

A monograph of 248 cases of lateral lithotomy operations : performed in the north-western provinces during a period of twelve years / by Rai Ram Narain Dass Bahadoor.

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LATERAL ECTOMY OPERATIONS

RAJ RAM NARAIN BASS BAHADUR

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LATERAL LITHOTOMY.



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A MONOGRAPH
OF 248 CASES OF
LATERAL LITHOTOMY OPERATIONS,
PERFORMED IN THE NORTH-WESTERN PROVINCES DURING A
PERIOD OF TWELVE YEARS,

BY

RAI RAM NARAIN DASS BAHADOOR,
ASSISTANT SURGEON,

*Late in charge of the Cawnpore Government Dispensary and of the Civil Station of
Budaon, N. W. P., and Lecturer of Surgery to the Bengalee and
Military Classes of the Medical College of Bengal, and
One of the House Surgeons to the Fever Hospital, and now Lecturer of Surgery to
Campbell Medical School, and First Surgeon to the Campbell Hospital.*

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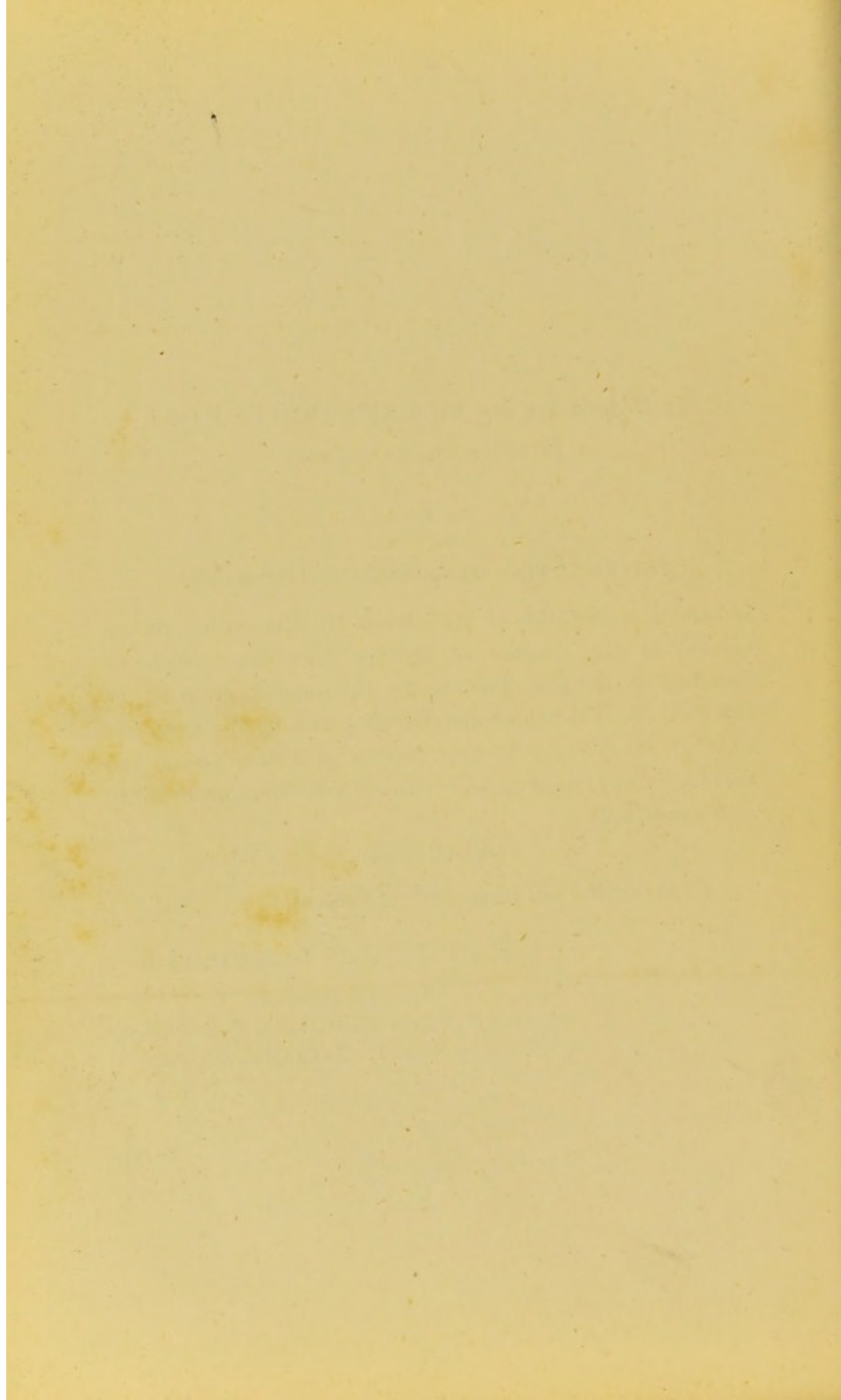
TO
THE HONOURABLE SIR RICHARD TEMPLE, K.C.S.I.,
LIEUTENANT-GOVERNOR OF BENGAL.

THE FOLLOWING MONOGRAPH ON LITHOTOMY,
in humble appreciation of the interest His Honour has always
evinced in the progress of Medical Education, which he
has done so much to promote, by the support given to the
Campbell Medical School and Hospital, and by the establish-
ment of the Temple Medical Schools at Patna, Dacca, and
Cuttack, is by permission and with all gratitude and humility
most respectfully

DEDICATED

By his dutiful and most obedient Servant,

RAI RAM NARAIN DASS BAHADOOR,
ASSISTANT SURGEON,
*Lecturer of Surgery to the Campbell Medical School,
and 1st Surgeon to the Campbell Hospital.*



ERRATA.

- Page 18, line 28, *for* "pelius," *read* "pelvis."
" 19, " 6, *for* "thi," *read* "this."
" 20, " 39, *for* "ound," *read* "found."
" 21, " 23, *for* "26," *read* "24."
" 29, " 3, *for* "C," *read* "Richard."
" " 4, *for* "Henry," *read* "John."
" " 8, *for* "C," *read* "Richard."
" 35, " 8, *for* "4 dr.," *read* "6 dr."
" 48, " 2 from bottom, *for* "moadun," *read* "moodeen."
" 52, *for* "Sect. 18th," *read* "25th." See p. 54.
" 54, *for* "Sect. 25th," *read* "18th." See p. 52.
" 91, line 6 from bottom, *for* "18," *read* "5 & 6."
" 92, " 15, *for* "an," *read* "on."

STATES

1. The first section of the report
2. The second section of the report
3. The third section of the report
4. The fourth section of the report
5. The fifth section of the report
6. The sixth section of the report
7. The seventh section of the report
8. The eighth section of the report
9. The ninth section of the report
10. The tenth section of the report

INTRODUCTION.

SINCE I have come down to Calcutta, I have all along intended writing a paper on the subject of the Stone operations I had performed during the period of my twelve years' service in the North-Western Provinces ; but the calls of private practice and the public duties of my post as Professor of Surgery to the vernacular classes of the Medical College, together with those of the College Hospital, to which I was attached as an ex-officio assistant to the second surgeon of the hospital, have left me no leisure to undertake the difficult task ; now, however, having more leisure in consequence of my having been relieved of my hospital duties, I have been enabled to take the difficult task in hand ; difficult, I say, because it has necessitated a collection of all my previous papers and reports on the subject of my stone operations, and a careful arrangement and analysis of the stones themselves, which having been sent to the Government with my original reports, had been stored in the College Museum. The work of arrangement and analysis has been greatly facilitated by the permission granted me by Dr. Chevers, the Principal of the Medical College, and by Dr. Ewart, who has the College Museum under his charge, to take the *calculi* to my own home to examine them at my leisure ; to the former gentleman I am also greatly indebted for presenting me with the catalogue of the *calculi* contained in the museum of the Royal College of Surgeons of England, a work which has greatly assisted me in analysing the stones and arranging them systematically, and without an analysis and systematical arrangement of the stones I could scarcely have ventured to undertake the task. In addition I am also greatly obliged to Dr. Palmer, the officiating Professor of Chemistry of the College, for assisting me with the reagents and necessary apparatus from his laboratory ; and I am no less indebted to Dr. Partridge,

Professor of Anatomy and second Surgeon to the Hospital, for his advice and assistance in arranging these papers for publication in England, a proceeding rendered necessary, as the coloured plates of the stones could not be printed here.

For the sake of convenience I have divided my subject into three parts; 1st, the historical, 2nd, the ætiological, and 3rd, the operative part. Throughout the book tables are given to show the scales of frequency, cure, and deaths of vesical calculous diseases, and also the scales of mortality according to the ages of the patients and weights of their stones; a comparative table is also given of the results of my Lateral Lithotomy operations, compared with those of Mr. Smith, of Bristol, as given in the eleventh volume of the Medico-Chirurgical Transactions, London; and with those of Mr. Chesilden, as given in an old work entitled "Observations on Lithotomy," by John Thomson, M.D., Professor of Surgery to the Royal College of Surgeons, &c., dated London, 1808. This table has been added as a contribution to the statistics of Lateral Lithotomy, and I trust I may be excused for my presumption in placing my operations in comparison with those of such great men and operators; and lastly the Register of 248 cases of stones are given with the chemical and microscopical analysis of the 128 stones out of the 248, and according to the nature and character of their nuclei they are arranged in order.

THE MONOGRAPH OF TWO HUNDRED AND FORTY-
EIGHT CASES OF LATERAL LITHOTOMY OPERA-
TIONS PERFORMED DURING A PERIOD OF
TWELVE YEARS IN THE NORTH-WESTERN PROV-
INCES, AND THE CIRCUMSTANCES CONNECTED
WITH THEM.

IN newspapers, journals, medical books, and in public meetings where lithotomy operations have been the subject of discussion, I have been fortunate enough to see and hear my name frequently mentioned as a successful operator, and therefore for the information of the public and particularly for that of the profession, it has become incumbent upon me to write in detail an account of the lithotomy operations I have performed in the North-Western Provinces during my residence there as a sub-assistant surgeon.

The first appointment to which I was posted was the charge of the Government Dispensary at Cawnpore, and with it the Relief Society's Hospital, capable of containing fifty patients. The Cawnpore Dispensary was opened in December, 1839, and was amalgamated with the Relief Society's Hospital, which had been in operation since the great famine in the North-Western Provinces in the year 1837. I took charge of the dispensary with the amalgamated hospital in July, 1840, and during my incumbency as a sub-assistant surgeon there, from July, 1840, to May, 1847, a period of seven years, I operated on twenty-eight cases of stone successfully without a single death. Cawnpore being a large military station and the head-quarters of a division, a superintending surgeon resided there, and it was a rule in the dispensary to inform the superintending surgeon whenever there was a case for operation. On receiving the information, he was in the habit of inviting the surgeons of all the regiments of the station to witness the operations at the dispensary, and therefore at all our operations we had from six to twelve surgeons present as visitors.

Of the twenty-eight cases of lateral lithotomy operations I had performed at the Cawnpore Government Dispensary two only require particular mention, as presenting any feature of a peculiar or exceptional character.

A case of extreme local irritation of the bladder, with return of calculus and second operation after a year, is as follows,—

One Gohindah, a Maharatta Bramhun lad, seven years old, a thin emaciated looking boy of fair complexion, native of Bithoor (the residence of Nunnah, the infernal wretch of the Sepoy mutiny of 1853), was admitted on the 7th July, 1841; he had been labouring under the symptoms of stone in the bladder for a couple of years; his urine was fetid and ammonial, and loaded with ropy and adherent mucus, indicating the existence of severe chronic inflammation in the mucous membrane of the bladder, his sufferings were very great; he was operated on, the 10th July, 1841, three days after his admission, and during the extraction the stone being soft broke into four pieces; after the operation the chronic inflammation of the bladder disappeared, the cause having been removed, the urine became natural, and the boy gradually picked up his strength; the wound healed up most satisfactorily and he was discharged cured on the 10th August, 1841; having been one month under treatment.

The next year the boy was again brought in, the stone having been regenerated, and two days after his second admission he was operated on in the old scar; the stone was of the same nature and composition as on the first occasion, and by chemical analysis was found to be composed of triple phosphate. On this occasion the bladder was not inflamed, and the urine, therefore, was not fetid and ammoniacal. After the operation he got well without much suffering, and having been under treatment for twenty days, was discharged cured. After the operation he was made to take acid nitro muriatic dil., from ten to twenty drops thrice daily, and the parents were also instructed to continue the acid medicine for six months, and to bring the boy once every month for examination; he daily improved under this treatment, and there was no further formation of stone in the bladder. This was the first and last case in which I have had to operate a second time.

The second case was that of Shaik Munowur, a Mussulman from Lucknow, aged twenty-five, who came in on the 24th July, 1842; he had been labouring under the symptoms of stone in his bladder for a period of three years; his sufferings were very great; by profession he was a chupdar to one of the naubabs of Lucknow, and was originally a very healthy-looking stout man, of good muscular development; but latterly he had been greatly reduced by his constant sufferings. He was operated on, on the 27th July, 1842, three days after his admission, but the extraction of stone was found to be impossible, because every time the forceps were introduced into the bladder there was so much contraction and spasm of the bladder and of the perinæal muscles, that I found it impossible to open the blades of the instrument to catch the stone; the perinæal muscles were so very irritable, that a mere touch with the forceps caused them to contract violently. The gentlemen visitors who were present at the operation also tried without success to extract the stone; and persevering efforts for nearly an hour having proved unsuccessful, the patient was put to bed, with a wound in the perinæum wide enough for the extraction of almost any sized stone. Dr. Renny, who was then the superintending surgeon of the division, was not present on the occasion, as he was out of the station that day, and it was decided to report the nature of the case to him on his return. The next morning Dr. Renny saw the patient, ordered to put him on the table, and then requested me to try again; no sooner, however, were the forceps introduced into the wound than the perinæal muscles began to contract with greater force even than on the previous day, though the patient was by this time greatly exhausted. This being the case, after a pause Dr. Renny advised me to give him tartar emetic, thus:—Two grains of tartar emetic dissolved in eight ounces of water, one ounce to be given every five minutes, till there was nausea and sweating on the forehead; after four doses of the medicine had been administered, and when the muscles began to be relaxed, I was ordered to try again to extract the stone. This time I was able to get the forceps into the bladder with some difficulty, and was also able to open its blades, though still not with ease. When at last I succeeded in catching the stone, it broke into three pieces, being soft in its nature, and composed

of triple phosphate. The fragments were extracted with great caution, and afterwards the bladder was washed out with tepid water injections through the wound. Notwithstanding all this rough handling, the wound began to show healthy signs very soon, and the patient ultimately got well within a month's time, without suffering from any uncomfortable and dangerous symptoms after the operation.

Had chloroform been then in use, we should have been spared all this trouble and anxiety; and what could be more disheartening and distressing to an operator than the occurrences mentioned above?

The post of Sub-Assistant Surgeon, of the civil station of Budoan having become vacant, towards the end of May, 1847, I was transferred to it from Cawnpore; there I had the charge of the jail hospital, the dispensary, and the medical duties of the station, and held a partially independent post; the civil surgeon of Bareilly, the neighbouring sudder station, being my immediate medical superior. When I took charge of the Budoan dispensary in the month of June, 1847, it was in debt; it was not then a Government one, but was supported mainly by local contributions, Government supplying medicines and instruments. The subscriptions amounted to the scanty sum of 30rs. a month, and they were derived solely from the English officers of the station. The dispensary had been four years in existence, and for it a new building had just been completed under the superintendence of the magistrate at an expense of nearly two thousand rupees in a central and airy part of the town; the cost had been defrayed from special donations. As soon as I took charge of the dispensary, cases of surgical operation began to pour in; as there were not sufficient funds to support this sudden influx of in-patients I was obliged to feed them at my own expense. In the second month after my taking charge of the dispensary two cases of stone were operated on, in the third month one case, and in the fourth month four cases; during the half-year, therefore, ending on the 30th September, 1847, seven stone operations were performed, and all of the patients got well: two of these cases were made painless by the inhalation of sulphuric ether; it was tried in all the cases, but I was only thoroughly successful in these two.

The magistrates and the principal residents of the place were constant visitors of the operations at the dispensary, and in consequence the reputation of the dispensary rapidly spread itself, whilst the exhibition of the stones I had brought from Cawnpore tended still further to increase the confidence of the people; as none of the seven cases mentioned above had any especial peculiarity they do not require a detailed description, they are all entered in the General Register.

In the month of November 1847, on the occasion of his Honour the Lieutenant-Governor of the North-western Provinces making a tour through Rohilcund and other parts of the North-western Provinces, having visited Budoan and inspected the dispensary at the time of his entrance into the station, his Honour expressed himself as being highly satisfied with the working of the dispensary, and with the efficient state to which it had been then brought; and in a Government letter, No. 1045, dated 15th December, 1847, General Department, recommended the Budoan dispensary to the favourable notice of the supreme Government.

During the next half-year, ending 31st March, 1848, fifteen cases of stone were operated on, and all of them got well; two of these fifteen cases, Nos. 15 and 16 in the General Register, require slight mention. The perinæum in each case was short and deep, and stones of large size, weighing respectively an ounce and three, and an ounce and five drachms; and finding great difficulty in extracting them, the wound had to be extended, so as to involve the anus and a part of the rectum; and for a short time the patients were troubled with recto-vesical fistula, which ultimately, however, got well by the application of caustic.

In this half-year, besides the fifteen cases mentioned above, a patient named Bullah, aged thirty-two, a thin-looking man, Hindoo by caste, came in with symptoms of stone; on sounding, a distinct grating sensation was felt over an extensive surface, the urine was slightly muco-purulent and alkaline in its character, and most of the symptoms of stone were well marked. I operated on him on the 5th September, 1847, ten days after his admission, and on reaching the bladder found no stone. I was extremely surprised on discovering my mistake. In order to

ascertain the cause of the symptoms of stone the patient had exhibited, I thoroughly examined the mucous surface of the bladder through the wound, and found the rugæ of the mucous membrane of the bladder much enlarged, with fan-shaped hollows between them; the rugæ and the hollows were found to be rough and incrustated with deposits; these were, as far as I could do so without tearing the lining membrane, removed by a scoop with the aid of my left forefinger, and on examining the incrustations thus removed I found them to be composed of phosphate of lime with traces of triple phosphate. The case was therefore purely one of chronic inflammation of the mucous membrane of the bladder of some years' standing, and in consequence, the urine having undergone decomposition, its inorganic earthy products had been deposited on the surface, and hence the incrustations. After the operation he was treated with dilute nitro-muriatic acid and nourishing food, and to remove the local inflammation fomentations and leeches were applied to the pubic region. Ten leeches were thus applied in the course of a fortnight, one or two at a time. Under this treatment the wound healed up quietly, and he got well, having been under treatment for a period of a month. This is the first case of the kind I have ever seen or read of; this case is not included in the Register, as not strictly being one of stone.

The question might be asked, ought the man to have been operated on? In reply I would ask, what would have been the consequence had the patient not been operated on, and had the incrustations not been removed? They would certainly have increased daily from the continual addition of the inorganic deposits from the urine under the influence of the persistent inflammation of the mucous surface of the bladder, and the symptoms of stone increasing at the same time would have pulled down the patient, and ultimately probably would have been the cause of his death. After the operation I was very much afraid of cystitis and of local peritonitis, as there had been so much handling, but fortunately nothing of the kind occurred.

In the middle of the third half-year, a letter dated 2nd June, 1848, was received from the Commissioner of the division with a Government letter, sanctioning the sum of seventy rupees a month for the dispensary, namely, forty rupees for the establish-

ment, twenty rupees for the country medicines, and ten rupees for keeping the in-patients. From this date the dispensary was made a Government one, and stood on the same footing and enjoyed the same privileges as the other Government dispensaries in the North-western Provinces.

During this third half-year, ending 30th September, 1848, thirteen cases of stone were operated on, and of these one died. As none of the successful cases presented any peculiarity, they require no particular mention, and the history of the fatal case in this half-year is as follows:—Peeroo, a thin, half-starved looking boy, of sixteen years old, a Hindoo weaver by caste, came in on the 25th June, 1848, suffering from stone in his bladder. He had been labouring under the complaint for a period of four years, and the symptoms were very distressing and painful; the urine was found to contain a good deal of pus and adhesive mucus, which indicated the existence of chronic inflammation of the mucous surface of the bladder. After his admission for about a month and a half he was treated with tonics and stimulants, and was supported with nourishing food, and thus his health having been much improved, he was operated on on the 22nd August, 1848, and up to the 24th instant did well; towards the evening of that date however, he appeared to be sinking without any apparent cause; mustard plasters and stimulants kept him up and he did well up to the 29th instant; on the 1st September, 1848, his bowels began to be loose, and there was tenderness and tympanitis. From this date the wound began to lose its healthy appearance, and at last, exhausted by the uncontrollable looseness, he died on the 8th September, 1848, having been two months and thirteen days under treatment.

Chloroform having been received for the first time on our indent, had been used in every case of operation from the beginning of this half-year. It was a wonder to the people how formidable operations could thus be made painless, and how the surgeons having chloroform for their help could perform any formidable and difficult operations with ease and coolness of mind, without being disturbed with the cries of the patients. A surgeon also who has operated without and with chloroform can easily realize the vast difference in the two cases, and would scarcely hesitate to declare that the discovery of chloroform has given life to surgery.

During this half-year—that is to say, the half-year ending 30th September, 1848, a burned dead body was sent to me by the magistrate, for medico-legal examination, the medical duties of the station being under my charge. On the post-mortem examination of the body a large stone was found in the bladder, and from the size of the stone it appeared probable that the poor man must have been suffering for three or four years. The statement of the villagers corroborated this; they asserted that the pain having become insufferable, he had set fire to his thatched room at night, and had thus perished. On furnishing the report of the case to the magistrate, I took the opportunity of advising him to allow a *tum-tum* to go the round of every village of the district, proclaiming that cases of urinary diseases have been successfully treated at the Budoan Government Dispensary, and that anybody labouring under these complaints would be readily received at the dispensary, and would be comfortably lodged. The magistrate acted upon this suggestion, and the thanadars and tisildars of the district were also particularly instructed by the magistrate to observe the order. From this time the number of admissions of lithotomy cases began to increase.

During the fourth half-year, ending 31st March, 1849, nineteen cases of stone were operated on, and of these two died, one from looseness of the bowels six days after the operation, and the other four days after the operation. This latter case requires particular mention, because the stone was of immense size; the name of the patient was Mohammed Khan (No. 37 in the Register), aged eighty-one, Mussulman by caste, and he came in on the 17th October, 1848. He was a tall, thin-looking old man, with grey hair; his sufferings were not very great, but there was constant dribbling of urine; and on sounding him a stone of large size was felt in the bladder, and there was a good deal of difficulty in introducing the sound into the bladder, as the stone occupied almost the whole cavity, hence probably the incontinence of urine. He said he did not recollect how long he had been suffering under the complaint. On the 20th October, 1848, he was operated on, and on finding the stone to be of an immense size, the anus and a part of the rectum were incised to facilitate the extraction. The stone was 10 inches in circumference, its long axis was $4\frac{1}{2}$ inches, and its short axis

was 3 inches. The weight was 10 ounces; it was originally lithate, having phosphatic deposit on its surface. The patient lived four days after the operation, and ultimately died from exhaustion. The stone being of such an extraordinary size was sent from Thanah to Thanah, and from Tosil to Tosil, throughout the district with a view that the people might see it, and that they might thereby be encouraged to visit the dispensary for medical and surgical aid. In the course of its circuit I am sorry to say the stone was lost.

As the number of in-patients requiring operations was daily increasing, the sum of 10 rs. allowed by the Government for keeping them was found to be hardly sufficient to feed them, even with a coarse kind of food; as a matter of necessity, therefore, on my requisition to the magistrate the former subscription was kept up.

During the fifth half-year, ending 30th September, 1849, twenty-six cases of stone were operated on. Of these, one died, and the history of this fatal case is as follows:—Pamah, a thin, tall-looking man, aged forty, Kahar by caste, came in on the 11th May, 1849. He had been suffering under the complaint for a period of five years, and the symptoms he had been labouring under were very distressing. He was operated on on the 15th May, 1849, under the influence of chloroform, and a large-sized mulberry calculus, weighing 2 ounces 5 drachms, was extracted. He did well for a week after the operation, but then, though his strength was kept up as much as possible with nourishing food and stimulants and tonics, he began to sink, and the wound gradually lost its healthy appearance: he died on the 26th May, 1849, having been only fifteen days under treatment.

During the sixth half-year, ending 31st March, 1850, twenty-one cases of stone were operated on, the particulars of which are entered in the General Register; of these, three died. The unsuccessful cases were old persons, who had suffered for a period of three and four years, and whose symptoms were of the worst kind, as a result of their prolonged sufferings. They came in in a bad state of health, but as there was no other chance of cure they were operated on on the plain and clear understanding of the doubtful results of operative interference.

In this half-year my application for leave of absence for the period of seven months after ten years' unremitting service was sanctioned, and my successor relieved me in July, 1850. I operated on twenty-nine cases of stone between April and August, 1850, and of these, three died of exhaustion; they were bad cases from long suffering, and the twenty-nine cases are entered in the General Register.

From September, 1850, to March, 1851, for a period of seven months I was on leave of absence on private affairs; during that time thirty-nine cases of stone were operated on at the Budoan Government Dispensary by the superintendent of the dispensary, the civil surgeon of Bareilly, and by my successor Mr. Raddock, the sub-assistant surgeon; of these, three died. These thirty-nine cases are not included in the General Register, as they were not mine; they are only mentioned here to show the continual prosperity of the dispensary.

On the 1st April, 1851, I resumed the charge of the Budoan Government Dispensary, as well as my other duties, after leave of absence for seven months, and during the half-year from 1st April to 30th September, 1851, forty-two cases of stone were operated on, and of these four died; these forty-two cases are entered in the General Register with the others.

During the half-year from 1st October, 1851, to March, 1852, thirty-four cases of stone were operated on, which are all entered in the General Register; of these, one died of diarrhœa after his return home. This case and another, No. 206 in the General Register, require slight mention, as these stones were of large size, weighing from four to five ounces. Their extraction being found difficult and impossible through the usual wound, the incisions were necessarily extended to the rectum and anus, and thus a wound was made wide enough to allow of their easy removal. The first of these two cases, No. 199 in the General Register, was unsuccessful, as the patient died of diarrhœa after his return home, as mentioned above; whilst the second one, No. 206, was discharged with an unhealed recto-vesical fistula, as he would not remain for the requisite after treatment.

From April to May, 1852, fourteen cases of stone were operated on; of these, two died. In the month of June, 1852, I was transferred from the Government of the North-western Provinces

to the Government of Bengal, for the purpose of being appointed to the post of Professor of surgery to the vernacular classes of the medical college.

My service as a sub-assistant surgeon in the North-western Provinces, at the Cawnpore Government Dispensary, and in the civil station of Budoan, extended over a period of twelve years, from July, 1840, to May, 1852, and during that time I performed 248 lateral lithotomy operations, and seventeen of my patients died,—that is to say, one died in fourteen and a half.

ÆTIOLOGY OF CALCULI VESICÆ IN THE NORTH-WESTERN PROVINCES.

WITH regard to the twenty-eight cases of stone operated on at the Cawnpore Government Dispensary during the period of nearly seven years, from July, 1840, to May, 1847, I cannot state the relative numbers of Mussulmans and Hindoos, because in my reports the number of lateral lithotomy operations only has been recorded, except in eight cases entered in the General Register, in which caste and age have also been noted.

Of the 220 cases of stone operated on at the Budoan Government Dispensary during the period of five years and two months from April, 1847, to May, 1852, 30 were Mussulmans, and 190 were Hindoos. From this statement it appears that the number of Hindoos affected by the disease was six times greater than that of Mussulmans, and that therefore the Hindoos were more liable to the disease. This liability appears to be mainly due to the nature and character of their food; Hindoos live mostly on vegetables, and low classes of Hindoos in the North-western Provinces, among whom the disease is most prevalent, are in the habit of eating raw vegetables, which by causing indigestion produce acidity, and from the predominance of acid in the primæ viæ the urine undergoes a change, and it becomes acid in its character; together with the indigestion thus produced, the skin sympathetically becomes inactive, having a close sympathy with the mucous membrane of the bowels, and the nitrogenous substances produced from the metamorphosis of the living tissues being unable to make their exit through the inactive skin, are eliminated through the kidneys in the form of uric acid and urea; when uric acid is in excess in the urine, being retained in the bladder for a while, it begins to deposit in the form of minute particles like sand, being insoluble in the watery part of the urine, and some of these particles coalescing together form the nucleus of a stone. Sometimes the excess of uric acid exists in the urine in combination with soda or potash, forming urate of soda or potash, which is more soluble than uric acid

itself. The presence of lactic acid is not incompatible with the existence of the urate of soda or potash in solution, and when present, decomposition takes place, the lactic acid produced by indigestion, as mentioned above, combining with the soda or potash, sets free the uric acid, which being more insoluble forms deposits within the bladder, and thus originates a uric or lithic acid calculus, or forms the commonest nucleus of a calculus.

The urea which is formed with uric acid from the metamorphosis of the living tissues is very susceptible of decomposition, so much so that the mucus of the mucous surface of the bladder easily and readily decomposes it, and its decomposition gives rise to the formation of ammonia, which by combining with uric acid forms urate or lithate of ammonia, rendering the urine alkaline. Old persons are more subject to indigestion than people of middle age, because the activity of the digestive functions decreases with age; and the digestive functions of children also are readily disturbed; and this probably is the reason why old people and young children are more subject to lithic acid or lithate of ammonia calculi, as in both the predisposing causes to indigestion are more predominant and frequent.

Those who have been labouring under calculus vesicæ for a length of time, on account of their suffering from constant difficulty in making water, and from irritability of the bladder, caused by the presence of the stone, and from sympathetic affection to the neighbouring organs, become rapidly emaciated. In this state it has been invariably found that the urine undergoes another change; it becomes alkaline, the urea decomposes, and in consequence on the acid nucleus first formed, phosphate and triple phosphate are deposited in the form of a white coating, and thus is developed a calculus of mixed character and composition. With the development of this variety the irritability of the bladder increases, the chronic inflammation of its lining membrane ensues, and in consequence pus and mucus are abundantly secreted; the urine becomes ropy and muco-purulent in its character, and the mucus is often found to be thick and adherent. In this state the sufferings of the patients are sometimes very great and distressing, and their condition is comparatively an unfavourable one for operation. The wound sympathizes directly with the inflamed bladder, and the whole system is more or less affected. Those

patients whose stones are simply lithates, are not usually found to suffer much, and do not generally look much emaciated; they get well also rapidly after their operations, and without much trouble, their bladders being sound and not much affected by the presence of the stones.

Patients whose stones are composed of phosphate and triple phosphate, or even merely coated with these salts, are usually thin, emaciated-looking subjects, with health much impaired, and symptoms which are very agonizing; they suffer more after their operations and are longer in getting well; their urine is always ammoniacal from the decomposition of urea. In the specimens of calculi I examined I found no stone composed exclusively of triple phosphate or phosphate, but I found these salts variously mixed with uric acid and urate of ammonia; in none of the specimens was the nucleus found to be composed of phosphate and triple phosphate.

Among the specimens of stones examined, not one was found to be purely of the mulberry kind, but the oxalate of lime was found to be variously mixed with uric acid and urate of ammonia: the symptoms of the stone in these cases were very agonizing, but they were not generally emaciated-looking subjects; they were usually of middle age, and after the operation they got well rapidly without much suffering. It was often found that these patients were more afraid of submitting to the operation than others, labouring as they usually did under great nervous depression, a common accompaniment of oxaluria; this nervous depression may even be the cause of morbid action leading to oxidation of a portion of urea and formation of oxalic acid, the oxygen being derived either from the metamorphosis of the living tissues or from increased activity of the respiratory organs.

Besides the nature and character of food producing indigestion being a cause of the origin of stone as aforesaid, the waters of the place, which are strongly impregnated with calcareous matter, have been considered to exercise a great influence on the formation of stone; none of the forms of calculi, however, correspond with the salts which exist in the natural waters, and the only mode in which these salts can operate in the production of calculus must be by causing precipitation of the salts which naturally exist in the urine. These waters being alkaline in their character

favour the deposit of phosphate from the urine, and are said to prevent the formation of uric acid calculus; but, as I have stated, in none of the specimens of stone which I have examined was there a calculus wholly composed of phosphates; the phosphates were invariably found variously mixed with uric acid and urate of ammonia.

As the disease is very common in the North-western Provinces, other causes are probably at work; besides the nature and character of the food of the population, and the quality of their water supply, the geological peculiarities and climate of the country probably exercise great influence on the origin of the complaint. The disease is particularly common throughout Rohilkund, and especially in the stony and sandy districts. The temperature of these districts is exceedingly high, and consequently the atmosphere is rarefied, and the oxygenating processes of respiration are correspondingly imperfect, more work is thrown upon the kidneys, and the excretion of urea and uric acid is increased. Moreover the varieties of temperature are great, and the functions of the skin are therefore being constantly interfered with, and additional work is thrown upon the kidneys. Probably, therefore, a variety of predisposing causes, indigestible food, drinking calcareous waters, and climatic and geological local conditions, explain the fact that vesical calculous diseases are found to be as common among the people in the sandy and stony districts of the North-western Provinces as elephantiasis is in Bengal.

After carefully examining my collection of calculi I find that most of the small-sized stones are composed of uric acid and urate of ammonia, variously mixed with each other in the nucleus, as well as in the surrounding laminæ; a very limited number of calculi, besides the uric acid and urate of ammonia, contain traces of phosphate of lime, oxalate of lime, and triple phosphate of magnesia and ammonia.

One patient, No. 15 of the General Register, by caste a Mussulman, lived from his infancy on animal food, of which he was very fond; his parents, in fact, stated that he would eat nothing but animal food. In this case an excess of nitrogenous food was probably the sole cause of the disease; the nitrogenous substances, undergoing chemical changes within the body,

were converted into uric acid and urea, the uric acid thus formed finding its exit by the urinary passage, and being in excess and insoluble in water, was deposited, and thus formed a uric acid calculus or a nucleus of one; whilst urea, also an organic product, soluble in water, but easily decomposed with development of ammonia, and actually thus decomposed by the mucus of the bladder, would give rise to the formation of urate of ammonia and the development of a urate of ammonia calculus.

THE OPERATIVE PART OF THE SUBJECT.

THE preliminary steps I resorted to for the lateral lithotomy operations, were, first to have the rectum emptied of its contents. For this purpose a dose of castor oil was given to the patient on the previous day; the next morning I had the perinæum shaved; I also always endeavoured to make the patient retain urine in his bladder as far as could be done; if he could not do so (on account of the irritability of the bladder—and this was often the case with many of the patients), then before the operation, after the patient was placed on the operating table, I injected tepid water into the bladder; for this as large-sized a catheter as the urethra would admit, and a four-ounce syringe, were required; after the injection a full-sized staff with a central grove on its back was introduced into the bladder. I prefer this kind of staff to the one which has a groove on its side. This staff I entrusted to an assistant, who held it with his right hand, and lifted up the scrotum with his left. I instructed him to hold it a little obliquely, so that its curve should incline a little towards the left side of the raphæ, and whilst its extremity struck against the stone and remained in contact with it. At the Cawnpore Government Dispensary I was assisted by the superintendent of the dispensary, or by one of the surgeon-visitors. But at Budoan, where I had to depend upon new and incompetent hands, and had to entrust the staff to a compounder, with instructions to maintain it *in situ* as delivered to him, not to depress its handle on any account, but to maintain it firm from first to last, hooked against the symphysis of the pubis.

It is easier to introduce the staff into the bladder before tying the patient in the lithotomy position; but this plan has one fault—the irritation the staff creates makes the patient to strain much, and the urine retained or the tepid water injected has a tendency to pass off by the side of the groove of the staff, a result which is only to be prevented by grasping the penis with considerable force; on the other hand, after tying

the patient in the lithotomy position, the introduction of the staff into the bladder is always attended with some difficulty ; my practice varied with the nature of the case ; when the bladder was unusually irritable, the staff was introduced under the influence of chloroform after the hands were tied to the feet.

After these preliminary steps, the patient being brought to the edge of the table, an incision commencing from the centre of the space between the root of the scrotum and anus, or where the staff begins to deepen a little to the left side of the median line or raphe, was carried obliquely downward and outward, midway between the anus and tuberosity of the ischium to the extent of three inches, more or less ; for this purpose I always prefer a small-sized scalpel to the large lithotomy knives. This first incision divided the skin and superficial fascia, cut between the erector penis and accelerator urinæ, and also divided the transverse perinaeal muscle and its artery, and some fibres of the levato ani muscle, laying open the ischio-rectal space. The forefinger of the left hand was then introduced through the loose cellular tissue towards the groove of the staff behind the bulb, and the nail of my forefinger (which I allowed to grow long) enabled me readily to reach the groove of the staff ; the point of the scalpel was then slipped along the nail, and this, guided by the finger, was made to enter the groove at the membranous portion of the urethra. When this was done I took the staff out of the assistant's hold with my left hand, and while depressing its handle to a position parallel with the axis of the pelvis, I pushed the scalpel along the groove of the staff, keeping exactly in the median line ; this plan of depressing the handle of the staff renders the bladder tense, in which condition it is more easily cut. In this second step of the operation, or making the deep incision, the following parts are divided :—the deep fasciæ, the membranous portion of the urethra and its muscles, the left lobe of the prostate gland, and a small portion of the neck of the bladder. This deep incision is the most important one ; it should be of the length of the external wound, and not more extensive than necessary. If it be commenced a little too far upward, the bulb of the urethra is likely to be wounded, and

then there would be risk of profuse bleeding. On the other hand, if the incision be carried too much outward towards the ramus of the pubis, the pudic artery may be likely to be wounded, whilst if it be carried too deeply the rectum would be in danger of being cut. In none of my operations, however, have I met with any of these accidents. Moreover this incision must be a free one, that is to say, sufficient to remove all resistance to the extraction of the stone. If this deep incision be not in the direction of the external wound, and not free enough to overcome the resistance during the extraction, the result would be bruising and laceration of the triangular portion of the deep fasciæ, which would necessarily involve the recto-vesical fasciæ, and would thereby break down the natural boundary between the internal and external cellular tissue, and leave nothing to prevent the infiltration of urine, an accident which always proves fatal. This awful accident has never occurred in any of my cases. Many surgeons make the deep incision on the groove of the staff without lowering its handle, but I prefer by the other way.

After the deep incision the forefinger of the left hand was introduced into the bladder, and then the staff taken out, the finger acting as a plug and preventing the escape of urine or the water injected; by the side of the finger using it as a director, a hernia knife, or a probe-pointed bistoury, with two-thirds of its cutting edge covered with sticking-plaster, was passed into the bladder, and brought out in the direction of the external wound; by this all the remaining undivided muscular fibres and fasciæ, which would otherwise create obstruction to the easy extraction of the stone, were divided. Keeping the forefinger still in the bladder and touching the stone, a small or a middle-sized lithotomy forceps was next introduced by the side of the finger, using it as a guide; and when the forceps was fairly in the bladder and touching the stone the finger was withdrawn. Next using both the hands, the blades of the forceps were separated and the stone is caught, taking care to seize it by its short axis; a turn was then given to the instrument to ascertain that the mucous membrane of the bladder had not been caught together with the stone, and then the forceps was gradually withdrawn by moving it gradually

up and down and right and left ; by this manœuvre a stone, of whatever size it may be, is easily extracted. In cases when the stone broke into pieces the bladder was washed out by a tepid water injection through the wound, and then a female catheter or a small gum-elastic tube kept in the bladder for twenty-four hours in children and forty-eight hours in adults, for the purpose of allowing a free escape of urine ; after this the patient was removed to his bed.

The admissions of the lithotomy cases into the Budoan Government Dispensary having increased in number, I used to operate latterly on two or three patients one after another ; the morning was the time fixed for operations, mainly for the convenience of the magistrates, who were my constant visitors.

