food had been tried only to be discarded. Of these the mother professed the poorest opinion. When, however, a third largely advertised food was begun improvement had been immediate, and of this her praises were loud. An examination of the baby showed that its illness had been due to anterior poliomyelitis, which had paralysed the extensor muscles of the right leg. Because of the obvious paralysis in this case it was easy to prove the point that the alimentary disturbance had been secondary to the infective disorder and had disappeared when the infection declined, and that, as many diets had been tried, the last was bound to bear off the credit. In most cases, however, the infection which underlies the symptoms of digestive disturbance will subside leaving no trace by which we may confute such claims.

In observing the course of an alimentary disturbance which is secondary to infection of parts remote from the bowel—which is secondary, for example, to influenza, naso-pharyngitis, bronchitis, otitis media, pyelitis, and so forth—it is obviously a matter of great difficulty to estimate the part played in improvement by changes in diet, and the inherent tendency of the infant to recover from the infection must not be taken as evidence of the success of any dietetic modifications which may have been introduced. The frequency of these obscure and often undetected infections in infants, and especially in artificially fed infants, accounts for the apparently discordant results obtained in the treatment of infantile diarrhoea and vomiting by dietetic measures, and while it explains many of the successes which have followed a haphazard change to a proprietary food, it teaches us at the same time how little importance is to be attached to the deductions of nurses and mothers which appear in the testimonials and advertisements.

5. The Dangers of their Prolonged Administration.

The child which is permanently deprived of the standard substitute diet, that is to say, cow's milk, and receives only one or other of the proprietary foods which contain a high percentage of starch and sugar, is in a condition of unstable equilibrium. For a time the greater intake of carbohydrate may appear to have achieved nothing but good. The rate of growth may become more rapid, and the agility and vigour of the child may increase. When the tolerance for carbohydrate is exceptionally good these benefits may even be permanent. For the majority of infants, however, the risk of fermentative dyspepsia is too great to be lightly disregarded. Especially in times of great heat, when both the need for carbohydrates and the tolerance of them rapidly diminish, a very large proportion of infants fed in this way will develop severe diarrhoea.

The dyspepsia of infants fed upon cow's milk to which no large proportion of carbohydrate has been added resembles that of the breast-fed infant in its relatively mild type. In the infant whose diet contains a relatively high percentage of starch or sugar dyspepsia may become a formidable disorder with intense diarrhoea, severe prostration, and a great and rapid loss of weight. Although the risk is not equally great with all proprietary foods, nevertheless it remains true that their permanent use is fraught with dangers which are too considerable to be neglected. With the baser kinds of foods, which consist chiefly of unaltered starch, their tendency to cause diarrhoea becomes an important factor in the production of our present high rate of infant mortality.

But the danger of a too high percentage of sugar or of starch is not confined to the risk of severe and even dangerous fermentative diarrhoea. It is, perhaps, of even greater significance that the use of such a diet is often accompanied by a profound lowering of the child's resistance to infective processes of all sorts, and that the infant fed in this way is not only more prone to nasal, respiratory, or intestinal catarrhs, but during the attack suffers more severely, and shows more constitutional disturbance than the child whose diet is better adjusted.

6. Conclusions.

The danger to the nation of the unrestricted sale of carbohydrate foods or of foods containing a very high percentage of carbohydrate is not lightly to be disregarded. The great movement which is now afoot, and which has as its object the lowering of our high infant mortality, is checked on all sides, not only by the ignorance and apathy

of the poor and by the difficulty of securing a reasonably pure milk supply, but also by the blind, unquestioning belief of the public in the misleading claims of the vendors of proprietary foods. Although in appropriate cases their temporary use under strict supervision may achieve excellent results, nevertheless, if it were possible wholly to do away with them, only good would result, because they contain nothing which cannot be adequately replaced by a simple combination of milk, malt, and flour, and because their advertisements deliberately encourage in the public mind distrust of the standard substitute diet, cow's milk.

In France—a country forced by the stern necessity of a fast declining birth-rate to interest herself in the welfare of infancy—the Roussel law prohibits the administration of any solid food to infants under the age of 12 months without the express direction of a medical man. In Australia a regulation is general which demands that starch-containing foods shall bear upon a label the words, "Not suitable for infants under the age of 6 months." In this country no such safeguards exist, and no attempt is made to curb the vast sale of foods unsuitable for young infants, nor is it likely that legislation will shortly supply the deficiency.

