One year's statistics of lithotomy operations performed in the Hyderabad Civil Hospital, Sind, India / by B.C. Keelan.

With the author's Compliments

ONE YEAR'S STATISTICS

OF

LITHOTOMY OPERATIONS

PERFORMED IN THE

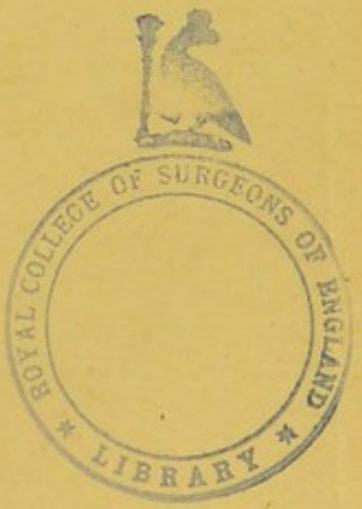
HYDERABAD CIVIL HOSPITAL, SIND, INDIA.

BY

SURGEON-MAJOR B. C. KEELAN,

INDIAN MEDICAL DEPARTMENT, CIVIL SURGEON AND SUPERINTENDENT OF THE MEDICAL SCHOOL, HYDERABAD, SIND.

"Non timeo, sed caveo."



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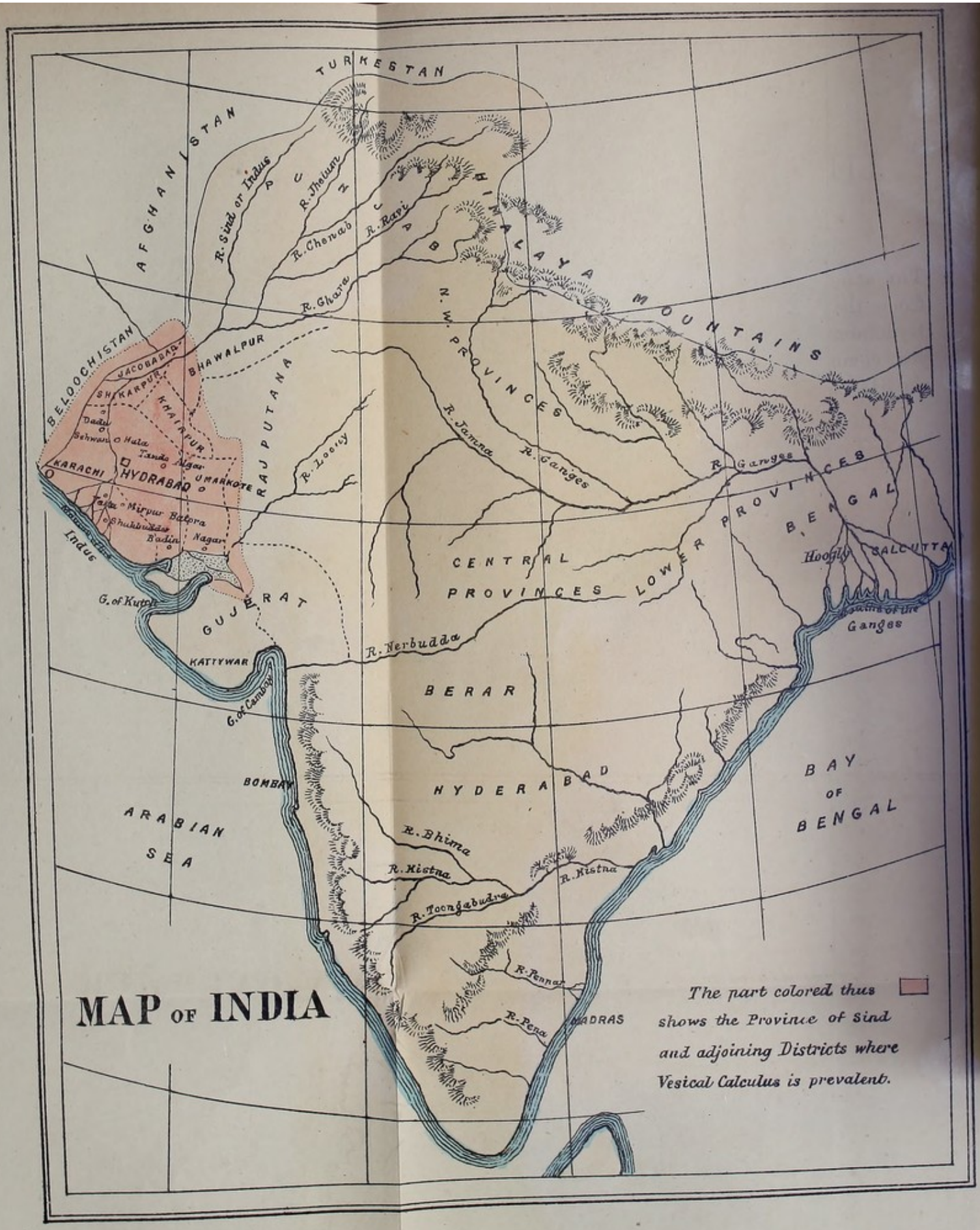

MAP OF INDIA

The part colored thus ▭ *shows the Province of Sind and adjoining Districts where Vesical Calculus is prevalent.*

LITHOTOMY OPERATIONS.

THE annexed table gives a summary which is taken from the Monthly Returns of the Civil Hospital, Hyderabad, Sind, of operations for lithotomy for one year commencing from the 1st June 1886 and ending the 31st May 1887, giving a total of 188 cases.

A Tabular Statement showing the number of Cases operated upon, with results, &c., &c.

Age in Quinquennial periods.	Number of cases operated on.	Results.		Average number of days in hospital.	Average duration of illness in months.	Weight of stones corresponding to the different ages of persons operated on, arranged quinquennially.
		Cured.	Died.			
1 to 5	45	45	...	15	10	ʒi., ʒii., ʒii., ʒi., ʒi., ʒiss. ʒi., ʒiiss., ʒii. ℈i., ʒii., ℥iss., ʒii., ʒv., ʒi., ʒii., ʒii., ʒiss., ʒii., ʒi., ℈ii., ʒiss., ʒi., ʒi., ʒii., ʒii., ʒii., ʒss., ʒi., ʒiss., ʒiss., ʒiii., ʒi., ʒss., ʒss., ℈i., ʒii., ʒss., ʒiiss., ʒii., ʒiiss., ʒss., ℈i., ʒiss., ʒii., ʒiiss., ʒiss.
6 to 10	33	33	...	17	18	ʒv., ʒiii., ʒv., ʒiii. ℈ii., ʒii., ʒii., ℈ii., ʒii. ℈ss., ʒii., ʒiss., ʒii., ʒv., ʒiii., ʒii., ℥i., ℥iss., ʒivss., ʒiii., ʒiiss., ʒii., ʒii., ʒvi., ʒiv., ʒi., ʒiii., ʒss., ʒvi., ʒii., ʒiii., ʒvi., ℥ss., ʒii., ʒiii.
11 to 15	9	9	...	17	20	ʒi. gr. x., ℥i. ʒvi., ʒiiss., ʒiv., ʒiv., ʒv., ℥ii., ʒv., ʒvi., ʒi.
16 to 20	10	10	...	20	24	℥i. ℈ii., ʒv., ʒi. ℈i., ℥ii., ℥ss., ʒii., ℈ii., ʒii. ʒiv., ʒiv.

Age in Quinquennial periods.	Number of cases operated on.	Result.		Average number of days in hospital.	Average duration of illness in months.	Weight of stones corresponding to the different ages of persons operated on, arranged quinquennially.
		Cured.	Died.			
21 to 25	8	8	...	22	24	ʒvi., ℥i. ʒi. ℈ii., ʒvi., ʒvi., ʒiii., ʒiv., ℥i., ℥iss.
26 to 30	10	9	1	26	28	ʒii. ℥v., ʒii., ℥i., ℥iiss., ℥i. ʒvi., ʒiv. ℥ivss., ℥i., ʒiv.
31 to 35	10	10	...	26	28	℥i. ℈ii., ʒv., ℥v., ʒiss., ℥i. ʒii., ʒii., ℥ii., ʒii., ʒiii., ʒii., ℥i.
36 to 40	13	13	...	28	30	℥i., ʒii., ℈ii., ʒiii., ℥i., ʒi., ʒiv., ʒiss., ℥ii., ℥i., ʒvii., ʒvi., ʒii., ʒv., ℥iss.
41 to 45	13	12	1	28	30	ʒvii., ℥iv. ʒvss., ℥ivss., ℥i., ℥i. ʒii., ℥i., ℥i., ʒvii., ℥iss., ʒii., ℥ii., ℥iii., ʒii.
46 to 50	24	22	2	30	36	℥i., ʒiii., ʒv., ℥v., ℥i., ʒii., ℥i. ʒi., ʒvii. gr. iv., ℥i., ʒiv., ℥i., ʒii., ℥i., ʒvi., ℥iv., ℥i., ℥i., ʒii., ʒvi., ℥xiv., ℥i., ℥iss., ℥ii., ℥ii., ℥iss., ℥iiiss.
51 to 55	2	1	1	30	38	℥iii., ℥i.
56 to 60	9	8	1	30	38	ʒiv., ℥i., ℥ii. ʒii., ℥iv. ℈ii., ʒi. ℈ii., ℥iss., ℥ivss., ℥ii., ℥i.
61 to 65	1	...	1	30	36	℥i.
66 to 70	1	...	1	30	36	℥ii.
TOTAL.....	188	180	8			

The patients operated upon were all healthy as far as I could ascertain. Old and weak men were not operated upon, nor were persons whom I had reason to suppose were suffering from any organic disease. The operations on moderately aged men were not

objected to by myself, provided always in those cases there was no constitutional affection or bodily infirmity discernible. Many old and feeble cases were, much against their will, sent to their homes without being operated upon, with instructions, however, for treating urgent symptoms both medicinally and dietetically.