I have been very successful in my lithotomy operations, mainly, I believe, because I have taken great care to make my deep incision free enough, so as to avoid laceration of the parts during the process of extraction ; keeping this object in view in the case of those who had large stones requiring a wider wound for their easy extraction, I have, after meeting with difficulty in extracting them, extended the wound to the anus and a part of the rectum, and thus I have been able to remove with ease the large stones without lacerating the wound. Such patients were always particularly attended to, their wounds were washed out with tepid water injections every second hour to prevent faecal matter lodging in the bladder, and thus their wounds readily filled up, leaving a small recto-vesical fistula, which ultimately got well under the application of caustic.

In none of my operations have I ever found stones adhering to the surface of the bladder or lying in a diverticulum of its cavity, nor have I found stones covered by a false membrane formed by the exudation of plastic lymph, the result of irritation caused by the stone and an inflammatory process depending thereon.

The disease is most prevalent amongst children from two to ten years old, particularly among those who have been ill fed and badly clothed. This is shown in Table No. 2, and the mortality rate among them is not, however, heavy, being only one in twenty-eight nearly ; the amount of previous sufferings was generally found to be greater in these cases than in the elderly people, and

the prolapse of the anus was a common complication, and the previous treatment I adopted for this condition was the use of sugar of lead and laudanum injection twice daily: though the injection failed to stop the mischief entirely, it generally abated the symptoms to such an extent that the protrusion of the bowels did not interfere materially with the operation. The hands of these little patients were constantly found to emit a smell of urine, as they were in the constant habit of squeezing the penis and drawing out the prepuce to mitigate the pain and difficulty in passing water; the prepuce on this account also was almost always found very much elongated.

The mortality of cases from ten to twenty years of age was 1 in $13\frac{1}{3}$.

People from twenty to thirty years old, being in the full strength, vigour, and prime of their lives, were comparatively exempt from the disease, and suffered less after the operation, and none of my cases between these ages died; but the mortality beyond thirty years gradually increased according to the increase of age: thus from thirty to forty one died in ten and a half; from forty to fifty one died in seven; from fifty to sixty one died in two and a half; from sixty to seventy I had only one case which recovered; and from seventy to eighty the only case I had died. (*Vide* Table No. 2 and page 26.)

2. BUDOAN GOVERNMENT DISPENSARY.

| Periods. | Numbers operated. | Numbers cured. | Numbers died. | Average in each year. | Remarks. |
|---|----------------------|-------------------|------------------|--------------------------|---|
| During the half year from 1st April to 30th Sept. 1847 | 7 | 7 | — | 44 in each year. | <p>The civil station of Budoan having been under the Meerut division, the half year begins from the month of April.</p> <p>From September, 1850, to March, 1851, I was on leave for seven months.</p> <p>In June, 1852, I was transferred from Budoan, to the Post of Professor of Surgery, to the Secondary classes Medical College, Calcutta.</p> |
| " " from 1st Oct. 1847 to 31st Mar. 1848 | 15 | 15 | — | | |
| " " from 1st April to 30th Sept. 1848 | 13 | 12 | 1 | | |
| " " from 1st Oct. 1848 to 31st Mar. 1849 | 19 | 17 | 2 | | |
| " " from 1st April to 30th Sept. 1849 | 26 | 25 | 1 | | |
| " " from 1st Oct. 1849 to 31st Mar. 1850 | 21 | 18 | 3 | | |
| " " 5 months from 1st April to 19th Aug. 1850 | 29 | 26 | 3 | | |
| " " the half year from 1st April to 30th Sept. 1851 | 42 | 38 | 4 | | |
| " " from 1st Oct. 1851 to 31st Mar. 1852 | 34 | 33 | 1 | | |
| " " 2 months from 1st April to May 1852 | 14 | 12 | 2 | | |
| During the period of 5 years | 220 | 203 | 17 | | |
| TOTAL - - - | | | | | |
| During the period of my 12 years' service - GRAND TOTAL | 248 | 231 | 17 | | |

TABLE II.

A Scale of Relative Frequency, Cures, and Deaths of Vesical Calculus Cases, arranged according to ages, during the period of Twelve Years, at the Cawnpore and Budoan Government Dispensaries.

| 1. CAWNPORE GOVERNMENT DISPENSARY. | | | | | 2. BUDOAN GOVERNMENT DISPENSARY. | | | | |
|---|-------------------|----------------|---------------|---------------------|----------------------------------|-------------------|----------------|---------------|-------------------------|
| Ages. | Numbers operated. | Numbers cured. | Numbers died. | Ratio of Mortality. | Ages. | Numbers operated. | Numbers cured. | Numbers died. | Ratio of Mortality. |
| | | | | | | | | | |
| From 2 to 10 years | 5 | 5 | — | None. | From 2 to 10 years | 82 | 79 | 3 | 1 in 27 $\frac{1}{3}$ |
| " 10 to 20 " | 1 | 1 | — | — | " 10 to 20 " | 40 | 37 | 3 | 1 in 13 $\frac{1}{3}$ |
| " 20 to 30 " | 2 | 2 | — | — | " 20 to 30 " | 21 | 21 | — | — |
| | | | | | " 30 to 40 " | 42 | 38 | 4 | 1 in 10 $\frac{1}{2}$ |
| | | | | | " 40 to 50 " | 28 | 24 | 4 | 1 in 7 |
| | | | | | " 50 to 60 " | 5 | 3 | 2 | 1 in 2 $\frac{1}{2}$ |
| | | | | | " 60 to 70 " | 1 | 1 | — | — |
| | | | | | " 70 to 80 " | 1 | — | 1 | 1 in 1 |
| TOTAL | 8 | 8 | — | — | TOTAL | 220 | 203 | 17 | — |
| The ages and castes of the remaining 20 Lithotomy cases operated on at the Cawnpore Government Dispensary have unfortunately not been recorded; all of them got well. | | | | | Operations performed at Cawnpore | 28 | 28 | — | — |
| | | | | | GRAND TOTAL. | 248 | 231 | 17 | 1 in 14 $\frac{10}{17}$ |

TABLE III.

A Scale of relative Deaths among Hindoos and Mussulmen at different ages, with the weights of the stones; being a summary of the Mortality in 248 cases of Lateral Lithotomy operations performed during a period of Twelve Years.

| Castes and Ages. | Died. | Weight of the stones. |
|--|-------|---|
| Hindoos, from 2 to 10 years | 3 | { 1st case, between 1 ounce and 2 ounces. 2nd " 2 drams. 3rd " weight not taken. |
| Hindoos, from 10 to 20 years | 3 | { 1st case, between 7 drams and 1 ounce. 2nd " " 1 ounce and 2 ounces. 3rd " " 4 ounces and 5 " |
| Hindoos, from 30 to 40 years | 4 | { 3 cases, between 2 and 3 ounces. 4th case, " 3 and 4 " |
| Hindoos, from 40 to 50 years | 4 | { 1st case, between 1 and 2 ounces. 2nd " " 2 " 3 " 2 cases, weights not taken. |
| Hindoos, from 50 to 60 years | 2 | { 1st case, 2 drams. 2nd " weight not taken. |
| Mussulman, from 70 to 80 years | 1 | 1st case, 10 ounces. |
| TOTAL | 17 | |

TABLE IV.

A Scale showing the different ages in 220 Vesical Calculus Cases operated on at the Budoan Government Dispensary during the period of Five Years, and the weights of their stones, with the results of their operations.

| Ages. | One ounce and under. | | | | | | | | Total Nos. operated. | | Cured. | Died. | Ratio of Mortality. |
|-------------------|----------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|----------------------|--------------------|--------|-------|-------------------------|
| | 1 dr. & under. | 1 to 2 drs. | 2 to 3 drs. | 3 to 4 drs. | 4 to 5 drs. | 5 to 6 drs. | 6 to 7 drs. | 7 to 8 drs. | Weights taken. | Weights not taken. | | | |
| From 2 to 10 yrs. | 7 | 22 | 12 | 10 | 4 | 4 | 5 | — | 3 | — | 79 | 8 | 1 in 27 $\frac{1}{2}$ |
| " 10 to 20 " | — | 6 | — | 3 | 1 | — | 3 | 3 | 12 | 15 | 37 | 3 | 1 in 13 $\frac{1}{2}$ |
| " 20 to 30 " | — | 2 | 2 | 3 | 1 | — | — | 1 | 4 | 4 | 21 | — | — |
| " 30 to 40 " | 2 | 1 | 2 | 6 | 3 | 5 | 1 | 3 | 12 | 1 | 38 | 4 | 1 in 10 $\frac{1}{2}$ |
| " 40 to 50 " | 3 | — | 2 | 2 | 3 | 2 | 2 | 1 | 7 | 3 | 24 | 4 | 1 in 7 |
| " 50 to 60 " | — | — | 1 | 1 | — | — | — | — | — | 2 | 3 | 2 | 1 in 2 $\frac{1}{2}$ |
| " 60 to 70 " | — | — | — | — | — | — | — | — | 1 | — | 1 | — | — |
| " 70 to 80 " | — | — | — | — | — | — | — | — | — | 1 | — | 1 | 1 in 1 |
| Total ... | 12 | 31 | 19 | 25 | 12 | 16 | 11 | 8 | 39 | 9 | 203 | 17 | 1 in 14 $\frac{10}{11}$ |

* The weights of fifteen stones extracted in June, July, and August, 1850, just before my taking leave of absence for a period of seven months were not taken.

* The weights of fourteen stones extracted in April and May, 1852, just before my transfer from Budaon to the Calcutta Medical College were not taken.

TABLE V,
COMPARATIVE.

| Table of Mortality from Lithotomy operations at different ages at the Bristol Infirmary, as given by Richard Smith, Esq., in the 11th vol. of "Medico-Chirurgical Transactions," London, 1821. | | | | | Table of Mortality from Lithotomy operations at different ages, from the practice of Mr. Cheselden, in St. Thomas's Hospital, as given in a work entitled "Observations on Lithotomy, by John Thomson," 1808. | | | | | Table of Mortality from Lithotomy operations at different ages from the practice of Sub-Assistant Surgeon Ramnarain Dass, in the Cawnpore and Budoan Government Dispensary Hospitals. | | | | |
|--|--------|-------|------------------------|---------------------|---|--------|-------|------------------------|---------------------|---|--------|-------|------------------------|---------------------|
| Period of Ages. | Cured. | Died. | Total number operated. | Ratio of Mortality. | Period of Ages. | Cured. | Died. | Total number operated. | Ratio of Mortality. | Period of Ages. | Cured. | Died. | Total number operated. | Ratio of Mortality. |
| From 2 to 10 yrs. | 106 | 29 | 135 | 1 in 4½ | Under 10 years | 102 | 3 | 105 | 1 in 35 | From 2 to 10 yrs. | 79 | 3 | 82 | 1 in 27½ |
| " 10 " 20 | 52 | 13 | 65 | 1 in 5 | Between 10 and 20 " | 58 | 4 | 62 | 1 " 15½ | " 10 " 20 | 37 | 3 | 40 | 1 " 13½ |
| " 20 " 30 | 30 | 5 | 35 | 1 in 7 | " 20 " 30 " | 9 | 3 | 12 | 1 " 4 | " 20 " 30 | 21 | — | 21 | — |
| " 30 " 40 | 27 | 7 | 34 | 1 in 5 | " 30 " 40 " | 8 | 2 | 10 | 1 " 5 | " 30 " 40 | 38 | 4 | 42 | 1 in 10½ |
| " 40 " 50 | 26 | 11 | 37 | 1 in 3½ | " 40 " 50 " | 8 | 2 | 10 | 1 " 5 | " 40 " 50 | 24 | 4 | 28 | 1 " 7 |
| " 50 " 60 | 22 | 6 | 28 | 1 in 4½ | " 50 " 60 " | 3 | 4 | 7 | 1 " 1¾ | " 50 " 60 | 3 | 2 | 5 | 1 " 2½ |
| " 60 " 70 | 11 | 7 | 18 | 1 in 2½ | " 60 " 70 " | 4 | 1 | 5 | 1 " 5 | " 60 " 70 | 1 | — | 1 | — |
| " 70 " 80 | 1 | 1 | 2 | 1 in 2 | " 70 " 80 " | 1 | 1 | 2 | 1 " 2 | " 70 " 80 | — | 1 | 1 | 1 in 1 |
| TOTAL . . | 275 | 79 | 354 | 1 in 4½ | TOTAL . . | 193 | 20 | 213 | 1 in 10½ | TOTAL . . | 203 | 17 | 220 | — |
| | | | | | | | | | | Add the operations performed at Cawnpore . | 28 | — | 28 | — |
| | | | | | | | | | | GRAND TOTAL . | 231 | 17 | 248 | 1 in 14½ |

Comparing the foregoing tables with those of Mr. Richard Smith of Bristol, as given in the 11th volume of the *Medico-Chirurgical Transactions*, pages 8 and 9, I find that my 248 lateral operations of lithotomy performed during a period of twelve years represent a comparatively larger experience than 354 lateral lithotomy operations performed during a period of eighty-two years; whilst 79 deaths in 354 cases represent a higher rate of mortality than my 17 deaths in 248 cases. Again, a comparison of my table with that of Mr. Cheselden, as given in "Observations on Lithotomy," by Mr. John Thomson, page 68, shows that my operations were more numerous, and the number of deaths less than in Mr. Cheselden's practice. Moreover, comparing the foregoing tables with those given by Mr. C. Williams in the 4th volume of "Holmes' System of Surgery," page 462, it will be found that my 248 operations of lateral lithotomy, performed during a period of twelve years, represented a more extended experience than 811 lateral lithotomy operations performed during a period of ninety years; whilst 105 deaths in 811 cases is a higher rate of mortality than 17 deaths in 248.

The *Medical Mirror* for September, 1866, criticising Dr. Fayrer's address on surgery published in his work entitled "Clinical Surgery in India," and quoted in No. 21 of the *Madras Quarterly Journal of Medical Science*, dated January, 1867, accused Dr. Fayrer very unfairly of want of modesty of expression, though what he wrote was really just and true; not satisfied, moreover, with this accusation, it goes a step further, and says, "Lecturing to the half-castes and natives is evidently elevating, but we scarcely think that any more elevation is required. Perhaps a few years' sojourn in England would sober down Professor Fayrer's style, which from the following extract would appear to be decidedly in want of a little wholesome pruning."

From these remarks it would appear that the *Medical Mirror* belongs to the old school, and objects to seeing or hearing of anything concerning progress amongst the natives of India, raising them to the level of their brethren in the Western Hemisphere. Is it not, however (I ask), a great triumph that the natives of this country should succeed in mastering a foreign language, and through its medium should also succeed in learning a difficult profession, and should in the practice of that profession,

obtain an amount of success practically equivalent to that of the most noted practitioners of Europe? The *Madras Quarterly Journal of Medical Science*, comparing the statistics of Mr. C. Smith of Bristol, of Mr. Henry Thompson, and Dr. Fayrer's records of Indian practice, says that "facts are stubborn things." In support of these facts I have ventured to record my experience, and trust I shall not be accused of presumption in placing side by side with Mr. C. Smith's and Mr. Cheselden's tables of the statistics of lateral lithotomy, the results of my practice, which have, I think, not been inferior either in extent or in success. I would venture to suggest that Dr. Fayrer's style does not require "a little wholesome pruning," as the *Mirror* asserts, but that his instructions to the half-castes and natives have produced abundant and satisfactory fruit; and I would at the same time remark that it is a great pity that distinction of creed and colour should be allowed to hold any place in questions of professional progress and success.

Register of Stone Cases admitted into the Cawnpore Government Dispensary and Relief Society's Hospital during a

Period of Seven Years, from July, 1840, to May, 1847.

| No. | Names. | Age. | Occupation. | Castes. | How long Ill. | | Dates of Admission | Dates of Discharge or Cure. | Dates of Death. | Dates of Operations | Nature and Composition of Stones. | Weights of Stones. | | Remarks. |
|---|---------------|-------|-------------|---------|---------------|-----|--------------------|-----------------------------|-----------------|---------------------|-----------------------------------|--------------------|-----------|------------|
| | | | | | Yrs. | Ms. | | | | | | Oz. | Dis. Grs. | |
| One Case operated on during the half-year from 1st February to 31st July, 1841. | | | | | | | | | | | | | | |
| 1 | Gobindah | 7 y. | Bramhun | Hindoo | 2 | | 1841 7 July | 1841 10 Aug. | | 1841 10 July | Triple Phosphate | | | Not taken. |
| Admitted none during the half-year from 1st August, 1841, to 31st January, 1842. | | | | | | | | | | | | | | |
| Two cases were operated on during the half-year from 1st February to 31st July, 1842. | | | | | | | | | | | | | | |
| 2 | Nunnah | 12 d. | | Hindoo | 2 | | 1842 | 1842 | | 1842 | | | | |
| 3 | Shaik Munowur | 32 y. | Chupdar | Mussilm | 3 | | 24 July | 23 Aug. | | 27 July | Triple Phosphate | | | |

Six cases were operated on during the half-year from 1st August, 1842, to 31st January, 1843, but detailed accounts have not been recorded in the half-yearly report.

Three cases were operated on during the half-year from 1st February to 31st July, 1843, but detailed accounts have not been recorded in the half-yearly report.

One case was operated on during the half year from 1st August, 1843, to 31st January, 1844.

| | | | | | | | | | | | | | |
|----|---|--------|--------|---|---------|------|---------|--|--|--|--|--|--|
| 13 | 2 | Weaver | Hindoo | 6 | 24 Dec. | 1844 | 10 Jan. | | | | | | |
|----|---|--------|--------|---|---------|------|---------|--|--|--|--|--|--|

Three cases were operated on during the half-year from 1st February to 31st July, 1844, but detailed accounts have not been recorded in the half-yearly report.

One case was operated on during the half-year from 1st August, 1844, to 31st January, 1845.

| | | | | | | | | | | | | | |
|----|----|----------|---------|---|--------|------|---------|---------|---------|--|--|--|--|
| 17 | 35 | Nooralie | Musslmn | 6 | 2 Oct. | 1844 | 22 Nov. | 16 Oct. | Lithate | | | | |
|----|----|----------|---------|---|--------|------|---------|---------|---------|--|--|--|--|

Three cases were operated on during the half-year from 1st February to 31st July, 1845, but detailed accounts have not been recorded in the half-yearly report.

Two cases were operated on in the half-year from 1st August, 1845, to 31st January, 1846, but detailed accounts have not been recorded in the half-yearly report.

Three cases were operated on in the half-year from 1st February to 31st July, 1846, but detailed accounts have not been recorded in the half-yearly report.

Three cases were operated on in the half-year from 1st August, 1846, to 31st January, 1847.

| | | | | | | | | | | | |
|----|------|---------------|---------|---|---------|------|---------|---------|---------|-----------------------|---------------|
| 26 | 3 d. | Khadar Hassim | Musslmn | 2 | 8 Nov. | 1846 | 14 Dec. | 1846 | 10 Nov. | Lithate and Phosphate | $\frac{1}{2}$ |
| 27 | 6 | Munnah | Hindoo | 1 | 1 Dec. | 1847 | 4 Jan. | 12 Dec. | 1847 | Do. | 1 |
| 28 | 3 | Beharry | | 3 | 12 Jan. | 1847 | 2 Feb. | 18 Jan. | | Do. | 1 |

Register of Stone Cases admitted into the Budoan Government Dispensary's Hospital, during a period of Five Years From May, 1847, to June, 1852.

| No. | Names. | Age | Occupation. | Castes. | How long ill. | | Dates of Admission. | Dates of Discharge or Cure. | Dates of Death. | Nature and Composition of the Stones. | Weights of Stones. | | Remarks. |
|--|----------------|-----|-------------|----------|---------------|-----|---------------------|-----------------------------|-----------------|---------------------------------------|--------------------|-----------|---------------------|
| | | | | | Yrs. | Ms. | | | | | Oz. | Dts. Grs. | |
| 7 Cases of Stone were operated on during the half-year from 1st April to 30th September, 1847. | | | | | | | | | | | | | |
| 1 | Bahootha ... | 30 | Kissan | Hindoo | 6 | | 1847 1 June | 14 July | 1847 5 June | Phosphate | 1 | 3½ | 2 calculi in number |
| 2 | Abhoo ... | 30 | Ihur | " | 3 | | " | 15 " | 5 " | " | 3 | 15 | |
| 3 | " | 7 | Shepherd | " | 2 | | 25 " | 30 " | 10 July | Lithate | 1 | | |
| 4 | Sunkar | 40 | Chamar | " | 4 | | 20 July | 22 Aug. | 1 Aug. | " | 4 | | 3 calculi in number |
| 5 | Woomaid ... | 60 | " | " | 2 | | 3 Aug. | 5 Sept. | 6 " | " | 4 | | of equal size. |
| 6 | Makun | 10 | Morah | " | 2 | | " | 5 " | 20 " | " | 6 | 30 | |
| 7 | Boogah | 15 | Shepherd | " | 2 | | 29 July | 9 " | 27 " | Mulberry | 1 | | |
| 15 Cases were operated on during the half-year from 1st October, 1847, to 31st March, 1848. | | | | | | | | | | | | | |
| 8 | Rambux..... | 7 | Shepherd | Hindoo | 2 | | 1 Oct. | 12 Oct. | 4 Oct. | Lithate | 2 | | |
| 9 | Johahur | 16 | Kissan | " | 3 | | " | 10 Nov. | 4 " | Triple Phosphate | 2 | | |
| 10 | Kissnah | 9 | " | " | 4 | | " | 21 " | 24 " | " | 6 | 40 | |
| 11 | Khassallie ... | 25 | Weaver | " | 3 | | " | 21 " | 24 " | Lithate | 2 | 40 | |
| 12 | Byromah ... | 9 | Blacksmith | " | 1 | | " | 10 Dec. | 15 Nov. | " | 4 | | |
| 13 | Damin | 50 | Shepherd | " | 5 | | 30 " | 30 " | 15 " | " | 6 | | |
| 14 | Bhowanie .. | 40 | " | " | 2 | | 12 Nov. | 20 Jan. | 14 Dec. | " | 2 | | |
| 15 | Khursaid .. | | " | " | | | 27 " | 14 " | 8 " | Lithate and Phosphate | 1 | 5* | * Anus and rectum |
| 16 | Hossim | 16 | Burkundaz | Muslimn. | 4 | | 2 Dec. | 23 " | 8 " | Lithate | 1 | 3+ | were cut down be- |
| 17 | Bachun Khan | 50 | Kahar | Hindoo | 1 | | 23 " | 14 " | 25 " | " | 1 | 40 | cause the stone was |
| 18 | Shama | 50 | Ihur | " | 1 | 6 | 27 " | 27 " | 1848 | " | 3 | 30 | a large one. |
| 19 | Kharatie ... | 32 | Godeo | " | 3 | | 20 " | 31 " | 8 Jan. | Triple Phosphate | 3 | 30 | + Do, do. |
| 20 | Neerunjun ... | 20 | Kissan | " | 2 | | 19 Feb. | 10 " | 14 March | Lithate | 6 | | |
| 21 | Rutta | 10 | " | " | 2 | | 10 Mar. | 25 " | 27 " | Oxalate | 1 | 30 | |
| 22 | Karunta | 18 | " | Muslimn. | 6 | | 10 " | 15 " | 27 " | Lithate and Phosphate | 2 | | |

REGISTER OF STONE CASES (continued).

| No. | Names. | Age. | Occupation. | Castes. | How long Ill. | | Dates of Admission. | Dates of Discharge or Cure. | Dates of Death. | Dates of Operation. | Nature and Composition of the Stone. | Weights of Stones. | | Remarks. |
|--|----------------|------|-------------|----------|---------------|-----|---------------------|-----------------------------|-----------------|---------------------|--|--------------------|-----|--|
| | | | | | Yrs | Ms. | | | | | | Oz. | Its | |
| 26 Cases were operated on during the half-year from 1st April to 30th September, 1849. | | | | | | | | | | | | | | |
| 55 | Bolakee | 4 | Shepherd | Hindoo | 2 | | 1849 7 April | 1849 1 May | 1849 | 1849 9 April | Lithate | | | |
| 56 | Khurgah | 20 | Kurnee | " | 2 | | 14 " | 15 " | | 29 " | " | 1 | 3 | |
| 57 | Kumdaul | 10 | Barber | " | 2 | | 27 " | 17 " | | 15 May | " | | 3 | |
| 58 | Beerbul | 50 | Kahar | " | 2 | | 28 " | 31 " | | 11 " | " | | 3 | |
| 59 | Gorah | 8 | Kissan | " | 2 | | 5 May | 10 June | | 19 " | " | | 7 | |
| 60 | Chatram | 40 | Bania | " | 3 | | 5 " | 16 " | | 11 " | " | 1 | | |
| 61 | Pamah | 40 | Kahar | " | 5 | | 11 " | | 26 May | 15 " | " | 2 | 5 | Died of exhaustion. |
| 62 | Chiennah | 10 | Bramhun | " | 2 | | 12 " | 9 June | | 19 " | " | | 4 | |
| 63 | Pemraj | 50 | Ihur | " | 4 | | 27 " | 19 July | | 20 June | Urate of Ammonia | 1 | | Hourglass-shaped. |
| 64 | Darum Doss. | 50 | Bramhun | " | 3 | | 27 " | 4 " | | 20 " | Uric Ac. & Urate of Amm. | | 4 | |
| 65 | Tojah | 50 | Kissan | " | 1 | | 13 June | 9 " | | 20 " | Urate of Amm. & Uric Ac. & Oxalate of Lime. | 2 | 4 | |
| 66 | Suetah | 10 | Kahar | " | 1 | | 14 " | 22 " | | 20 " | Urate of Amm. & Phosph. of Lime externally. | | 2 | Two Calculi. |
| 67 | Allum | 40 | | Mussuln. | 6 | | 17 " | 22 " | | 29 " | Urate of Amm. & Uric Ac. & traces of Oxal. of Lime. | 1 | 1 | |
| 68 | Punchum | 12 | Dhobee | Hindoo | 1 | | 7 July | 18 Aug. | | 24 July | Do. do. | 1 | 1 | |
| 69 | Khanjun | 4 | Tacoar | " | 1 | | 13 " | 29 " | | 5 Aug. | Lithate of Ammonia. | | 3 | |
| 70 | Toolaram | 35 | Bramhun | " | 2 | | 18 " | 12 " | | 24 July | Lithic Ac. & Lithate Am. | 1 | | |
| 71 | Lakee | 15 | Shepherd | " | 3 | | 21 " | 20 " | | 24 " | " | | | Lost. |
| 72 | Jeesook | 16 | Bramhun | Hindoo | 1 | | 1 Aug. | 1 Sep. | | 5 Aug. | Lith. of Am., & Lith. Acid, & traces of Ox. of Lime. | 1 | | 2 Calculi, 1 large and 1 small one. |
| 73 | Gocool | 6 | Kahar | " | 2 | | 11 " | 5 " | | 21 " | Urate of Ammonia, with traces of Uric Acid. | | 2 | Do. do. |
| 74 | Sobahram | 35 | Talee | " | 3 | | 13 " | 8 " | | 21 " | Uric Ac. & Urate of Am. | | 4 | 2 Cal., 1 large and 1 pea-shaped size. |
| 75 | Mohaboolah.. | 60 | | Mussuln. | 4 | | 14 " | 17 " | | 21 " | Do. do. | 3 | 4 | Two Calculi of equal size. |
| 76 | Toolah | 10 | Shoemaker | Hindoo | 2 | | 1 Sep. | 3 Oct. | | 18 Sep. | Ox. of Lime and traces of Urate of Ammonia. | | 3 | 30 |

REGISTER OF STONE CASES (continued).

| No. | Names. | Age. | Occupation. | Castes. | How long Ill. | | Dates of Admission | Dates of Discharge or Cure. | Dates of Death. | Dates of Operations. | Nature and Composition of the Stones. | Weights of Stones. | | | Remarks. |
|--|---------------|------|-------------|----------|---------------|-----|--------------------|-----------------------------|-----------------|----------------------|--|--------------------|------|-----|---------------------|
| | | | | | Yrs. | Ms. | | | | | | Oz. | Dts. | Gr. | |
| 99 | Lokeman ... | 10 | | Hindoo. | 1 | | 1850 15 Mar. | 1850 15 April | 1850 | 1850 25 Mar. | Uric Ac. & Urate of Am. | | 2 | 30 | |
| 100 | Mohun | 8 | | " | 2 | | 17 " | 11 " | | 25 " | Do. | | 4 | | |
| 101 | Urjoon | 8 | | " | 1 | | 20 " | 25 " | | 25 " | Do. | | 1 | 40 | |
| 29 Cases were operated on during the five months from 1st April, to 19th August, 1850. | | | | | | | | | | | | | | | |
| 102 | Rahamut ... | 60 | Bheestec | Mussuln. | 1 | | 7 April | | 3 May | 20 April | Uric Acid with traces of Urate of Ammonia. | | 2 | | Died of Exhaustion. |
| 103 | Hatum | 40 | Milkman | " | 2 | | 15 " | 27 May | | 23 " | Uric Ac. & Urate of Am. | | 5 | | |
| 104 | Chidoo | 20 | Kahar | Hindoo | 3 | | 17 " | 24 " | | 27 " | Urate of Am. & Uric Ac. & Triple Ph. of Lime & Ph. of Lime externally. | 1 | 4 | | |
| 105 | Golam Mo- | 45 | Mussuln. | Mussuln. | 3 | 6 | 21 " | 19 " | | 30 " | Uric Ac. & Urate of Am. | | | | |
| 106 | hamud ... | 10 | Kissan | Hindoo | 2 | | 2 May | 25 " | | 10 May | Uric Ac. & Urate of Am. & Oxalate of Lime. | 1 | 3 | | |
| 107 | Rutnah | 10 | " | " | 2 | | 6 " | 13 " | | 24 " | Oxalate of Lime & Urate of Ammonia. | 6 | 6 | 30 | |
| 108 | Purhan | 15 | " | " | 2 | | 7 " | 31 " | | 10 " | Urate of Am. & Uric Ac. | | 4 | 30 | |
| 109 | Munsa | 40 | " | Mussuln. | 2 | | 7 " | 27 " | | 10 " | Uric Ac. & Urate of Am. | | 4 | 30 | |
| 110 | Chintah | 50 | Kissan | Hindoo | 2 | 6 | 7 " | 27 " | | 10 " | Urate of Ammonia and Phosphate of Lime. | | 6 | | |
| 111 | Kanjah..... | 10 | Shoemaker | " | 3 | | 12 " | 14 June | | 24 " | Oxalate of Lime & Urate of Am. & Uric Acid. | | 6 | | |
| 112 | Munglah ... | 14 | Shepherd | " | 2 | | 15 " | 12 " | | 24 " | Urate of Am. & Uric Ac. variously mixed with Oxalate of Lime. | | 4 | | |
| 113 | Khan Sing... | 8 | Kissan | " | 1 | | 2 June | 4 July | | 14 June | Uric Ac. & Urate of Am. | | 3 | | |
| 114 | Utwaree..... | 40 | Kahar | " | 2 | | 3 " | 14 " | | 11 " | Urate of Ammonia and Phosphate of Lime. | | 4 | | Died of Exhaustion. |
| 115 | Khamanee ... | 60 | Kissan | " | 3 | | 4 " | 4 " | 24 June | 14 " | | | | | |
| 116 | Hofizoolah... | 10 | Barber | Mussuln. | 2 | | 5 " | | | 14 " | | | | | |

| | | | | | | | | | | | | |
|-----|----------------|----|------------|----------|---|---------|---------|---------|--|---|---|--|
| 117 | Loomarah ... | 8 | Kissan | Hindoo | 2 | 30 June | 19 June | 11 June | Phosphate of Lime and Triple Phosphate and traces of Urate of Ammonia. | 4 | 1 | Died of Exhaustion. The Weights and Compositions of 15 stones from Nos. 116 to 130, except 123, removed just before my taking leave of absence for 7 months were not recorded. |
| 118 | Khoondun ... | 50 | " | " | 1 | 5 June | 19 June | 7 " | | | | |
| 119 | Bulgut | 35 | " | " | 2 | 7 " | " | 11 " | | | | |
| 120 | Bulucrah | 8 | Dhobee | " | 1 | 11 " | " | 19 " | | | | |
| 121 | Bhurn Sin ... | 10 | Goldsmith | " | 1 | 12 " | " | 18 July | | | | |
| 122 | Kharatee ... | 25 | " | Mussuln. | 1 | 13 " | " | 18 " | | | | |
| 123 | Ujeet | 50 | Shop-kepr. | Hindoo | 2 | 15 " | " | 23 " | | | | |
| 124 | Ticeoram ... | 6 | Dhobee | " | 1 | 17 " | " | 23 " | | | | |
| 125 | Jubba | 10 | Kissan | " | 1 | 22 " | " | 30 " | | | | |
| 126 | Munglee | 5 | Shepherd | " | 1 | 25 " | " | 30 " | | | | |
| 127 | Bany | 60 | Shop-kepr. | " | 2 | 1 Aug. | " | 6 Aug. | | | | |
| 128 | Greedhary ... | 20 | Beggar | " | 2 | 7 " | " | 19 " | | | | |
| 129 | Sobah | 8 | Bania | " | 2 | 9 " | " | 19 " | | | | |
| 130 | Nundah | 8 | Kissan | " | 1 | 12 " | " | 19 " | | | | |

42 Cases were operated on during the half-year from 1st April, to 30th September, 1851.

| | | | | | | | | | | | | |
|-----|---------------|----|----------|----------|---|---------------|---------------|---------------|---|---|----|---------------------|
| 131 | Lall Sing ... | 50 | Tacoor | Hindoo | 1 | 1851 10 April | 1851 24 April | 1851 24 April | Urate of Am. & Uric Ac. | 7 | 50 | Died of Exhaustion. |
| 132 | Hossunna ... | 10 | " | Mussuln. | 2 | 12 " | " | 19 " | Urate of Am. & Uric Ac. & traces of Phosphate of Lime externally. | 1 | 5 | |
| 133 | Paransook ... | 8 | Milkman | Hindoo | 1 | 6 | 15 " | 28 " | Uric Ac. & Urate of Am. | 2 | 30 | |
| 134 | Doomah ... | 50 | Kissan | " | 2 | 2 May | 12 June | 15 May | Do. do. | 2 | 10 | |
| 135 | Rampersand. | 6 | Bania | " | 1 | 15 " | " | 24 " | Uric Ac. & Urate of Ammonia. | 4 | 20 | |
| 136 | Mohun | 5 | Shepherd | " | 1 | 20 " | " | 2 June | Uric Ac. & Urate of Am. & traces of Ox. of Lime. | 3 | 40 | |
| 137 | Kaneyah ... | 10 | Dhobee | " | 1 | 22 " | " | 2 " | Uric Ac. & Urate of Am. | 6 | 5 | |
| 138 | Sobah | 7 | Barber | " | 1 | 23 " | " | 4 " | Do. do. | 2 | 20 | |
| 139 | Gomannee ... | 8 | Kissan | " | 2 | 25 " | " | 11 " | Do. do. & Triple Ph. externally. | 1 | 2 | |
| 140 | Munnee | 40 | " | " | 3 | 25 " | " | 9 " | Do. do. | 6 | 4 | |
| 141 | Nuthoo | 50 | Bania | " | 4 | 25 " | " | 21 " | Uric Ac. & Urate of Am. | 4 | 50 | |
| 142 | Hurrysing ... | 20 | Kissan | " | 2 | 26 " | " | 11 " | Ox. of Lime. & Ur. of Am. | 1 | 2 | |
| 143 | Kulloo ... | 30 | Dhobee | " | 2 | 27 " | " | 13 " | Ox. of Lime and traces of Urate of Ammonia. | 4 | 20 | |
| 144 | Dullah .. | 30 | Kissan | " | 1 | 27 " | " | 9 " | Urate of Am. and traces of Uric Acid. | 1 | 50 | |

REGISTER OF STONE CASES (continued).

| No. | Names. | ॐ ॐ ॐ | Occupations. | Castes. | How long ill. | | Dates of Admission. | Dates of Discharge or Cure. | Dates of Death. | Dates of Operations. | Nature and Composition of the Stones. | Weights of Stones. | | | Remarks. |
|-----|----------------|-------------|--------------|----------|---------------|-----|---------------------|-----------------------------|-----------------|----------------------|---|--------------------|------|------|---|
| | | | | | Yrs | Ms. | | | | | | Oz. | Dts. | Grs. | |
| 145 | Jogonauth ... | 4 | Bramhun | Hindoo | 1 | | 1851 29 May | 1851 | 1851 10 June | 1851 3 June | Urate of Am. & Uric Ac. | | | | |
| 146 | Papee | 35 | Shepherd | " | 5 | | 3 June | 16 July | 10 June | 21 " | Do. | 6 | 2 | 30 | |
| 147 | J. m. ah | 50 | Shoemaker | " | 1 | | 21 " | 19 Aug. | | 3 July | Urate of Am. with traces of Oxalate of Lime. | | 2 | 5 | |
| 148 | Mohumdee... | 10 | Weaver | " | 1 | | 24 " | 18 " | | 1 " | Uric Ac. & Urate of Am. | 1 | 2 | | |
| 149 | Toorsee | 30 | Kahar | " | 3 | | 27 " | 11 " | | 3 " | Do. | 6 | | | |
| 150 | Jogan | 6 | Shoemaker | " | 2 | | 28 " | 22 July | | 3 " | & traces of Ph. of Lime. | 3 | | | |
| 151 | Joyram | 35 | Milkman | " | 1 | 6 | 4 July | 11 Aug. | | 21 July | Urate of Ammonia and traces of Oxalate of Lime. | 3 | | 10 | |
| 152 | Kaul | 30 | Kissan | " | 1 | | 11 " | 11 " | | 21 " | Do. | 3 | 3 | 15 | |
| 153 | Wodo | 15 | Bramhun | " | 2 | | 15 " | 20 " | | 25 " | Do. | 7 | | | |
| 154 | Munglee..... | 30 | Shoemaker | " | 4 | | 29 " | 2 Sept. | | 4 Aug. | Uric Ac. & Urate of Am. | 3 | 6 | 40 | |
| 155 | Khoondun ... | 3 | Kissan | " | 1 | | 1 Aug. | 11 " | | 13 " | Do. | 2 | 7 | | |
| 156 | Cassum | 15 | | Mussuln. | 3 | | 5 " | 12 " | | 13 " | Uric Ac. & Urate of Am. & traces of Ph. of Lime. | 3 | 5 | | |
| 157 | Hurryram ... | 35 | Shoemaker | Hindoo | 3 | | 5 " | | 31 Aug. | 13 " | Urate of Am. & Uric Ac. | 2 | 6 | | |
| 158 | Mohajeet ... | 50 | Tacoar | " | 3 | | 9 " | | 28 " | 20 " | Do. | 2 | 4 | | |
| 159 | Munglee..... | 10 | Dhobee | " | 2 | | 11 " | 6 " | | 20 " | Uric Ac. & Urate of Am. | 2 | | | |
| 160 | Bucktee | 30 | Milkman | " | 4 | | 12 " | 18 " | | 25 " | Urate of Am. & Uric Ac. | 2 | | | |
| 161 | Ranrutun... | 40 | Kahar | " | 1 | 6 | 14 " | 27 " | | 20 " | Li. of Am. & Ox. of Lime. | 4 | | | |
| 162 | Toolah | 25 | | Mussuln. | 1 | | 15 " | 15 " | | 25 " | Urate of Am. & Uric Ac. | 1 | | | |
| 163 | Sumbhoo ... | 50 | Tacoar | Hindoo | 2 | | 15 " | 5 " | | 25 " | Urate of Am., traces of Uric Ac. in abundance. | 7 | | | |
| 164 | Labaree | 40 | Kahar | " | 3 | | 20 " | 24 " | | 1 Sept. | Do. | 2 | | | Four Calculi and several small ones from pea shape to small grains. |
| 165 | Punchum ... | 12 | Shoemaker | " | 1 | | 25 " | 30 Oct. | | 10 " | Uric Ac. & Urate of Am. | 5 | 40 | | |
| 166 | Chiddeo | 8 | Godee | Mussuln. | 1 | 6 | 27 " | 30 " | | 10 " | Lithate of Am. & Lith. Ac. | 5 | 30 | | |
| 167 | Bunsee | 8 | Weaver | Hindoo | 1 | | 29 " | 3 " | | 10 " | Uric Ac. & Urate of Am. | 3 | 30 | | |
| 168 | Indur Sing... | 45 | Tacoar | " | 2 | | 1 Sept. | 3 " | | 12 Sept. | Lithate of Am. & Lith. Ac. with traces of Ox. of Lime | 1 | 6 | | |

| | | | | | | | | | | | |
|---|----------------|----|-----------|----------|---|----------|---------|----------|--|----|-----------------------------|
| 169 | Bucksee | 15 | Dhoonah | Mussuln. | 2 | 5 Sept. | 3 Oct. | 12 Sept. | Uric Ac. & Urate of Am. | 6 | 2 Calculi of equal sizes. |
| 170 | Poonah | 35 | Dhobee | Hindoo | 4 | 7 " | 22 " | 26 " | Urate of Am. & Uric Ac. and traces of Oxalate of Lime. | 4 | |
| 171 | Hemraj | 7 | Bania | " | 1 | 15 " | 31 " | 26 " | Uric Ac. and traces of Urate of Am. | 3 | |
| 172 | Runnah | 50 | Godee | Mussuln. | 1 | 6 17 " | 18 " | 26 " | Uric Ac. & Urate of Am. | 5 | |
| 34 Cases were operated on during the half-year from 1st October, 1851, to 31st March, 1852. | | | | | | | | | | | |
| 173 | Neetah | 35 | Tacoar | Hindoo | 3 | 25 Sept. | 31 Oct. | 11 Oct. | Urate of Ammonia and Phosph. of Lime. and traces of Cystic Oxide | 1 | 2 Calculi, large and small. |
| 174 | Neetah | 16 | Koomar | " | 4 | 29 " | 31 " | 11 " | Urate of Am. & traces of Oxalate of Lime. | 2 | |
| 175 | Bulgeet | 10 | Kissan | " | 1 | 1 Oct. | 8 Nov. | 17 " | Urate of Am. & traces of Uric Acid. | 2 | |
| 176 | Noorree | 5 | Shoemaker | " | 1 | 2 " | 31 " | 13 " | Uric Ac & traces of Urate of Am. & Phosph. of Lime externally. | 2 | |
| 177 | Bucka | 6 | Kissan | " | 1 | 6 | 29 " | 11 Nov. | Uric Ac. & Urate of Am. | 35 | |
| 178 | Mowah | 8 | Milkman | " | 1 | 27 " | 29 " | 11 " | Do. | 2 | |
| 179 | Buldeb | 6 | Kissan | " | 1 | 2 Nov. | 29 " | 11 " | Do. | 30 | |
| 180 | Joka | 10 | Shepherd | " | 1 | 4 " | 29 " | 16 " | Do. | 2 | |
| 181 | Bullah | 8 | Shoemaker | " | 1 | 4 " | 31 " | 16 " | Do. | 2 | |
| 182 | Doomur | 35 | Milkman | " | 1 | 7 " | 29 " | 15 " | Do. | 2 | |
| 183 | Roy Sing | 6 | Kissan | " | 1 | 5 " | 11 Jan. | 10 Dec. | Urate of Ammonia with traces of Uric Acid. | 40 | |
| 184 | Solba | 6 | Shoemaker | " | 1 | 29 " | 6 " | 10 " | Oxalate of Lime & Urate of Ammonia & Uric Ac. | 2 | |
| 185 | Domlee | 8 | Milkman | " | 2 | 6 1 Dec. | 31 Dec. | 10 " | Urate of Am. and Cystic Oxide and Uric Acid. | 6 | |
| 186 | Tocoreah | 5 | Shepherd | " | 1 | 7 " | 6 Jan. | 21 " | Urate of Ammonia and Oxalate of Lime. | 1 | |
| 187 | Woomadah... | 8 | Kissan | " | 2 | 9 " | 4 " | 21 " | Uric Ac. & Urate of Am. | 1 | |
| 188 | Motee..... | 4 | Shoemaker | " | 1 | 9 " | 10 " | 29 " | Urate of Ammonia. | 2 | |
| 189 | Ticcaran ... | 5 | Shepherd | " | 1 | 25 " | 24 " | 4 Jan. | Uric Acid with traces of Urate of Ammonia. | 30 | |

