructed a long tube which he passed down the urethra. The extravesimal end of this tube fitted on to a box containing a candle as a source of illumination. At the back of the box the observer's eye was placed, and a partition was so arranged as to shade the light of the candle from his eye. Such was the first primitive cystoscope (*Fig. 1*).

In 1826 Segalas (1792–1875) introduced a cysto-urethral speculum which received little attention, but a more successful attempt was made by Désormeaux, a French surgeon, who is sometimes referred to as ‘the father of cystoscopy’. In 1853 he demonstrated his ‘endoscope’ to the Parisian Academy, and in 1865 published his work,



*Fig. 1.—*  
Bozzini's cystoscope.  
(Redrawn from the original.)

\* Free translation from Nitze's *Lehrbuch der Kystoskopie*, 2nd ed., Berlin, 1907.

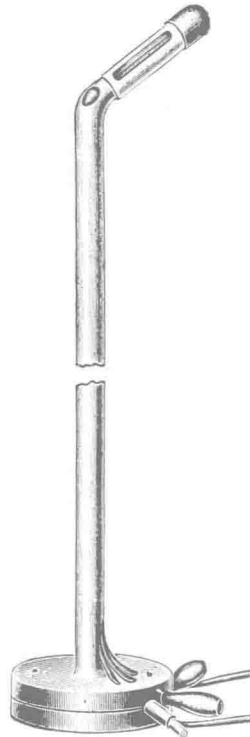
*De l'Endoscopie et de ses Applications au Diagnostic et au Traitement des Affections de l'Urèthre et de la Vessie.*

The instrument made by Désormeaux (1815—82) was more complicated than its predecessors. Its source of light was a gas lamp, and the rays from this, collected by a lens, were reflected by a plain mirror into an endoscopic tube which passed into the urethra and bladder. The observer's eye was placed behind a hole in the mirror. It had, in fact, many points in common with our modern anterior urethroscope. The limitations of this instrument are obvious. The light could never be adequate to give a decent picture of the vesical wall; and even if such a picture could be obtained, only a small portion of the fundus of the bladder could be brought into view. Various other investigators, however, thought it worth while to use and develop Désormeaux's 'endoscope'. Their efforts were directed mainly to the improvement of the illumination. Thus Cruise, of Dublin, and Furstenheim, of Berlin, substituted petroleum for the gas, whilst Stein adopted magnesium wire. In all cases, however, they followed Bozzini and Désormeaux in that they relied on an external source of light reflected down an endoscopic tube. Their results were necessarily poor, and their instruments did not come into general use. One investigator, however, showed originality. Bruck in 1867 attempted to illuminate the bladder by placing in the rectum a lamp containing platinum wire, which he rendered incandescent by means of an electric current, and around which he ran a current of water to avoid burning the rectal mucosa. This he used in combination with a urethral endoscopic tube, hoping by transillumination to obtain sufficient light to investigate the condition of the bladder. His method also was a failure. In these days of superior instruments it is interesting to look back sympathetically at the primitive attempts of these pioneers, and to realize how keenly they felt the necessity of obtaining a view, however imperfect, of the interior of the viscus.

Matters stood thus in 1876 when Nitze (1848—1906) took up the problem. His work culminated in the invention of a cystoscope which in its essentials is the instrument in use to-day. From the commencement he foresaw that no advance was possible so long as external illumination was used, and that a light must be carried into the bladder itself exactly "as one takes a lamp into a room in order to light it". At that time, of course, the Edison lamp had not been invented and Nitze had to devise a lamp himself. After many experiments he selected platinum wire rendered incandescent by the electric current as the most suitable source of illumination. It occupied little room, and was thus easily introduced into the bladder on the end of the cystoscope. By it a clear and strong white light

could be obtained. Against these advantages was to be placed the fact that it generated intense heat, which would prohibit its use if it could not be controlled. At first Nitze tried to cool the lamp with a current of air, but this proved unsatisfactory; later he had resort to water-cooling. Two tubes ran throughout the length of the instrument and served to carry water to the beak where the lamp was situated (*Fig. 2*). This method, though clumsy, proved fairly efficient. Nevertheless, the lamp remained the chief source of difficulty right up to the time when the Edison lamp was invented and adopted for use with the cystoscope. Nitze was constantly working to improve his lamp and his methods of cooling it. The one which he ultimately devised was contained in a metal case whose window was made of a piece of thinly scraped goose quill. Inside this there was a glass bulb containing the platinum, and between the glass and the goose quill water circulated to cool the lamp. This remarkable lamp, says Nitze, was wonderfully efficient and durable, though the platinum wire frequently fused at the critical moment.

It was of little value to have introduced a light into the bladder if a larger part of the vesical wall could not be brought into view, for hitherto only that portion of the viscus which lies directly opposite the end of the tube could be seen (*see Fig. 14*). The examination would therefore have to be limited to a portion of the fundus and trigone of the bladder. The solution of this problem came suddenly one day when Nitze was doing some microscopical work in Dresden. Whilst changing the eye-piece of a microscope he held it up to the window to see if it was clean, and through it received the small inverted image of a neighbouring church tower. The problem was solved. With the assistance of a Dresden instrument maker he worked out a lens system which he introduced into the interior of his cystoscope. This had the effect of increasing the field of vision and of bringing the object closer to the eye of the observer. Even so, only that portion of the bladder lying opposite the internal meatus could be inspected. The instrument was, in fact, a direct cystoscope.



*Fig. 2.*—Nitze's first cystoscope. Optical system terminal. Platinum filament lamp. Note water-cooling system. (*Redrawn from the original.*)



The next stage consisted in the introduction of a prism at the end of the shaft. One aspect of the prism looked out through a window cut in the side of the tube and its hypotenuse acted as a mirror to reflect the beams down the tube. By this means a mirror picture of the whole of the bladder wall was obtained. In order to make it as perfect as possible Nitze left Dresden for Vienna, where he collaborated with the well-known surgical instrument maker, Leiter. The first models produced in that city are known as the Nitze-Leiter cystoscopes. In 1879 he demonstrated his inventions to the Vienna Medical Society, where they received much approbation. However, the clumsiness of the lighting system and its water-cooling apparatus prevented the instrument from coming into common use, even amongst the specialists of the day.

The following year, 1880, saw the appearance of the Edison lamp. Nitze was somewhat shy of it in the first instance and, according to Casper, thought it might explode in the bladder. The honour of being the first to have a cystoscope fitted with a 'Mignon lamp' belongs to von Dittel, who had one made by Leiter. But he had to wait until 1886 before it was found possible to construct a lamp sufficiently small and delicate for his purpose. When Nitze saw it in use his fears disappeared and he realized that therein lay the salvation of his instrument. Then the complicated platinum wire with its water-cooling apparatus disappeared, and the cool carbon-filament lamp solved the last and greatest of Nitze's difficulties. The instrument thus completed was the same in principle as the one we use to-day; details have been altered and improved, and additions have been made to it, such as irrigating parts, provision for ureteral catheterization and intravesical operating, etc., but the fundamentals of the optical and lighting apparatus remain.

Thereafter the number of practitioners of cystoscopy rapidly grew, many of them anxious to add to the new diagnostic method. Nitze himself participated fully in the subsequent progress and improvement of his instrument and its equipment, and was responsible for the invention of many of the accessories, such as operating parts, hot wire snares, modifications of ureteric catheters, and the like.