It will be seen that there was no death among 105 persons operated upon under the age of 25 years; from 26 to 70 years there were 83 cases operated upon, with 8 deaths.

Of the 188 cases operated upon during the year under review, 163 were Mussalmans and 25 were Hindus—181 males and 7 females.

In order to avoid taking up too much room in this paper and to prevent the necessity of having too many tables, I have thought it better to arrange their ages in this table into quinquennial periods. The table will also show the average number of days spent by patients in hospital as well as the average duration of the growth of the calculi, arranged in quinquennial periods, to suit the ages of persons operated upon, which are also similarly arranged.

The weights of the stones are also shown in the same table in order to obviate the necessity of having a separate form for them.

The above statistics will show that stone is more prevalent in this Province in children of from 1 to 10 years of age and in adults from 30 to 50 years than at any other period of life. Very large calculi are only to be found late in life in persons whose ages vary from 45 to 70 years. One of the means of diagnos-

ing whether the calculus is a very large one is by asking the patient how long he has been suffering from symptoms of stone in the bladder. If his troubles arising from this source are asserted by the patient to be of 8 or 9 years' standing, then generally a fair estimate can be made of the size of the stone; and if the symptoms are accompanied by intense pain and straining with bloody urine, the probabilities are that the stone is rough.

The admissions are from various parts of the Province of Sind, including the Thar and Parkar Districts, and also from the western parts of Gujerat and Rajputana, Kutch, Beloochistan, and the lower part of Afghanistan; and I may say that every patient suffering from stone in the bladder who comes to the Civil Hospital of Hyderabad (Sind) for treatment is generally accompanied by one or two or three of his relatives and friends, who devote their time to attending upon him in one of the stone wards until he is quite cured after operation. I have also observed that stone cases very rarely come singly, but in parties of two or three companions in affliction; so it can be easily imagined that this hospital is often crowded to excess. When a batch of stone cases come with their relations they are treated for a day or two, and all are operated upon, one after another, on the same day, as the persons who come in a party are all anxious to leave in each other's companionship. Owing to this rule in the Civil Hospital, Hyderabad, I have often to operate upon four individuals one after the other and on one and the same day. This, of course, necessitates the employment of a very large staff of attendants for


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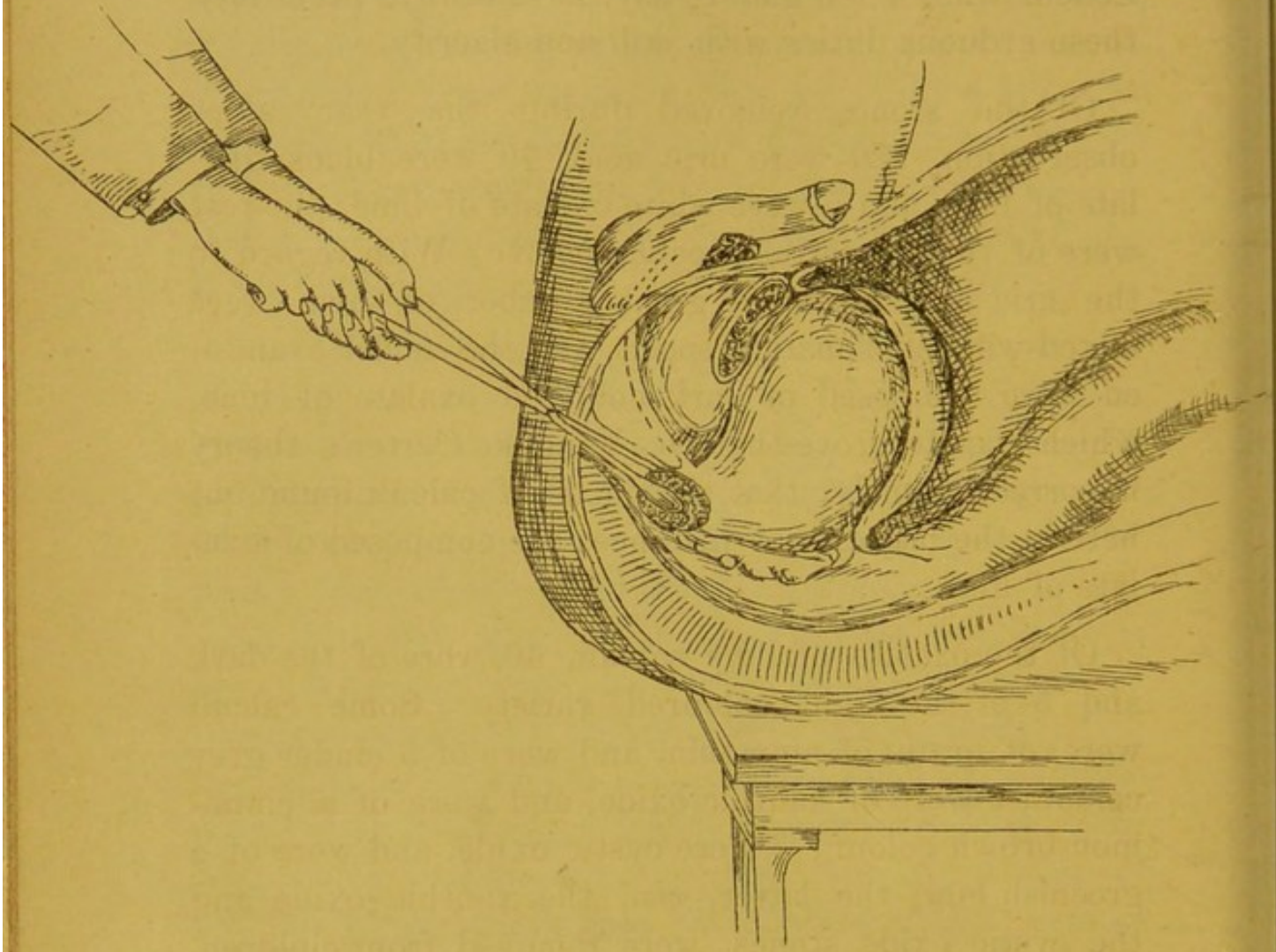

Showing the direction (viz: upwards and forwards)
in which a large stone should be drawn
out of the bladder.

the after treatment of the patients, and that service falls partly on the students of the Hyderabad Medical School who, I am glad to say, have always performed these arduous duties with skill and alacrity.

Of the stones removed during the year under observation, 120 were uric acid, 40 were black oxalate of lime, and 5 were white oxalate of lime; the rest were of various sorts, phosphates, &c. With regard to the uric acid calculi a great number of them were mixed with phosphatic deposit, and the nuclei examined were composed of dark coloured oxalate of lime, which goes to prove that Dr. Vandyke Carter's theory is correct, namely, that the nuclei of calculi found out here in the majority of instances are composed of oxalate of lime.

Of the oxalate of lime calculi, 40 were of the dark and 5 of the light coloured variety. Some calculi were of urate of ammonia, and were of a cinder grey colour; 2 were of xanthic oxide, and were of a cinnamon brown colour; 3 were cystic oxide, and were of a greenish hue; the latter, *viz.*, the xanthic oxide and the cystic oxide stones, were removed from children. Many of the phosphatic calculi were fetid and ammoniacal.

One of the calculi was covered with some substance which presented a considerable lustre. After some months this outer layer cracked and became very closely adherent to the stone, which was of a dark mahogany colour. This calculus appears to me to be the uro-steolith calculus described by Moore in the *Dublin Quarterly Journal* of 1854.

One of the calculi appeared to me to be similar to that which I have seen described in books as triple phosphate calculus or ammonio-magnesian phosphate.