REGISTER OF STONE CASES (continued).

| No. | Names. | Age | Occupation. | Castes. | How long Ill. | | Date of Admission. | Date of Discharge or Cure. | Date of Death. | Date of Operation. | Nature and Composition of the Stone. | Weights of Stones. | | | Remarks. |
|-----|---------------|-----|-------------|----------|---------------|-----|--------------------|----------------------------|----------------|--------------------|--|--------------------|------|-----|--|
| | | | | | Yrs. | Ms. | | | | | | Oz. | Dis. | Gr. | |
| 190 | Paransook ... | 35 | Milkman | Hindoo | 2 | | 1851 29 Dec. | 1852 6 Feb. | 1852 | 4 Jan. | Urate of Am. & Uric Ac. & Phosphate of Lime. | | 6 | 30 | |
| 191 | Kissory Sing | 30 | " | " | 3 | | 1852 1 Jan. | 6 " | | 11 " | Ur. of Am. & Uric Ac. & Ph. of Lime, & Tpl. Ph. | 2 | | 49 | Two Calculi, large and small. |
| 192 | Rajah | 50 | " | " | 1 | | 3 " | 31 " | | 13 " | Oxalate of Lime & Uric Acid & Urate of Am. | | 3 | | |
| 193 | Paymah | 40 | Kissan | " | 1 | 6 | 5 " | 22 " | | 18 " | Urate of Am. & traces of Oxalate of Lime. | | 6 | 20 | |
| 194 | Bham Sing .. | 6 | Milkman | " | 1 | | 7 " | 4 Mch. | | 23 " | Uric Ac. & Urate of Am. | | | | |
| 195 | Lucka | 30 | " | " | 1 | | 12 " | 13 Feb. | | 25 " | Uric Ac. & Urate of Am. & also of Ox. of Lime. | 1 | 4 | 45 | |
| 196 | Gonga | 35 | Shepherd | " | 2 | | 25 " | 26 " | | 5 Feb. | Urate of Am. & Uric Ac. & Oxalate of Lime. | 1 | | | |
| 197 | Joahur | 40 | " | " | 1 | | 27 " | 22 " | | 5 " | Uric Ac. & Urate of Am. | | | | |
| 198 | Muluah | 12 | Godee | Mussulm. | 1 | 6 | 29 " | 29 " | | 5 " | Oxalate of Lime & Urate of Am. & Uric Acid. | | 6 | 40 | Broken into pieces during the extraction. |
| 199 | Buldeb | 12 | Kissan | Hindoo | 4 | | 1 Feb. | | 27 Feb. | 9 " | Urate of Ammonia and Phosphate of Lime. | 4 | 4 | | Died of looseness after his returning home. |
| 200 | Duramah ... | 35 | Weaver | " | 2 | | 1 " | 2 Mar. | | 6 Feb. | Uric Ac. & Urate of Am. and Oxalate of Lime. | | 5 | 10 | |
| 201 | Mool Chund. | 20 | Milkman | " | 2 | | 1 " | 4 " | | 6 " | Urate of Am. & Uric Ac. & traces of Ox. of Lime. | | 6 | 30 | |
| 202 | Ramdutt | 10 | " | " | 1 | | 5 " | 5 " | | 17 " | Urate of Am. & Uric Ac. and Phosph. of Lime externally. | 3 | 45 | | Three Calculi, one large and two small ones. |
| 203 | Chadah | 40 | Shoemaker | " | 1 | | 12 " | 9 April | | 20 " | Uric Ac. & Urate of Am. | | 3 | 30 | |
| 204 | Kissnah | 10 | Kissan | " | 1 | 6 | 15 " | 7 Mar. | | 27 " | Urate of Am. & Uric Ac. | | 6 | | |
| 205 | Cladah | 10 | " | " | 1 | | 2 Mch. | 4 May | | 29 Mar. | Do. do. | | 3 | | |
| 206 | Nudah | 30 | Shepherd | " | 4 | | 4 " | 14 " | | 13 " | & traces of Ox. of Lime. Urate of Ammonia and Uric Acid and traces of Phosphate of Lime. | 5 | 5 | | Discharged with Recto-vesical Fistula. |

14 Cases were operated on during 2 months from April to May, 1852.

| No. | Species | Weight | Measure | Remarks |
|-----|-----------|--------|---------|---------|
| 207 | Mungoo | 30 | | |
| 208 | Lallgeet | 50 | | |
| 209 | Joahur | 7 | | |
| 210 | Bheem | 30 | | |
| 211 | Ummur | 30 | | |
| 212 | Kulloo | 14 | | |
| 213 | Dhunsu | 50 | | |
| 214 | Balkissen | 20 | | |
| 215 | Buljeet | 7 | | |
| 216 | Moorlee | 10 | | |
| 217 | Jeesook | 30 | | |
| 218 | Khurjee | 6 | | |
| 219 | Judoo | 6 | | |
| 220 | Hurbhajun | 18 | | |

The statement of the nature and composition of the sixty-two stones from No. 1 to No. 62 in the Register was based upon a mere inspection of their form and appearance without any chemical or microscopical examinations, instruments and chemical reagents for the necessary examination not existing in a charitable dispensary. Sixty-one stones, out of these sixty-two which were sent to the Government with the half-yearly reports of the Dispensary, mounted on boards, had been stored in the College Museum, and the remaining one, No. 37 in the Register, has been lost in its circuit, as stated in the history of the case.

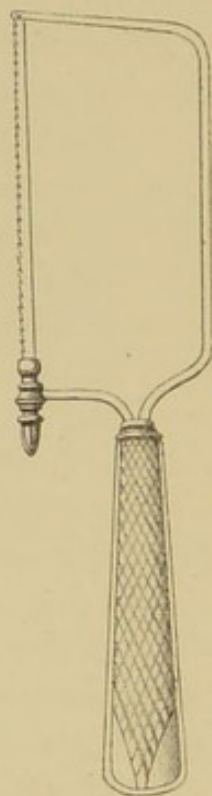
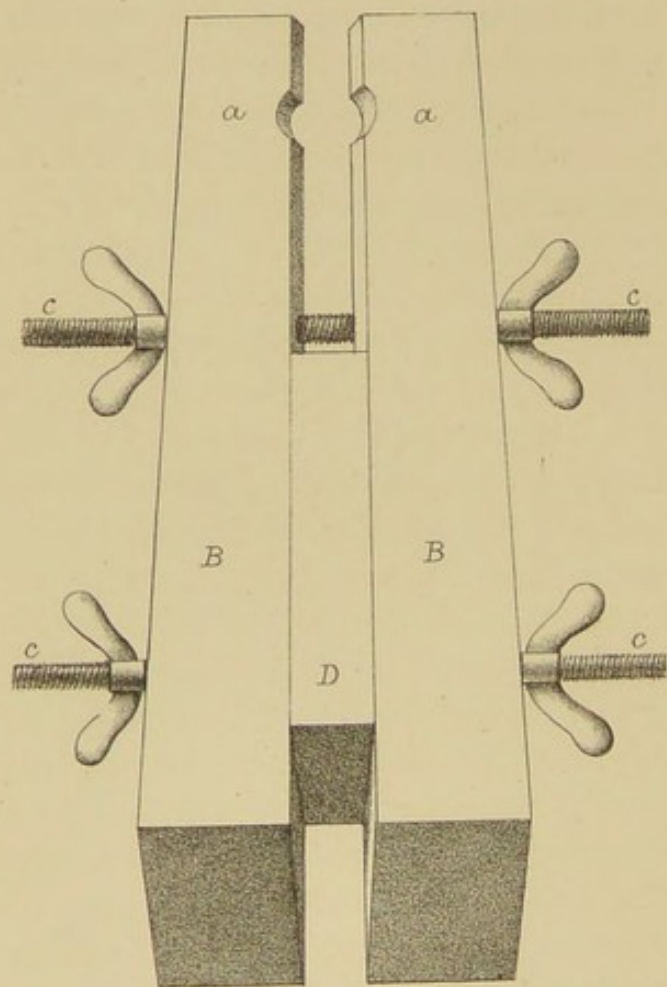
The fifteen stones from No. 115 to No. 130 of the Register, exclusive of No 123, were not then sent to the Government, as they were extracted just before my taking leave of absence for seven months, and the time for the usual half-yearly report had not then expired; in the like manner, and for a similar reason, the fourteen stones from No. 207 to No. 220 of the Register which were extracted just before my transfer from Budoan to the Calcutta Medical College were not sent to the Government; the stone in case No. 71 of the Register was lost; thus altogether there were ninety-two stones which were not examined chemically and microscopically. The remaining 128 of the 220 stones recorded in the Register of the Budoan Government Dispensary have been carefully examined. These 128 stones, which were sent to the Government with the half-yearly Reports of the Dispensary, each enclosed in a small cloth bag, together with a paper containing details of the name, age, and caste of the patient, with the date and result of the operation, had been stored in the College Museum.

The sixty-two stones which were stored in the College Museum mounted on board in the manner stated above, have been lost, the cause I believe being that the stones getting loose from the boards, their identification became impossible, and they were ultimately set aside as worthless.

Dr. Edward Goodeve, then in charge of the College Museum, advised me that sending stones mounted on boards from so long a distance as the North-western Provinces, was not a good plan, as on arrival he found many of them detached from their mounting. Acting on this advice, I subsequently sent them as above mentioned, each enclosed in a small cloth bag, in which condition they were stored in the College Museum.



*The Instruments used for sawing
the stones.*



*Rai Ram Narain Dass Bahadur,
del.*

W. West & Co. lith.

Thacker, Spink & Co., Calcutta.

Some of the stones which were not sent were taken away by the patients, as they desired to carry them home for the purpose of showing them to their relatives and friends. I had no objection to their requisition, knowing that it would increase the reputation of the dispensary, and would induce the people to resort to it for aid in their medical and surgical diseases, for want of which aid hundreds were known annually to die.

For the purpose of examination each calculus has been neatly sawn through the centre in the direction of its long flat axis. Of all the plans hitherto recommended for sawing calculi without breaking them, the following is I think the best.

The calculus, protected on either side with soft rag or leather, is placed in the hollow A A at the end of an instrument, such as shown in the diagram, the two pieces of wood B B are kept together by two screws C C C C, and are steadied by placing a third piece of wood, D, as a wedge between them: the upper screw is sufficiently tightened to hold the stone steady, and to make it immoveable during the working of the saw, and the third piece of wood also prevents too much pressure being accidentally applied to the stone by the tightening of the upper screw, and thus prevents crushing it. A bone saw, as shown in the diagram, was the instrument used for sawing. During the process of sawing water was constantly dropped into the cut part, to make it soft, and to keep the teeth of the saw clean by washing off the sawdust from them. When almost the whole of the calculus had been sawn through, it was taken out by loosening the upper screw, and the remaining part very gently sawn through whilst the stone was held with the left hand.

The nucleus and the laminæ, layers, or rings, which surround the nucleus and constitute the calculus, being thus clearly brought into view, have been carefully examined and analyzed. In the examination the microscope has been invariably used in the following manner. I obtained by scraping with the point of a penknife samples of the nucleus and of each of the layers separately; these samples I placed on a piece of glass, moistening them with a little distilled water, and covering them with a piece of thin glass in the usual way. In this manner uric acid and urate of ammonia have in every case been readily recognised, but oxalates and phosphates have not been so easily identified;

and therefore for their detection I have further chemically examined each specimen, and confirmed the results by a microscopic examination of the products.

Not one of the calculi examined has been found to be simple in character; every one has been found to be composed of two or three substances, these have generally been of organic character, such as uric acid and urate of ammonia: and these organic substances almost invariably formed the basis of every nucleus. Inorganic substances, such as phosphates and oxalates, entered into the composition of the outer layer; but rarely,—viz., in few cases—did they enter into the composition of the nucleus, being there combined with uric acid and urate of ammonia.

I have arranged and classified the calculi according to the composition of their nuclæ as follows.

1st. Uric acid, called also lithic acid, is an organic product of the metamorphosis of the tissues, serving the same office as urea, *i. e.*, constituting a vehicle for the removal of an excess of nitrogen from the system. It is found in the excrementitious products of animals, but does not enter into the composition of any of the animal tissues, nor is it a component of the blood; it is found in the urine of many animals, and is a natural constituent of the urine of man and of the carnivorous animals. In certain diseases it is generated in considerable quantities, and is precipitated from the urine either in the form of small granular or crystalline particles, constituting the disease called gravel, or in form of solid masses, constituting what is called stone or calculus disease.

The uric acid calculus may be divided into two varieties: one laminated, its texture compact and solid, and the surface smooth though granular or tuberculated, as in figure No. 11; the second variety imperfectly laminated, so as to give it a more dense and homogeneous appearance, and the surface rough, with its internal structure porous and of an earthy appearance, as in figure No. 34.

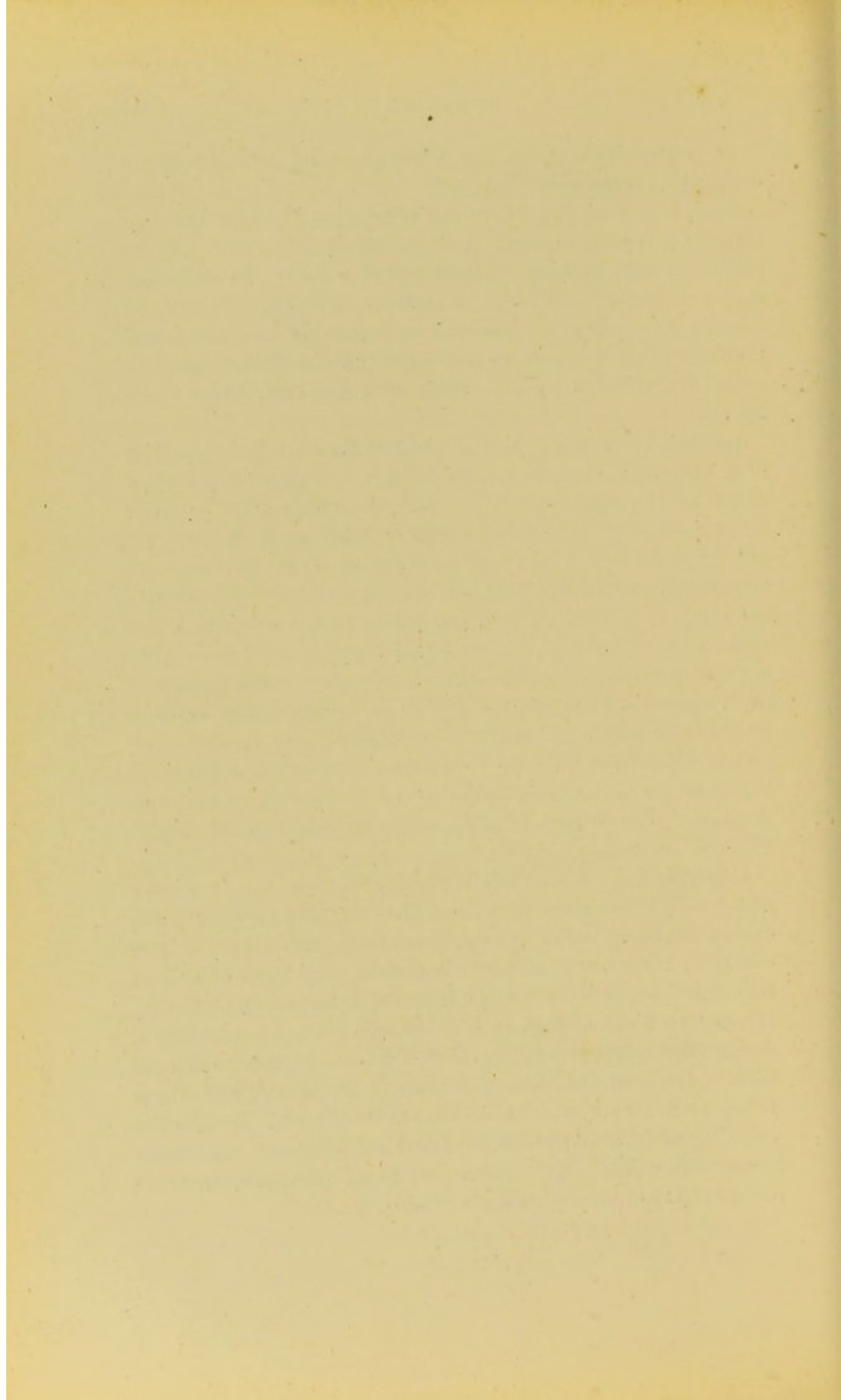
There are few calculi which present these characters in a perfectly distinct and separate manner; the two forms are usually either mixed together or pass into one another by insensible gradations. A considerable difference in the degree of compactness and structural appearance of calculi is the result.

Most commonly, however, the porous or granular variety forms the nucleus of the calculus.

There is another variety worthy of mention, the pea-shaped or pisiform uric acid calculus. This variety is characterized by its small size, which seldom exceeds that of a large pea or hemp-seed, and by the calculi being numerous instead of solitary: the internal structure of such calculi is invariably laminated, and they are often flattened on their surface, the flattening being caused by attrition against neighbouring calculi, as in figure No. 42.

Besides the above physical characters, the chemical properties of a uric acid calculus are as follows. Uric acid possesses distinct acid properties, and in combination with alkaline bases forms a class of salts called urates or lithates; it is sparingly soluble in boiling water, and the solution on cooling deposits rhombic prisms of uric acid. It readily dissolves by boiling in caustic potash solution, and on adding to the solution a few drops of muriatic acid, the uric acid is precipitated, presenting at first a gelatinous appearance, and then assuming a crystalline form. If a small fragment be heated on a watch-glass or on a piece of talc with a few drops of strong nitric acid, it effervesces, and on continuing the heat to dryness it acquires a beautiful purple colour from the formation of a substance called purpuric acid; and this colour is heightened by addition of liquid ammonia.

Uric acid in a calculus is never found pure, but is always mixed with the colouring matter of the urine, and therefore in its crude state under the microscope the rhombic crystals are always coloured; moreover it contains a certain proportion of animal matter, and hence when a small fragment is heated on platinum-foil, or on a piece of talc, it immediately blackens, emitting a disagreeable smell resembling that of burnt feathers. On continuing the heat the charred residue is consumed, and there remains a white ash, which is alkaline to test-papers. Besides the colouring and animal matters, the following substances are usually present in varying proportions, urate of ammonia, urate of lime, oxalate of lime, phosphate of lime, &c.





URINARY CALCULI.

1.



Ext.



Sect.

2.

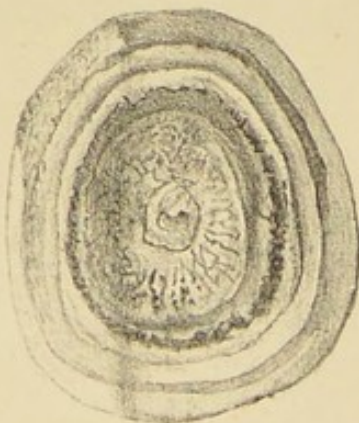


Sect.



Ext.

3.



Sect.



Ext.

*Rai Ram Narain Dass Bahadoor
del.*

Thacker, Spink & Co Calcutta.

W. West & Co Lith.

CALCULI OF WHICH THE NUCLEUS CONSISTS OF
URIC ACID.

1st. The nucleus is of dark colour, and is composed of uric acid with traces of urate of ammonia, and the surrounding laminae are of light yellow colour, and are composed of uric acid with slight traces of urate of ammonia.

It is a small oval calculus of light yellow and whitish colour externally, and also lightly tuberculated on its external surface, weighing 34.

Extracted successfully from Darumdass, a Hindoo of fifty years old, on the 20th June, 1849, at the Budoan Government Dispensary.

2nd. The nucleus is composed of uric acid with slight traces of urate of ammonia and oxalate of Lime, and the surrounding layer is uniform and not laminated, and is composed of oxalate of lime in abundance, with slight traces of urate of ammonia.

It is largely tuberculated externally, and is a hard compact calculus, weighing 3j 3j.

Extracted successfully from a Hindoo lad named Punchum, of twelve years old, on the 24th July, 1849, at the Budoan Government Dispensary.

3rd. The nucleus is composed of uric acid and urate of ammonia in equal proportions, and is porous, and the surrounding laminae are compact, and are principally composed of uric acid with traces of urate of ammonia.

It is a roundish flat calculus of brown colour, and lightly granular on its external surface, weighing 3l.

Extracted successfully from Toolahram, a Hindoo of thirty-five years old, on the 24th July, 1849, at the Budoan Government Dispensary.

4th. The nucleus is of dark colour, and is mostly composed of uric acid with traces of urate of ammonia, and the surrounding laminae are well defined but loosely connected with each other; therefore on sawing the stone they separated themselves, and are found to be similarly composed as the nucleus.

There were two calculi, one of large size and the other of the size of a seed of bean; the former has polished surface, and the other is rough, weighing together $33\frac{1}{2}$.

Extracted successfully from Mohaboolah, a Mussulman of sixty years old, on the 21st August, 1849, at the Budoan Government Dispensary.

5th. The nucleus is excentric, and is equally composed of uric acid and urate of ammonia, and the surrounding part is uniform and not laminated, and is porous, entirely composed of urate of ammonia.

It is a small oval flat calculus, of light yellow colour externally, and minutely tuberculated on its surface, weighing 34.

Extracted successfully from a Hindoo of thirty-five years old, named Sobahram, on the 21st August, 1849, at the Budoan Government Dispensary.

6th. The nucleus is of dark colour, and is composed of uric acid with traces of urate of ammonia, and the surrounding layers are well marked and are also of dark colour, and are composed of uric acid and urate of ammonia almost in equal proportions, with traces of phosphate of lime.

It is an oval calculus of light brown colour externally, weighing 33.

Extracted successfully from a Mussulman of thirty years old, named Mahamud, on the 18th September, 1849, at the Budoan Government Dispensary.

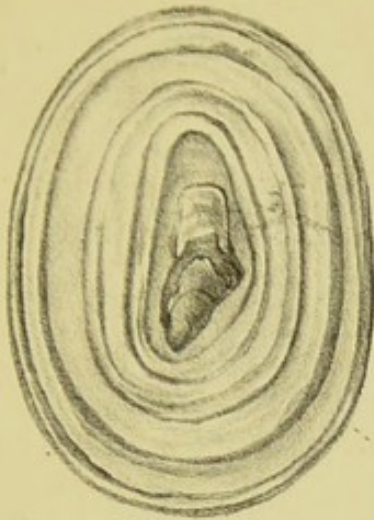
7th. The nucleus is porous and not well defined, and is composed of uric acid with traces of urate of ammonia, and the outer layer is equally composed of uric acid and urate of ammonia.

It is a small flat oval calculus, polished on its external surface, weighing 3j.

Extracted successfully from a Mussulman named Emma-moadun, fifty years old, on the 18th September, 1849, at the Budoan Government Dispensary.

URINARY CALCULI.

4.



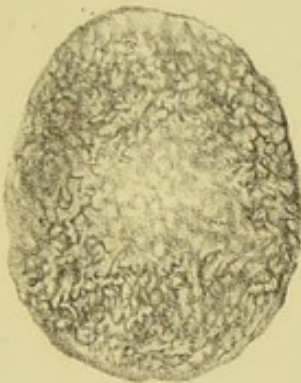
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5.



Ext.



Sect.

6.



Sect.



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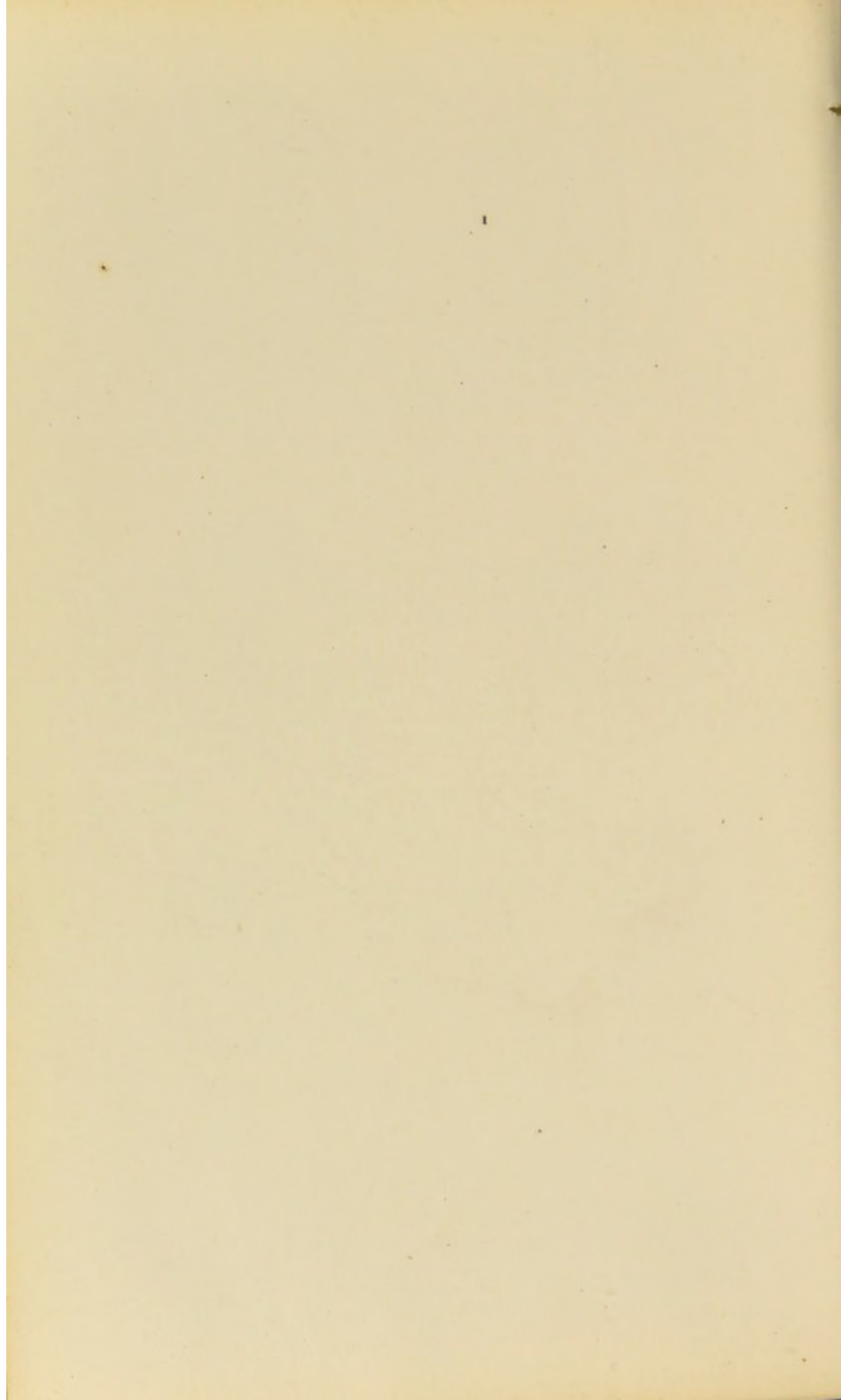
7.



Sect.



Ext.





11th. The nucleus is composed of uric acid with traces of urate of ammonia, and the surrounding layers are well marked, and are also similarly composed; the last layer, which is of a somewhat darker colour, is also composed mainly of uric acid, with slight traces of urate of ammonia.

It is a compact oval calculus of large size, of dark yellow colour, polished on its external surface though granular or tuberculated, weighing 3j 3vi.

Extracted successfully from a Hindoo named Bhowanee, of twenty years old, on the 6th November, 1849, at the Budaon Government Dispensary.

12th. The nucleus is composed of uric acid with slight traces of urate of ammonia; the first surrounding layers are coloured, and are composed of urate of ammonia, with traces of uric acid, and the last surrounding layer is white, and is composed mainly of urate of ammonia.

It is a roundish calculus of chalky colour, polished on its surface, weighing 33.

Extracted successfully from a Hindoo lad named Nundram, of six years old, on the 27th November, 1849, at the Budaon Government Dispensary.

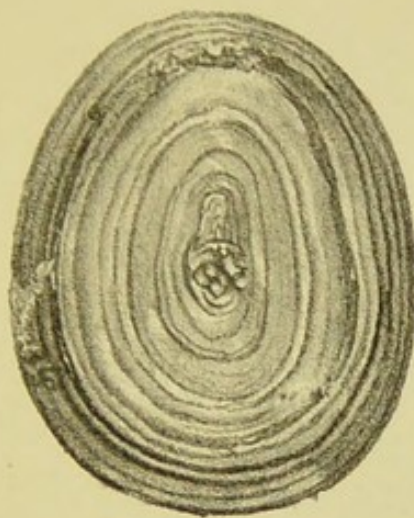
13th. The nucleus is composed almost equally of uric acid and urate of ammonia, and the surrounding rings are well marked, and are mostly composed of urate of ammonia, with traces of uric acid.

It is a middle-sized oval calculus of light yellow colour externally, weighing 34.

Extracted successfully from a Hindoo boy of eight years of age, named Mohun, on the 26th December, 1849, at the Budaon Government Dispensary.

URINARY CALCULI

11

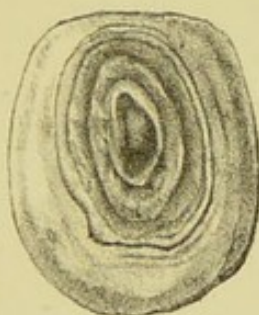


Sect.



Ext.

12.



Sect.



Ext.

13.



Sect.



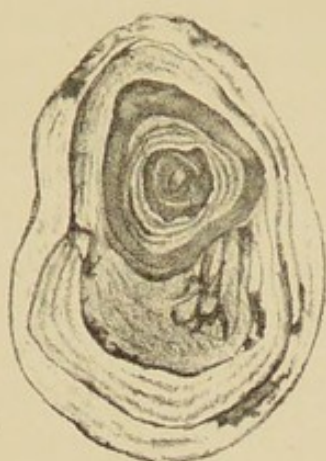
Ext.

8



URINARY CALCULI.

14.



Sect.



Ext.

15.



Sect.



Entire Calculus.



Ext.

16.



Sect.



Ext.

14th. The nucleus is excentric, and is composed of uric acid and urate of ammonia in equal proportions, and the next surrounding rings are composed of uric acid with slight traces of urate of ammonia; the last ring is whitish and porous, and is composed of uric acid with slight traces of urate of ammonia also.

It is an oval flat calculus, tapering towards one end, where it is thicker than at the other, weighing 36.

Extracted successfully from a Hindoo named Khomanee, of thirty-five years old, on the 30th December, 1849, at the Budaon Government Dispensary.

15th. The nucleus and the surrounding laminæ are not distinct; the internal surface is porous throughout; they are composed of uric acid and urate of ammonia.

They were two calculi, weighing 3iss, and were broken during the extraction.

Extracted successfully from a Hindoo boy of eight years of age, named Heera Sing, on the 15th January, 1850, at the Budaon Government Dispensary.

16th. The nucleus is composed of uric acid and urate of ammonia almost in equal proportions, and the surrounding layers are composed of urate of ammonia with traces of uric acid; the hour-glass shaped part is composed of phosphate of lime with traces of urate of ammonia, and is exceedingly porous.

It is an hour-glass shaped calculus, of white colour externally, weighing 37.

Extracted successfully from a Hindoo lad of ten years of age, named Dillsook, on the 5th February, 1850, at the Budaon Government Dispensary.

17th. The nucleus is of dark colour in two places, and is composed of uric acid with traces of urate of ammonia; the surrounding laminae are just the contrary, containing mostly urate of ammonia with traces of uric acid.

It is a compact hard calculus of dark brown colour, weighing 32.

Extracted successfully from a Hindoo lad named Sarupsook, of five years old, on the 9th March, 1850, at the Budaon Government Dispensary.

18th. The nucleus is composed of equal proportions of uric acid and urate of ammonia; the surrounding rings contain uric acid principally with slight traces of urate of ammonia; the external surface is white; and is also similarly composed, the small calculus extracted with it is mainly composed of uric acid with traces of urate of ammonia.

It is a calculus of triangular shape, of chalky colour externally; and the small one is of the same shape also, weighing 3j grs. 20.

Extracted successfully from a Hindoo named Kharaj, of thirty-five years old, on the 9th March, 1850, at the Budaon Government Dispensary.

19th. The nucleus is composed of uric acid and urate of ammonia almost in equal proportions; the surrounding layer is one and all, and is porous, and is entirely composed of urate of ammonia.

It is a middle-sized roundish calculus, of light yellow colour externally, weighing 3j and gr. 40.

Extracted successfully from a Hindoo named Urjoon, of eight years old, on the 25th March, 1850, at the Budaon Government Dispensary.

20th. The nucleus is not well marked, the whole of the internal part is porous, and the stone throughout is composed of uric acid and urate of ammonia.

It is an oval flat calculus of light yellow colour and granular on its surface, and the internal part is of the same colour, weighing 32½.

Extracted successfully from Lokeman, a Hindoo lad of ten years of age, on the 25th March, 1850, at the Budaon Government Dispensary.

URINARY CALCULI.

17.



Ext.



Sect.

18.



Ext.



Sect.

19.



Sect.



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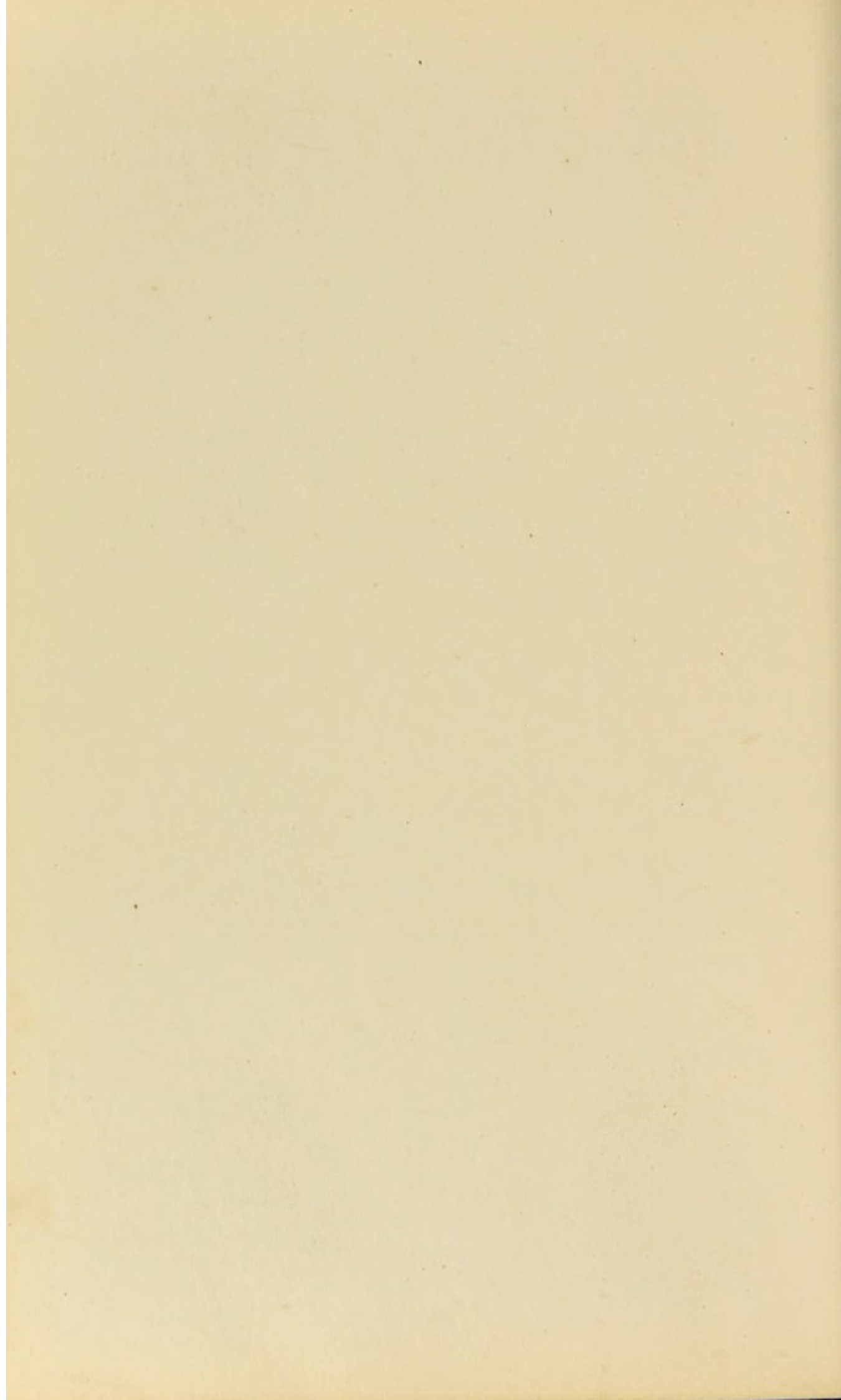
20.



Ext.



Sect.





URINARY CALCULI.

21.



Sect.



Ext.

22.



Ext.



Sect.

23.



Ext.



Sect.

21st. The nucleus and the next surrounding layers are well marked, and the rest is uniformly porous; the nucleus and all are equally composed of uric acid and urate of ammonia.

It is an oval calculus of light yellow externally, weighing 34.

Extracted successfully from a Hindoo lad of eight years of age named Mohun, on the 25th March, 1850, at the Budaon Government Dispensary.

22nd. The nucleus and the next surrounding layers are well marked, and the rest is uniformly porous, and every part of the calculus is composed of uric acid with traces of urate of ammonia.

It is a middle-sized calculus, soft in its texture, and therefore it broke during extraction, and is of light yellow colour externally, weighing 32.

Extracted from a Mussulman of sixty years old, named Rohamut, on the 20th April, 1850, at the Budaon Government Dispensary, but the patient died thirteen days after the operation.

23rd. The nucleus is of light dark colour and porous, and is composed of uric acid and urate of ammonia, almost in equal proportions, and the last surrounding white layer is also similarly composed.

It is a middle-sized calculus of light brown colour externally, and slightly tuberculated on its surface, weighing 35.

Extracted successfully from a Mussulman named Hateem, of forty years of age, on the 23rd April, 1850, at the Budaon Government Dispensary.

24th. The nucleus is not defined, and the whole of the internal part is of light yellow colour, and is porous, and is composed of uric acid and urate of ammonia.

It is a flat roundish calculus of light yellow colour externally, and granular on its surface, weighing $34\frac{1}{2}$.

Extracted successfully from a Mussulman named Munsa, of forty years old, on the 10th May, 1850, at the Budaon Government Dispensary.

25th. The nucleus is not defined, and the internal structure is not laminated, and is uniformly porous and white in colour, and every part of it is composed of uric acid with traces of urate of ammonia and of oxalate of lime.

It is a small calculus of light yellow colour, with white deposits on its surface, weighing 33.

Extracted successfully from a Hindoo lad named Cholia, of ten years of age, on the 10th May, 1850, at the Budaon Government Dispensary.

URINARY CALCULI.

24.



Ext.



Sect.

25.



Sect.



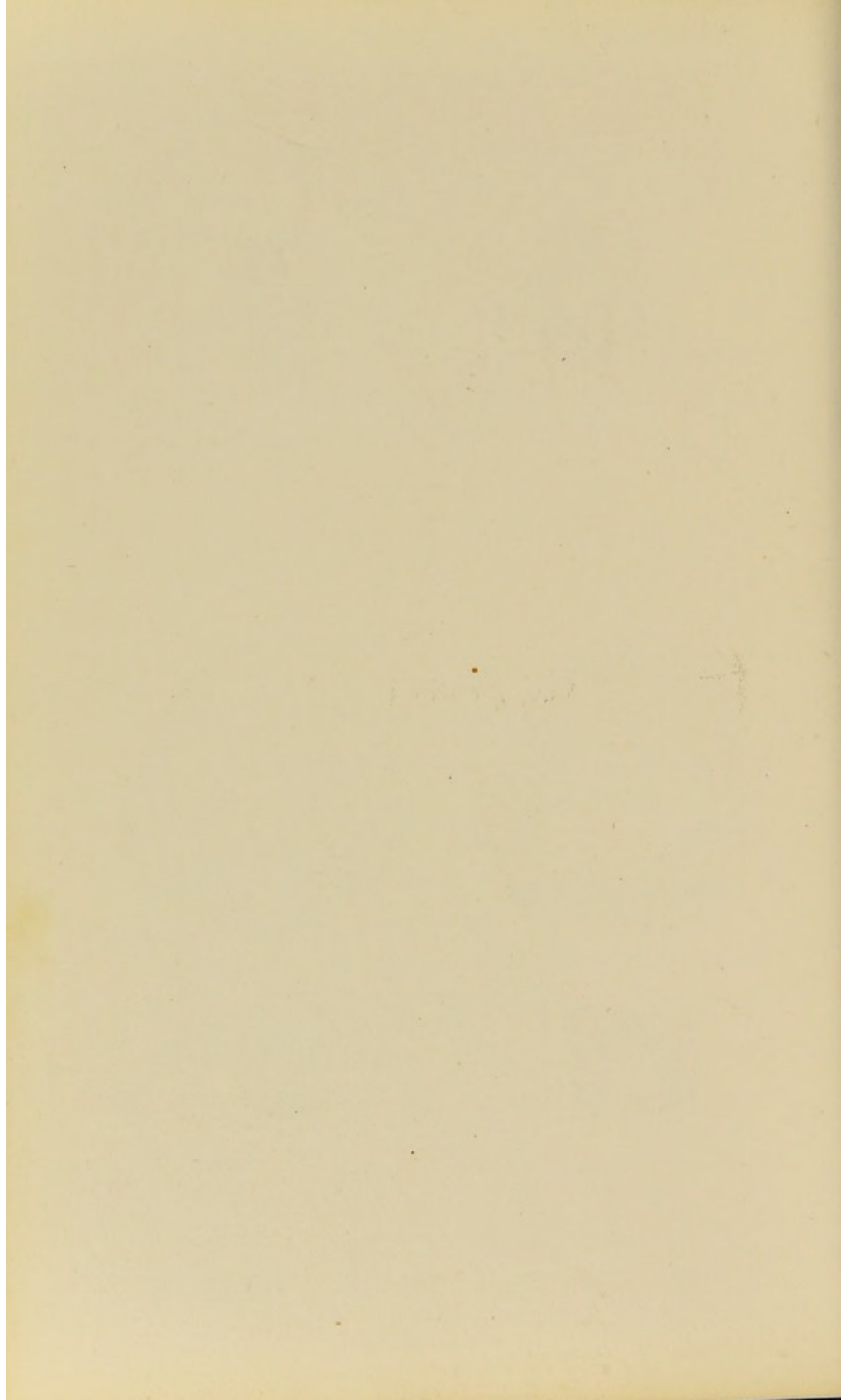
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Sect.





URINARY CALCULI.

26.

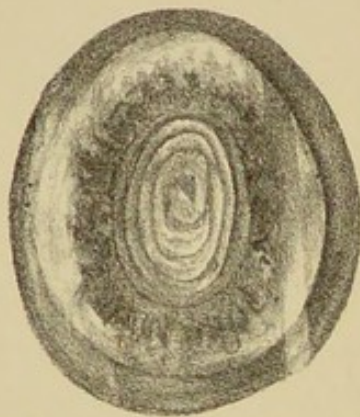


Ext.



Sect.

27.



Sect.



Ext.

28.



Ext.



Sect.

29.



Sect.



Ext.

26th. The nucleus is of light dark colour, and is principally composed of uric acid with traces of urate of ammonia; and the surrounding layers are composed of uric acid and urate of ammonia almost in equal proportions.

It is a small oval calculus of whitish brown colour externally, and lightly granular on the surface, weighing 33.

Extracted successfully from Khansing, a Hindoo lad of eight years old, on the 14th June, 1850, at the Budaon Government Dispensary.

27th. The nucleus and the surrounding coloured laminæ are composed of uric acid and urate of ammonia in almost equal proportions, and the next surrounding lamina is white, and is composed of urate of ammonia with traces of uric acid and phosphate of lime, and the part between the white and coloured laminæ is porous.

It is an oval calculus of light yellow colour, weighing 37.

Extracted successfully from Hossaina, a Mussulman lad of ten years of age, on the 19th April, 1851, at the Budaon Government Dispensary.

28th. The nucleus is distinct and surrounded by porous layers, and they are composed of uric acid and urate of ammonia.

It is a pyramidal-shaped small calculus, and minutely tuberculated on the surface, weighing 3j grs. 5.

Extracted successfully from a Hindoo lad named Paransook, of eight years old, on the 28th April, 1851, at the Budaon Government Dispensary.

29th. The nucleus is excentric, and is of white colour, surrounded by a dark-coloured lamina, and the next surrounding part is porous, and has on its external side a compact hard lamina of light brown colour, and all of them are composed of uric acid with traces of urate of ammonia.

It is a flat oval calculus of light brown colour, weighing 3ij.

Extracted successfully from a Hindoo boy of ten years old, named Kanayah, on the 2nd June, 1851, at the Budaon Government Dispensary.

30th. The nucleus is mostly composed of uric acid with traces of urate of ammonia and oxalate of lime, and the surrounding rings are porous, and are composed of urate of ammonia with traces of uric acid.

It is a roundish calculus of light brown colour, weighing 34 grs.

Extracted successfully from Mohun, a Hindoo lad of five years old on the 2nd June, 1851, at the Budaon Government Dispensary.

31st. The nucleus is composed of uric acid with traces of urate of ammonia, and the surrounding laminae are equally composed of uric acid and urate of ammonia.

It is a small calculus, of light yellow colour externally, and granular on the surface, weighing grs. 20.

Extracted successfully from Munnee, a Hindoo of forty years old, on the 9th June, 1851, at the Budoan Government Dispensary.

32nd. The nucleus is of pyramidal shape, of dark colour, and is composed of uric acid and urate of ammonia; the surrounding white part is porous and not well laminated, and is composed of urate of ammonia and triple phosphate in almost equal proportions.

It is a long oval-shaped calculus approaching somewhat to an hour-glass shape; it is of chalky colour externally, weighing 36 grs.

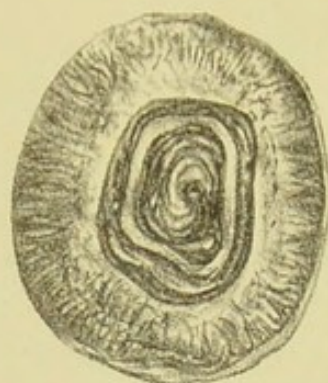
Extracted successfully, from a Hindoo lad of eight years of age, named Gomanee, on the 11th June, 1851, at the Budoan Government Dispensary.

URINARY CALCULI

30.



Ext.

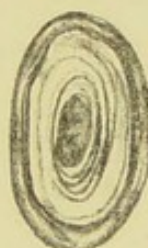


Sect.

31.

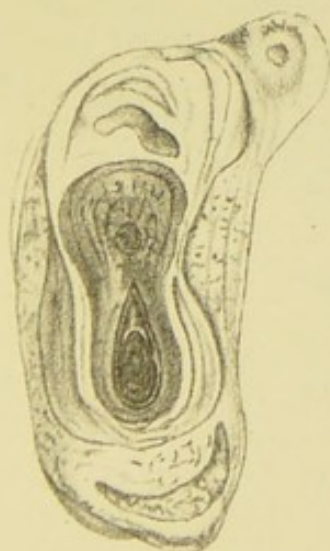


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Sect.

32.



Sect.

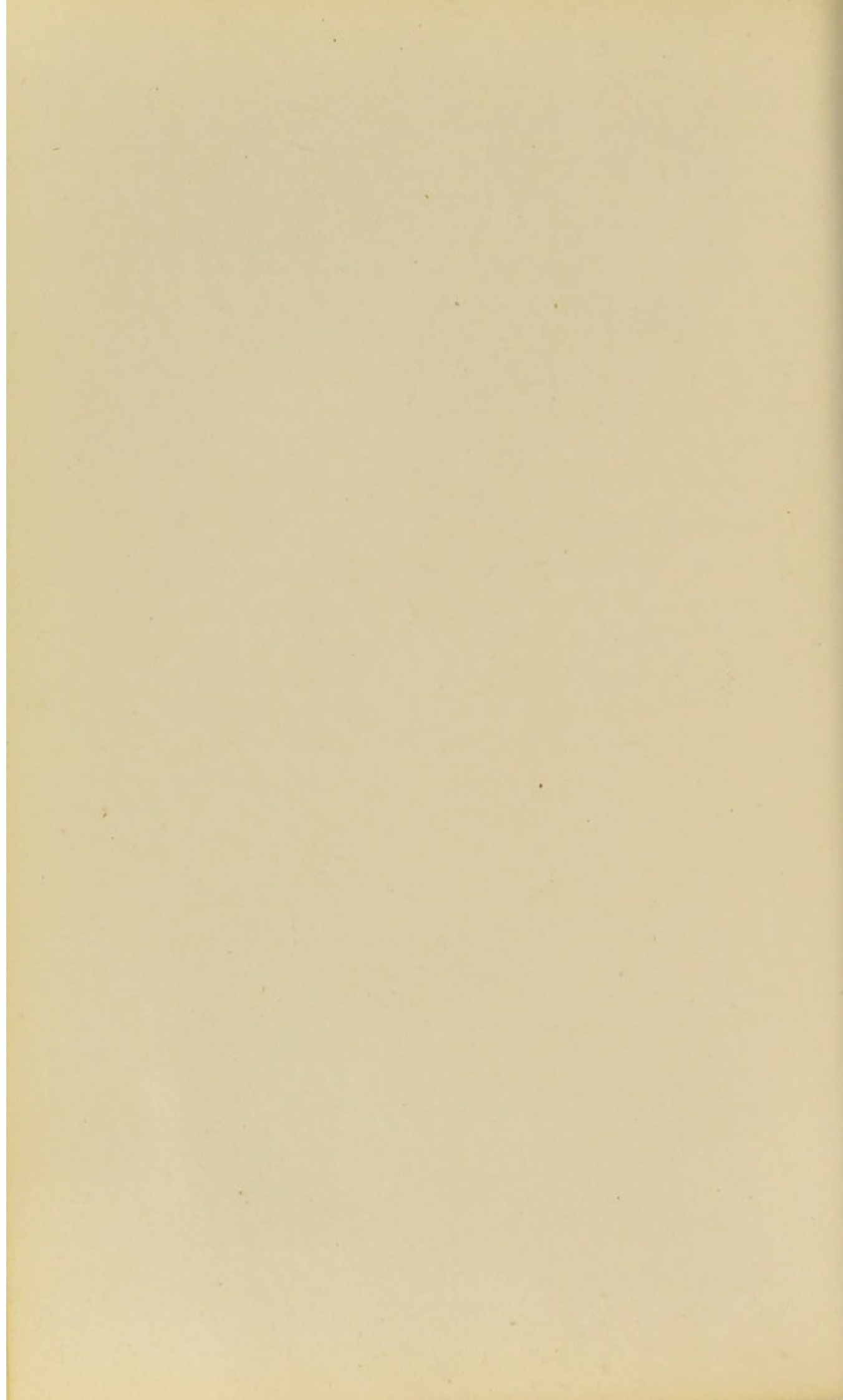


Ext.

Raj Ram Narain Dass Bahadur
del.

Thacker, Spink & Co., Calcutta.

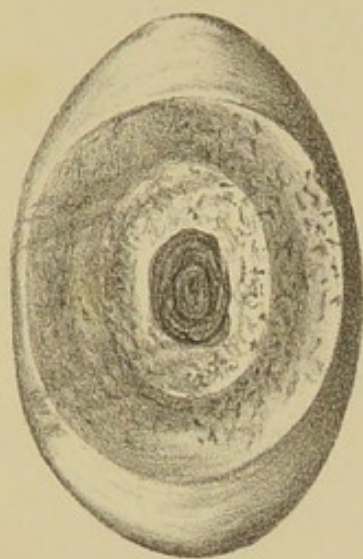
W. West & Co., lith.





URINARY CALCULI

33.



Sect.



Ext.

34.



Sect.



Ext.

*Fig. Ram Narain Dass Bahadoor
delt.*

W. West & Co. lith.

Thacker, Spink & Co., Calcutta.

33rd. The nucleus is of dark colour, and is composed of uric acid and urate of ammonia almost in equal proportions; the surrounding yellowish and bluish layers are also similarly composed, and the last layer is white, and is also similarly composed.

It is a pretty large oval-shaped calculus of yellow colour, mixed with white deposits here and there on its surface, weighing 3j 32.

Extracted from a Hindoo named Nuthoo, of fifty years old, on the 21st June, 1851, at the Budaon Government Dispensary; but the patient died three days after the operation.

34th. The nucleus is not well defined; it is uniformly wide and porous, composed of uric acid and urate of ammonia in equal proportions; the surrounding layer is hard and compact, and is also composed of uric acid and urate of ammonia.

It is a large calculus of oval shape, of dark white colour externally, and of light yellowish colour internally, weighing 36 3ss.

Extracted successfully from Papee, a Hindoo of thirty-five years old, on the 21st June, 1851, at the Budaon Government Dispensary.

35th. The nucleus is composed of uric acid with traces of urate of ammonia, and the surrounding rings are also similarly composed.

It is a small oval calculus of light brown colour externally, weighing 32.

Extracted successfully from a Mussulman lad of ten years of age named Mohandee, on the 1st July, 1851, at the Budaon Government Dispensary.

36th. The nucleus is porous and excentric, and is composed of uric acid with traces of urate of ammonia; the surrounding part is white but not laminated, and the part towards the base is also white; these white parts are composed of urate of ammonia with traces of uric acid and phosphate of lime.

It is a pyriform-shaped calculus of light brown colour externally, and minutely granulated on its surface, weighing 33 gr. 15.

Extracted successfully from Kaul, a Hindoo of thirty years old, on the 21st July, 1851, at the Budaon Government Dispensary.

37th. The nucleus is white, composed of uric acid with traces of urate of ammonia, and the surrounding black parts are also similarly composed; on sawing, the laminæ separated themselves.

It is largely tuberculated on the surface, but the tubercles are polished, and are of light dark colour, weighing 33 36.

Extracted successfully from Munglee, a Hindoo of thirty years old, on the 4th August, 1851, at the Budaon Government Dispensary.

URINARY CALCULI.

35.

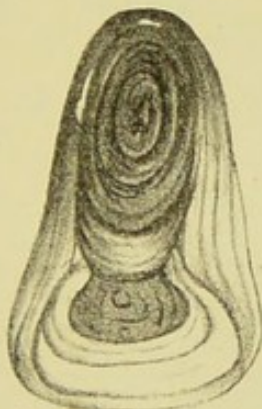


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Sect.

36.

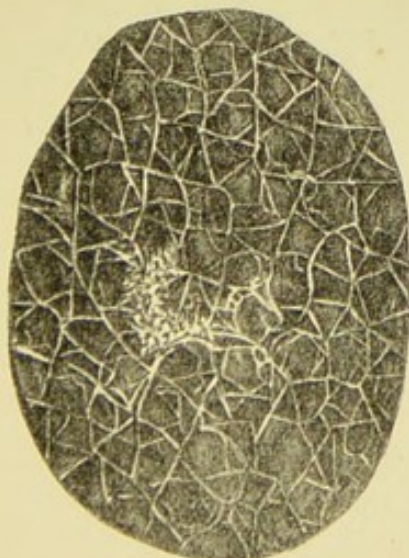


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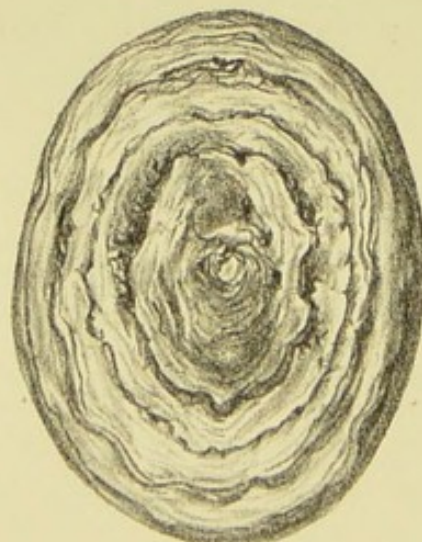


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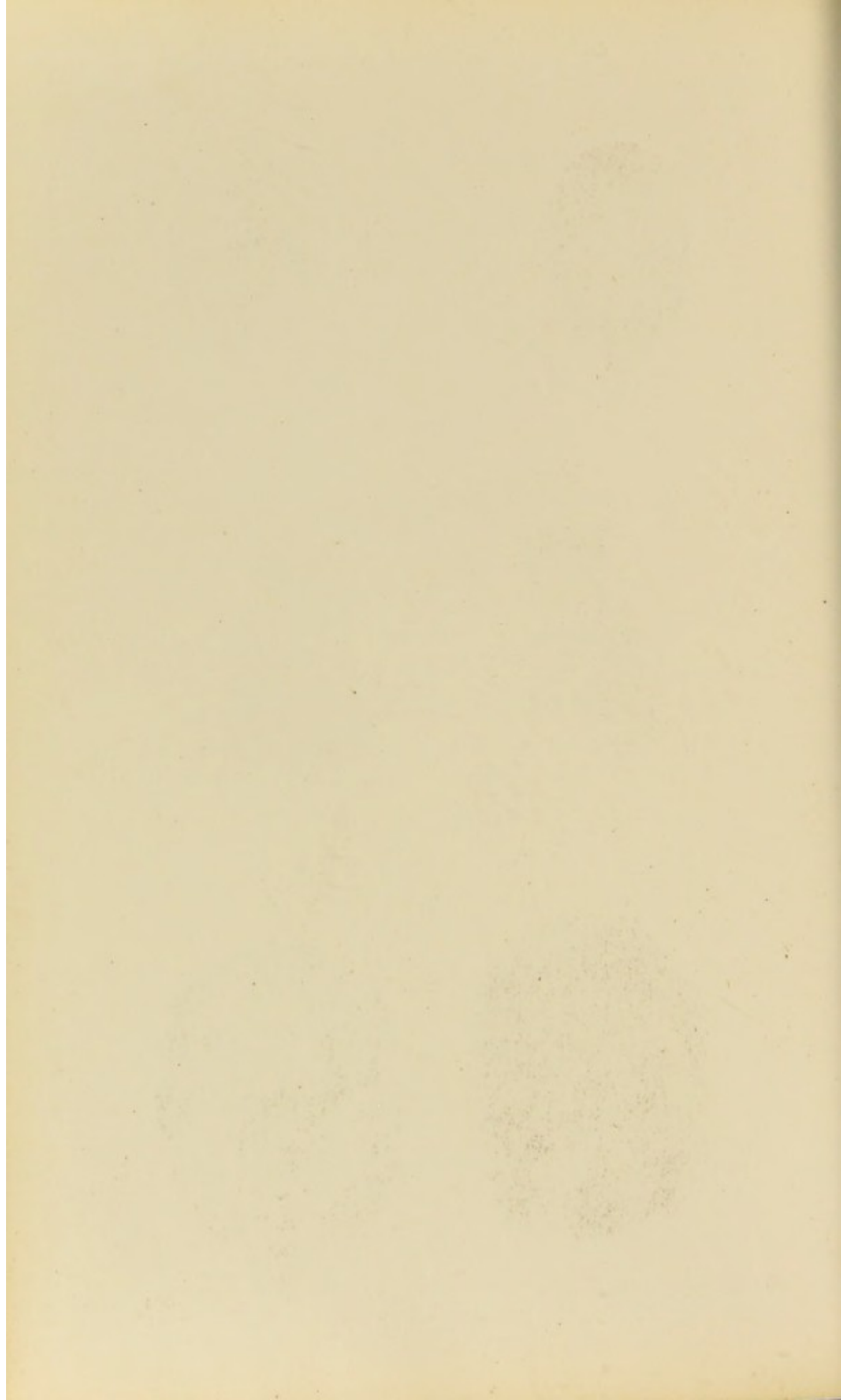
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URINARY CALCULI.

38.

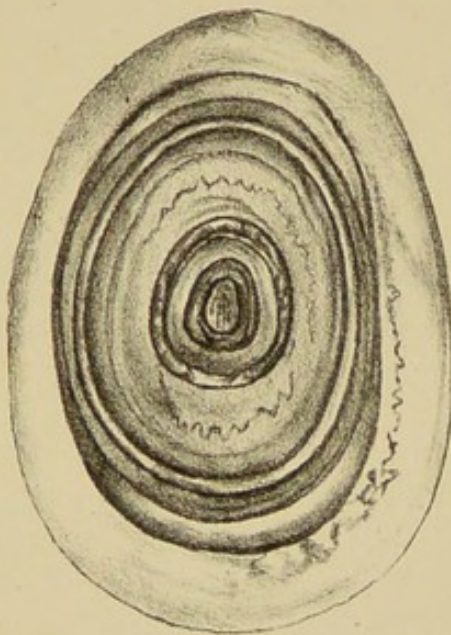


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39.



Sect.



Ext.

40.



Sect.



Ext.

W. West & Co lith.

Rai Ram Narain Dass Bahadoor.

Thacker, Spink & Co, Calcutta.

38th. The nucleus is distinct and hollow, and the surrounding layers are also well marked, composed of uric acid and urate of ammonia.

It is a small oblong calculus minutely tuberculated on the surface, weighing 92.

Extracted successfully from a Hindoo boy of three years of age named Khoondun, on the 13th August, 1851, at the Budaon Government Dispensary.

39th. The nucleus is composed of uric acid with traces of urate of ammonia, and the surrounding coloured layers are variously composed of uric acid and urate of ammonia, and the last white layer is composed of phosphate of lime, with traces of urate of ammonia.

It is a large oval calculus of chalky colour externally, weighing 32 37.

Extracted successfully from Cassum, a Mussulman lad of fifteen years old, on the 13th August, 1851, at the Budaon Government Dispensary.

40th. The nucleus and the surrounding layers are of light yellow colour, composed of uric acid and urate of ammonia, and the white layer on one side is entirely composed of urate of ammonia.

It is a middle-sized calculus, little curved on one side, and little pointed on one end, of chalky colour, weighing 34.

Extracted successfully from Munglee, a Hindoo lad of ten years of age on the 20th August, 1851, at the Budaon Government Dispensary.

41st. The nucleus is composed of uric acid and urate of ammonia almost in equal proportions, and is porous; the surrounding layers are also porous, and are composed of uric acid and urate of ammonia.

It is a large calculus of somewhat triangular shape, of dark brown colour, with white deposits on its surface, which is granular though polished, weighing 32 36.

Extracted from Mohajeet, a Hindoo of fifty years old, on the 20th August, 1851, at the Budaon Government Dispensary, but the patient died eight days after the operation.

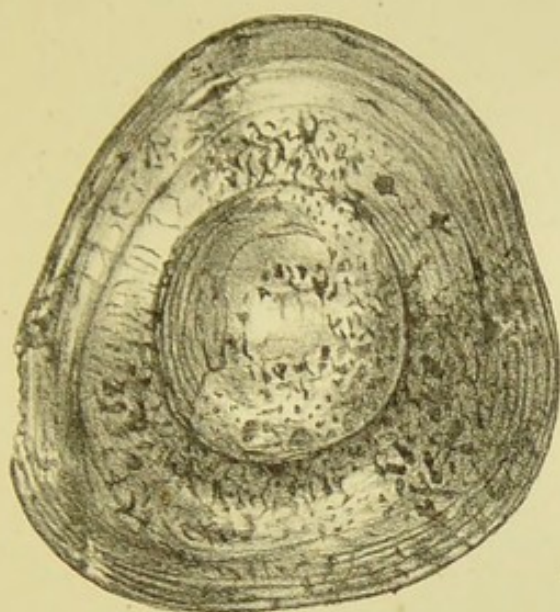
42nd. The nucleus and the surrounding laminæ are well marked, and they are composed of uric acid and traces of urate of ammonia.

Calculi are four in number, and besides twenty-three small ones from pea shape to the size of small grains, they are polished on their surfaces, weighing in all 37.

Extracted successfully from Sumbhoo, a Hindoo of fifty years old, on the 25th August, 1851, at the Budaon Government Dispensary.

URINARY CALCULI.

41.



Sect.



Ext.

42.



Sect.



Ext.



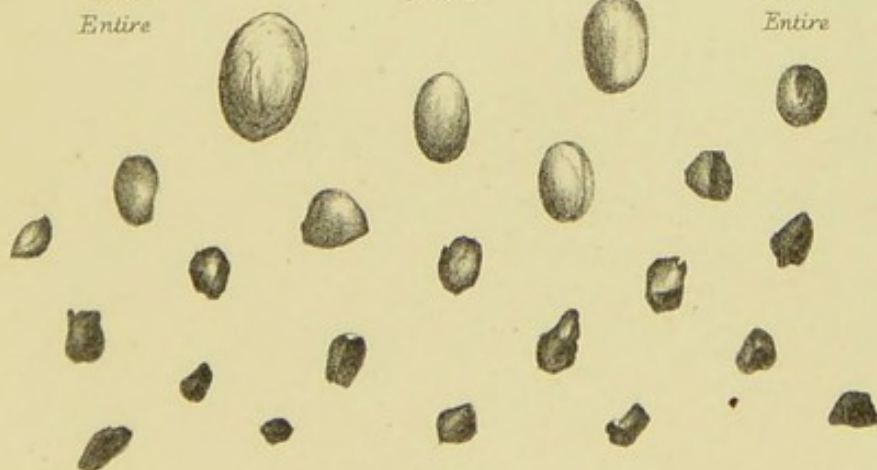
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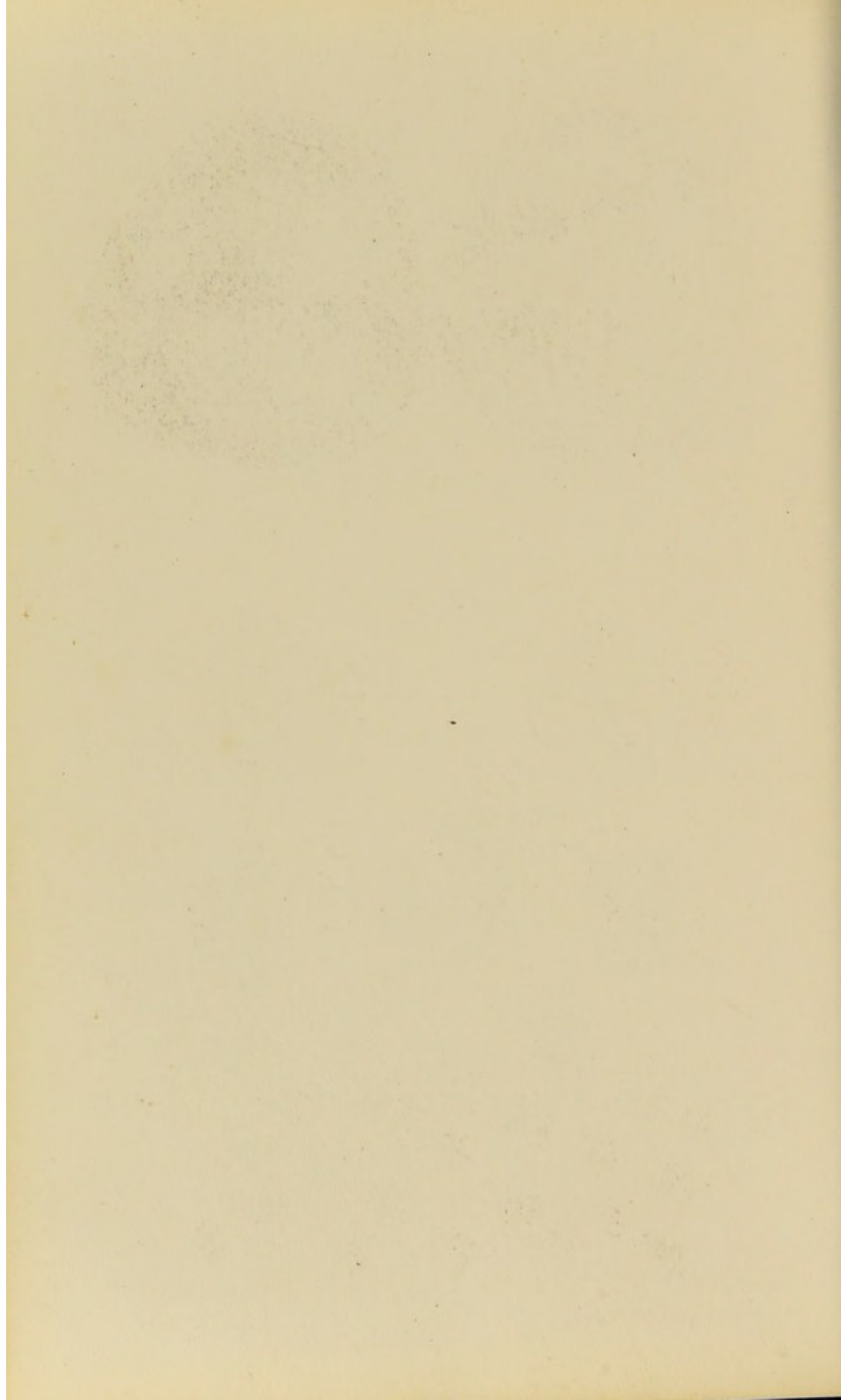
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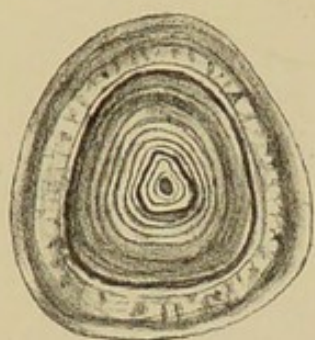
Small Calculi.



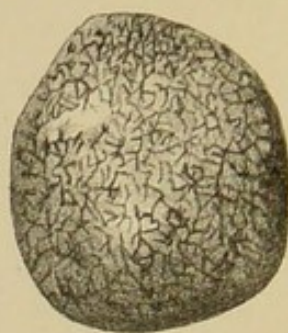


URINARY CALCULI.

44.

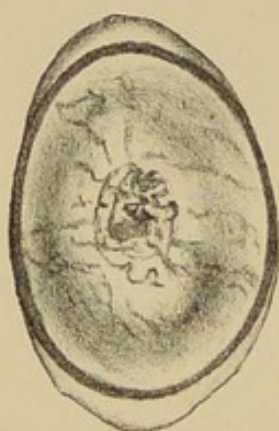


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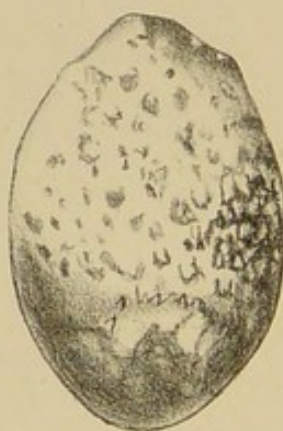


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45.



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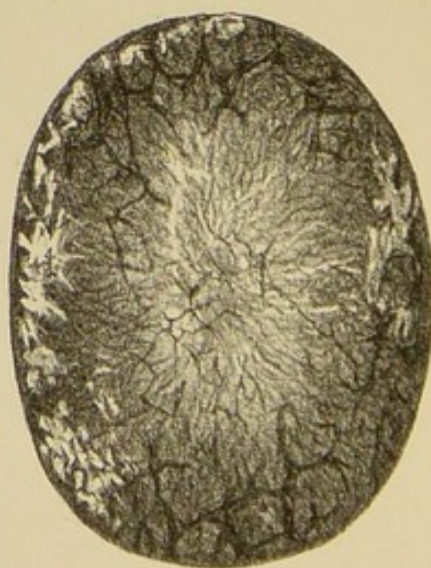


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43.



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Ext.

44th. The nucleus is well marked, and is composed of uric acid and urate of ammonia almost in equal proportions; the surrounding laminae are compact and hard, and are also well defined, but the last lamina is porous, and they are composed of uric acid with slight traces of urate of ammonia.

It is a middle-sized calculus, somewhat of triangular shape, of light yellow colour, and minutely granular on the surface, weighing $53\frac{1}{2}$.

Extracted successfully from Bunsee, a Hindoo lad of eight years old, on the 10th September, 1851, at the Budaon Government Dispensary.

45th. The nucleus is almost entirely composed of uric acid with slight traces of urate of ammonia; the surrounding part is not laminated but uniformly porous, and is composed of urate of ammonia with traces of uric acid, and the next and last dark line is also composed of uric acid and urate of ammonia.

It is a middle-sized calculus of oval shape, of chalky colour externally, and granular on the surface, weighing 35 grs. 40.

Extracted successfully from Punchum, a Hindoo lad of twelve years of age, on the 10th September, 1851, at the Budaon Government Dispensary.

43rd. The nucleus is mostly composed of uric acid, containing traces of urate of ammonia; and the next surrounding layer is composed of uric acid and urate of ammonia almost in equal proportions, and the part exterior to it is porous and is similarly composed.

It is a large flat oval calculus, of light dark colour externally, and flatly tuberculated on its circumference only, weighing 32.

Extracted successfully from Lahorree, a Hindoo of forty years old, on the 1st September, 1851, at the Budaon Government Dispensary.

46th. The nucleus is composed of uric acid and urate of ammonia almost in equal proportions, and the surrounding rings are of dark colour, and are also similarly composed.

It is a roundish calculus of chalky colour externally, and largely tuberculated on the surface, weighing 36.

Extracted successfully from Buxsee, a Mussulman lad of fifteen years of age, on the 12th September, 1851, at the Budaon Government Dispensary.

47th. The nucleus is mostly composed of uric acid with slight traces of urate of ammonia, and the surrounding rings are well marked, and are of light yellow colour, composed of uric acid and urate of ammonia almost in equal proportions, and the outer layer is of slate colour, and is wholly composed of urate of ammonia.

It is an oval calculus of light yellow colour externally, weighing 33 grs. 40.

Extracted successfully from a Hindoo boy named Hemraj, of seven years of age, on the 26th September, 1851, at the Budaon Government Dispensary.

48th. The nucleus is well marked, and composed of uric acid with traces of urate of ammonia, and the surrounding laminae are distinctly marked, and are also similarly composed of uric acid and urate of ammonia, and the external surface is composed of uric acid with traces of phosphate of lime.

It is a small calculus, minutely granulated on the surface, weighing 32.

Extracted successfully from Nooree, a Hindoo lad of five years of age, on the 13th October, 1851, at the Budaon Government Dispensary.

URINARY CALCULI.

46.

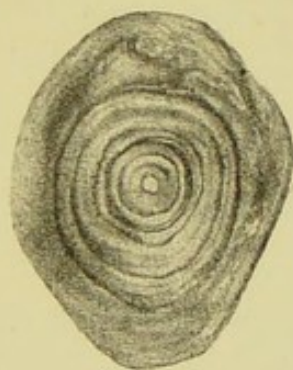


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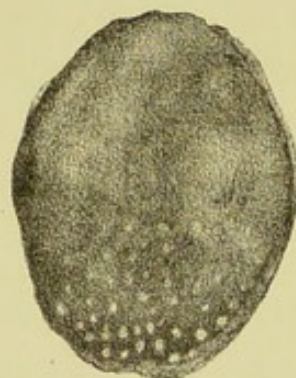


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47.



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Ext.

48.