One of the stones which were removed weighed 14 ounces; its outer covering was of uric acid and internally it was made up partly of phosphates, and consequently there was not much difficulty in breaking it up in the bladder. It was broken into 40 fragments, which were easily removed in 20 minutes. This large stone, now having been cemented together, forms the centrepiece of my collection of over 1,000 stones, which are all exposed for public view in the Hyderabad Medical School Museum, thus presenting quite an imposing spectacle and a wide field of investigation for persons skilled in the knowledge of human calculi. This collection is increasing daily, and I believe that after the lapse of five years more the number will not be less than 2,000.

These stones are all removed by means of the lateral method of lithotomy, with the exception of the very large ones, which require the bilateral operation for their removal, and the results, I may venture to state, speak well for that operation. Lithotrity in this hospital is only undertaken when the stone is small and soft, and can be crushed at one sitting. I may here mention generally that if a hard stone, weighing 2 or 3 ounces, is unfortunately crushed in the bladder of a human being and the fragments not removed in one sitting, which, to my mind, is next to impossible, the patient is not only worse off than he was before


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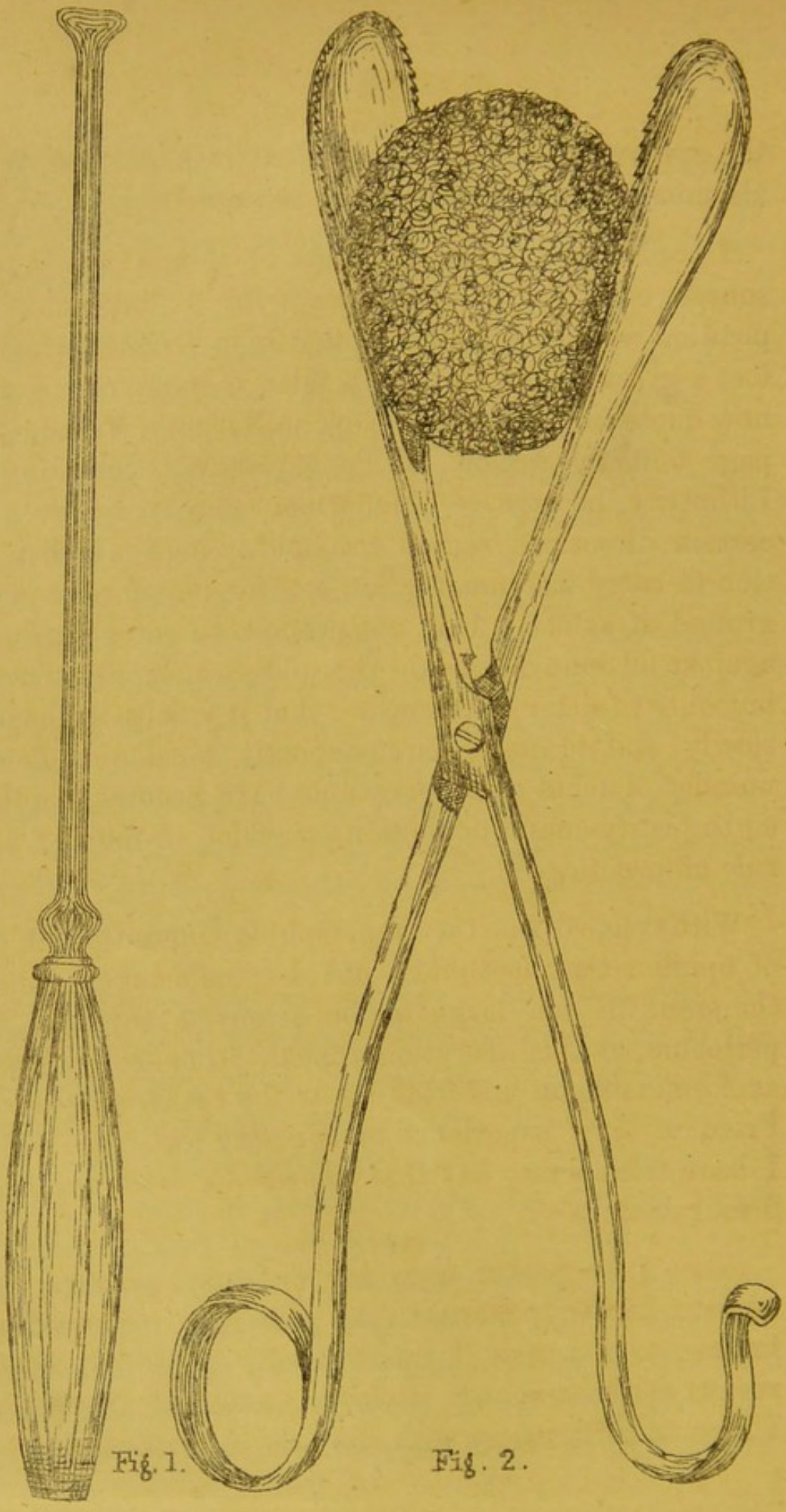

Fig. 1. Fig. 2.

Fig. 1 Probang for pushing stone in Fig. 2 to its proper position.

the operation, but in two cases out of three the most alarming consequences may be the result.

I need not say that this state of things would be a source of great embarrassment to a Surgeon; his position would be similar to that of a General who had lost a great battle through a false manœuvre. I will now quote from that great book on Surgery, Volume II., page 656, by Agnew, of Pennsylvania. Speaking of Lithotrity, he says:—"Modern surgery is, I think, in certain directions rather too bold; there is a disposition to carry instrumentation a little beyond the solid ground of safety. I do not propose to enter a protest against all innovations on the old usages of our art, but only to utter the caution that it is wise to hasten slowly and to move circumspectly until a sufficient number of facts or observations have been accumulated to justify sound deduction on which to found a safe rule of practice."

With regard to the supra-pubic operation, I am of opinion that it should not be undertaken unless the stone be too large to be removed through the perineum, as this operation appears to me to be nearly as formidable an undertaking as the Cæsarian section. From my own experience of the very few cases which I have tried I may say that the results were far from favourable.

Were I to depart from my ordinary practice and perform lithotrity oftener than I do now, it is needless for me to say that I could hardly hope for similar results to those shown in the beginning of this paper. I have tried lithotrity with the best instruments which

could be procured from London, but was obliged to abandon the operation in favour of lithotomy (except in instances when the size and structure of the stone permitted of its removal in one sitting) owing to the former operation having been attended by more fatal consequences; and it was very fortunate that I did so, for this hospital, under no other system, would, I feel convinced, have earned the confidence it now enjoys in this remote part of Her Majesty's dominions.

There is a striking contrast between the number of patients operated on for stone in the bladder in the Civil Hospital and that treated in the London hospitals.

These statistics will show that the patients admitted under this head in Hyderabad during one year were 188—a number which can hardly be exceeded by the total annual admissions of persons suffering from calculi in the bladder in twelve of the largest hospitals in the Metropolis.

The natives here affect to be so knowing that they can hardly be persuaded to undergo any operation for stone but that of lithotomy, which they are accustomed to, and which has justly won their confidence. They call for the stone after the operation, and if it is broken they consider this a bad omen, and another operation, in a year or two hence, to be a necessity—a surmise which very often proves unfortunately only too true, and they look for the same reason on lithotrity as only a half measure, which must be repeated as often as necessary, and in this I quite agree with them—not that I am against litho-