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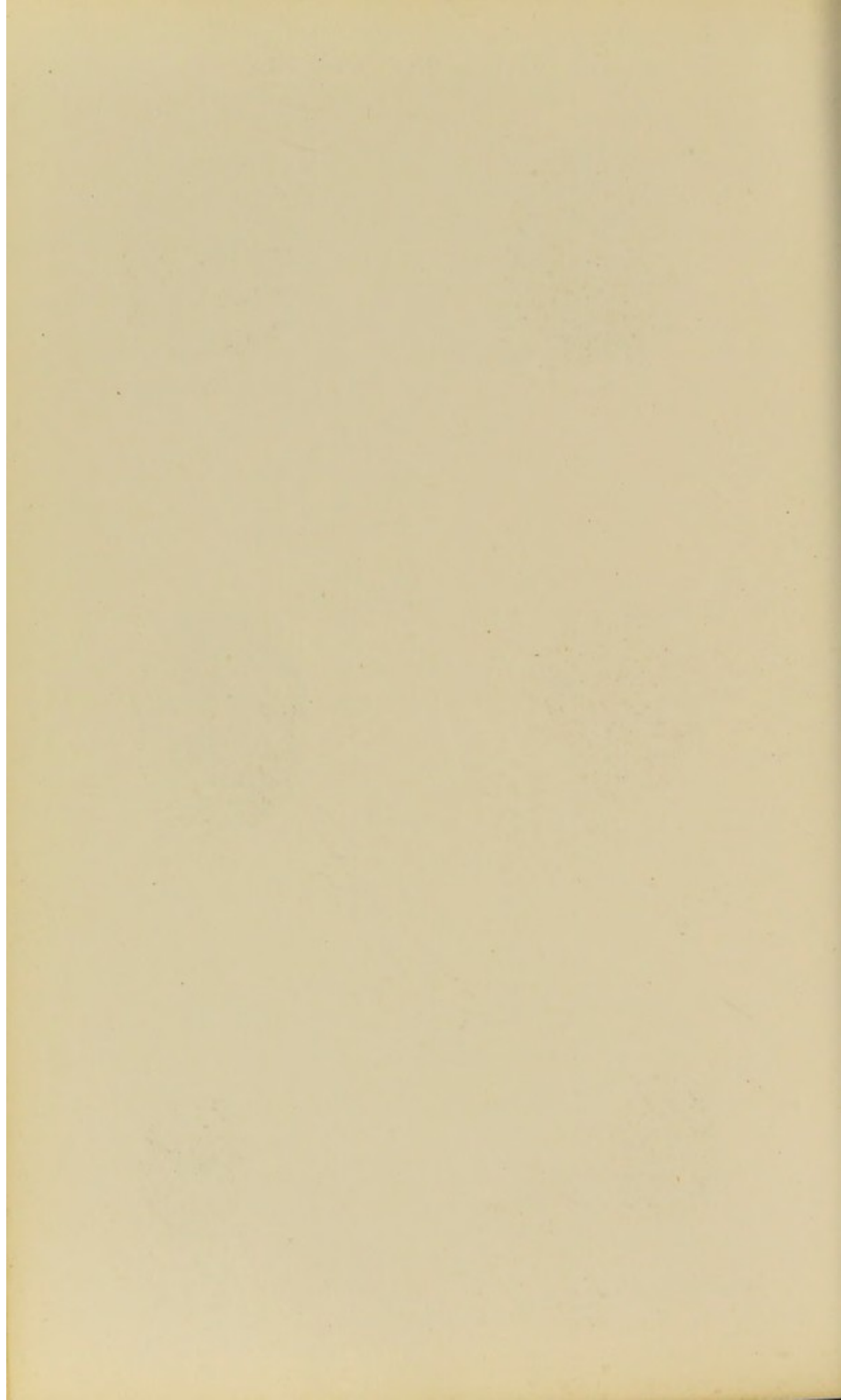


Sect.

*Rai Ram Narain Dass Bahadur
del.*

Thacker, Spink & Co, Calcutta.

W. West & Co lith.





URINARY CALCULI.

49.



Ext.



Sect.

50.



Ext.

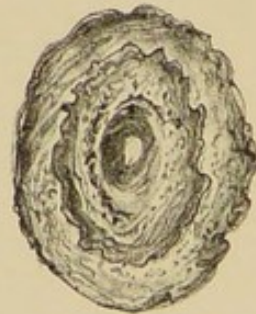


Sect.

51.



Ext.



Sect.

52.



Ext.



Sect.

49th. The nucleus is equally composed of uric acid and urate of ammonia; the surrounding part is not laminated, but porous, and exceedingly friable, and is composed of urate of ammonia, with traces of uric acid.

It is a small calculus of chalky colour externally, weighing grs. 35.

Extracted successfully from a Hindoo, named Bucka, of six years old, on the 11th November, 1851, at the Budaon Government Dispensary.

50th. The nucleus is composed of uric acid and urate of ammonia, and the surrounding layers are composed of uric acid mostly, with traces of urate of ammonia.

It is a small oval calculus of light yellow colour externally, weighing $32\frac{1}{2}$.

Extracted successfully from Nawah, a Hindoo boy of eight years of age, on the 11th November, 1851, at the Budaon Government Dispensary.

51st. The nucleus is composed of uric acid and urate of ammonia almost in equal proportions, and the surrounding laminae are wholly composed of urate of ammonia.

It is a small calculus of yellowish white colour externally, and lightly granular on its surface, weighing 32.

Extracted successfully from Bullah, a Hindoo boy of eight years of age, on the 16th November, 1851, at the Budaon Government Dispensary.

52nd. The nucleus and the laminae are composed of uric acid and urate of ammonia almost in equal proportions.

It is a small oval calculus and laminated, and the laminae are loosely connected with each other, and therefore separated by sawing, weighing 32.

Extracted successfully from Joka, a Hindoo boy of ten years old, on the 16th November, 1851, at the Budaon Government Dispensary.

53rd. The nucleus is almost entirely composed of uric acid with slight traces of urate of ammonia; the surrounding white layer is also similarly composed.

It is a large oval-shaped calculus, of white colour externally, and irregularly tuberculated on the surface, weighing 3j 3ijs.

Extracted successfully from Woomada, a Hindoo lad of eight years of age, on the 21st December, 1851, at the Budaon Government Dispensary.

54th. The nucleus is distinct and surrounded by a porous layer; they are composed of uric acid with traces of urate of ammonia.

It is a small oval calculus of light brown colour, polished on its surface though minutely tuberculated, weighing 3½.

Extracted successfully from Ticcaram, a Hindoo boy of five years of age, on the 4th January, 1852, at the Budaon Government Dispensary.

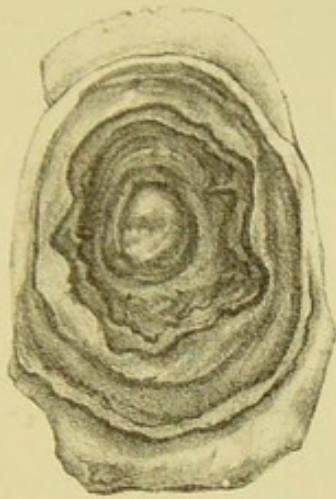
55th. The nucleus is composed of uric acid and urate of ammonia almost in equal proportions; the surrounding rings are not well defined, and are porous, and similarly composed as the nucleus.

It is a small roundish calculus of white colour externally, and minutely tuberculated on the surface, weighing 3j grs. 5.

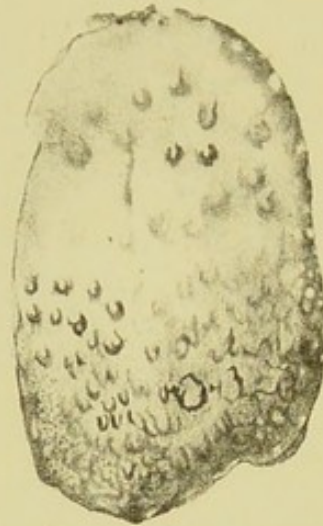
Extracted successfully from a Hindoo boy of six years of age, named Bhamsing, on the 23rd January, 1852, at the Budaon Government Dispensary.

URINARY CALCULI.

53.



Sect.



Ext.

54.



Sect.



Ext.

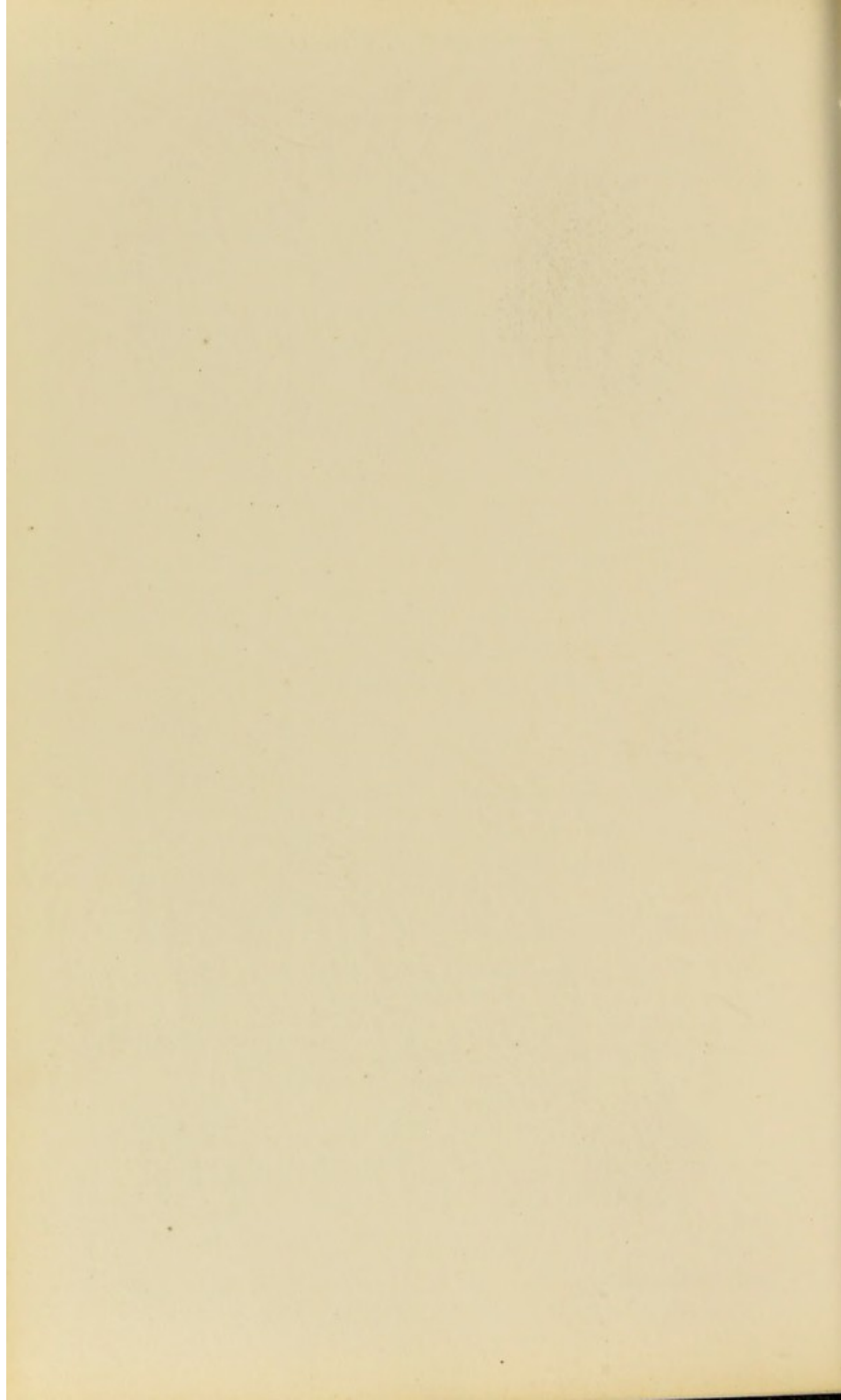
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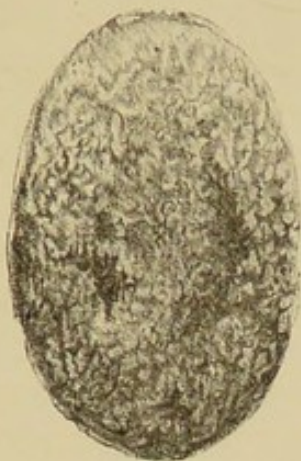
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URINARY CALCULI.

56.



Ext.



Sect.

57.



Sect.



Ext.

58.



Ext.



Sect.

Raj Ram Narain Dass Bahadur.
del.

Thacker, Spink & Co., Calcutta.

W. West & Co. lith.

56th. The nucleus is of dark colour, and is composed of uric acid, containing traces of urate of ammonia and oxalate of lime in various proportions, the surrounding part is of light brown colour, and is porous, composed mostly of oxalate of lime, with traces of urate of ammonia and uric acid.

It is an oval-shaped calculus of light brown colour, weighing 34 grs. 45.

Extracted successfully from a Hindoo named Lucka, of thirty years old, on the 25th January, 1852, at the Budaon Government Dispensary.

57th. The nucleus is excentric, and is composed of uric acid and urate of ammonia with traces of oxalate of lime, and the surrounding layer is white, and is composed of urate of ammonia, variously mixed with oxalate of lime.

It is a roundish calculus of white colour externally, weighing 36 grs. 30.

Extracted successfully from a Hindoo named Moolchund, of twenty years of age, on the 6th February, 1852, at the Budaon Government Dispensary.

58th. The stone broke into pieces during the extraction; the nucleus and the broken pieces are composed of uric acid with traces of urate of ammonia, weighing grs. 40.

It is a small oval calculus, of brownish white colour externally.

Extracted successfully from a Hindoo named Joahur, of forty years old, on the 5th February, 1852, at the Budaon Government Dispensary.

59th. The nucleus is of dark colour, and is wholly composed of uric acid with traces of urate of ammonia, and the next surrounding layers are also of dark colour, and are also similarly composed, and the third layer is of brown colour, and is also similarly composed, and the external surface is of chalky colour, and is also similarly composed.

It is an oval flat calculus of dark and light brown colour internally, and of chalky colour externally, weighing $33\frac{1}{2}$.

Extracted successfully from Chadah, a Hindoo of forty years of age, on the 20th February, 1852, at the Budaon Government Dispensary.

2ND. URATE OF AMMONIA.

Urate of ammonia is often found forming the nucleus of a calculus, either alone or in combination with uric acid; when it forms the entire calculus the stone is always of small size, and of flattened oval shape, and it is generally met with in early life. When it begins to form there is always great constitutional disturbance, accompanied with symptoms of great local irritation. It is either smooth or lightly tuberculated or granular on its external surface, and the colour of such a calculus is brownish grey or clay-coloured, it is always brittle, and therefore generally crumbles into pieces during extraction. When sawn through the internal structure is found to consist of a series of well-defined concentric layers or laminae, which are sometimes so very thin and so closely arranged as to give them a dense or homogeneous appearance; sometimes they are porous and earthy-looking.

Besides the above physical characters a urate of ammonia calculus or nucleus possesses the following chemical properties:

1. When a fragment is placed on a platinum foil, or on a piece of tale, and then heated over a spirit lamp, the ammonia escaping from the compact texture crepitates with great violence, and the fragment gradually disappears, leaving but a small quantity of ash.

2. It is more soluble in boiling than in cold water, and therefore when a strong aqueous solution cools a precipitate is formed of white flocculi, which under the microscope appear to consist of minute rounded particles adhering to each other and

URINARY CALCULI.

59.



Ext.



Sect.

61.



Ext.



Entire.



Sect.

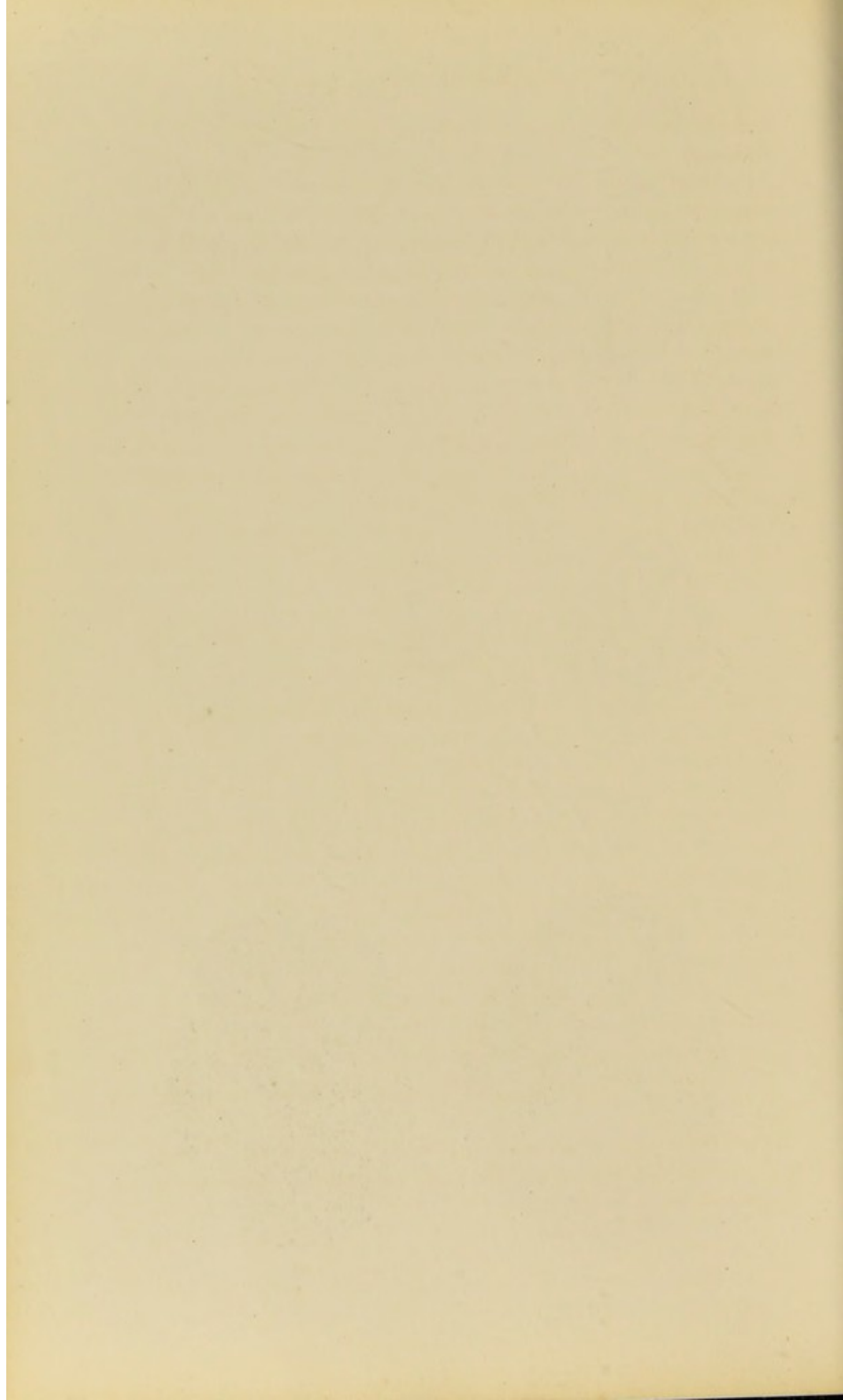
60.



Ext.



Sect.



forming irregular linear masses or little stellated tufts of crystals.

3. When boiled in a solution of potash, and a glass rod dipped in strong muriatic acid held over it, a decomposition ensues, and ammonia escaping unites with the muriatic acid and forms abundant white fumes of muriate of ammonia.

4. When this test for ammonia does not give satisfactory result, a little bit of the calculus may be dissolved in dilute muriatic acid; muriate of ammonia is then formed, which remains in solution, whilst uric acid is set free as a precipitate. To the clear filtered solution add chloride of platinum, and then a yellow precipitate of chloride of platinum and ammonia is formed.

5. When a small piece of urate of ammonia is heated with strong nitric acid, it produces, like uric acid, the beautiful purple compound, the colour of which is heightened by the addition of ammonia.

CALCULI OF WHICH THE NUCLEUS CONSISTS OF URATE OF AMMONIA.

61st. The nucleus is composed of urate of ammonia, and the surrounding laminae are composed of the same substance, and the external surface is composed of urate of ammonia with traces of phosphate of lime.

It is a small calculus of whitish yellow colour externally, somewhat of triangular shape, and there was a smaller one with it, weighing together 32.

Extracted successfully from Seetah, a Hindoo lad of ten years of age, on the 20th June, 1849, at the Budaon Government Dispensary.

60th. The nucleus is composed of lithate of ammonia, and the next surrounding laminae are composed of uric acid variously mixed with oxalate of lime.

It is a large oval calculus of dark brown colour, weighing 32½.

Extracted successfully from a Hindoo named Tojah, of fifty years old, on the 20th June, 1849, at the Budaon Government Dispensary.

62nd. The nucleus is not well defined, it is continuous and porous, and surrounded by a compact lamina ; the whole of the internal part is composed of urate of ammonia.

It is a large hour glass-shaped calculus of light yellow colour, with white deposits here and there on its surface, and it is lightly granular, weighing 3j.

Extracted successfully from Pemraj, a Hindoo of fifty years old, on the 20th June, 1849, at the Budaon Government Dispensary.

63rd. The nucleus is excentric, and is composed of urate of ammonia and uric acid in almost equal proportions ; it contains besides traces of oxalate of lime, and the surrounding layers are well marked and are also similarly composed, and the external surface, though white, is also similarly composed.

It is an oval-shaped calculus, of white colour externally, weighing 3j 3j.

Extracted successfully from a Mussulman named Allum, of forty years old, on the 29th June, 1849, at the Budaon Government Dispensary.

64th. The nucleus is wholly composed of urate of ammonia, and the surrounding layers are well marked and are also similarly composed.

It is a small oval calculus, of light yellow colour externally, with white deposits here and there on its surface, weighing 33.

Extracted successfully from a Hindoo boy named Khanjun, of four years of age, on the 5th August, 1849, at the Budaon Government Dispensary.

62.



Sect.



Ext.

63.



Sect



Ext.

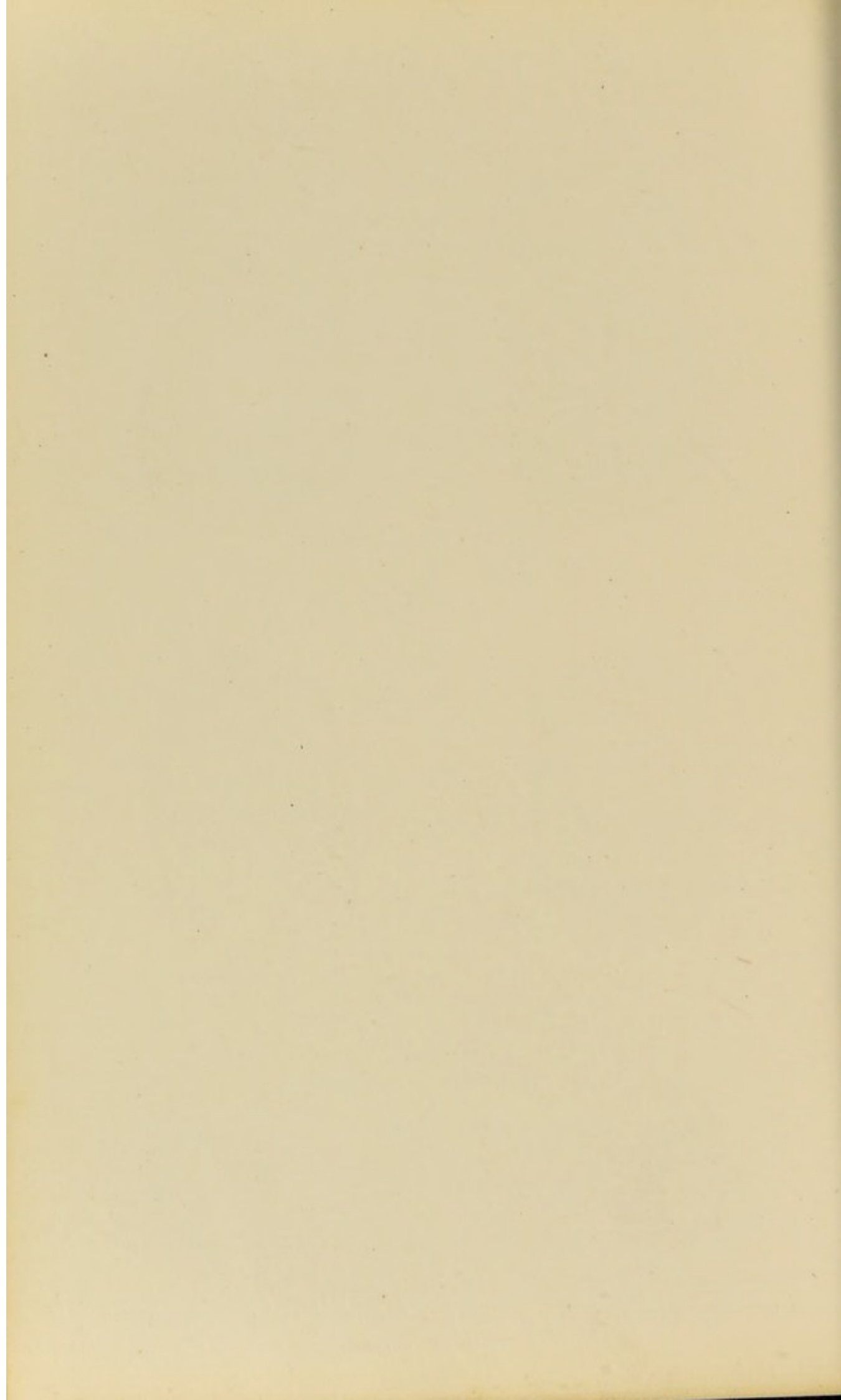
64.



Ext.



Sect.





URINARY CALCULI.

65.



Sect.



Ext.



Entire

66.



Sect.



Entire



Ext.

67.



Ext.



Sect.

*Raj Ram Narain Dass Bahadoor
delt*

Thacker, Spink & Co, Calcutta.

W. West & Co, lith.

65th. The nucleus is of white colour, and is variously composed of urate of ammonia, oxalate of lime, and uric acid, and the surrounding layers are also similarly composed.

There are two calculi in number, one a middle-sized, and second small; they are of light yellow colour externally, with white deposits here and there on their surfaces, weighing 3j.

Extracted successfully from Jesook, a Hindoo of sixteen years of age, on the 5th August, 1849, at the Budaon Government Dispensary.

66th. The nucleus is wholly composed of urate of ammonia, and the surrounding white layers are composed of uric acid and urate of ammonia almost in equal proportions.

It is a small calculus, of light yellow mixed with white colour externally, and minutely tuberculated on the surface; it had with it a pea-shaped calculus, weighing 32 in all.

Extracted successfully from Gocool, a Hindoo of six years of age, on the 21st August, 1849, at the Budaon Government Dispensary.

67th. The nucleus is of dark colour and porous, and is wholly composed of urate of ammonia; the concentric rings are principally composed of urate of ammonia, variously mixed with oxalate of lime; the external surface contains more of oxalate of lime.

It is a middle-sized calculus, of light brown colour externally, but the rings are of different colours; some of them are yellow, and others are of dark colour, weighing 3j 3ss.

Extracted successfully from a Hindoo named Mackunlall, of forty years old, on the 30th September, 1849, at the Budaon Government Dispensary.

68th. The nucleus is entirely composed of urate of ammonia, and the surrounding laminae are well marked, and are composed of urate of ammonia and uric acid in almost equal proportions; and the last layer is white, and is almost similarly composed as the surrounding layers, with slight traces of phosphate of lime.

It is an oval flat calculus, of chalky colour, largely tuberculated on its surface; it has with it a small calculus, of chalky colour also, and it is composed as the external white lamina, weighing 53.

Extracted successfully from Khurgah, a Hindoo lad of eight years of age, on the 27th November, 1849, at the Budaon Government Dispensary.

70th. The nucleus is wide and porous, and is equally composed of urate of ammonia and uric acid; the surrounding rings are well defined, hard and compact, and are composed of urate of ammonia and uric acid.

It is a large oval calculus, little flattened, of light yellow colour, and also lightly tuberculated on the surface, weighing 3j 3j.

Extracted from Mungee, a Hindoo of forty years old, on the 25th January, 1850, at the Budaon Government Dispensary, but the patient died forty-two days after the operation.

69th. The nucleus is composed of urate of ammonia, surrounded by layers of urate of ammonia variously mixed with oxalate of lime; the third white layer is wholly composed of oxalate of lime, with traces of urate of ammonia; and the fourth layer is of dark colour, and is wholly composed of urate of ammonia.

It is an oval calculus of dark colour, weighing 32.

Extracted from a Hindoo named Hurryram, of forty years old, on the 15th January, 1850, at the Budaon Government Dispensary, but the patient died seven days after the operation.

URINARY CALCULI

68.



Ext.



Entire.



Sect.

70.



Ext.

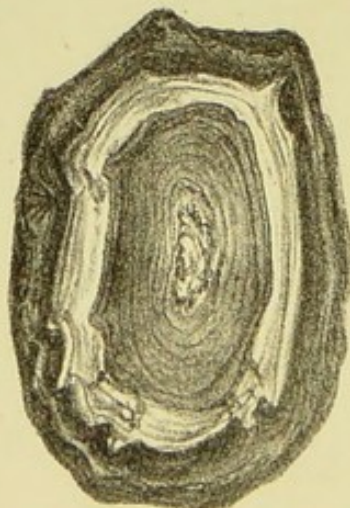


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69.



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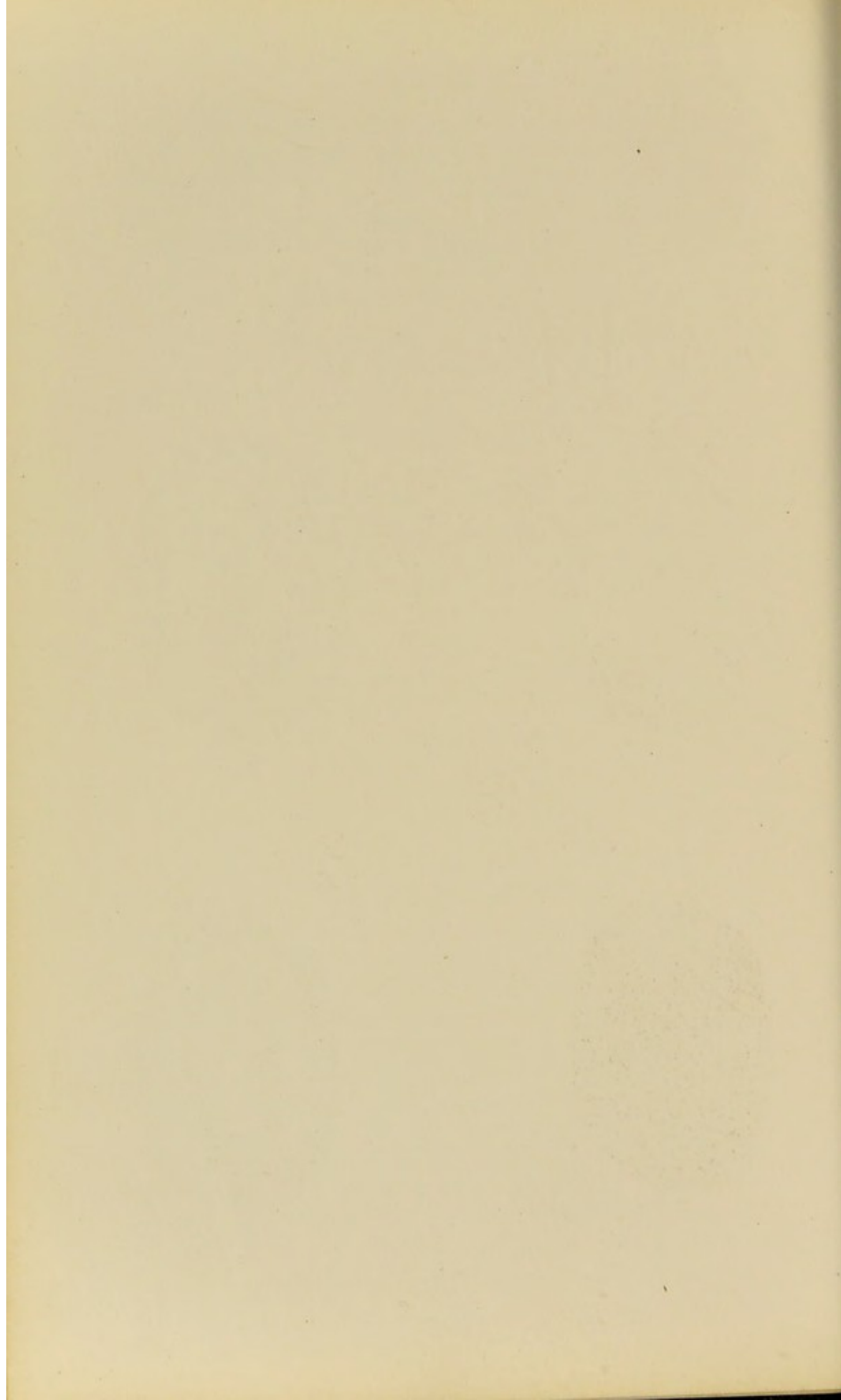


Sect.

*Rai Ram Narain Dass Bahadoor
del.*

W. West & Co., lith.

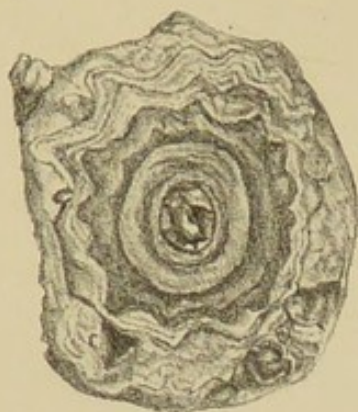
Thacker, Spink & Co., Calcutta.





URINARY CALCULI.

71

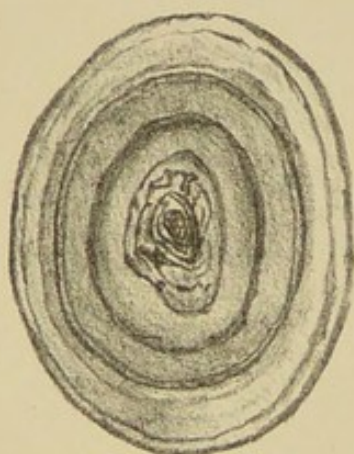


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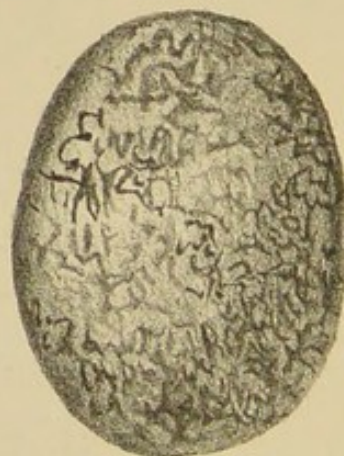


Ext.

72.



Sect.



Ext.

73.



Sect.



Ext.

*Rai Ram Narain Dass Bahadoor
del^t*

Thacker, Spink & Co, Calcutta.

W. West & Co lith.

71st. The nucleus is composed of urate of ammonia with slight traces of uric acid; the next surrounding layer is of a light yellow colour, and is composed of equal proportions of urate of ammonia and uric acid; the second surrounding layer is also similarly composed; the last layers are not well defined, but are similarly composed of urate of ammonia and uric acid; the tubercles on the surface are large ones, and they are also composed of almost equal proportions of urate of ammonia and uric acid.

It is a roundish calculus, largely tuberculated on its external surface, and is of a dark brown colour externally, with white deposits on its surface, weighing 3j 35.

Extracted successfully from Juggee, a Hindoo of thirty-five years old, on the 9th February, 1850, at the Budaon Government Dispensary.

72nd. The nucleus is wholly composed of urate of ammonia; the surrounding laminæ are also entirely composed of urate of ammonia; and the external laminæ, which separated during the process of sawing, were also found to be composed of urate of ammonia with slight traces of uric acid.

It is a large roundish calculus, of brown colour with polished surface, weighing 32.

Extracted from a Hindoo boy named Sobah, of ten years of age, on the 19th February, 1850, at the Budaon Government Dispensary, but the boy died three days after the operation.

73rd. The nucleus is composed of urate of ammonia with slight traces of uric acid; the next coloured rings or layers are well marked, and are similarly composed, and the outer white part is porous and crystalline, and is composed of urate of ammonia and triple phosphate with phosphate of lime.

It is a roundish calculus, of white colour externally, and lightly granular on the surface, weighing 3j 34.

Extracted successfully from a Hindoo named Chiddoo, of twenty years of age, on the 27th April, 1850, at the Budaon Government Dispensary.

74th. The nucleus is wide and porous, and is entirely composed of urate of ammonia; the surrounding rings contain urate of ammonia, mostly with slight traces of uric acid, and the tubercles on the external surface are composed of urate of ammonia with traces of uric acid.

It is a flat oval calculus, largely tuberculated on its external surface, weighing 3j.

Extracted successfully from a Mussulman named Golam Mohamud, of forty-five years old, on the 30th April, 1850, at the Budaon Government Dispensary.

75th. The nucleus is composed of urate of ammonia, and the concentric rings are composed of urate of ammonia with traces of phosphate of lime.

It is an oval middle-sized calculus, of whitish yellow colour, externally, and largely tuberculated on the surface, weighing 56.

Extracted successfully from Chintah, a Hindoo of fifty years old, on the 10th May, 1850, at the Budaon Government Dispensary.

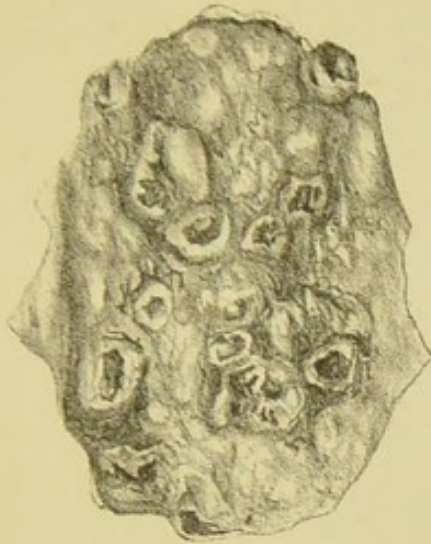
76th. The nucleus is entirely composed of urate of ammonia, the surrounding laminae are well marked, and are composed of uric acid and urate of ammonia almost equally.

It is an oval calculus, of a darkish colour externally, and of a compact nature, weighing 34 grs. 30.

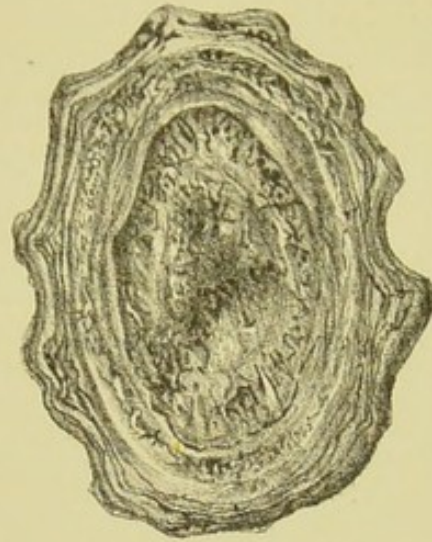
Extracted successfully from Purbhan, a Hindoo of fifteen years of age, on the 10th May, 1850, at the Budaon Government Dispensary.

URINARY CALCULI.

74.



Ext.

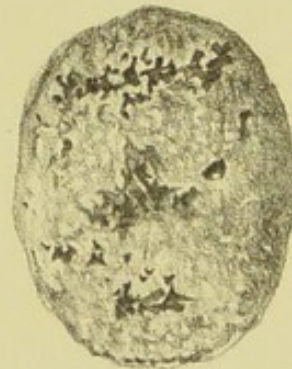


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75.



Sect.