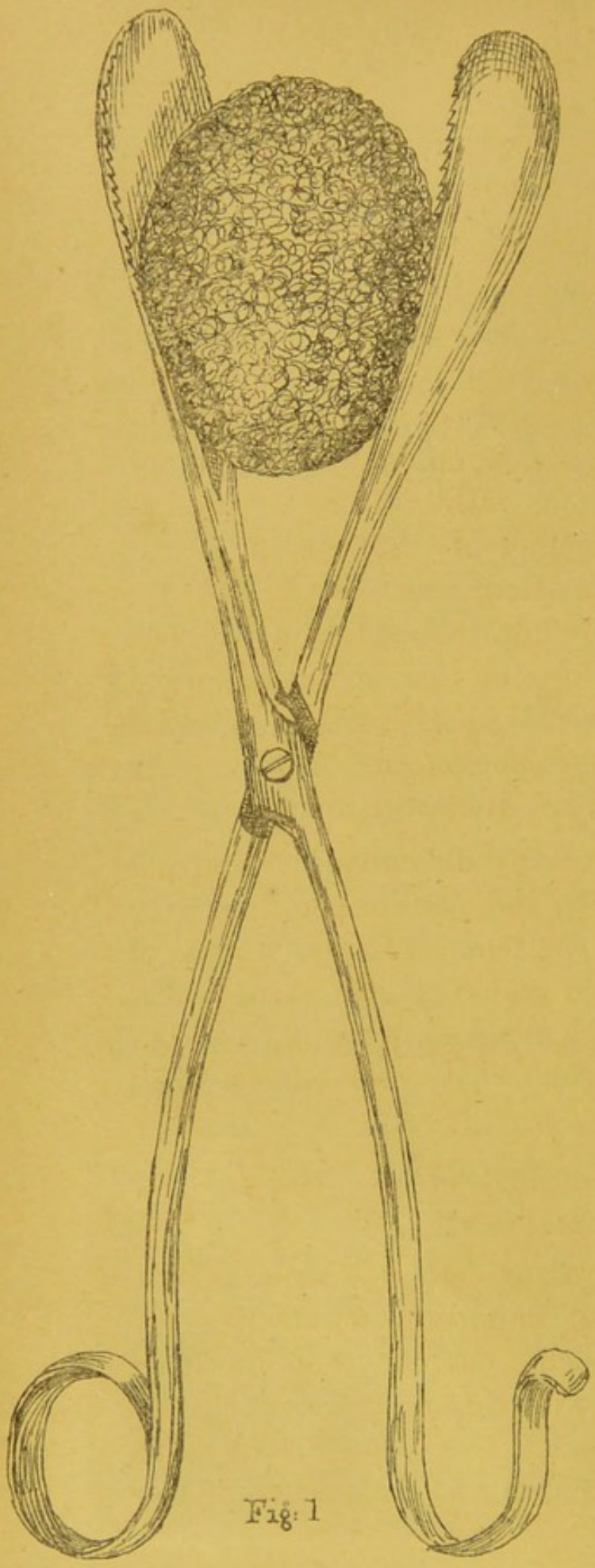

Fig. 1

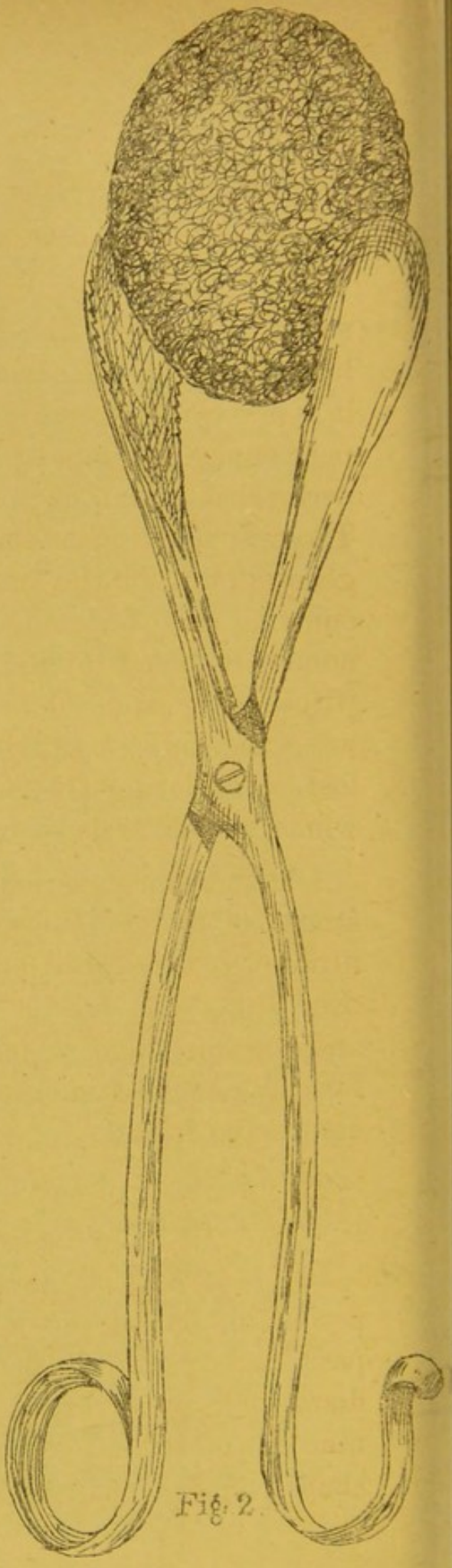

Fig. 2

Fig. 1. How not to grasp the stone.

Fig 2. How to grasp the stone.

trity when undertaken to crush small stones or when the *débris* can be removed in one sitting.

The only means I know of ascertaining the exact size of a stone in the bladder is by introducing the lithotrite and measuring it between the blades. If it is a very large one—too large to pass through the perineum—the supra-pubic operation should then be performed after the method adopted by Sir Henry Thompson, the most eminent authority of the present generation. In the beginning of 1886, when I was enjoying my furlough in Bournemouth, I had the honour of being invited by him to London in order to witness his mode of performing this operation, and I was much impressed with the small amount of blood lost, considering the magnitude of the operation, in which he was assisted by Mr. Buxton Browne.

I have never experienced any difficulty in removing stones of under 4½ ozs. by the lateral operations for lithotomy through the perineum. Large stones of over 6 ozs. can be felt through the abdominal walls, and the soft stone which I removed, weighing 14 ozs., formed a small tumour, somewhat resembling a small contracted uterus.

A New and Improved Mode of operating on large-sized Stones.

In removing a large-sized stone through the perineum, one of the most important points to compass is to seize it in such a manner that its long diameter may correspond with that of the wound as in nine out of ten cases the calculus has an oblong oval shape. This must be ascertained by means of the

forefinger of the left hand, and if the stone is grasped crossways in the blades of the forceps, it must be dropped and seized again and the long diameter of the stone should be thoroughly ascertained and worked round with the finger until the desirable position is attained. It is sometimes exceedingly difficult to let go the stone from the blades of the forceps owing to the spasmodic contraction of the bladder; but this difficulty is easily overcome by means of a probang, as shown in the drawing, which I have invented and which has been in use in the Hyderabad Civil Hospital for the past seven years. This probang is passed through the wound by the side of the forceps until the stone is reached. The blades of the forceps having been then relaxed, the stone can be easily pushed from between them and the narrow part of the stone brought down towards the wound. The next most important matter to dwell upon is the order in which traction is to be effected, and this must be done in the direction of the lower outlet of the pelvis. Now, this direction from the position of the patient, placed as he is in the position for lithotomy on an operating table, is upwards and forwards, and in order to remove the stone in this direction (it being absolutely impossible to do so when the operator is standing in front of the perineum), the operator must stand upon a chair so as to get well above the breech. This gives him a complete command over his forceps. The stone should not be removed roughly or with any great degree of force. The parts should be cut and not torn; when the stone has been drawn into the wound, which is made to correspond with the size of the calculus, the fore-


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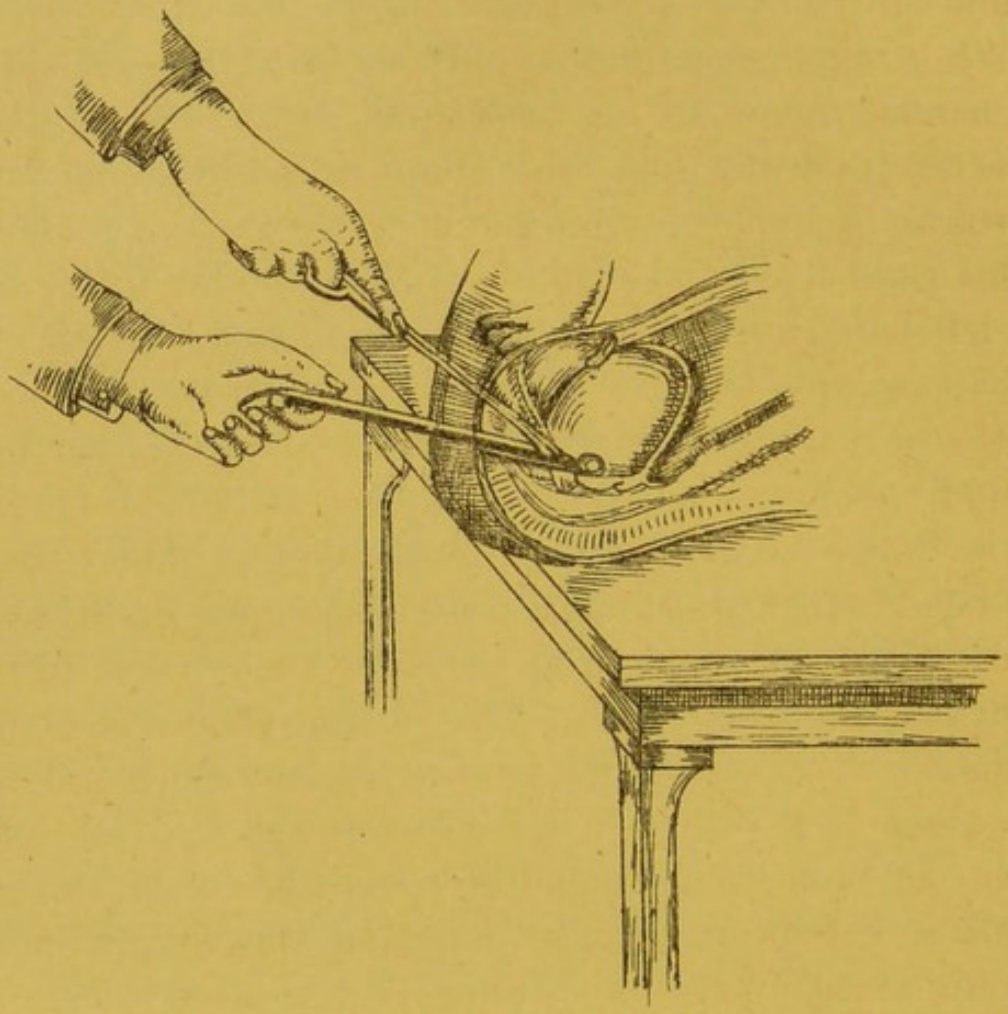

Plate to illustrate mode of using forceps and director in removing small stones in children under 5 years of age.

finger of the right hand should be passed round the stone so as to ascertain where the tension of the soft parts produced by the pressure of the stone against them is greatest. This is what has to be incised and it can be easily felt by the finger.

While exploring for this purpose, the forceps should be handed over to an assistant, who should be directed to draw upon the stone in a direction upwards and forwards, while the operator takes a scalpel in his right hand and explores with the index finger of his left hand, cutting freely and cautiously any bands of soft tissue which may be found obstructing the passage of the stone. This method of enlarging the wound should be adopted as often as any necessity is observed for so doing. The forceps having been now taken from the hands of the assistant, the stone should be pulled upwards and forwards, and at the same time rocked from right to left and *vice versâ*. This rocking should be done to the extent of one-fourth of a circle, not more, unless the stone goes round itself either to the right or left side. In this case it should be permitted to do so, as it is a sure indication of its entering the wound in a favourable diameter. Soon after the operation is begun the lower portion of the neck of the bladder will be found to give way, after which there is not much difficulty in removing the stone, provided always that the soft parts be cut when they obstruct the passage of the stone. If the calculus does not come after a moderate traction accompanied by the lateral motion above described, the forefinger of the left hand is again passed into the wound, which is searched in all directions, and those soft parts which are put upon the stretch by

the pressure of the stone are incised cautiously in as many places as the circumstances will demand. It does not make much difference whether the obstructions be above, below, or to the right or left side; the tuber ischii, however, must be avoided, as the pudic artery runs under cover of it. The other arteries are so small that they hardly deserve much attention, as nearly all must be severed in removing a large stone through the perineum. Then, on again taking the forceps from the hands of the assistant, the narrow side of the stone should be seized, just sufficiently far from the edge to prevent the blades from slipping. To render this easy, the probang should be passed through the wound and the stone gently tapped or pushed with it a few times while the forceps are slightly relaxed. It is not a good practice to enclose the stone completely within the blades. The calculus is again gently pulled or rocked as before. When the stone is small, there is of course no difficulty in its removal. But when it reaches from $2\frac{1}{2}$ to 5 ozs., then I find its successful removal can only be accomplished by attending to the above remarks.

When a stone is large and round it cannot usually be removed by an ordinary stone forceps owing to its liability to slip away from the grasp of the blades. To obviate this, I use a forceps as shown in the accompanying drawing. It will be observed that the blades are bent near their extremities to meet at an acute angle.

A stone seldom slips from a forceps made in this way.


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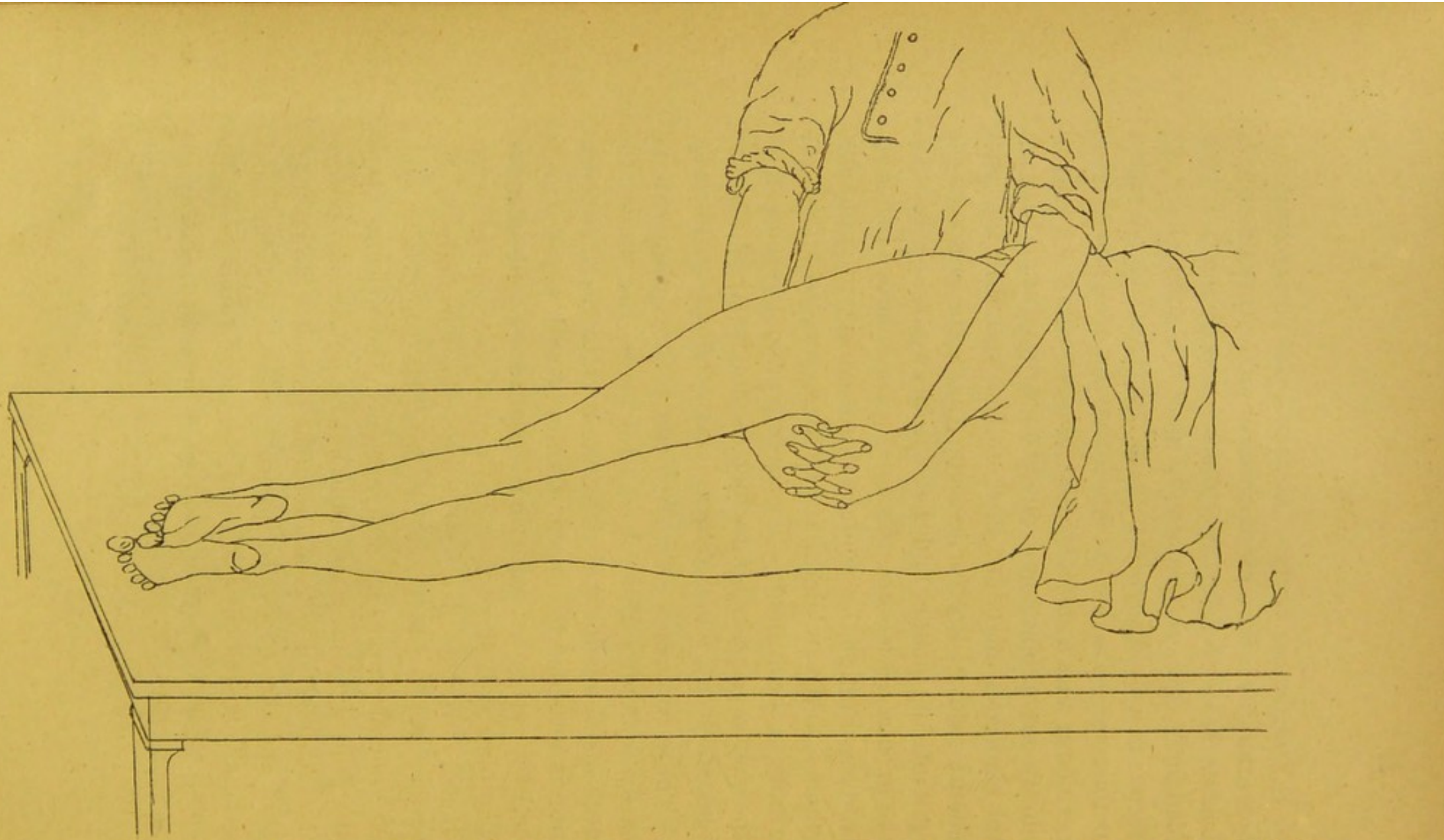

An improved and successful mode of arresting haemorrhage after the operation of lateral Lithotomy, by a pad of carbolized tow combined with palmar pressure, as practiced in the Hyderabad Hospital.

The process is so simple that it can be carried out by ordinary ward-servants

A New Operation for Children.—In performing the operation for lithotomy on children under 5 years of age, I never have occasion to introduce my finger into the bladder—a proceeding which I consider somewhat dangerous in a child so young. I perform such an operation as follows:—The usual opening having been made in the perineum with a small scalpel and carried on by a small blunt pointed bistoury in the groove of the staff, to reach the bladder I introduce through the wound in the perineum a grooved director, passing it along the groove of the staff into the bladder and then withdrawing the staff. On the groove of the director now in the bladder I then introduce through the wound a very small pointed forceps, which is much smaller than the finger and made to fit the groove in the director. The forceps cannot possibly miss the bladder, on reaching which the blades are opened to seize the stone, which can be done without any difficulty.

The advantages of this mode of operating can be easily understood, as lacerating with the finger the neck of the bladder of so young a child as this operation is intended for might be fraught with some danger or even attended with most alarming consequences. The plate will show how the pointed forceps is introduced into the bladder through the perineum in the groove of the director. In one of the children operated upon there was an obstruction in the urethra about the bulb and the sound could not be got to pass beyond it. An incision was made in the perineum down to the staff and the grooved director pushed into the bladder. This was cut open and the stone removed by the small forceps before alluded to, which I invariably use in such cases.

As regards the operation in children, which is by far the most frequently performed in this hospital, the parents have long since ceased to regard it as a formidable operation. They without the least hesitation bring their children for operation and look on the result as a certainty, namely, that the little patient will be considered convalescent and will be allowed to walk after ten or twelve days, and in the course of another few days will be completely and permanently cured of a most painful and wearing disease. The child to be operated upon is placed sitting in its mother's lap, where chloroform is administered until its little limbs have been somewhat relaxed. In this way the child is not alarmed, as it would be if put upon the operating table at once. The semi-conscious child is then placed upon the operating table and completely put under the influence of chloroform. I need not dwell upon the ordinary method of performing lithotomy in children, as this is fully described in the Text-books.