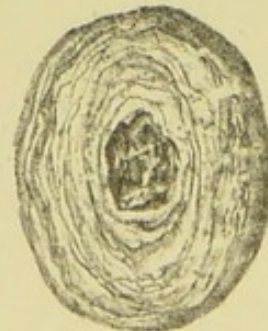


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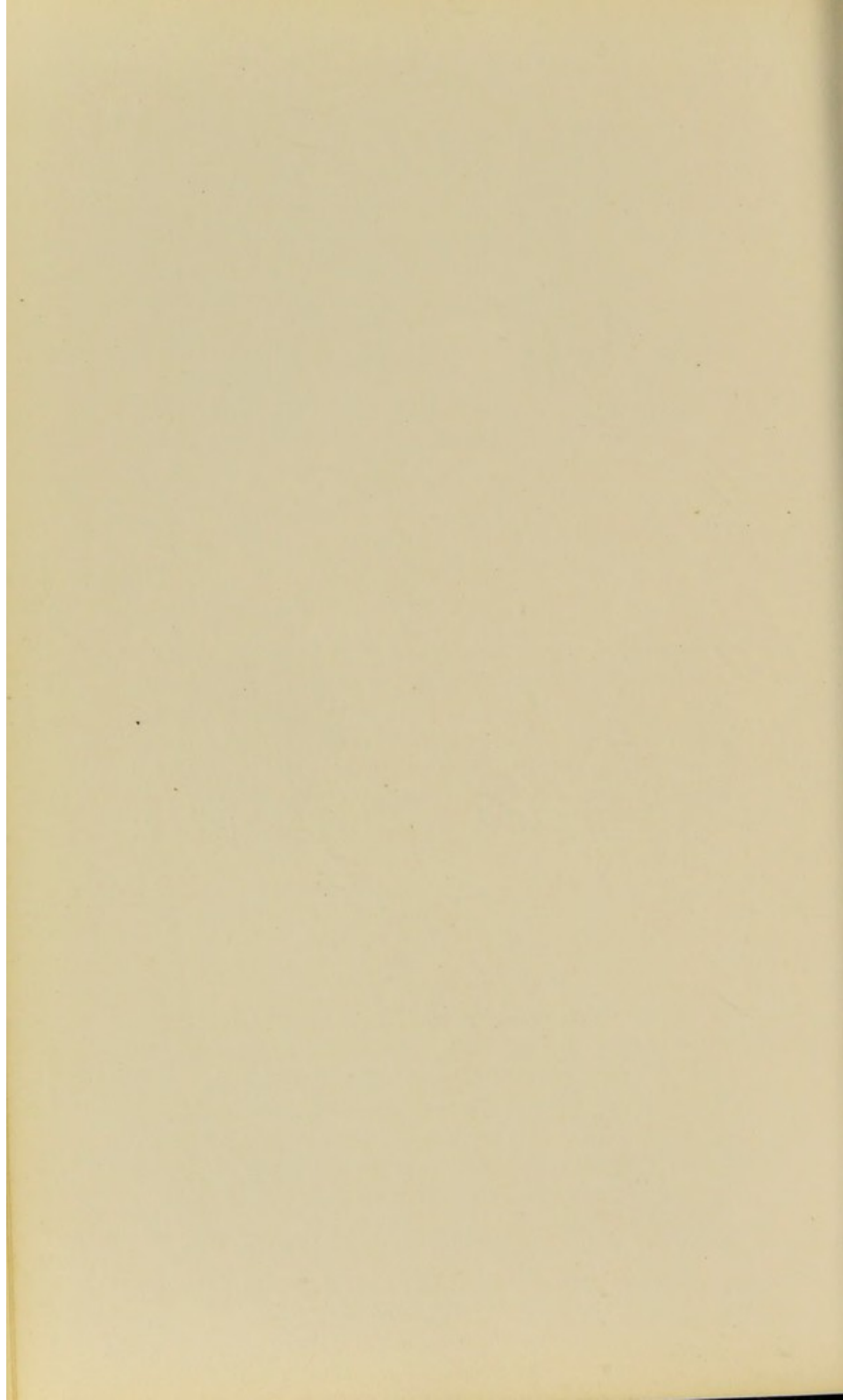
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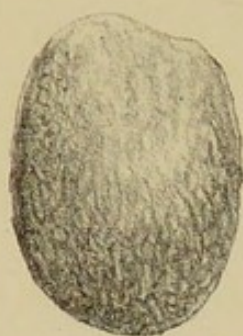
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URINARY CALCULI.

77.

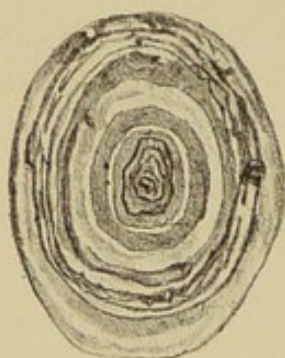


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Sect.

78.



Sect.



Ext.

79.



Sect.



Ext.

Rai Ram Narain Dass Bahadur
del.

Thacker, Spink & Co, Calcutta.

W. West & Co lith.

77th. The nucleus is excentric, and is composed of urate of ammonia variously mixed with oxalate of lime, the surrounding layers are porous, and are principally composed of urate of ammonia with traces of uric acid and oxalate of lime.

It is a flat oval calculus of light brown colour externally, weighing 34.

Extracted successfully from a Hindoo named Munglah, of fourteen years of age, on the 24th May, 1850, at the Budaon Government Dispensary.

78th. The nucleus is wholly composed of urate of ammonia, and the surrounding rings are composed of urate of ammonia, with traces of phosphate of lime.

It is an oval calculus of light yellow colour externally, and minutely granulated on the surface, weighing 34.

Extracted successfully from Utwaree, a Hindoo of forty years old, on the 11th June, 1850, at the Budaon Government Dispensary.

79th. The nucleus is entirely composed of urate of ammonia; the next surrounding layer is also similarly composed, but the outer or the last layer is composed of urate of ammonia with traces of uric acid; internally it is porous and of a white colour.

It is a roundish calculus, of light yellowish colour externally, and minutely granular on the surface, weighing 35½.

Extracted successfully from a Mussulman lad named Chiddoo, of eight years of age, on the 10th September, 1851, at the Budaon Government Dispensary.

80th. The nucleus is well defined, surrounded by dark lines, which are composed of urate of ammonia with traces of uric acid, and the outer white layer is composed of urate of ammonia and uric acid in almost equal proportions.

It is a small flat oval calculus, very lightly granular on the surface, weighing grs. 50.

Extracted successfully from a Hindoo of fifty years old, named Lallsing, on the 24th April, 1851, at the Budaon Government Dispensary.

81st. The nucleus is entirely composed of urate of ammonia, the next surrounding layer is porous; this and other layers are composed of urate of ammonia mixed in varying proportions with uric acid.

It is a large calculus of light brownish colour externally, and lightly granulated on the surface, weighing $32\frac{1}{2}$.

Extracted successfully from a Hindoo named Doomah, of fifty years old, on the 15th May, 1851, at the Budaon Government Dispensary.

82nd. The nucleus is well marked and of yellowish colour, and is composed of urate of ammonia with traces of uric acid, and the surrounding rings are also similarly composed.

It is a small calculus of roundish shape, lightly tuberculated on its surface, and of light yellow colour externally, weighing 32 grs. 10.

Extracted successfully from a Hindoo boy of six years of age, named Rampersaud, on the 24th May, 1851, at the Budaon Government Dispensary.

URINARY CALCULI.

80.



Ext.

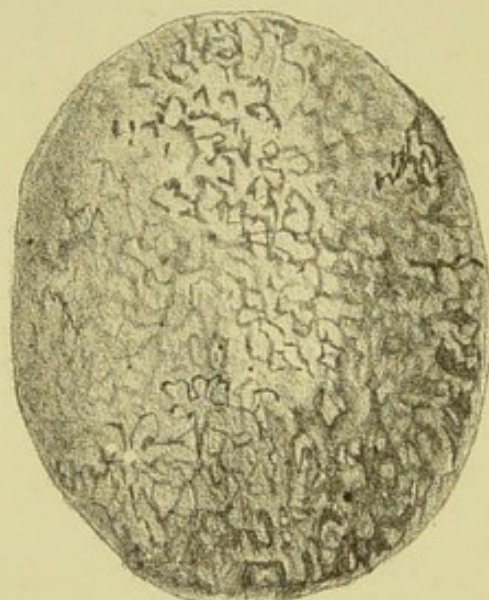


Sect.

81.



Sect.



Ext.

82.



Ext.

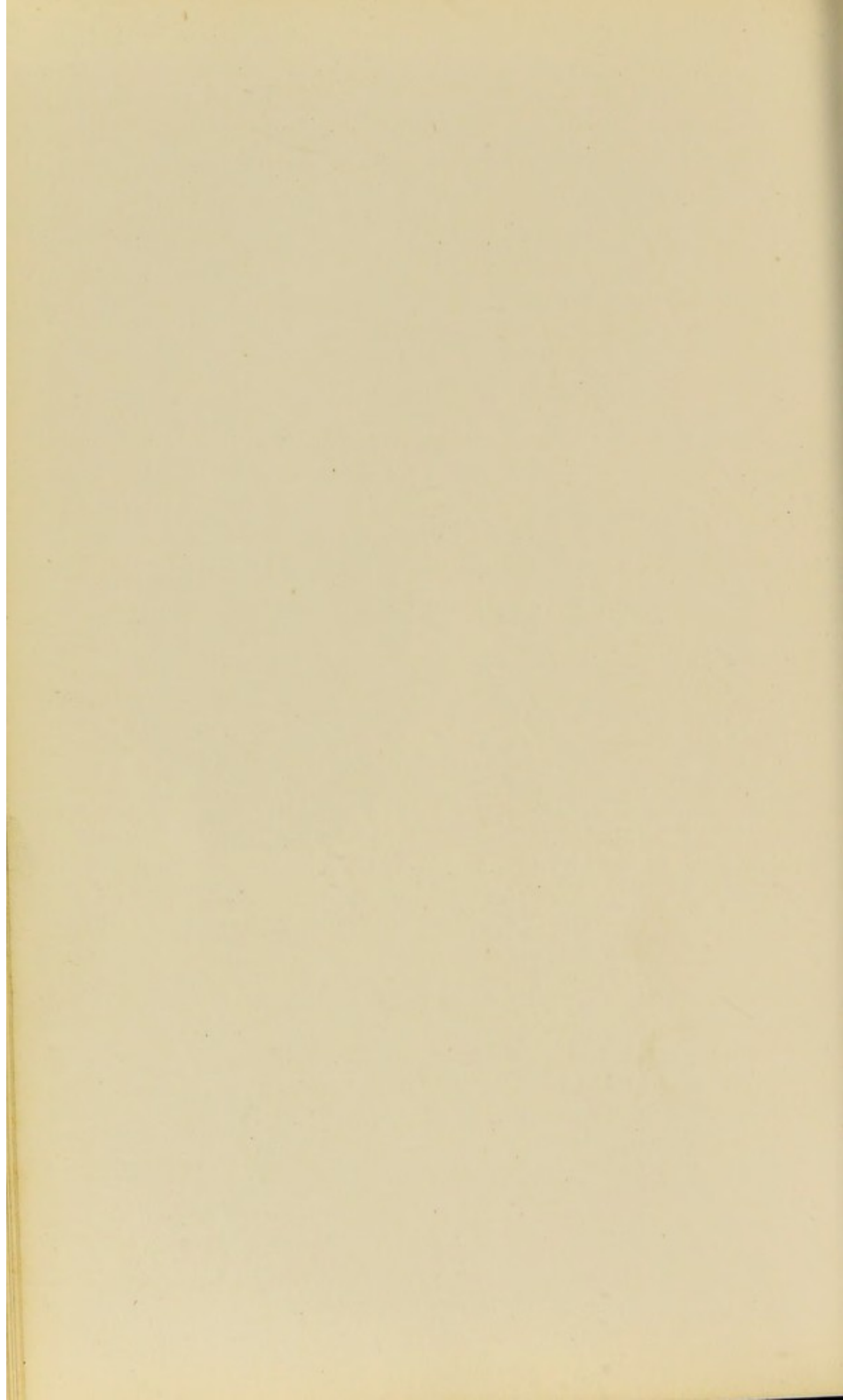


Sect.

*Rai Ram Narain Dass Bahadur
del^t*

W. West & Co lith.

Thacker, Spink & Co, Calcutta.



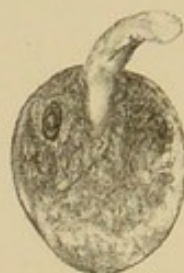


URINARY CALCULI.

83.



Sect.



Ext.

84.



Ext.



Sect.

85.



Ext.



Sect.

Rai Ram Narain Dass Bahadoor
del.

W. West & Co lith.

Thacker, Spink & Co Calcutta.

83rd. The nucleus is porous, and is composed of urate of ammonia and uric acid in almost equal proportions, and the surrounding white layer is also similarly composed.

It is a small roundish calculus of light brown externally, and has a separate piece attached to it like the stalk of a fruit, weighing 52.

Extracted from Jagonauth, a Hindoo boy of four years of age, on the 3rd June, 1851, at the Budaon Government Dispensary, but the boy died seven days after the operation.

84th. The nucleus is mostly composed of urate of ammonia, with traces of uric acid, and the surrounding part is porous but not laminated, and is composed of urate of ammonia and uric acid in almost equal proportions.

It is an oval calculus, of brown colour, and largely tuberculated on its surface, weighing 53½.

Extracted successfully from a Hindoo boy of seven years of age, named Sobah, on the 4th June, 1851, at the Budaon Government Dispensary.

85th. The nucleus is of dark colour, and is entirely composed of urate of ammonia, and the surrounding laminæ are uniform and porous, and are composed of urate of ammonia, with traces of uric acid.

It is a small roundish calculus, of dark brown colour externally, and minutely tuberculated on the surface, weighing 5j gr. 50.

Extracted successfully from a Hindoo of thirty years old, named Dullah, on the 9th June, 1851, at the Budaon Government Dispensary.

86th. There is no definite nucleus, but the stone is uniform and porous throughout; it is composed of urate of ammonia and uric acid.

It is a large oval calculus, of light yellow colour, and tuberculated on its surface, weighing 3j 36.

Extracted successfully from Toorsee, a Hindoo of thirty years old, on the 3rd July, 1851, at the Budaon Government Dispensary.

87th. The nucleus is mostly composed of lithate of ammonia containing traces of oxalate of lime; the next surrounding rings are distinct, and are composed of the same substances in the same proportions; the third layer is not well marked, and is wholly composed of oxalate of lime, with traces of lithate of ammonia; the fourth or the outer layer is whiter than the rest, and is wholly composed of oxalate of lime, containing traces of lithate of ammonia.

It is a small oval calculus, of light brown colour, tuberculated on its surface, weighing 53.

Extracted successfully from Jogun, a Hindoo boy of six years of age, on the 3rd July, 1851, at the Budaon Government Dispensary.

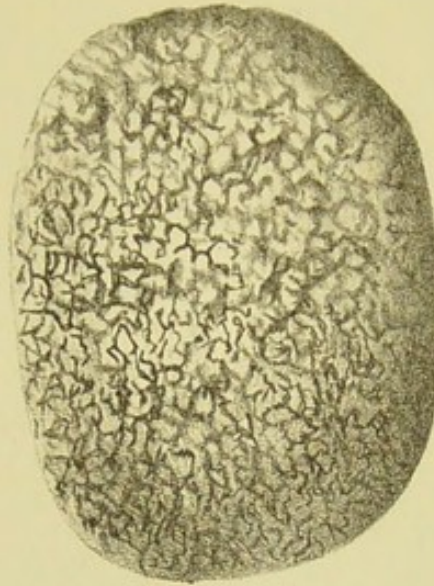
88th. The nucleus is of brown colour and wide, and is wholly composed of lithate of ammonia; the outer white layer is also principally composed of lithate of ammonia, containing traces of oxalate of lime; but the dark ring between them is composed of oxalate of lime, with traces of lithate of ammonia.

It is a large calculus of oval shape, of brown colour externally, weighing 52 gr. 5.

Extracted successfully from Jamah, a Hindoo of fifty years old, on the 3rd July, 1851, at the Budaon Government Dispensary.



Sect.



Ext.

87.



Sect.

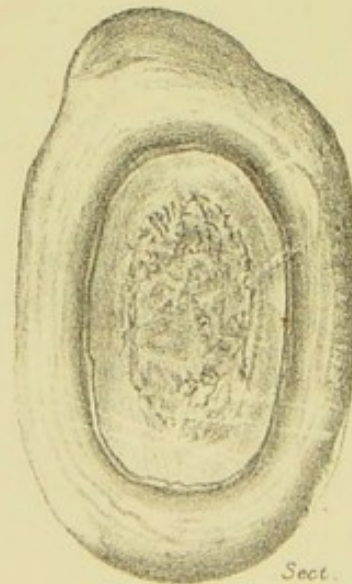


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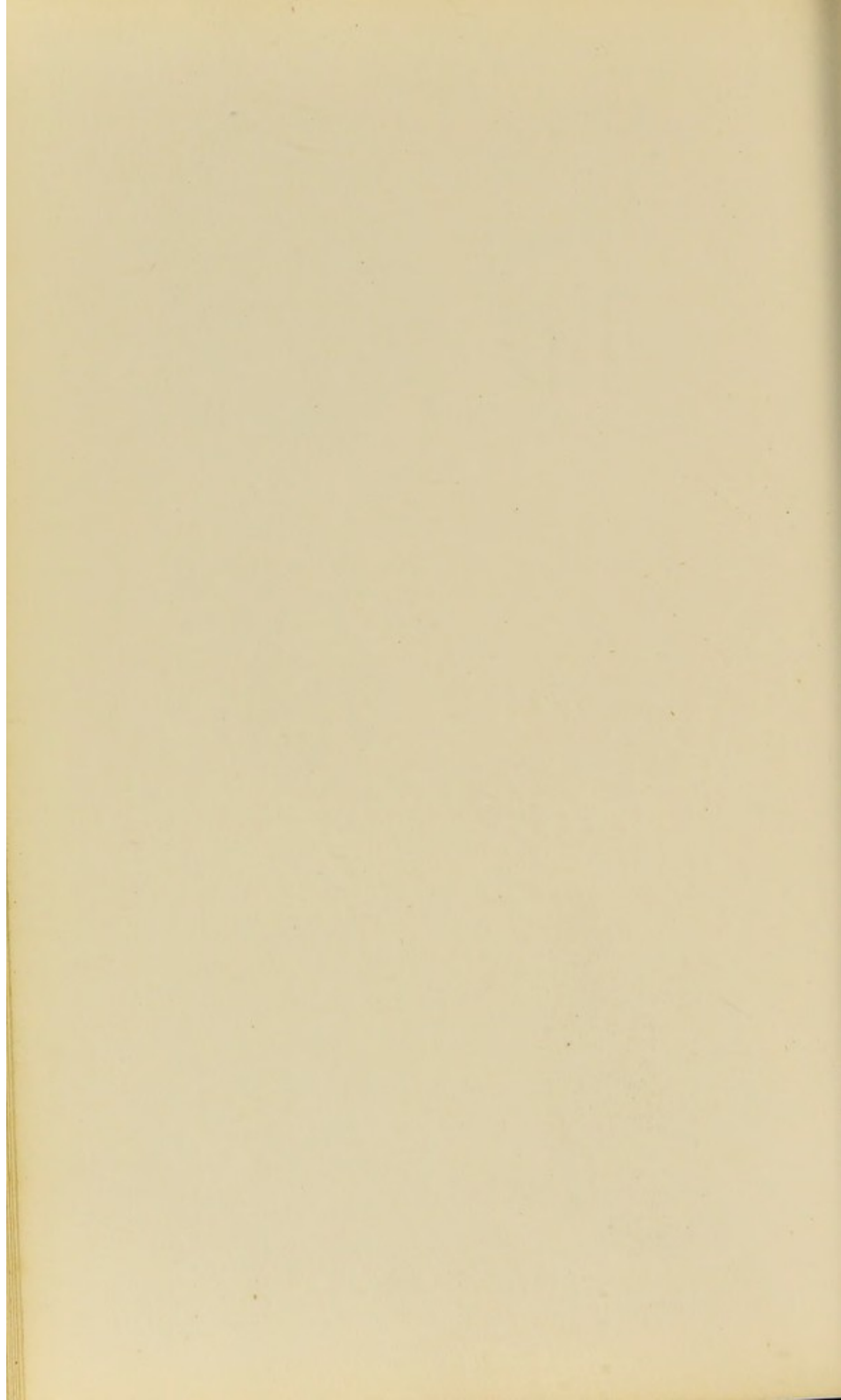
88.



Ext.



Sect.





URINARY CALCULI.

89.



Ext.



Sect.

90.

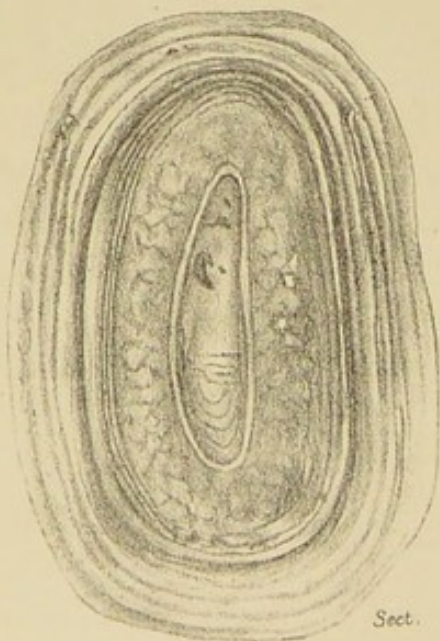


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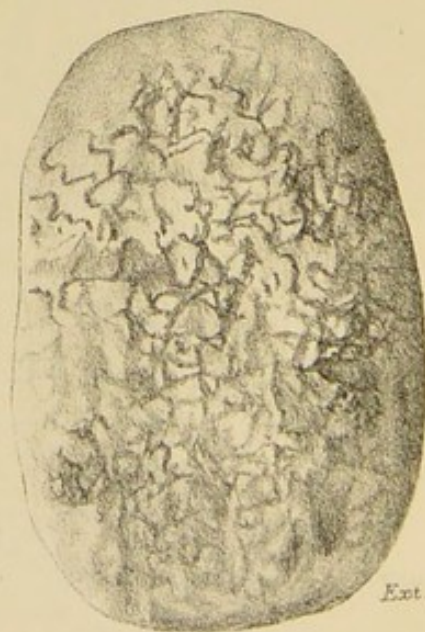


Sect.

91.



Sect.



Ext.

89th. The nucleus is composed of urate of ammonia and uric acid, in almost equal proportions; the surrounding layers are of light yellowish colour, and the outermost layer is of whitish colour, and they are composed of lithate of ammonia, with slight traces of phosphate of lime.

It is a roundish flat calculus, of light yellow colour externally, and minutely tuberculated on its surface, weighing 33 gr. 10.

Extracted successfully from Joyram, a Hindoo of thirty-five years old, on the 21st July, 1851, at the Budaon Government Dispensary.

90th. The nucleus is composed of lithate of ammonia, with traces of uric acid; the second surrounding part is not laminated, and irregularly extends into the third or the last surrounding part, which is of chalky colour, and is also similarly composed as the nucleus, with traces of phosphate of lime; the white deposits on the external surface are also composed of lithate of ammonia, with traces of lithic acid and phosphate of lime.

It is a middle-sized calculus of roundish shape, of amber colour, with white deposits externally, weighing 37.

Extracted successfully from Woodo, a Hindoo lad of fifteen years of age, on the 25th July, 1851, at the Budaon Government Dispensary.

91st. The nucleus is entirely composed of lithate of ammonia; the next surrounding layer is porous, and this, with the last layer, which is compact, is composed of equal proportions of urate of ammonia and uric acid.

It is a large calculus, of oblong shape, largely tuberculated on its surface, and is of light brown colour, weighing 33 35.

Extracted from Hurryram, a Hindoo of thirty-five years old, on the 13th August, 1851, at the Budaon Government Dispensary, but the patient died eighteen days after the operation.

92nd. The nucleus is composed of lithate of ammonia and oxalate of lime in equal proportions; the next surrounding layer is of light brown colour, and is entirely composed of lithate of ammonia; the third layer is of chalky colour, and is composed of lithate of ammonia and oxalate of lime.

It is a small oval calculus, of reddish brown colour externally, weighing 34.

Extracted successfully from Ramrutton, a Hindoo of forty years of age, on the 20th August, 1851, at the Budaon Government Dispensary.

93rd. The nucleus is porous, and is entirely composed of urate of ammonia, and the surrounding white layer is composed of uric acid and urate of ammonia.

It is a small, roundish calculus, minutely tuberculated on the surface, weighing 3j.

Extracted successfully from a Mussulman named Toolah, of twenty-five years old, on the 25th August, 1851, at the Budaon Government Dispensary.

94th. The nucleus is of dark colour, and is entirely composed of urate of ammonia; the surrounding layers are well marked, and are also similarly composed; the last layer is of white colour, and is equally composed of urate of ammonia and uric acid.

It is a large oval calculus, of deep brown colour externally, weighing 32, polished on its surface.

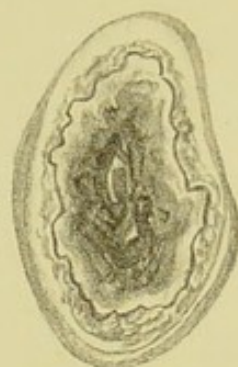
Extracted successfully from Bucktee, a Hindoo of thirty years old, on the 25th August, 1851, at the Budaon Government Dispensary.

URINARY CALCULI.

92.



Ext.



Sect.

93.



Sect.



Ext.

94.



Ext.

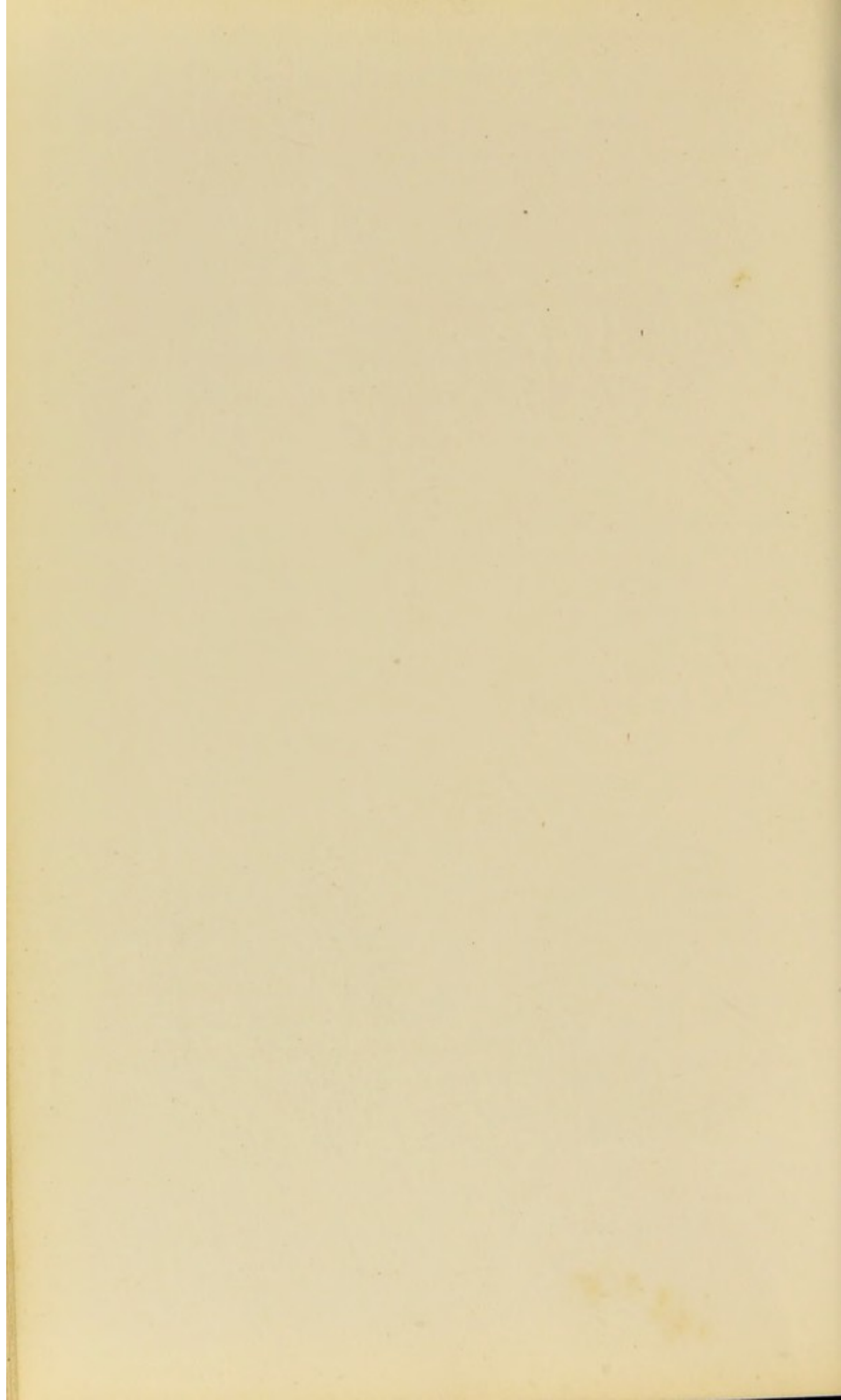


Sect.

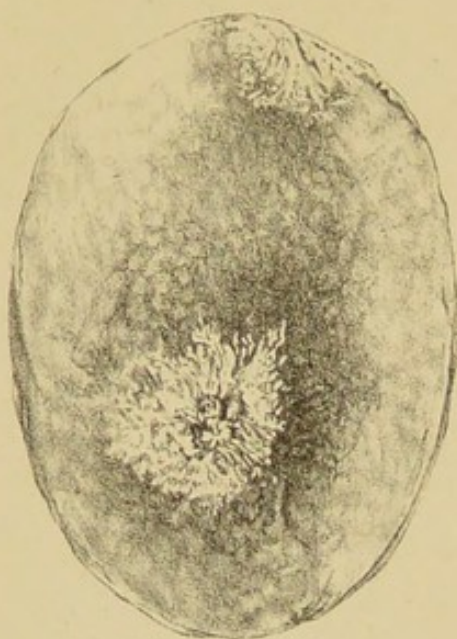
Rai Ram Narain Dass Bahadoor
del^t

W. West & Co lith.

Thacker, Spink & Co, Calcutta.







Ext.



Sect.

96.



Ext.



Entire Calculus.



Sect.

97.



Ext.



Sect.

95th. The nucleus is composed of urate of ammonia and uric acid in equal proportions, containing traces of oxalate of lime, and is excentric and porous; the surrounding layers are also porous, and are also similarly composed.

It is a large oval calculus, of light brown colour, weighing 3j 36.

Extracted successfully from Indur Sing, a Hindoo of forty-five years old, on the 12th September, 1851, at the Budaon Government Dispensary.

96th. The nucleus is somewhat excentric, and is entirely composed of urate of ammonia, and the surrounding rings are of a light yellowish colour, and are composed of urate of ammonia with traces of uric acid; the last or the outer layer is of whitish yellow colour, and is composed of urate of ammonia and uric acid.

There were two calculi, of equal size, and were of flat oval shape, of light brownish colour externally, weighing 35.

Extracted successfully from Runnah, a Mussulman of fifty years old, on the 26th September, 1851, at the Budaon Government Dispensary.

97th. The nucleus and the coloured ring surrounding it are composed of urate of ammonia, with traces of uric acid and oxalate of lime; the second layer is whiter, and is composed of urate of ammonia, containing very little uric acid and traces of oxalate of lime.

It is an oval calculus, of light brown colour, tuberculated on its surface, particularly on its two ends, white deposits, weighing 3l½.

Extracted successfully from Poonah, a Hindoo of thirty-five years old, on the 26th September, 1851, at the Budaon Government Dispensary.

98th. The nucleus is composed of lithate of ammonia, with traces of oxalate of lime; the surrounding laminae are variously composed of lithate of ammonia, mixed with oxalate of lime.

It is a large oval calculus, of deep brown colour, polished on its surface, though minutely granulated, weighing 32.

Extracted successfully from Neetah, a Hindoo lad of sixteen years old, on the 11th October, 1851, at the Budaon Government Dispensary.

99th. The nucleus is entirely composed of urate of ammonia, with slight traces of uric acid; the surrounding part is not distinctly laminated; it is uniform, and is composed of urate of ammonia and uric acid in equal proportions.

It is a small roundish calculus, largely tuberculated on its surface, of whitish yellow colour externally, weighing 32.

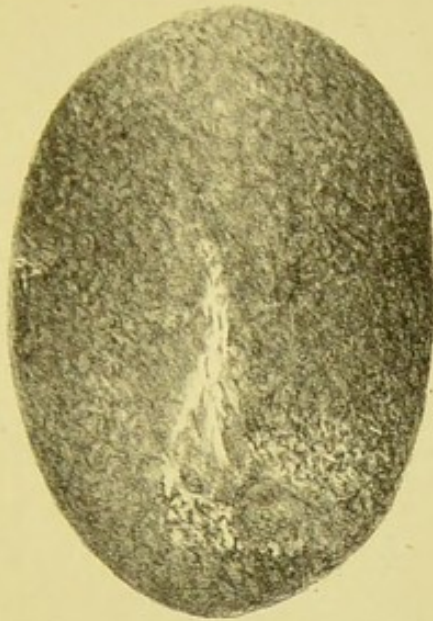
Extracted successfully from a Hindoo lad of ten years of age, named Buljeet, on the 17th October, 1851, at the Budaon Government Dispensary.

100th. The nucleus is of whitish colour, and is surrounded by a porous layer, and they are composed of urate of ammonia and uric acid.

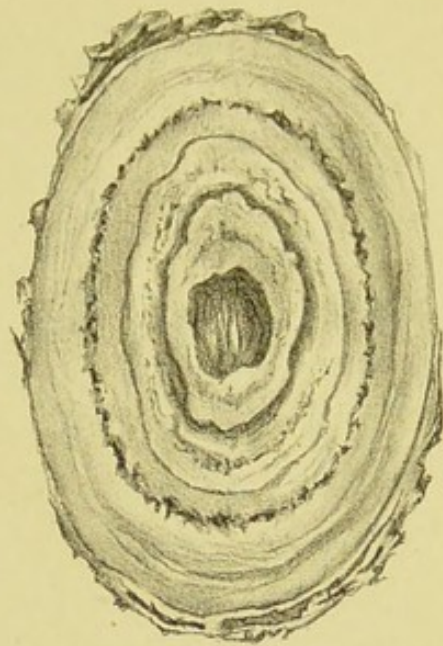
It is a small calculus, minutely tuberculated on the surface; it is of oval shape, weighing grs. 45.

Extracted successfully from Buldeb, a Hindoo boy of six years of age, on the 11th November, 1851, at the Budaon Government Dispensary.

98.



Ext.



Sect.

99.



Ext.



Sect.

100.



Ext.



Sect.

104th. The nucleus is entirely composed of urate of ammonia, and the surrounding yellowish and darkish layers are also entirely composed of urate of ammonia.

It is a small roundish calculus of amber colour externally, and minutely tuberculated on its surface, weighing 23.

Extracted successfully from Muttee, a Hindoo boy of four years of age, on the 29th December, 1851, at the Budaon Government Dispensary.

105th. The nucleus is of dark colour, and is composed of urate of ammonia and uric acid, with traces of phosphate of lime; the second, third, and fourth laminæ are chiefly composed of urate of ammonia.

It is an oval calculus, of chalky colour externally, though largely granular still polished on its surface, weighing $36\frac{1}{2}$.

Extracted successfully from Paransook, a Hindoo of thirty-five years old, on the 4th January, 1852, at the Budaon Government Dispensary.

106th. The nucleus is composed of urate of ammonia with traces of uric acid, and the surrounding layers are composed of urate of ammonia and uric acid almost in equal proportions; the last white layer and the upper end are porous, and are composed of phosphate of lime and triple phosphate, variously mixed with urate of ammonia.

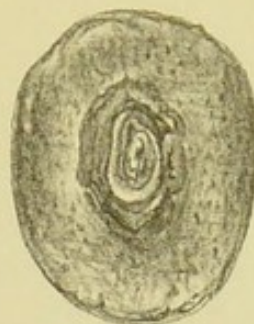
It is a somewhat hour-glass shaped calculus, of chalky colour externally; and besides the large one there was a small calculus of chalky colour, weighing in all $32\text{ gr. }40$.

Extracted successfully from Kissory Sing, a Hindoo of thirty years old, on the 11th January, 1852, at the Budaon Government Dispensary.

104.

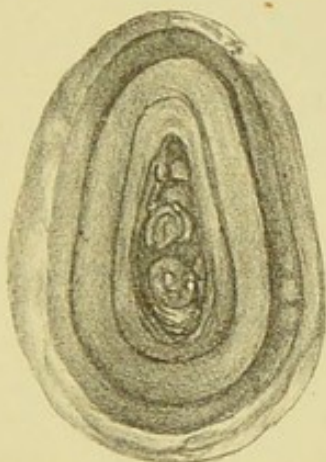


Ext.



Sect.

105.



Sect.



Ext.

106.



Ext.



Sect.

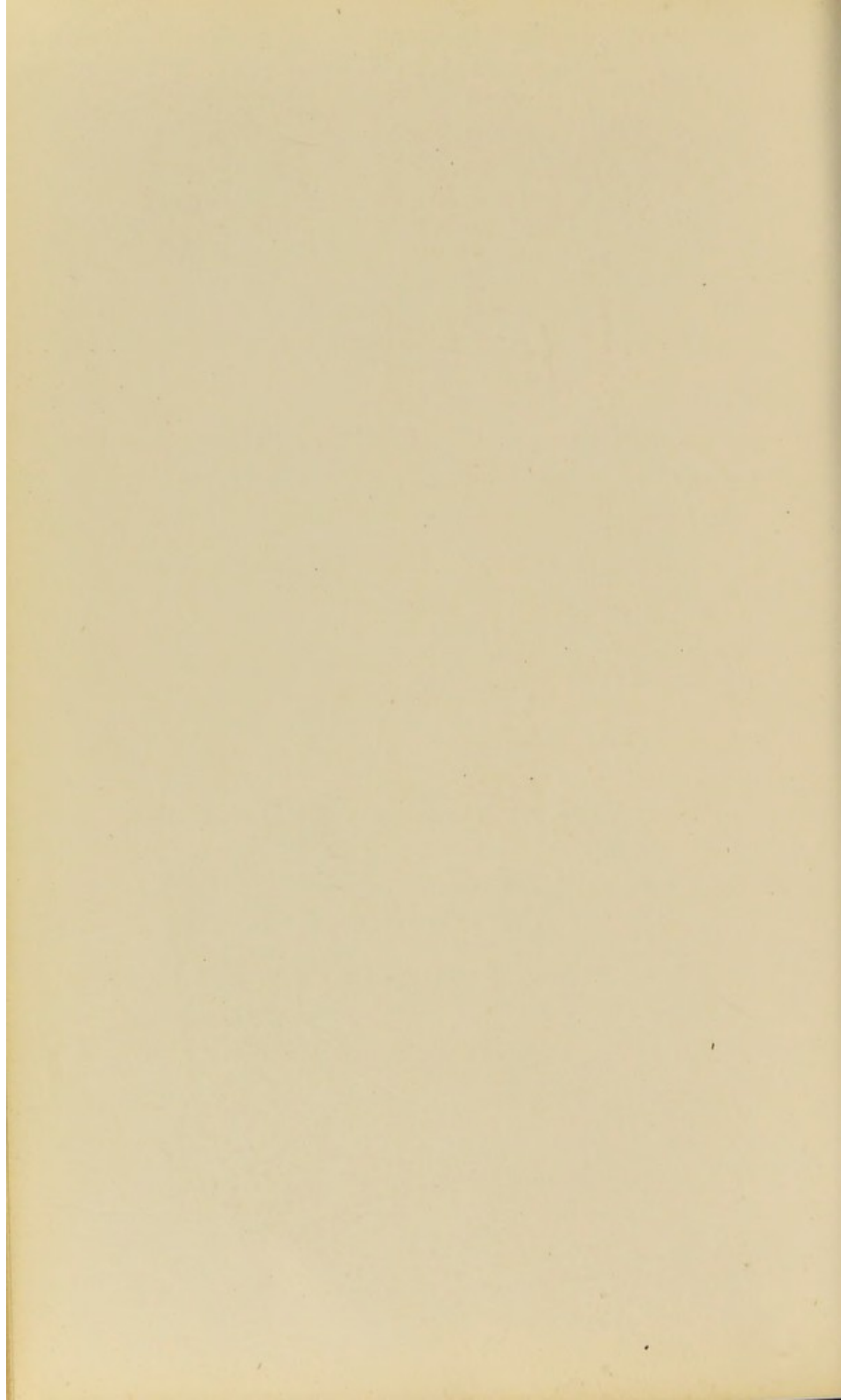


Entire.

Rai Ram Narain Dass Bahadur
del.

W. West & Co lith.

Thacker, Spink & Co, Calcutta.





URINARY CALCULI.

107.