It is very common for the staff to slip out of the bladder during the time of the operation, especially in young infants, unless the operator happens to possess considerable practice in reaching the bladder. Should an accident of this description occur, I would recommend the withdrawal of the sound and the searching of the bladder by the grooved director through the wound. This manœuvre is very easily performed and the director made to strike against the stone in the bladder. A blunt pointed knife may then be passed along the groove in the director and the bladder incised and the operation gone on with.

The operation in women is a very simple proceeding,

the urethra being short and dilatable. One of the females applied for relief in the eighth month of pregnancy. She was 35 years of age, and on examination it was found that the stone was 2 inches broad and 2½ inches long. The danger of parturition under these circumstances was impressed upon her, as, of course, it was impossible for the child's head to pass down the vagina with such a formidable obstruction as this calculus presented. She was therefore operated upon, and the stone, on being removed, weighed 2½ ozs. During the operation venous hæmorrhage was enormous, but the operation was so speedily performed that the loss of blood was not very great. It was checked at once after the operation by the pressure of a pad in the ordinary way. She made an excellent recovery, and left the hospital in about three weeks from the date of the operation.

There seems to be some apprehension felt abroad in the profession generally that the operation for lithotomy is frequently attended with primary or secondary hæmorrhage; but this complication appears to me to be of rare occurrence, as out of 188 cases under review in the paper, only 4 cases gave any trouble in the after treatment from this cause and the bleeding was arrested by pressing the lips of the wound together and applying a pad, which was pressed firmly over the wound by both hands of a hospital attendant for three hours in each case. In not a single case was it necessary to tie an artery. Directly the stone is removed, a pad, consisting of very fine tow previously steeped in carbolic solution, is placed over the wound, the lips of which having been previously brought together and

pressed there very tightly by a strong man. We have four such hospital attendants belonging to the stone wards who have acquired considerable experience in stopping hæmorrhage by external pressure. To this may be attributed the rare occurrence of hæmorrhage after lithotomy in the Hyderabad Civil Hospital. After the operation an opiate is given, the patient is removed from the operating table, and kept under observation of Mr. Jacob, an exceedingly able hospital assistant in the surgery, throughout the day. This is much safer than taking him to the stone ward immediately, as, if bleeding should occur, he orders external pressure to be continued as above indicated. About an hour after the operation the patient passes urine freely. This appears to give great relief from straining felt by him after the operation. This straining is a fertile cause of hæmorrhage, and generally lasts for an hour or so, when it gradually begins to decline; but it often lasts much longer than this period. When I pay my evening visit, that is about eight hours after the operation, I find generally that patients have little or no straining. They are then removed to the stone ward, where the after treatment is carried out. During this period no tube is passed into the bladder. The old system of the catheter, with the cloth tied round its middle, acts as a foreign body, and is a complete failure. Meddling with the wound during this time should be avoided, as the introduction of a catheter not only acts as a foreign body but also obstructs the free passage of urine, and therefore renders extravasation into the tissues around the neck of the bladder extremely probable. I need not dwell on the danger of this occurrence.

The urine is allowed to trickle through the wound, which is washed three times a day with water containing 2 per cent. of carbolic acid and dressed with carbolic oil, one in forty. Milk, chicken broth, and beef-tea, with rice, are given, sometimes accompanied with corn-flour, arrowroot, &c. If the wound is obstructed by a clot of blood endeavouring to escape from the bladder, a straight silver catheter is passed into the bladder and removed immediately, or the clot may be taken away by a dressing forceps. On the third day after the operation an enema is given, consisting of castor-oil, starch, and laudanum. If there is any pain over the bladder, hot fomentations are applied, accompanied by opiates. If there is fever, diaphoretics and quinine are given. These are common complications. Other complications are treated according to the circumstances of each particular case, and the patient should be watched to see that the urine is regularly voided and the nature of the fluid passed should be examined from time to time. If the urine comes freely, gradually assuming after a few days its natural colour, then it may be surmised that the patient is doing well; if, on the other hand, it is scanty and reddish, with much pain in the hypogastric region, the prognosis is not so favourable. But it must be remembered, however, that sometimes the urine becomes discoloured from clots of blood in the bladder: this must not be looked upon as an unfavourable sign. Should suppression set in, the case may be considered critical and dangerous. In eight or ten days convalescence is shown by the urine beginning to come from the urethra. Complications are so numerous that it would be too lengthy to record them

in this report. Towards the end, when the patient is convalescent after the operation, tonics are given.

A few of these operations have been successfully performed by my able assistants, Drs. Aquino and Bocarro.

Cause of stone.—As regards the cause of stone I will not venture an opinion, for it does not exactly fall within my province to do so. Sufficient light has been thrown on the subject by Drs. Bernard, Pavy, Sir Henry Thompson, and others during the past 20 years or so. However, I think it would hardly be out of place to mention that the natives of this province attribute its prevalence to the use of the muddy water of the river Indus, which they invariably drink. The province of Sind is a network of canals and tanks, derived from this river and its tributaries, and their waters are laden with silt. It is a most extraordinary circumstance that the natives prefer the muddy water of the river Indus as it exists to the water when it is rendered pure and sparkling by filtration and by the addition of a little alum. I do not know why this should be the case, except that they are too lazy to filter it; but that it is so there can be no question, for, it has degenerated into a habit which seems to have been sanctioned by long custom among the inhabitants.

I will now quote from that excellent book, A Manual of Practical Hygiene, by the late Dr. Edmund Parkes, edited by Dr. F. S. B. Francois De Chaumont, of Netley, page 56 :—

"It has long been a popular opinion that drinking lime waters give rise to calculi (calcium phosphate and oxalate). Several medical writers have held the same

opinion, and have adduced individual instances of calculi (? phosphatic) being apparently caused by hard waters and cured by the use of soft or distilled water. On a large scale, statistical evidence is, as far as I know, wanting. The excess of cases of calculi in Norwich and Norfolk generally is not, in Dr. Richardson's opinion, attributable to the water. Dr. J. Murray, of Newcastle, has lately given some evidence to show a connection between the lime waters and calculi, especially phosphatics, but it does not appear to be more convincing than that previously adduced.

"At Canton stone is common, while at Amoy, Shanghai, Ningpo, and other places it is not met with. The cause of the difference is not known, but it is not chalk-water, as the Chinese always drink boiled water.

"Professor Gamgee, however, states that sheep are particularly affected by calculus in the lime-stone districts."

With reference to the foregoing remarks, I will not undertake to say positively that the prevalence of stone in Sind has any connection with the hardness of the water of the river Indus and its branches; however, I may say that I am almost convinced that the evidence is strongly in favour of Professor Gamgee's statement regarding the sheep in the lime districts of England being applicable to the people who inhabit Sind. I may assert, however, that the nucleus in at least seven out of ten cases of those stones which I opened up was found to be oxalate of lime. This is invariably rough on the outside and causes much irritation of the bladder, which is excited to throw out a mucous discharge. A layer of this glutinous material soon covers a small calculus,

in which become embedded any deposits, such as uric acid, &c., which may happen to be in the urine, and which would otherwise probably pass away harmlessly: thus layer after layer surrounds the oxalate of lime nucleus until a stone is formed. Now, can this oxalate of lime nucleus be traced to the hardness of the Indus water? There can be no doubt whatever but that this water contains carbonate of lime. But how this substance becomes converted into oxalate of lime in the human body is a question which I must leave to others to decide.

It appears to me to be worth mentioning also that owing to religious customs among the natives, they are not permitted to pass their urine in any other than in the sitting position. It is very probable, therefore, that as the bladder cannot completely empty itself while a man is in this position that a few drops must remain behind owing to the pressure of the calves of both legs against the urethra. I imagine from this cause also that it is very difficult for a native to pass sediment or minute calculi when the urethra is thus constricted. Perhaps this mode of emptying the bladder might be reckoned as one of the causes of the prevalence of calculi in this country.

Sindhi Hakims.

Hippocrates, more than 400 B.C., alluded in his works to stone in the bladder and the means of its removal, which must have been exceedingly primitive in those days. It is alleged that long before this period the native hakims of India were adepts in operating for stone in the bladder by this method of "cutting

on the gripe." However, whether true or not, this is purely a matter of speculation, there being no written proof as far as I could ascertain. It is a well known fact, however, that during the Kalhora and Talpur dynasties in Sind, and even after the British conquest of the province, that itinerant native doctors, called hakims, operated for lithotomy. Their mode of operating was to introduce one finger into the rectum and feel for the stone through the walls of the bladder, which was hooked down until a tumour could be felt in the perineum, in which a deep incision was made by means of a common razor and the stone removed by pincers. This mode was in olden times called in Europe "cutting on the gripe," which literally means cutting on the grip of the finger.

These hakims are said to have been much respected, and it is alleged that they demanded high fees for removing calculi in this primitive manner. They also professed to possess the power of dissolving calculi in the bladder by means of drugs. Powdered pearls was a favourite remedy with them. These and other precious stones were pounded in presence of their credulous patients, who were charged proportionately for each case, while the wily hakim demurely, but inwardly exulting, pocketed his fees. This favourable reception of the hakim's persuasive powers was rendered more easy by the fact of the natives having been taught from their infancy to look upon these impostors as endowed with profound wisdom together with a supernatural knowledge of surgery and medicine. During these last ten years I have observed that the belief of the natives has been much shaken in regard to the skill of these men

to whom, I am happy to state, the natives no longer trust their lives.

Before ending this paper on lithotomy, I think I may state that what is asserted by myself suggests an allusion to a statement made by one of the foremost and famous Surgeons in London regarding this operation. I quote from page 315 of the British Medical Journal, dated August 14th, 1886, a statement made by Mr. John Eric Erichsen in an address delivered at Brighton at the meeting of the British Medical Association in August last:—

"The lithotomists of the 16th and 17th centuries cut successfully for stone until they were taught anatomy, and then a recognition of the dangers attendant on the operation shook their nerves and they lost their skill."

Now I have shown by these statistics what little danger there is attending upon this operation, and I trust that the true position which lateral lithotomy should hold in surgery may be recognised. My object in writing this paper is to show the fallacy of supposing that lithotrity or supra-pubic operation will ever supersede it. Statistics are stubborn facts, which I am sure will colour the question as to the choice of the operation for removing stone in the bladder. I would like to see other operators on stone publishing the result of their labours, being prepared to discuss the merits of their particular mode of operation, as I am anxious to advance the present knowledge of practical lithotomy, the literature of which, it is to be regretted, has had a checkered and uncertain existence in the present generation for want of reliable statistics.

It is quite true that anatomists have to some extent terrified Surgeons who have had little practical experience of this operation; but any formidable difficulties which demonstrators of anatomy can represent on the dead subject are purely theoretical, artificial, and delusive, and probably fashioned with the scalpel rather with the view to accommodate nature to descriptive prolixity than to describe the tissues of the perineum as they really exist in their entirety in the living body.

I maintain that the *transversus perineii*, long perineal and bulb arteries, are small and insignificant, and have never given me any trouble. The pudic artery is the only large artery in the perineum, and this vessel is protected by the tuber ischii. Of course, in searching out the relative merits of the different operations for removing stone from the bladder, it is necessary to work without prejudice, weighing each operation carefully, for it is only then that the interests of mankind can be fairly attended to.

My thanks are due to my assistant, Dr. Bocarro, for kindly presenting me with the map and plates which are embodied in this paper on lithotomy and which were drawn by him.

Copy of Register of Lithotomy Cases operated upon in the Civil Hospital, Hyderabad (Sind), from 1*st June* 1886 *to* 31*st May* 1887, *copied from the Hospital Register.*

No.	Names.	Caste.	Sex.	Age.	Place of residence.	Results.
1	Suchenoo	Muss ...	M.	50	Hutree	Cured.
2	Tyeb Jado.....	„ ...	M.	40	Nausharo	„
3	Chooto Allahwarayo..	„ ...	M.	8	Sindri	„
4	Allahrakhio	„ ...	M.	6	Moro	„
5	Sangun	„ ...	M.	34	Khipra	„

No.	Names.	Caste.	Sex.	Age.	Place of residence.	Results.
6	Suffar Maorid	Muss....	M.	13	Hala	Cured.
7	Bahajur.....	,, ...	M.	5	Tando Alahyar	,,
8	Gul Mahomed	,, ...	M.	28	Bula Khan's Thana.....	,,
9	Oors Chibhar	,, ...	M.	14	Tharusha	,,
10	Yaroo.....	,, ...	M.	60	Nausharo	,,
11	Abdoola.....	,, ...	M.	25	Khairpur	,,
12	Malhoo	,, ...	M.	8	Matari	,,
13	Hajee Rahamtoola ...	,, ...	M.	50	Mooltan.....	,,
14	Lahnee	Hindoo.	F.	40	Sakrand	,,
15	Doongar	Muss....	M.	5	Tando Bago ...	,,
16	Wassayo	,, ...	M.	3	Kotri	,,
17	Yousoob	,, ...	M.	6	Jerruck.....	,,
18	Mahadoo	,, ...	M.	55	Do.	Died.
19	Sadik Joomono	,, ...	M.	24	Tando Jam. ...	Cured.
20	Bacho Auchar	,, ...	M.	60	Nausharo	Died.
21	Jeeyo Hurroo	Hindoo.	M.	6	Gidu Bunder.	Cured.
22	Kassum Rahimunoo..	Muss ...	M.	48	Matari	,,
23	Kirta	Hindoo	M.	38	Hyderabad, Sind.....	,,
24	Thanwar	,, ...	M.	50	Mehar	,,
25	Mitho Salleh.....	Muss....	M.	40	Hala	,,
26	Gunoo Assoo	Hindoo.	M.	50	Hyderabad, Sind.....	,,
27	Oomer	Muss....	M.	8	Hyderabad, Sind.....	,,
28	Manoo	Hindoo.	M.	60	Gidu Bunder...	,,
29	Mithoo Sadick.....	Muss....	M.	17	Kotri	,,
30	Bhojoo	Hindoo.	M.	11	Tatta	,,
31	Poonya Malleh.....	,, ...	F.	4	Talhar	,,
32	Sewoo Lakoo	,, ...	M.	4	Gidu Bunder...	,,
33	Pario Ibrahim	Muss....	M.	50	Tando Mahomed Khan ...	,,
34	Bachal	,, ...	M.	60	Nausharo	,,
35	Audul.....	,, ...	M.	3	Moro	,,
36	Yousoof Soomar	,, ...	M.	60	Larkana	,,
37	Jeewat Laloo	Hindoo.	M.	3	Tando Bago ...	,,
38	Sadik Goolloo	Muss....	M.	40	Do. ...	,,
39	Allahwarayo	,, ...	M.	50	Do. ...	,,
40	Bacho Karim	,, ...	M.	5	Mirpur Khas..	,,
41	Waria Sutharno	,, ...	M.	42	Shadadpur ...	,,
42	Khoodad	,, ...	M.	20	Mehara	,,
43	Hasson Ibrahim	,, ...	M.	8	Tatta	,,
44	Hasson Batcho	,, ...	M.	45	Tando Bago ...	,,
45	Chain.....	Hindoo.	M.	55	Nausharo	,,
46	Waria Kowrho.....	Muss....	M.	40	Mirpur Butora	,,
47	Zendo.....	,, ...	M.	35	Boodhapure ...	,,
48	Ahmed Golo.....	,, ...	M.	4	Mitti	,,

No.	Names.	Caste.	Sex.	Age.	Place of residence.	Results.
49	Bachal	Muss....	M.	7	Nara	Cured.
50	Khakoo Koja	,, ...	M.	3	Jerruck	,,
51	Jooma	,, ...	M.	40	Tando Mahomed Khan ...	,,
52	Dilshahbad	,, ...	M.	60	Mehar	,,
53	Peerano Jamil	,, ...	M.	5	Badin.....	,,
54	Osman Karam	,, ...	M.	4	Tando Jam ...	,,
55	Khamiso	,, ...	M.	5	Tando Bago ...	,,
56	Memghan	Hindoo.	M.	30	Do. ...	,,
57	Alli Khan Hakim ...	Muss....	M.	3	Manjhand.....	,,
58	Osman Karam	,, ...	M.	4	Umerkote.....	,,
59	Haroon	,, ...	M.	8	Keti Bunder...	,,
60	Sarab	,, ...	M.	7	Tando Bago ...	,,
61	Ahmed Doss.....	,, ...	M.	50	Matari	,,
62	Jussoo Moorj	Hindoo.	M.	6	Do.	,,
63	Shewak Tikio	,, ...	M.	2	Bhitsha.....	,,
64	Sadik Gahram	Muss....	M.	2	Digree	,,
65	Duinoo Gohram	,, ...	M.	42	Tando Bago ...	Died.
66	Rozee.....	,, ...	M.	10	Umerkote.....	Cured.
67	Imam Bux	,, ...	M.	35	Do.	,,
68	Abdool Lutiff	,, ...	M.	9	Kipra.....	,,
69	Hashim Joosoob	,, ...	M.	9	Khanote	,,
70	Jeewan	,, ...	M.	4	Sehwan.....	,,
71	Matharo Gulam	,, ...	M.	50	Shadadpure ...	,,
72	Sangee Bux	,, ...	M.	5	Umerkote.....	,,
73	Begum	,, ...	F.	3	Do.	,,
74	Moroo Rahim	,, ...	M.	10	Khipra	,,
75	Soorio	,, ...	M.	3	TandoAllahyar	,,
76	Tahal Ayil	Hindoo.	M.	2½	Hala	,,
77	Jogee Mitho.....	Muss....	M.	20	Johee.....	,,
78	Ismael	,, ...	M.	3	Matari	,,
79	Gover Mitho	,, ...	M.	62	Sakrand	Died.
80	Abhayo.....	,, ...	M.	10	Do.	Cured.
81	Zangee Khan	,, ...	M.	50	Tando Jam ...	,,
82	Khoodo Salleh	,, ...	M.	7	Bhonote	,,
83	Sahewn Kadoo.....	,, ...	M.	4	Umerkote.....	,,
84	Mookim Aliff	,, ...	M.	4	Do.	,,
85	Hajee Sayinoo	,, ...	M.	26	Hala	,,
86	Karimunnoo.....	,, ...	M.	2	Shikarpur	,,
87	Akk. Muthoo	,, ...	M.	20	Tando Adam...	,,
88	Kambir Mohbet	,, ...	M.	30	Sakrand.....	,,
89	Moroo Saboo	,, ...	M.	10	Moro	,,
90	Mahomed Hoosain ...	,, ...	M.	70	Hyderabad, Sind.....	Died.
91	Misree Isso	,, ...	M.	45	Tando Alahyar	Cured.
92	Jogo	Hindoo	M.	16	Umerkote.....	,,
93	Kirta Kesree	,, ...	M.	60	Do.	,,
94	Muthoo Husson	Muss....	M.	4	Tando Alahyar	,,