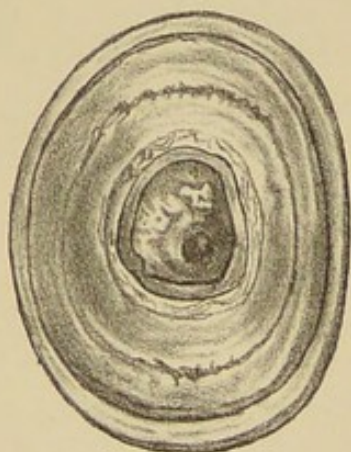


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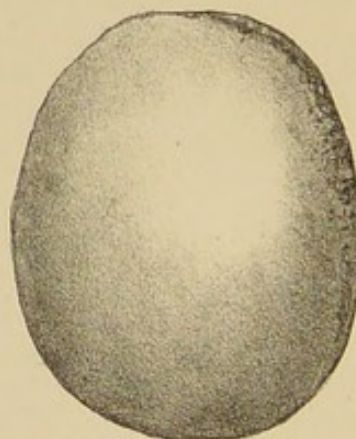


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108.

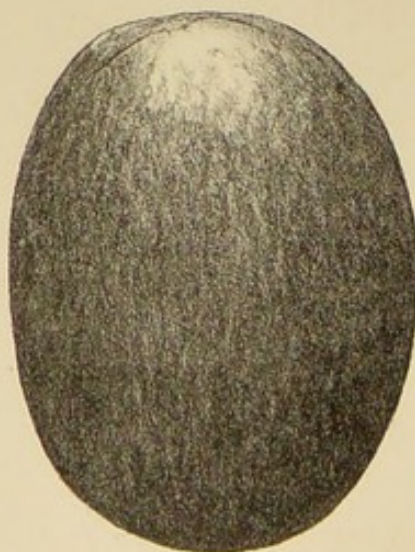


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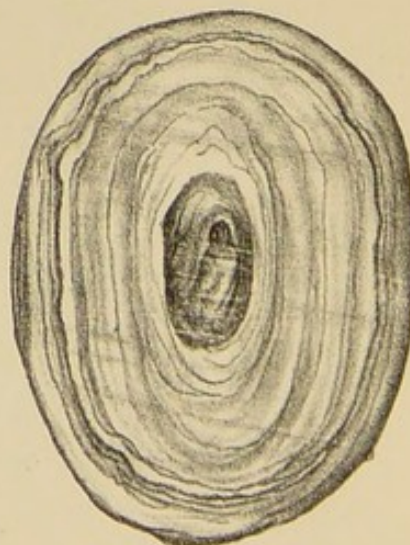


Ext.

109.



Ext.



Sect.

107th. The nucleus is not defined ; the whole of the stone is porous, and is composed of lithate of ammonia, containing traces of oxalate of lime.

It is an oval flat calculus of light brown colour, weighing 36 grs. 20.

Extracted successfully from a Hindoo named Paymah, of forty years old, on the 18th January, 1852, at the Budaon Government Dispensary.

108th. The nucleus is composed of urate of ammonia, with traces of uric acid, variously mixed with oxalate of lime ; the next surrounding layer is composed of urate of ammonia, with more of oxalate of lime and less of uric acid than the nucleus ; the second surrounding layers are composed of urate of ammonia, no uric acid, but varying proportions of oxalate of lime ; and the third or the last layer towards the surface is composed of equal proportions of urate of ammonia and uric acid.

It is a roundish calculus of light brownish colour, with polished surface, weighing 31.

Extracted successfully from Gonga, a Hindoo of thirty-five years old, on the 5th February, 1852, at the Budaon Government Dispensary.

109th. The nucleus is composed of urate of ammonia, and the surrounding laminae are composed of urate of ammonia with phosphate of lime.

It is a large oval calculus, of darkish brown colour externally and granular on the surface, weighing 34 34.

Extracted successfully from a Hindoo lad of twelve years of age, named Buldeb, on the 9th February, 1852 ; but the patient died of looseness 18 days after the operation, after his returning home.

110th. The nucleus is entirely composed of urate of ammonia, the surrounding part is laminated, and the laminae are distinctly marked, and are composed of equal proportions of urate of ammonia and uric acid; the white part on the surface is found to be composed of phosphate of lime in abundance, and of equal proportions of urate of ammonia and uric acid.

There were three calculi, one large and two small ones, as represented in the figure; they were covered by a white chalky-coloured deposit on their surfaces, but loosely connected, and therefore, on sawing the external white laminae, separated, leaving a polished surface, weighing 33 grs. 45.

Extracted successfully from Ramdutt, a Hindoo lad of ten years of age, on the 17th February, 1852, at the Budaon Government Dispensary.

111th. The nucleus is porous, and is composed of equal proportions of urate of ammonia and uric acid, and the surrounding layers are porous and are also similarly composed.

It is an oval calculus of light yellow colour externally, tuberculated on the surface, weighing 36.

Extracted successfully from Kissnah, a Hindoo lad of ten years of age, on the 27th February, 1852, at the Budaon Government Dispensary.

112th. The nucleus is of light colour, and is equally composed of urate of ammonia and uric acid, and the concentric rings are also well marked, and are composed of urate of ammonia and uric acid, variously mixed with phosphate of lime.

It is a large oval calculus, of light brown colour externally, and granulated on the surface, weighing 35 35.

Extracted successfully from Nudah, a Hindoo of thirty years of age, on the 13th March, 1852, at the Budaon Government Dispensary.

URINARY CALCULI.

110.



Ext.



Entire Calculus



Entire Calculus.

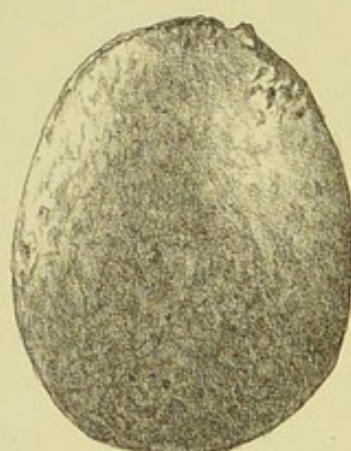


Sect.

111.

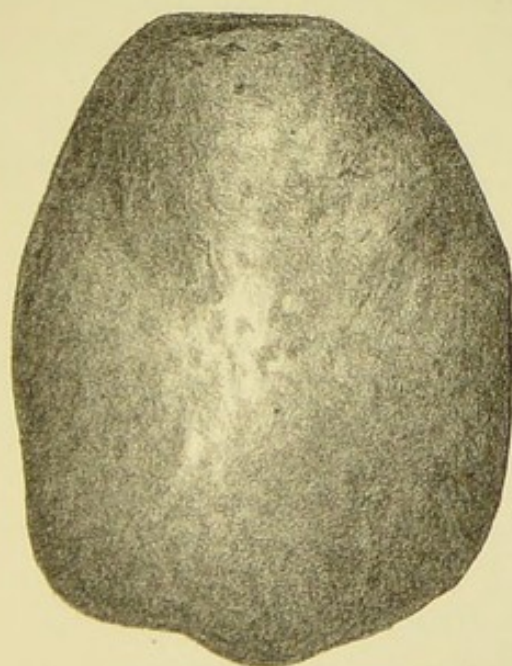


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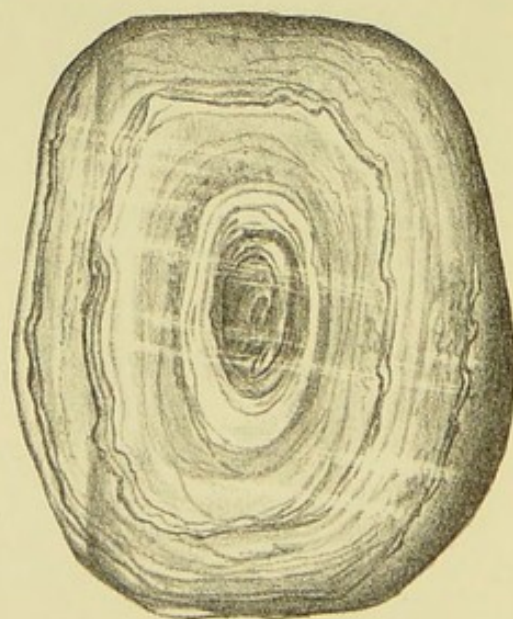


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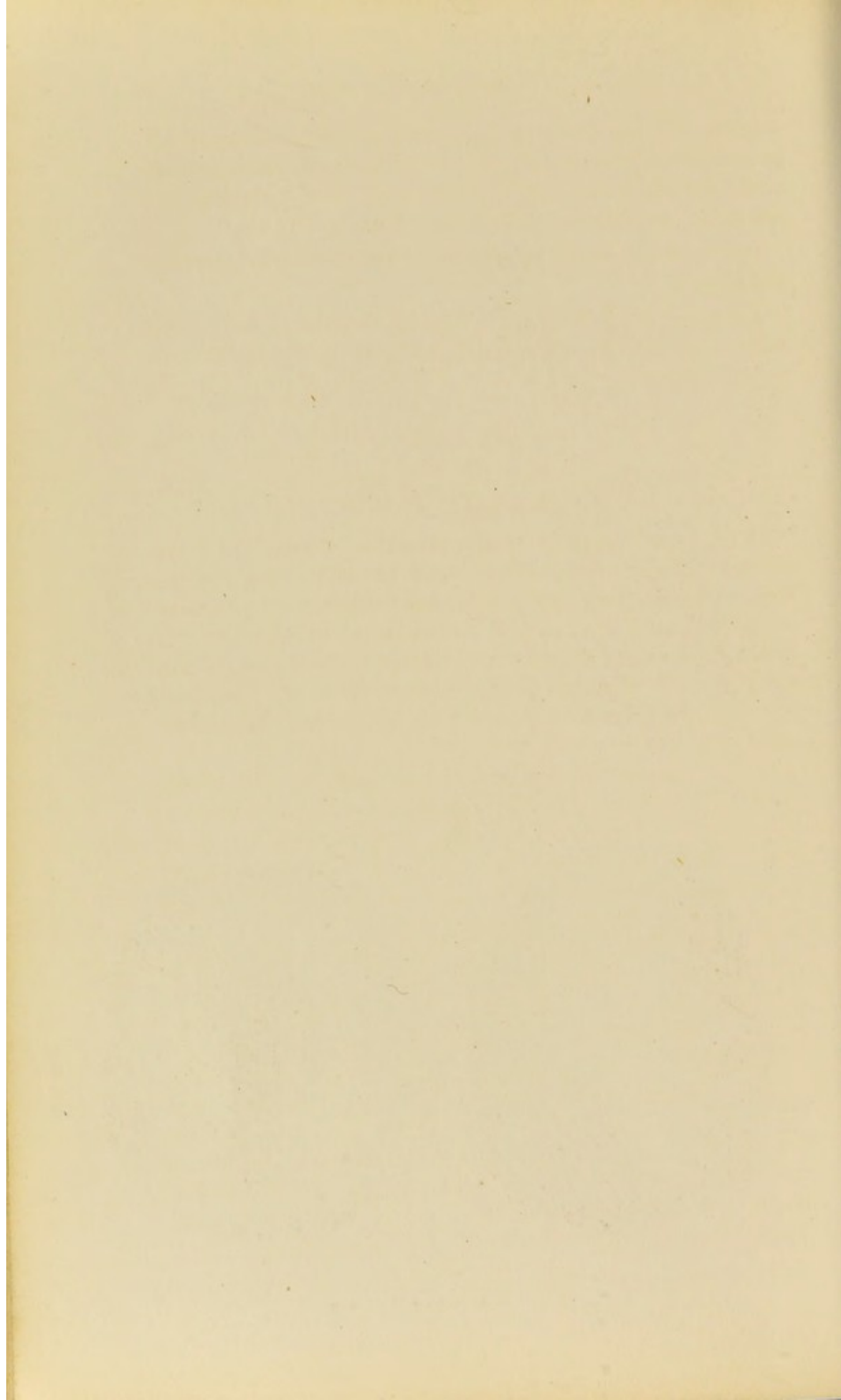
112.



Ext.



Sect.



113th. The nucleus is composed of urate of ammonia and uric acid, and the part surrounding it is not distinctly laminated, but is uniform and porous, and is composed of urate of ammonia and uric acid, and variously mixed with oxalate of lime.

It is rather a roundish calculus, of chalky colour externally, weighing 53.

Extracted successfully from Chadah, a Hindoo lad of ten years of age, on the 29th March, 1852, at the Budaon Government Dispensary.

III.—OXALATE OF LIME.

The calculus, composed entirely of oxalate of lime, is of roundish shape, and of dark brown or almost of black colour; its texture is generally very hard, and internal structure is of knotted appearance, as of the heart of an oak, as in the figure 122; its surface is rough and largely tuberculated; hence, from a fancied resemblance to the fruit of the mulberry, it is called mulberry calculus; when divided it generally presents an imperfectly laminated structure.

Of the oxalate of lime there are two varieties; one of them exhibits crystalline structure throughout, and its surface is studded with large tubercles, which often present very acute angles; hence the presence of such a calculus in the bladder is the cause of excessive pain and irritation; and this variety is generally of white colour, as in the figure 120.

The other variety occurs in the form of small rounded bodies; their surface is not tuberculated, but smooth and polished; when divided it presents a crystalline appearance at the centre, and laminated towards the surface, as in the figure 114.

Besides these physical characters there are chemical properties which distinguish it from phosphate or triple phosphate calculus.

1. When a fragment of the calculus is powdered and heated on a piece of talc or platinum, it blackens, and gives out a smell resembling that of burnt feather, and by continuing the heat, it leaves a bulky whitish ash of carbonate of lime, which, therefore, when moistened with water, reddens turmeric

paper, and effervesces on addition of an acid. Oxalate of lime readily dissolves in nitric or muriatic acid, and from the solution it is precipitated on the addition of ammonia; and the moist precipitate being insoluble when digested in acetic acid, distinguishes it from phosphate and triple phosphate.

Under the microscope, oxalate of lime is found usually in the form of octahedral crystals, or of dumb-bells.

Among my collection of stones the nucleus of a very limited number of calculi is composed of oxalate of lime, mostly in combination with urate of ammonia.

THE CALCULI OF WHICH THE NUCLEUS CONSISTS OF OXALATE OF LIME.

114th. The nucleus, the concentric rings, and the external surface are principally composed of oxalate of lime, containing traces of lithate of ammonia.

There were two calculi, of light brown colour, polished on their external surfaces, weighing 33 gr. 30.

Extracted successfully from a Hindoo lad of ten years old, named Toolah, on the 18th September, 1849, at the Budaon Government Dispensary.

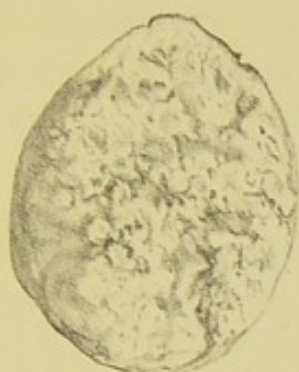
115th. The nucleus is of dark colour, and is composed of oxalate of lime in abundance, and much less of urate of ammonia, and the concentric rings are well marked, and are equally composed of oxalate of lime and urate of ammonia.

It is a flat oval calculus, of yellowish white colour, weighing 3j.

Extracted successfully from Heerah, a Hindoo of thirty-five years old, on the 9th March, 1850, at the Budaon Government Dispensary.

URINARY CALCULI.

113.



Ext.



Sect.

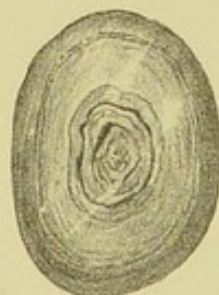
114.



Ext.

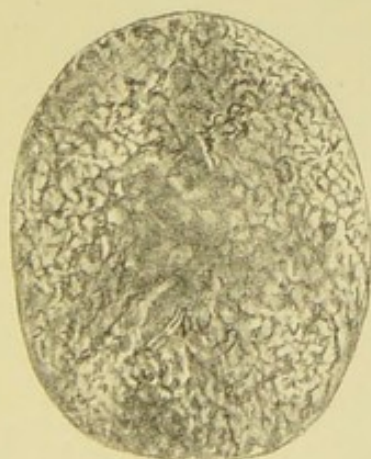


Entire Calculus.



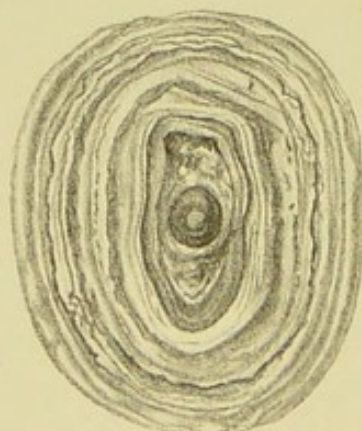
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115.



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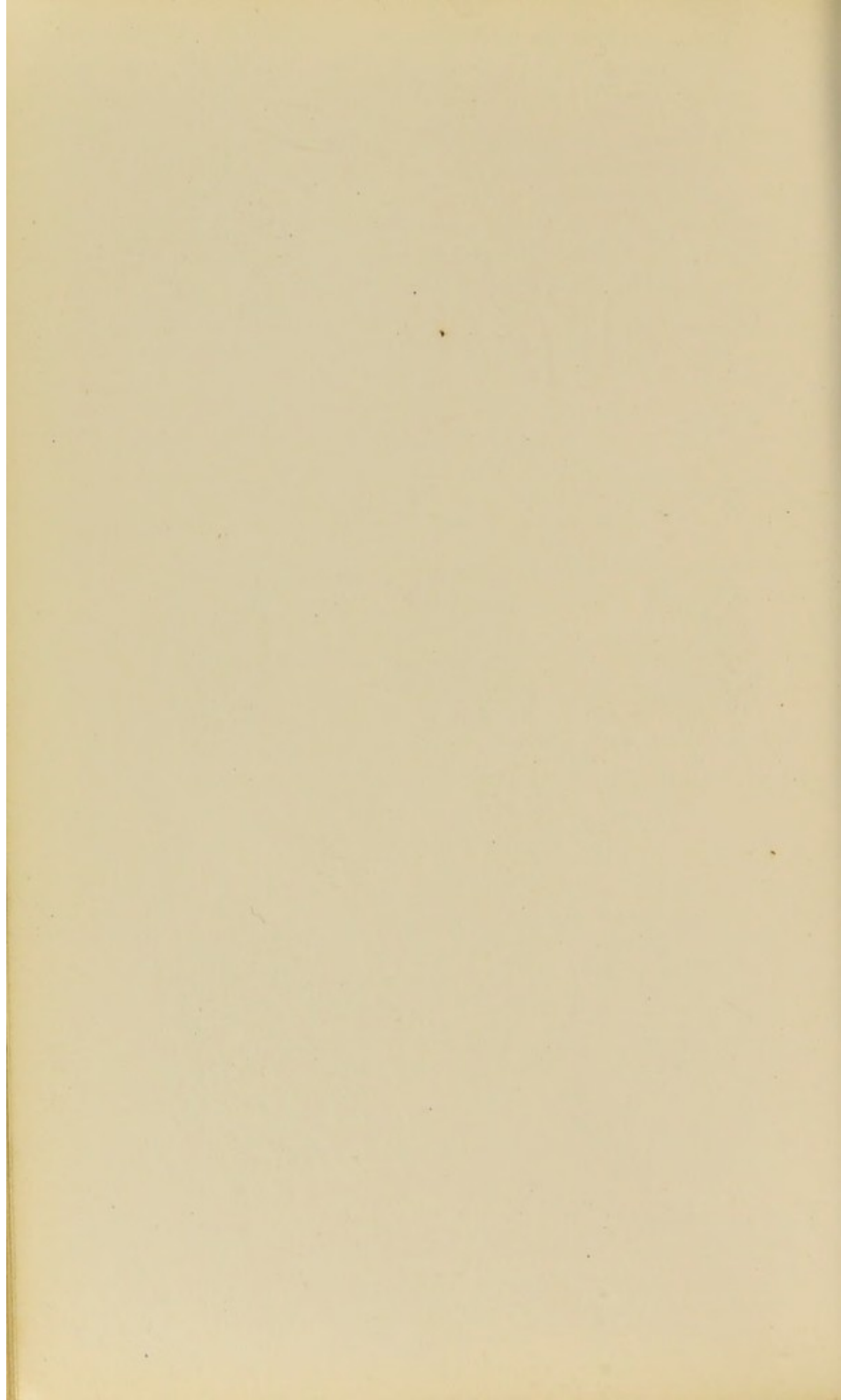
*Rai Ram Narain Dass Bahadoor
del^o*



Sect.

W. West & Co lith.

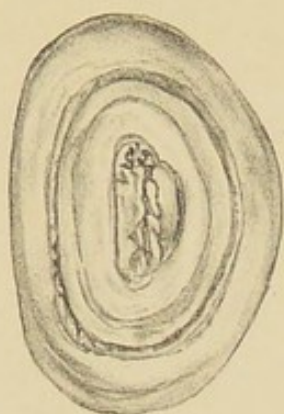
Thacker, Spink & Co, Calcutta.





URINARY CALCULI.

116.



Sect.

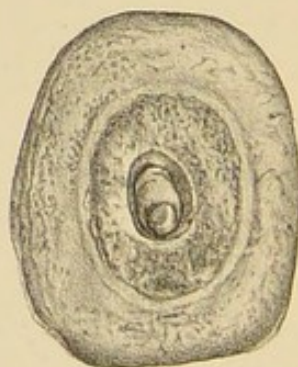


Ext.

117.



Ext.



Sect.

118.



Ext.



Sect.

W. West & Co. lith.

*Rai Ram Narain Dass Bahadoor,
del^o*

Thacker, Spink & Co. Calcutta.

116th. The nucleus is composed mostly of oxalate of lime, variously mixed with lithate of ammonia and lithic acid; first and second concentric rings are also composed of oxalate of lime, variously mixed with lithate of ammonia and lithic acid, and the third layer is equally composed of lithate of ammonia and lithic acid, and less of oxalate of lime.

It is a middle-sized oval calculus, of light whitish colour externally, weighing 36.

Extracted successfully from Kaneah, a Hindoo lad of ten years of age, on the 24th May, 1850, at the Budaon Government Dispensary.

117th. The nucleus is principally composed of oxalate of lime, with traces of urate of ammonia, and the next surrounding layer is mostly composed of urate of ammonia, with traces of oxalate of lime, and the outer or third layer is porous, and is similarly composed as the second layer.

It is a middle-sized oval calculus, of whitish brown colour, weighing 36.

Extracted successfully from Rutnah, a boy of Hindoo caste of ten years of age, on the 24th May, 1850, at the Budaon Government Dispensary.

118th. The nucleus is mostly composed of oxalate of lime, containing traces of lithate of ammonia, the surrounding rings are principally composed of lithate of ammonia with slight traces of oxalate of lime; the outer layer, which is of light colour, is, again composed of oxalate of lime, with slight traces of lithate of ammonia.

It is an oval middle-sized calculus, of brown colour externally, and studded with large tubercles on its surface, weighing 36.

Extracted successfully from Hurry Sing, a Hindoo of twenty years old, on the 11th June, 1851, at the Budaon Government Dispensary.

119th. The nucleus is well marked, and is composed of oxalate of lime with traces of lithate of ammonia, and the concentric rings and the outer or the last layer, which is not laminated, are found to be entirely composed of oxalate of lime.

It is a small calculus of whitish brown colour externally, and of whitish dark colour internally, and studded with large tubercles on its surface, weighing 34.

Extracted successfully from Kulloo, a Hindoo of thirty years old, on the 13th June, 1851, at the Budaon Government Dispensary.

120th. The nucleus is variously composed—of oxalate of lime, urate of ammonia, and uric acid; and the surrounding layers are composed of urate of ammonia and uric acid, but no oxalate of lime.

It is a small oval calculus, of whitish colour externally, weighing $32\frac{1}{2}$.

Extracted successfully from a boy of Hindoo caste of six years of age, named Soba, on the 10th December, 1851, at the Budaon Government Dispensary.

121st. The nucleus is composed of oxalate of lime, with traces of lithate of ammonia and lithic acid, and the surrounding rings are well marked, and are also similarly composed of oxalate of lime, with slight traces of lithate of ammonia and lithic acid.

It is a middle-sized calculus of roundish shape, of light brownish colour approaching to whiteness, weighing 33.

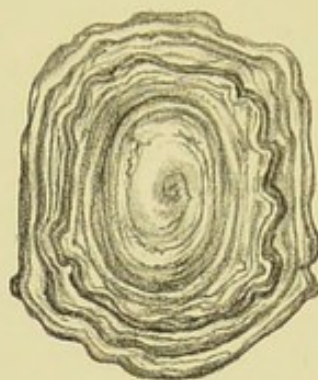
Extracted successfully from Rajah, a Hindoo of fifty years old, on the 13th January, 1852, at the Budaon Government Dispensary.

URINARY CALCULI.

119.



Ext.



Sect.

120.



Ext.



Sect.

121.



Sect.

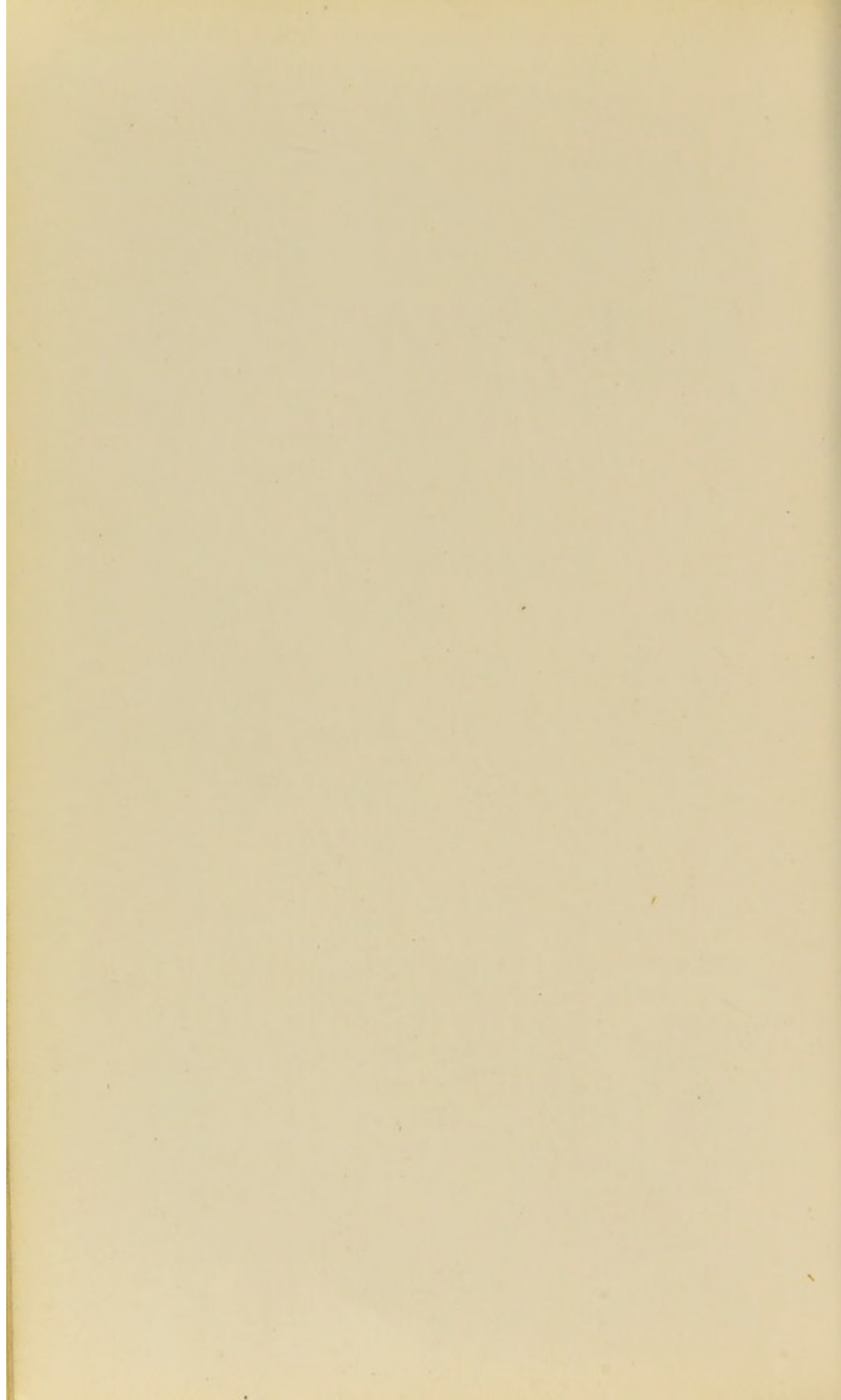
*Rai Ram Narain Dass Bahadur,
del.*



Ext.

W. West & Co lith.

Thacker, Spink & Co., Calcutta.





URINARY CALCULI.

122.



Sect.



Ext.

123.



Ext.



Sect.

124.



Sect.



Ext.

Rai Ram Narain Dass Bahadoor
del^t

Thacker, Spink & C^o, Calcutta.

W. West & C^o lith.

122nd The nucleus is composed of oxalate of lime, and the surrounding layers are composed of lithate of ammonia, variously mixed with oxalate of lime.

It is a middle-sized oval calculus, of brown colour externally, weighing 36.

Extracted successfully from Mulnah, a Mussulman lad of twelve years of age, on the 5th February, 1852, at the Budaon Government Dispensary.

123rd. The nucleus is composed of oxalate of lime, with traces of urate of ammonia, and the surrounding layers are knotted and porous, and are composed of urate of ammonia and uric acid, with traces of oxalate of lime.

It is a middle-sized oval calculus, of light yellow colour externally, and of light dark colour inside, weighing 35 grs. 10.

Extracted successfully from Durmah, a Hindoo of thirty-five years old, on the 6th February, 1852, at the Budaon Government Dispensary.

IV.—CYSTIC OXIDE, OR CYSTINE.

This organic substance has not been found entirely to enter into the composition of any of my stones; only in four calculi traces of it have been found to exist in combination with urate of ammonia and phosphate of lime. Its presence has been detected by microscope in the forms of a few hexagonal prisms, but Liebig's test of detecting sulphur in it by acetate of lead has not been satisfactory, because when to an alkaline solution of a fragment of the calculus, solution of acetate of lead is added and boiled, the liquid does not become black in colour unless it is boiled almost to dryness. This test could not be much trusted, because liq. potassæ, when boiled to dryness with the solution of acetate of lead, produces also inky colour, it being the black oxide of lead.

CALCULI CONTAINING TRACES OF CYSTIC OXIDE, &c.

124th. The nucleus is composed of urate of ammonia with traces of cystic oxide; the surrounding part is porous and homogeneous instead of being laminated, and is found to be composed of urate of ammonia and uric acid variously mixed with phosphate of lime.

It is an oval-shaped calculus, of yellowish white colour externally, weighing 34.

Extracted successfully from Doomah, a Mussulman lad of twelve years of age, on the 21st October, 1849, at the Budaon Government Dispensary.

125th. The nucleus is composed of urate of ammonia, containing traces of cystic oxide; the next surrounding layer is composed of urate of ammonia variously mixed with oxalate of lime, containing also traces of cystic oxide; the third layer is whitish, and is composed of urate of ammonia with oxalate of lime.

It is an oval middle-sized calculus, of brown colour externally, weighing 3j 54.

Extracted successfully from Kunchun, a Hindoo of forty-five years old, on the 26th December, 1849, at the Budaon Government Dispensary.

126th. The nucleus is excentric, and is composed of urate of ammonia with traces of cystic oxide, and the chalky-coloured part below is entirely composed of phosphate of lime.

It is a long oval calculus, a little curved on one side; it is of white marble colour externally, with it there was a small stone of the same colour externally; it has no definite nucleus, and it is porous internally, weighing in all 3j 56.

Extracted successfully from Neetah, a Hindoo of thirty-five years of age, on the 11th October, 1851, at the Budaon Government Dispensary.

URINARY CALCULI.

125.

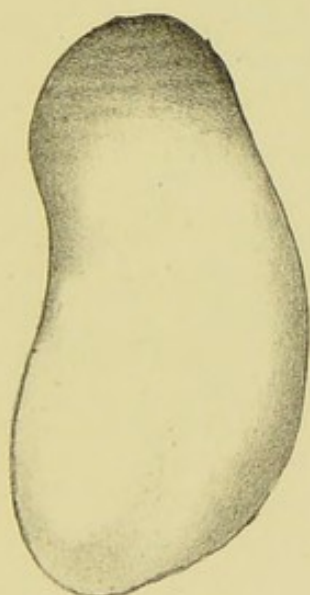


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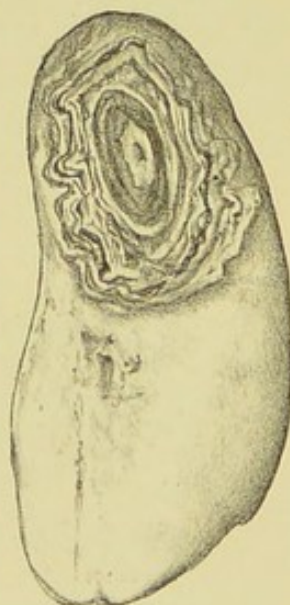


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126



Ext.



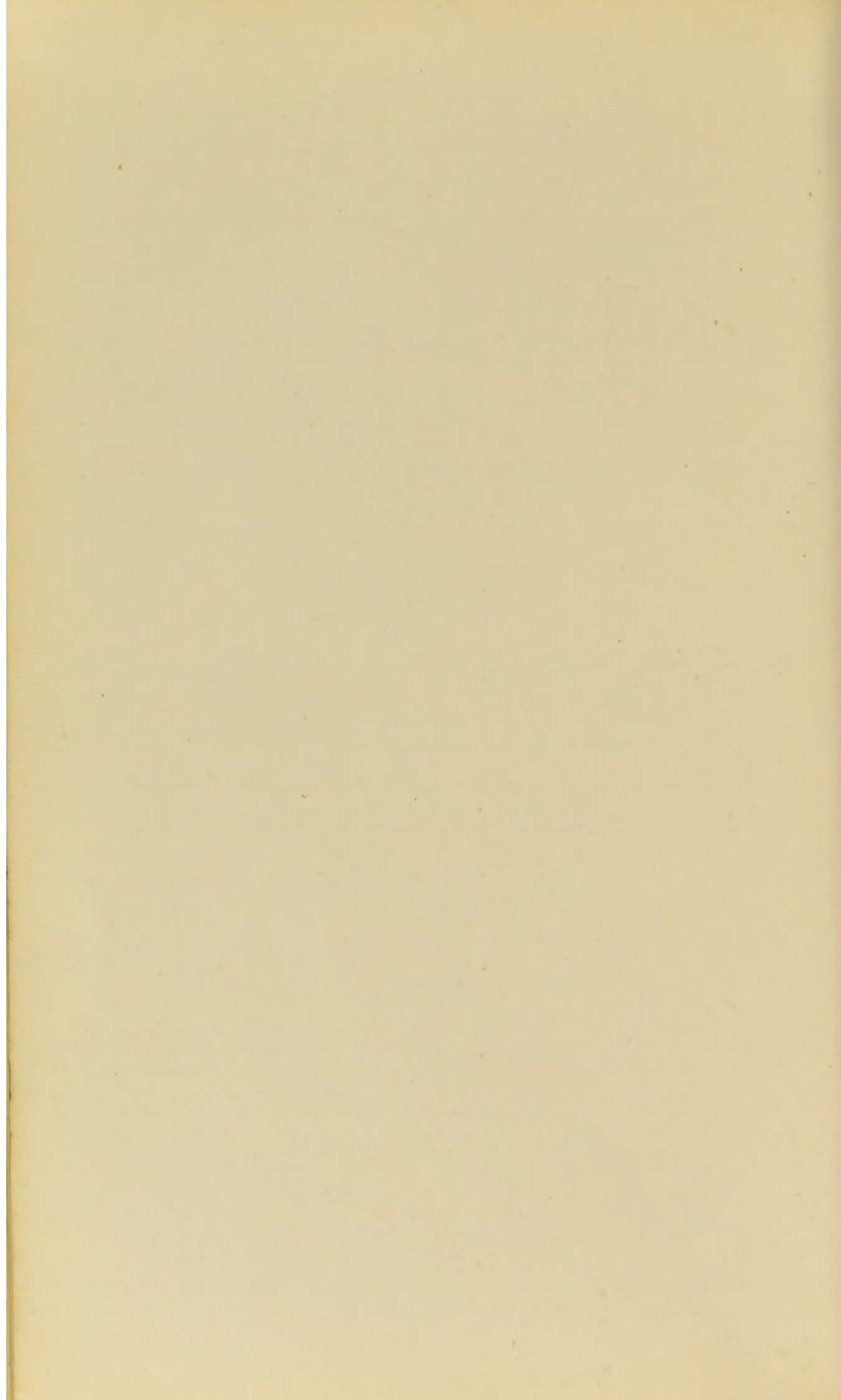
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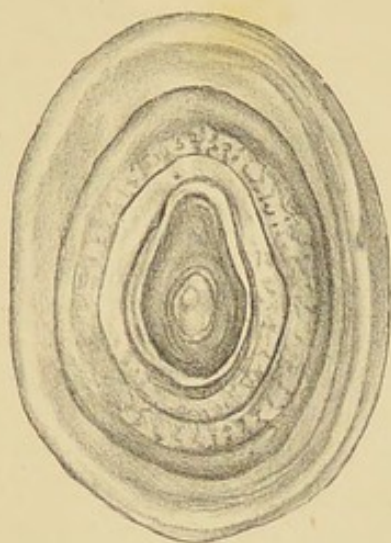
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URINARY CALCULI.

127.



Sect.



Ext.

128.



Ext.



Sect.

Rai Ram Narain Dass Bahadoor.
del.

Thacker, Spink & Co., Calcutta.

W. West & Co., lith.

127th. The nucleus is composed of urate of ammonia, containing traces of cystic oxide, the surrounding laminæ are well marked, and are variously composed of urate of ammonia and uric acid.

It is a large oval calculus, little depressed in the middle, of yellowish colour externally, and polished on its surface, weighing $\text{3j } 36\frac{1}{2}$.

Extracted successfully from Damlee, a Hindoo lad of eight years of age, on the 10th December, 1851, at the Budaon Government Dispensary.

V.—PHOSPHATE OF LIME, OR BONE EARTH.

Calculi of pure phosphate of lime are of very rare occurrence. Among my collection no calculus was found to be entirely composed of this substance, and no nucleus of a stone is found to be composed of this bone earth. It is frequently found mixed with phosphate of magnesia and ammonia, or what is commonly called triple phosphate.

The nucleus of one calculus of my collection has been found to be composed of phosphate of lime and triple phosphate; while in others they are deposited on their surfaces. In this manner it gives origin to the formation of layers of pure phosphate of lime, it being a morbid secretion of the mucous lining of the bladder under certain forms of disease of that viscus. When large quantities of it are secreted and not held in solution by a free acid, they concrete into irregular masses resembling mortar, or they form some crystalline powder usually enveloped in a thick tenacious mucus. In this latter state it is occasionally found adhering to the rugæ of the mucous membrane of the bladder, and to their fan-shaped hollows. Thus circumstanced it exactly resembles a case of stone; the case in page 18 is an instance of the kind. When a calculus of other kinds, such as uric acid and urate of ammonia, is present in the bladder for a length of time, it creates an irritation of the mucous surface of the bladder, and results in an inflammation of chronic character, thereupon effecting hypertrophy of the mucous membrane, and

in consequence its function becomes altered ; it then begins to secrete a good deal of thick ropy mucus and pus. In this state urine becomes highly alkaline, on account of the urea being decomposed into ammonia. In this morbid state of the mucous membrane of the bladder large quantities of phosphate of lime are secreted with triple phosphate, and with it the health of the patient falls down.

This bone earth is soluble either in muriatic or nitric acid. From its solution it is precipitated by the addition of Liq. Ammonia, in the form of gelatinous powder ; and on placing a drop of the moist precipitate under the microscope, the beautiful crystals of phosphate of lime are observed. If it be oxalate of lime, dumb-bell or octahedral crystals are perceived. To detect chemically one from the other, if it be phosphate of lime it will then dissolve on addition of acetic acid, and this clear solution being divided into two parts, lime would be detected in one by the addition of oxalate of ammonia, and phosphoric acid in the other by nitrate of silver or by perchloride of iron.