No.	Names.	Caste.	Sex.	Age.	Place of residence.	Results.
95	Mullook.....	Muss....	M.	3	Husri.....	Cured.
96	Hajee Soomar	,, ...	M.	40	Tatto	,,
97	Saheb Jadee.....	,, ...	F.	4	Mirpur Khos.	,,
98	Ahmed Khairo.....	,, ...	M.	50	Tando Mohamed Khan ...	,,
99	Salleh	,, ...	M.	8	Dowlutpoor ...	,,
100	Bachal	,, ...	M.	30	Matari	,,
101	Jooma	,, ...	M.	3	Bhanote.....	,,
102	Allahbuchayo	,, ...	M.	38	Mehar	,,
103	Pir Mahomed	,, ...	M.	6	Sakrand	,,
104	Kirpal	Hindoo.	M.	42	Umerkote	,,
105	Moorad	Muss....	M.	42	Khairpoor.....	,,
106	Oodhow Gyan	Hindoo.	M.	25	Shadadpur ...	,,
107	Allahwarayo.....	Muss....	M.	6	Hala	,,
108	Fakiro Fowzo	,, ...	M.	50	Sehwan.....	,,
109	Rijakbai	Hindoo.	F.	45	Sakrand	,,
110	Jagia.....	,, ...	M.	17	Umerkote	,,
111	Sidik Gunee.....	Muss....	M.	3	Mirpur Butora.	,,
112	Gohram.....	,, ...	M.	34	Moro	,,
113	Pallio	,, ...	M.	13	Do.	,,
114	Sanyiditho	,, ...	M.	50	Sakrand	,,
115	Allahwarayo	,, ...	M.	6	Shadadpur ...	,,
116	Nindo Rakhio	,, ...	M.	25	Nasarpur	,,
117	Gool Mahomed	,, ...	M.	60	Matari	,,
118	Allee Bux.....	,, ...	M.	2	Kandiaro	,,
119	Sookhio.....	,, ...	M.	42	Saidabad	,,
120	Kadoo Pandhi	,, ...	M.	12	Tando Bago ..	,,
121	Hoosain.....	,, ...	M.	38	Hala	,,
122	Bahadar Habib	,, ...	M.	45	Kotri	,,
123	Khan Mahomed	,, ...	M.	13	Jesulmir	,,
124	Allee Bux Fazal	,, ...	M.	2	Kandiaro	,,
125	Wahsal Janee	,, ...	M.	26	Larkana	,,
126	Salleh Humzo	,, ...	M.	12	Mirpur Sacro.	,,
127	Haji Abdul	,, ...	M.	60	Dadu	,,
128	Bungool Jeeyand ...	,, ...	M.	48	Tando Bago ...	,,
129	Mahomed Khan	,, ...	M.	38	Shahpur	,,
130	Dhunnoo Chundun...	Hindoo.	M.	30	Moro	,,
131	Joons.....	Muss....	M.	13	Jerruk	,,
132	Mahomed Buchu.....	,, ...	M.	7	Lahore	,,
133	Khavindinoo	,, ...	M.	34	Kandiaro	,,
134	Hajee Doss Mahomed	,, ...	M.	48	Hala	,,
135	Mahomed Sadik	,, ...	M.	3	Hyderabad, Sind	,,
136	Allee Bux.....	,, ...	M.	34	Nausharo	,,
137	Dada Choota	,, ...	M.	34	Do.	,,
138	Kuloo Kessoo	Hindoo.	M.	36	Dadu Taluka...	,,
139	Adam Hassul	Muss....	M.	34	Matari	,,
140	Joommoo Hofio	,, ...	M.	32	Mitti	,,

No.	Names.	Caste.	Sex.	Age.	Place of residence.	Results.
141	Oomar Abdulla	Muss....	M.	7	Shadadpur ...	Cured.
142	Liyar	,, ...	M.	50	Hutree	,,
143	Pario Joommoo	,, ...	M.	25	Tando Kesser..	,,
144	Godoo Jessoo	Hindoo.	M.	11	Limojo Kamb..	,,
145	Bacho Bahadoor	Muss....	M.	4	Shadadpur ...	,,
146	Sarab Soaro	,, ...	M.	45	TandoAlahyar.	,,
147	Oors Moorid.....	,, ...	M.	6	Tajpoor	,,
148	Yaroo	,, ...	M.	22	Shadadpur ...	,,
149	Rajoor Bhumro	,, ...	M	28	Hala	,,
150	Wudho Acho	,, ...	M.	42	Kotri	,,
151	Mutharosha	,, ...	M.	1½	Tando Mahomed Khan ...	,,
152	Meherbai	,, ...	F.	4	Sakrand.....	,,
153	Moortja Ahmedsha...	,, ...	M.	8	Tando Mahomed Khan ...	,,
154	Allahrakhio	,, ...	M.	50	Do.	Died.
155	Badul Summo	,, ...	M.	8	Tando Kesser.	Cured.
156	Haroon Cassum	,, ...	M.	16	Gidu Bunder...	,,
157	Hajee Jamal.....	,, ...	M.	16	Tando Bago ...	,,
158	Rumzan	,, ...	M.	45	Mirpur Khos...	,,
159	Oorasdad	,, ...	M.	8	Bookera.....	,,
160	Gazee	,, ...	M.	22	Tando Mahomed Khan ...	,,
161	Moosa	,, ...	M.	42	Shadadpur ...	,,
162	Wassand Nebhow ...	,, ...	M.	8	Umerkote	,,
163	Mahomed Goolam ...	,, ...	M.	3	Sakrand	,,
164	Hajee Ahmed	,, ...	M.	50	Petaro	Died.
165	Allarakhio	,, ...	M.	4	Khokar	Cured.
166	Khair Mahomed	,, ...	M.	30	Shadadpur ...	Died.
167	Kadoo Abbum	,, ...	M.	4	Hyderabad, Sind.....	Cured.
168	Khamisso	,, ...	M.	5	Do.	,,
169	Bachal Pario	,, ...	M.	50	Tajpur	,,
170	Matharo Goolam	,, ...	M.	60	Shadadpur ...	,,
171	Kessur Farrid	,, ...	M.	4	Shabjibhit.....	,,
172	Khoodoo	,, ...	M.	4	Hyderabad, Sind	,,
173	Humzo	,, ...	M.	22	Sakrand	,,
174	Mahomed Dowlat ...	,, ...	M.	30	Do.	,,
175	Kandero Bulund	,, ...	M.	8	Tando Alahyar.	,,
176	Joomo Dinno	,, ...	M.	38	Matari	,,
177	Allee Bux.....	,, ...	M.	18	Mirpur Khos...	,,
178	Waleno Enayet	,, ...	M.	50	Mehar	,,
179	Khooda Bux	,, ...	M.	22	Umerkote	,,
180	Hyder	,, ...	M.	48	Khipra	,,
181	Goolam Alee.....	,, ...	M.	17	Tando Mahomed Khan ...	,,
182	Pario Nehal	Hindoo.	M.	48	Sakrand.....	,,

No.	Names.	Caste.	Sex.	Age.	Place of residence.	Results.
183	Allahbuchayo	Muss....	M.	2	Khebar	Cured.
184	Dado Ameen	,, ...	M.	50	Khipro	,,
185	Sayan.....	,, ...	F.	35	Shadadpur ...	,,
186	Allahwarryo.....	,, ...	M.	2	Khipro	,,
187	Choota	,, ...	M.	9	Gidu Bunder..	,,
188	Delawar	,, ...	M.	6	Mehar	,,

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