No calculus among my collection is entirely composed of triple phosphate of magnesia and ammonia, nor the nucleus of any of my calculi entirely consists of it ; it is always found to exist in combination with phosphate of lime, forming what is called fusible calculus.

The triple phosphate is not in itself a constituent of the urine ; it originates when the urea of the urine undergoes decomposition ; the ammonia of the decomposed urea combining with phosphate of magnesia—one of the constituents of the urine—forms phosphate of magnesia and ammonia. When this process of decomposition is going on, the irritability of the bladder increases, as well as the alkalinity of the urine proportionally with it, and the patient then exhibits symptoms of great exhaustion.

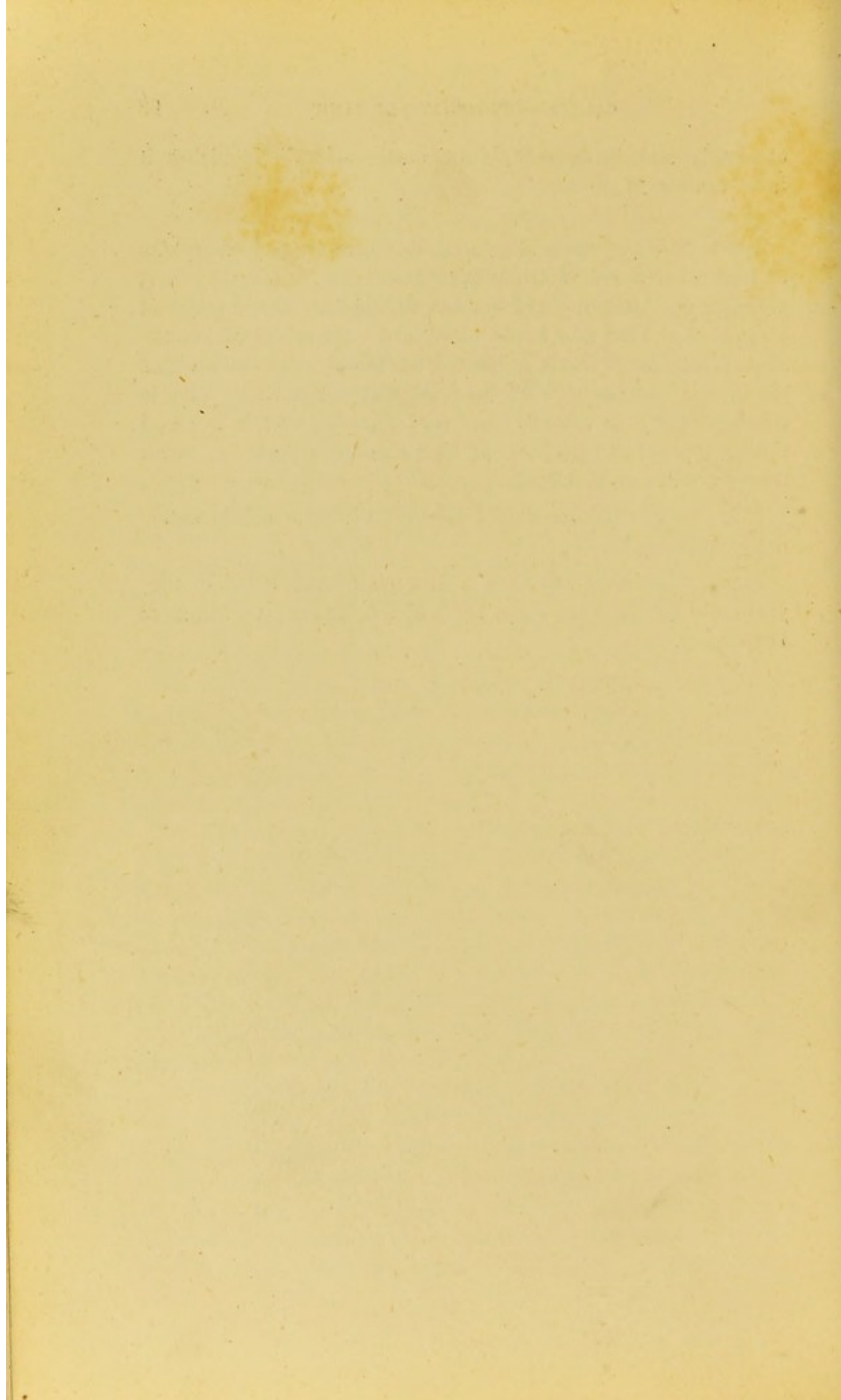
The triple phosphate is deposited from the urine either in the form of shining white crystalline powder, called white gravel, or in that of a solid concretion. This substance is friable and of chalky colour, and soluble in muriatic, sulphuric, or acetic acid ; and from the acid solution it could be precipitated by the addition of ammonia ; and the precipitate being examined under a microscope, stellated prisms with foliated appearance are

observed; and being soluble in acetic acid distinguishes it from oxalate of lime.

128th. The nucleus is almost entirely composed of phosphate of lime, with traces of triple phosphate; the surrounding part is irregularly laminated and porous, and is equally composed of phosphate of lime and triple phosphate. After extraction, the stone falling down from my hand, it broke into two halves, and the internal surface of each half is polished, of white marble colour, and shining crystals are observed on it; and it is found to be composed of phosphate of lime and triple phosphate, with traces of urate of ammonia.

It is a large irregular-shaped calculus, of white colour externally, weighing 34.

Extracted successfully from a Hindoo, named Ujeet, of fifty years old, on the 23rd July, 1850, at the Budoan Government Dispensary.



REVIEWS AND CRITICAL NOTICES
ON
MONOGRAPH OF LATERAL LITHOTOMY OPERATIONS,
BY RAI RAM NARAIN DASS, BAHADOOR.

—:O:—

4th September, 1871.

MY DEAR BABOO,

I RETURN your Monograph on Lithotomy with many thanks. I have read it with much interest, for it is a valuable record of your great experience and success.

I hope you will publish it, for it does great credit to Indian Surgery, and must enhance your deservedly high reputation.

With best wishes,

Yours sincerely,

J. FAYRER,

*Professor of Surgery, Medical College,
and First Surgeon, College Hospital.*

THIS work consists of 93 pages demy octavo, of excellent type, good paper, and capital binding. The first 11 pages are devoted to "history of cases," the next 5 to the "ætiology of calculi vesicæ in the North-Western Provinces," and then 5 pages only are given to the "operative part of the subject." We next meet with tables containing numerous statistics and information, and the last 47 pages give excellently executed lithographs of the different varieties of calculi, and a brief description of each illustration. The author has simply placed on record his own experience, tells us exactly what he has done, gives us a short history of any unusual or interesting case which came under his own treatment during the 12 years of which the subject treats, and describes each stone extracted by himself. No new rule of practice is laid down; no novel method of doing this, that, or the other is recommended, and no dogmatic assertions disfigure his pages. Taking it for what it is, a good record of experience and an excellent pathological map of calculi, the Monograph is highly creditable to Rai Ram Narain Dass, Bahadoor. It displays skill as an operative surgeon, exhibits the devotion of the author to his profession, and is an undoubted proof of industry and worth. Excellent as the work is, we are afraid that, in a financial point of view, the author will not find it successful, for monographs of this sort never pay in India the cost of printing; however, the Baboo may

console himself with the consciousness of having done well, and of having gained the approbation of his professional brethren, both European and Native. The author's experience has been altogether in the North-Western Provinces, where the disease is very common. During a period of five years and two months, 220 cases of stone were operated on at the Budaon Government Dispensary, of which Rai Ram Narain Dass, Bahadoor, was in medical charge. He tells us that the number of Hindoos affected was six times greater than that of Mussulmans, and that, therefore, the Hindoos are more liable to the disease. He attributes this to—

(a). *Nature and character of their food.*—This consists chiefly of vegetables, and many of the low classes are in “the habit of eating raw vegetables, which by causing indigestion produce acidity, and from the predominance of acid in the primæ viæ the urine undergoes a change, and it becomes acid in its character; together with the indigestion thus produced, the skin sympathetically becomes inactive, having a close sympathy with the mucous membrane of the bowels, and the nitrogenous substances produced from the metamorphosis of the living tissues, being unable to make their exit through the inactive skin, are eliminated through the kidneys in the form of uric acid and urea; when uric acid is in excess in the urine, being retained in the bladder for a while, it begins to deposit in the form of minute particles like sand, being insoluble in the watery part of the urine, and some of these particles coalescing together form the nucleus of a stone.” In some cases “the lactic acid produced by indigestion” decomposes the urate of soda or potash, “sets free the uric acid, which being more insoluble forms deposits within the bladder, and thus originates a uric or lithic acid calculus, or forms the commonest nucleus of a calculus. Old persons are more subject to indigestion than people of middle age, because the activity of the digestive functions decreases with age, and the digestive functions also are readily disturbed; and this probably is the reason why old people and young children are more subject to lithic acid or lithate of ammonia calculi, as in both the predisposing causes to indigestion are more prominent and frequent.” Those who have been suffering from calculus vesicæ for a length of time, become emaciated. “In this state it has been invariably found that the urine undergoes another change; it becomes alkaline, the urea decomposes, and in consequence, on the acid nucleus first formed, phosphate and triple phosphate are deposited in the form of a white coating, and thus is developed a calculus of mixed character and composition.” Other causes may be—

(b). *Quality of the water-supply, and the geological peculiarities and climate of the country.*—The disease is particularly common in the stony and sandy districts. “The temperature of these districts is exceedingly high, and consequently the atmosphere is rarefied, and the oxygenating processes of respiration are correspondingly imperfect, more work is thrown on the kidneys, and the excretion of urea and uric acid is increased. Moreover, the varieties of temperature are great, and the

functions of the skin are, therefore, being constantly interfered with, and additional work is thrown on the kidney. Probably, therefore, a variety of predisposing causes, indigestible food, drinking calcareous waters, and climatic and geological local conditions, explain the fact that vesical calcareous diseases are found to be common among the people in the sandy and stony districts of the North-Western Provinces, as elephantiasis is in Bengal."

Dr. Debout D'Esties in his recent work—*Les Causes de la Gravelle et de la Pierre*—states that the gravel consisting of phosphate of lime, with carbonate of lime, the urates and alkaline phosphates (primary gravel), and which he met with chiefly in anæmic and tuberculous subjects and sailors from China and Senegal is, in his opinion, due to a mal-nutrition, the organic matters being used up and the minerals left in excess in the circulation. Lesions of nerves which preside over the renal function may also give rise to it. The production of the triple-phosphate (secondary gravel), he ascribes to the continued use of alkalies, fermentation of urine, &c., &c. Four cases of uric-acid gravel were due to mental emotion and in one case to contusion of the kidney in a child thirteen years of age.

Our author writes—"After carefully examining my collection of calculi I find that most of the small-sized stones are composed of uric acid and urate of ammonia, variously mixed with each other in the nucleus, as well as in the surrounding laminae; a very limited number of calculi, besides the uric acid and urate of ammonia, contain traces of phosphate of lime, oxalate of lime, and triple phosphate of magnesia and ammonia."

As regards his operative procedure, we notice that the Baboo first prepares his patient by clearing out the bowels and in having fluid in the bladder. If that viscus is too irritable to retain urine, he injects tepid water. He prefers a full-sized staff with a central groove, and he entrusts it to an assistant in the first steps of the operation. He uses a small-sized scalpel, and after having cut through the external structures, and placed his knife in the groove, he takes the staff out of the assistant's hand. Holding it with his left hand, he depresses its handle to a position parallel to the axis of the pelvis, and then pushes the knife along the groove, keeping exactly in the median line. "The deep incision," he writes, "must be a free one,—that is to say, sufficient to remove all resistance to the extraction of the stone," otherwise, and if not in the direction of the external wound, "the result would be bruising and laceration of the triangular portion of the deep fasciæ, which would necessarily involve the recto-vesical fasciæ, and would thereby break down the natural boundary between the internal and external cellular tissue, and leave nothing to prevent the infiltration of urine, an accident which always proves fatal. This awful accident has never occurred in any of my cases. Many Surgeons make the deep incision on the groove of the staff without lowering its handle, but I prefer the other way. This plan of depressing the handle of the staff," he tells us, "renders

the bladder tense, in which condition it is more easily cut." Of the 248 cases of lateral lithotomy operations, 17 died, being a mortality of 6·8 per cent. Our author writes:—"I have been very successful in my lithotomy operations, mainly, I believe, because I have taken care to make my deep incision free enough, so as to avoid laceration of the parts during the process of extraction; keeping this object in view in the cases of those who had large stones requiring a wider wound for their easy extraction, I have, after meeting with difficulty in extracting them, extended the wound to the anus and a part of the rectum, and thus I have been able to remove with ease the large stones without lacerating the wound. Such patients were always particularly attended to, their wounds were washed out with tepid water injections every second hour to prevent fæcal matter lodging in the bladder, and thus their wounds readily filled up, leaving a small recto-vesical fistula, which ultimately got well under the application of caustic." There is nothing like success, but this combining of the recto-vesical operation with lateral lithotomy should only be done in cases of stone, too large for the bilateral operation, in a diseased or highly irritable bladder where it is impossible to break up the stone with a crushing forceps. Concerning the internal free incision we may remark that it has the sanction of Sir H. Thompson, who writes:—"My belief is, however, that the result of our anxious care about this matter is, practically, that we are apt to cut rather too niggardly than too freely, and that the neck of the bladder in consequence receives severer injury from the stone and forceps than it otherwise would receive from the knife."

We have only a few words to say of the illustrations and descriptions of 128 calculi. Each stone has been sawn across, and we are presented with an external and sectional aspect, the latter exhibiting the nucleus and concentric laminae. The description gives the date and particulars of extraction, the composition of the stone, colour, and weight. As we said before, these illustrations are extremely well done, and the descriptions are valuable and interesting.—*The Indian Medical Gazette*, Jan'y. 1, 1877.

WE have to acknowledge with thanks Rai Ram Narain Dass, Bahadoor's book on Lithotomy Operations. This book owes its origin to a scurrilous paragraph, and a virulent attack on Dr. Fayrer in the *Medical Mirror* for September, 1866. Alluding to Dr. Fayrer's "Address in Surgery" this Journal says—"Dr. Fayrer says, 'we count our operations by hundreds; some of our graduates have cut as many men successfully for stone as the greatest Lithotomists ever saw!!!' Professor Fayrer is an adept in tall talk." Lecturing to half-castes and to natives is evidently very elevating indeed. Perhaps a few years' sojourn in England will sober down Professor Fayrer's style. Genius and modesty are often allied; we may have genius certainly among our surgeons of Her Majesty's Indian Service, as they love to write themselves; but we look in vain for modesty in one of them at any rate." And Rai Ram Narain

Dass proves that while the ratio of mortality in Bristol Infirmary and St. Thomas's Hospital is respectively 4·5 and 1 in 10·7, in Cawnpur and Burdwan Government Dispensaries under his charge, the ratio was 1 in 14·8. This is an unanswerable reply to the scurrilous remarks of the *Mirror*.—*Amrita Bazar Patrika*, Jany. 12, 1877.

WE find upon our table "A Monograph of 248 Cases of Lateral Lithotomy Operations, performed in the North-Western Provinces, during a period of twelve years, by Rai Ram Narain Dass Bahadoor, Assistant Surgeon." We need scarcely inform readers of this paper that our knowledge is encyclopædian; but, after laying out a ground plan, so to speak, for a review of this work, and an airing of our medical knowledge, it occurred to us that it might suit our readers better if we sent this review to the *Medical Gazette*. Suffice it, then, to say that the book is got up in Messrs. Thacker, Spink, and Co.'s usual finished style; and that the dignities of the author are a warrant that his monograph contains useful information.—*Englishman*, 1st December, 1876.

WE have received a Copy of a *Monograph of Lateral Lithotomy Operations*, by Rai Ram Narain Dass, Bahadoor, Lecturer of Surgery to the Campbell Medical School, and First Surgeon to the Campbell Hospital. This is hardly a work for popular review, and we can scarcely do more than acknowledge the receipt of it, and draw attention to its publication. The author has had twelve years' experience in the N. W. P., and believing that a record of his experience of such cases as he had treated might be of use, he has published them, dividing his work with convenient sections. It is amply illustrated by plates, which will, no doubt, interest the faculty. The work has been well got up by the publishers, Messrs. Thacker, Spink, and Co.—*Indian Daily News*, 4th December, 1876.

MEDICAL COLLEGE,

7th December, 1876.

MY DEAR RAI RAM NARAIN DASS,

I HAVE read with much pleasure the copy of your work on Lateral Lithotomy Operations, which you were kind enough to send me.

It is, undoubtedly, a valuable contribution to the statistics of stone in this country, and I congratulate you on the signal success that has attended your operative practice.

The collection of calculi so well described by yourself in their brochure, and lately presented by you to our museum, forms, I need hardly say, one of its most interesting and attractive features.

Permit me also to express my admiration of the very beautiful and faithful illustrations which accompany the letter-press of your work.

Yours sincerely,

J. W. McCONNELL,
*Professor of Pathology and Resident Physician,
College Hospital.*

MY DEAR SIR,

THE general excellence of your work on Lateral Lithotomy is typified by the direction you give for the deep incision, on which the issue of the operation mainly depends, and which are the best I have read in any language.

The only defect, if I may be allowed to call it so, in the book is that you have devoted so little space to suggestions regarding treatment. From your enormous experience I am sure these would be no less valuable than those principles you have laid down for conducting the operations.

Believe me to be,

My dear Sir,

Yours very obliged and truly,

ED. LAWRIE,

*Offg. Professor of Pathology,
and Resident Surgeon, College Hospital.*

RAI RAM NARAIN DASS, BAHADOOR,
First Surgeon, Campbell Hospital.

10, HARRINGTON STREET,
Calcutta, 4th March, 1877.

MY DEAR SIR,

I AM obliged to you for the work on stone in India, which you have sent me. I regret that want of time will prevent me for the present from studying it, but I must nevertheless congratulate you on having brought the task you have so long been labouring at to a successful termination. The illustrations form a new feature in a book published by an Indian author, and looking at them must prove of much interest to all, and to no one more than to yourself, to whom they must serve as a catalogue for your museum, and recall vividly the particulars of many of your cases. The reflection that you have been the direct means of saving so much life and of alleviating so much suffering must be a source of much pleasure to you, and I trust that you may have many years of life to prosecute the study in which you evince so much interest.

Yours very truly,

EDMONSTONE CHARLES, M.D.,

*Professor of Midwifery,
and Surgeon to Obstetric Hospital.*

RAI RAM NARAIN DASS, BAHADOOR.

TO RAI RAM NARAIN DASS, BAHADOOR,
Lecturer on Surgery, Campbell Medical School.

MY DEAR BABOO,

I HAVE perused your book on Lithotomy with very great pleasure. It forms a creditable record of very valuable experience, and will, I feel sure, be very much prized as such by all who are working in the same field.

I am,

My dear Baboo,

Yours very sincerely,

W. J. PALMER,

*Professor of Anatomy,
 and Second Surgeon, College Hospital.*

3rd February, 1877.

MEDICAL COLLEGE,
Calcutta, 15th March, 1877.

THE Monograph by Rai Ram Narain Dass, Bahadoor, on the Lateral Operation of Lithotomy, contains a mass of facts which must interest every practical Surgeon.

It is very evident that the author has had a wonderfully wide field of experience in the particular operation treated of ; and the results of that experience appear to have been of an exceptionally successful character.

The work affords ample proof of the author's industry and intelligence, and it adds to the praise already due to him for a very long and honorable career of usefulness.

DAVID B. SMITH, M.D.

Principal, Medical College.

93, LOWER CIRCULAR ROAD,
 15th December, 1876.

MY DEAR SIR,

PLEASE accept my thanks for your kindly presenting me with a copy of your Monograph on Lithotomy.

I am very glad that you have been able to publish and let the public know the result of your long and most successful experience in one of the most important and difficult departments of practical surgery. I have no doubt of this work of yours being valued by the profession ; and I have no hesitation in saying that your Monograph will contrast

very favorably alongside the works on the same subject of the eminent Surgeons of Europe.

With best wishes,

I remain,

Yours very sincerely,

R. C. CHANDRA,

*Professor of Materia Medica,
and Second Physician, College Hospital.*

TO RAI RAM NARAIN DASS, BAHADOOR.

*Lecturer on Surgery at the Campbell Medical School,
and First Surgeon to the Campbell Hospital.*

9, MIDDLETON STREET,

Calcutta, 20th July, 1877.

MY DEAR BABOO,

I HAVE much pleasure in acknowledging your well-illustrated Monograph on Lithotomy. Your success as a lithotomist precludes all criticism, and I congratulate you upon having been the means of doing so much good.

I am,

Yours truly,

E. J. GAYER.

TO RAI RAM NARAIN DASS, BAHADOOR,

*Lecturer on Surgery at the Campbell Medical School, and
First Surgeon to the Campbell Hospital, Calcutta.*

I HAVE glanced through the work on "Lateral Lithotomy Operations," recently brought out by Assistant Surgeon Rai Ram Narain Dass, Bahadoor, and consider the results obtained by him to prove how dexterously he operated on, and how judiciously he afterwards treated his patients—results all the more creditable to him, since his success, even early in his career, and before he had the splendid assistance of anaesthetics, was almost as marked as in the later operations done by him.

There is, however, one point in his reported operative procedure, which I should not consider it advisable for his followers to imitate, and which, I hope, he himself had recourse to only as a *dernier ressort*, "extending the wound to the anus and part of the rectum."

J. FULLARTON BEATSON, M.D.,

Surgeon-General, Indian Medical Department.

4, WOOD STREET,
17th August, 1877.

MY DEAR SIR,

I HAVE to thank you for the copy of your book on Lithotomy, which you have been good enough to send me.

It is a very interesting record of what you have accomplished in this branch of surgery, and shows an amount of success highly creditable to you.

I am,

Yours very truly,

R. COCKBORN,

Deputy Surgeon-General, Presidency Circle.

TO RAI RAM NARAIN DASS, BAHADOOR.

SEALDAH,
Calcutta, 20th August, 1877.

DEAR RAM NARAIN DASS,

ACCEPT my thanks for the valuable copy of your work on the "Lateral Lithotomy Operations" performed by you, so kindly sent for my acceptance, also for the two copies presented to this School. I think you have every reason to be proud of your great success in showing a loss of 17 cases only out of 248 operated on, in other words, 6 per cent. or 61 per mille.

I am, Dear Rajah,

Yours very faithfully,

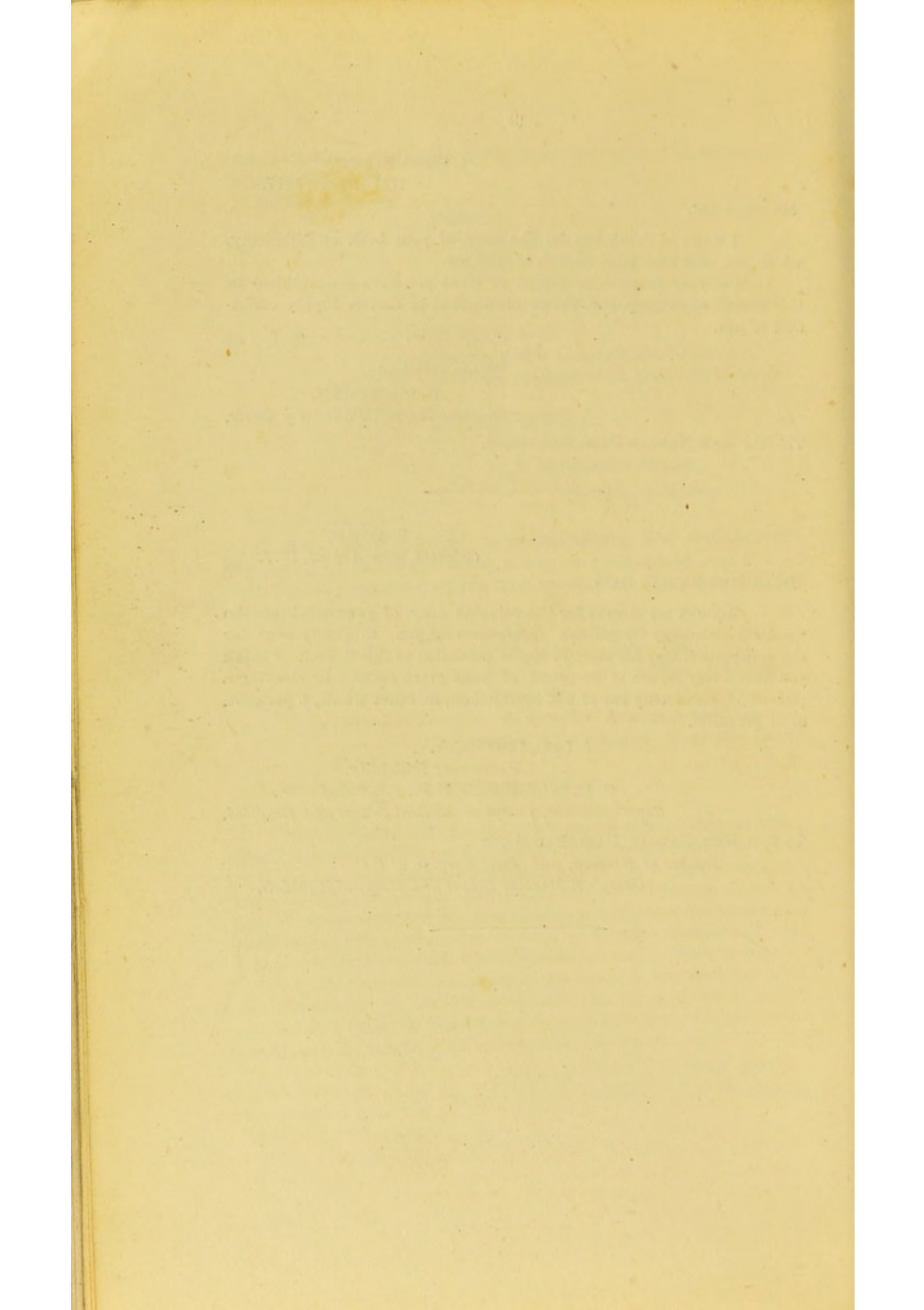
C. O. WOODFORD, M.D., F.R.C.S., LOND.,

Superintendent, Campbell Medical School and Hospital.

TO RAI RAM NARAIN DASS, BAHADOOR,

Teacher of Surgery, and First Surgeon at the

Campbell Medical School and Hospital, SealDAH.



MADRAS, 13th October, 1877.

DEAR SIR,

YOUR valuable Monograph was handed to me, as ex-editor of the Quarterly, and its successor the Monthly, Medical Journal, defunct, I am sorry to say, some years. Failing a professional journal in Madras, I thought I could best meet your wishes by reviewing your work in one of the ordinary newspapers. This I have done; and I send you a copy of the *Madras Times* containing the notice.

We shall, of course, have a copy of the Monograph for the Library of the Medical College.

I remain, Dear Sir,

Very truly yours,

HENRY KING,

Surgeon-Major.

PROFESSOR RAI RAM NARAIN DASS BAHADOOR.

Madras Times, October 11, 1877.

REVIEW.*

A work on surgical operations—still more on surgical operations of so special a kind as the subject of this volume—is necessarily “caviare to the general;” and it was not without considerable hesitation that we determined to notice it in our unprofessional columns. In the absence of any medical or surgical journal in this Presidency, it appeared incumbent upon us to bring to the notice of Madras medical men this record of a series of operations unsurpassed in number (relatively to the period over which they extended) and in success by those of any European operator. “Comparing,” says our author, “the foregoing tables with those of MR. RICHARD SMITH of Bristol, as given in the 11th volume of the *Medico-Chirurgical Transactions*, pages 8 and 9, I find that my 248 lateral operations of lithotomy performed during a period of 12 years represent a comparatively larger experience than 354 lateral lithotomy operations performed during a period of 82 years; whilst 79 deaths in 354 cases represent a higher rate of mortality than my 17 deaths in 248 cases. Again a comparison of my table with that of MR. CHESELDEN, as given in ‘*Observations on Lithotomy*’ by MR. JOHN THOMPSON, page 68, shows that my operations were more numerous, and the number of deaths less than in MR. CHESELDEN’S practice. Moreover, comparing the foregoing tables with those given by MR. C. WILLIAMS in the fourth volume of ‘*Holme’s System of Surgery*,’ page 462, it will be found that my 248

* A Monograph of 248 Cases of Lateral Lithotomy Operations performed in the North-Western Provinces during a Period of Twelve Years. By Rai Ram Narain Dass Bahadoor, Assistant Surgeon, &c., &c., &c. Calcutta, Thacker, Spink and Co., 1876.

operations of lateral lithotomy, performed during a period of 12 years, represented a more extended experience than 811 lateral lithotomy operations performed during a period of 90 years ; whilst 105 deaths in 811 cases is a higher rate of mortality than 17 deaths in 248."

No Surgeon in this Presidency has met with a tithe of the number of cases of calculus affections which it has fallen to MR. RAM NARAIN DASS to treat, and to treat with such success. His first appointment was to the Government Dispensary at Cawnpore, of which he took charge in July 1840. Here he remained for seven years, and during this period performed 28 of these operations without one death. In May 1847, he was transferred to Budaon, and he remained five years, during which he operated 220 times. The causes which confer on the North-West Provinces this evil superiority over Madras in the prevalence of one of the most painful diseases to which flesh is heir are deserving of fuller and more scientific investigation than they have yet received ; and we fear that the chapter in this work which is devoted to the *Ætiology of Calculi Vesicæ* does not throw much light on the subject.

The author starts with a statistical fallacy, which seems to have thrown him off the scent. Of his 220 Budaon cases, 30 were Mussulmans and 190 Hindoos. From these facts he infers that "the number of Hindoos affected by the disease was six times greater than that of Mussulmans, and that therefore the Hindoos were more liable to the disease." The soundness of the inference depends on the relative numbers of Hindoos and Mussulmans inhabiting the district from which the cases were drawn. If the numbers of the two groups are nearly equal, it would fairly follow that Hindoos are much more liable to calculus diseases than Mussulmans. If, however, Hindoos in the neighbourhood of Budaon bear to Mussulmans the numerical ratio of six to one, equal liability should be inferred. In this Presidency generally the ratio of Hindoos to Mussulmans is 17 to 1. In Madras City, it is 6 to 1. In the district of Malabar, where the Mussulman element is relatively strongest, the proportion is 3 to 1. How the relation stands in the North-West Provinces, we have not at hand the means of ascertaining ; but this point must be known before we can conclude that Hindoos are more liable than Mussulmans to this class of affections.

Assuming the greater liability of Hindoos, our author attributes it to their diet. "Hindoos," he says, "live mostly on vegetables, and low classes of Hindoos in the North-Western Provinces, among whom the disease is most prevalent, are in the habit of eating raw vegetables, which, by causing indigestion, produce acidity, &c., &c." Unfortunately for this theory, one patient was a Mussulman, who "lived from his infancy on animal food, of which he was very fond : his parents, in fact, stated that he would eat nothing but animal food. In this case an excess of nitrogenous food was probably the sole cause of the disease." We fear that the dietetic theory will not hold water. Our author himself remarks that "other causes are probably at work : besides the nature and character of the food of the population, and the quality of their water-

supply, the geological peculiarities and climate of the country probably exercise great influence on the origin of the complaint." He goes on to say that the disease is especially common "in the stony and sandy districts," and he enumerates "calcareous waters" among the probable predisposing causes. It is to be regretted, we think, that the inquiry into the cause was not carried on with as much zeal and success as removal of the effect.

A comparative Table (p. 27) shows the extraordinary success which has rewarded MR. RAM NARAIN DASS' skill in operation. Thus the mortality in 354 operations performed in the Bristol Infirmary was 1 in $4\frac{1}{2}$: in 213 operations in MR. CHESELDEN'S practice, 1 in $10\frac{1}{2}$; and in his 248 cases, 1 in $14\frac{1}{2}$.

Pages 47 to 93 of the Monograph are occupied with full descriptions of the calculi removed, illustrated by excellently executed lithographs. The classification is based upon the chemical composition of the nucleus.

We congratulate the Calcutta Medical College on possessing amongst its teachers a Surgeon so industrious, skilful, and successful as MR. RAM NARAIN DASS, and we are happy to find that his merit has not been unrecognized. The title of RAI BAHADOOR was conferred upon him in 1869 "in consideration of his distinguished services," and on the 1st January of this year he received, in the name of the Empress of India, a certificate, "in recognition of his position as a distinguished Medical practitioner."



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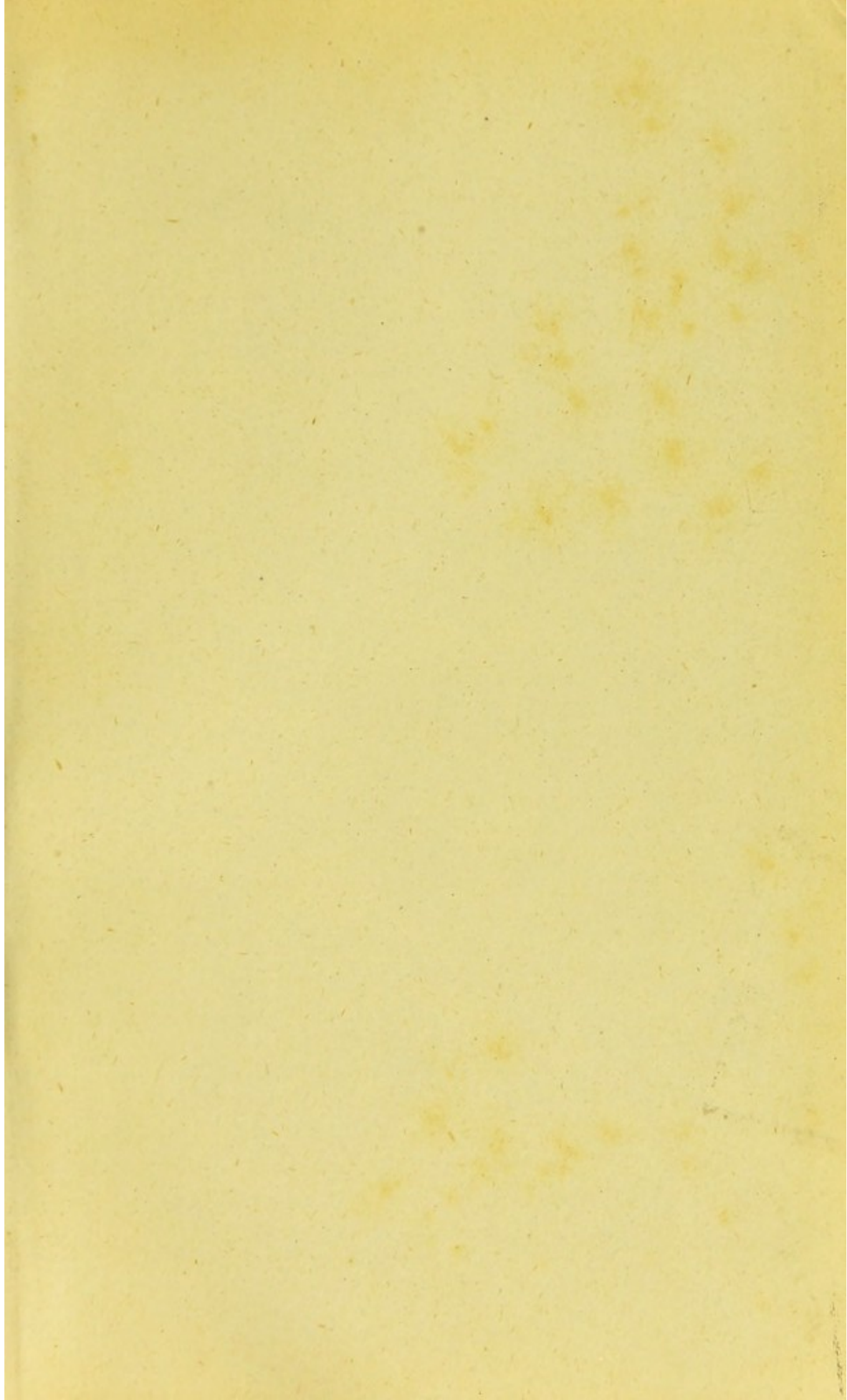
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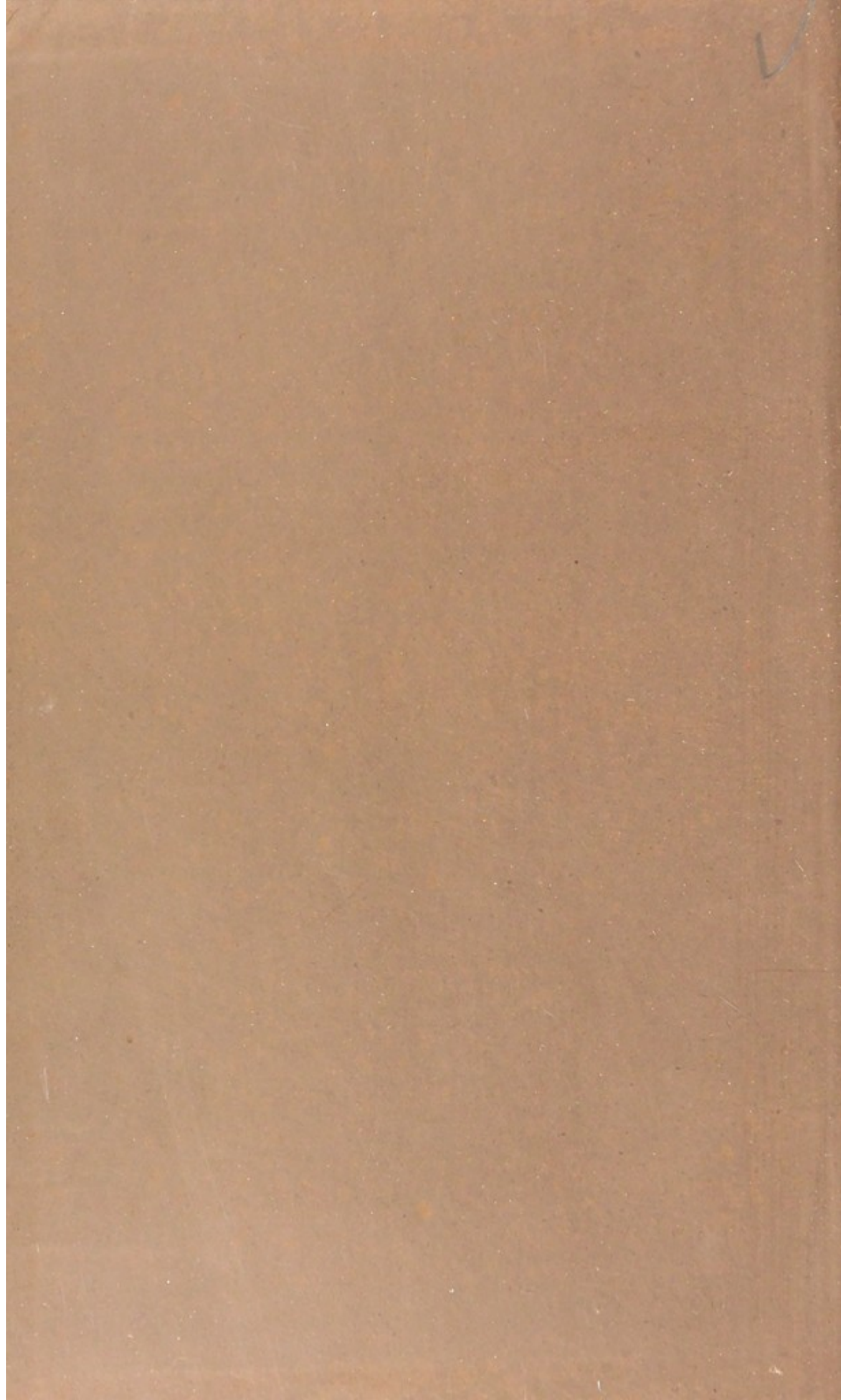
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