There is but one suggestion which it seems worth while to make. The undoubted therapeutic effect of the use of carbohydrate foods can be achieved equally well by preparations of baked flour or malted flour made in the home; and if among the poor the want of facilities for cooking prove an obstacle to this, then I do not see why it should not be possible to have something in the nature of a pharmacopoeial preparation of dextrinized flour and a pharmacopoeial preparation of malted flour, which, dispensed in a plain wrapper, could be prescribed without fear of the effects of misleading advertisements.

CALCULI OF THE PROSTATE.

BY

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IN the BRITISH MEDICAL JOURNAL of January 6th, 1912, I reported a case in which two calculi of the prostatic urethra were removed by the suprapubic route from a youth of 20. I there called attention to their faceted arrangement and the resemblance they bore to the scaphoid and semilunar bones of the wrist.

I now report two other cases of calculi of the prostate, from one of which twelve faceted calculi were removed, and from the other forty-six seedling calculi.

Prostatic calculi usually occur in middle life and old age. In the three cases that have so far come under my notice, the largest stones occurred in youths of 19 and 20, and small seed calculi in a man of 35.

As to the origin of prostatic calculi we know that, though lodged in the region of the prostate, they may have three modes of origin and formation:

1. They may be formed in the substance of the prostate gland itself. They have then as their basis the corpora amylacea with varying amounts of calcium phosphate and carbonate deposited round them, giving rise to stones varying in size from grains of sand to large calculi.

2. They may be formed in pouches, congenital or acquired, that communicate with the prostatic urethra, catching up deposits from the urine, and eventually forming stones that are more or less the moulds of the pockets that lodge them.

3. They may have their origin in the kidney or bladder, and become lodged in the prostatic urethra secondarily, where successive phosphatic deposits cause an increase in their size and mould them to the shape of the passage or diverticulum that gives them lodgement.

CASE I.—One Vesical Calculus and Twelve Prostatic Calculi Removed by Suprapubic Cystotomy: Subsequent Perineal Drainage: Recovery.

W., 19, Cingalese, agricultural labourer, was admitted into the General Hospital, Colombo, on September 5th, 1912, complaining of great difficulty in micturition, accompanied by a burning sensation in the urethra during the act, and of pain in the hypogastrium and penis at all times, but worse at night. He was in a highly nervous state, and was continually trembling.

The symptoms began with a white urethral discharge and burning pain which he noticed for the first time about a year ago. He denied ever having had sexual intercourse. The symptoms continued in greater or less degree until the present time. When he came under observation micturition was very scanty and accompanied by a severe burning sensation all the way down the urethra. By dint of much straining he was able to squeeze out a few drops of urine at frequent intervals, about ten times during the day and ten to twelve times during the night. A purulent urethral discharge was present, which on microscopic examination proved to be free from gonococci.

On digital examination per rectum the prostate felt stony hard, was slightly crepitant, and very painful; this at once settled the diagnosis. Further, on exerting pressure on the prostate, a drop of sero-purulent discharge appeared at the meatus. The urine (specific gravity 1015) was alkaline; slight traces of albumin were present; there was no evidence of blood; phosphates, pus, and epithelial cells were present in abundance; no gonococci in centrifugized deposit.

Operation.

On September 10th, 1912, a sound was introduced into the bladder without much difficulty, and a grating sensation was communicated to the hand from the region of the prostate; this confirmed the diagnosis already made; also a characteristic click told of a calculus free in the bladder. Through a suprapubic incision a stone a little smaller than a hen's egg was removed from the bladder; and by means of a finger passed through the bladder meatus, aided by a finger in the rectum, no less than twelve faceted stones of various shapes and sizes (see fig.) were extracted from the prostate, which was found to be

Case 1.—Twelve prostatic calculi, showing facets. Natural size.

tightly packed with them. Removal of the first was a somewhat difficult matter, but after that there was not very much difficulty with the rest; they were all removed by the index finger without the aid of scoop or forceps. A large rubber drainage tube was passed into the bladder, and a gauze strip to the fossa of Retzius. The patient's condition after operation was grave, and showed signs of profound shock, from which he rallied under saline proctoclysis, warmth, etc.

Progress.

The temperature varied from 97° to 103° for the next twenty-two days, during which time he was given urotropin and acid sodium phosphate. There was a tendency for pus to accumulate in the prostatic cavity left by the removal of the stones; this was overcome by massage per rectum combined with urethro-vesical irrigations by means of a short nozzle, the irrigating fluid finding an exit in the suprapubic wound. These measures, however, proved insufficient, and the temperature kept up. On October 2nd the urethra was dilated with sounds and a quantity of encysted pus was liberated from the prostatic region. On October 12th, the temperature still keeping high, a catheter was again passed under an anaesthetic and a large quantity of pus was again liberated from the same area. As the temperature still kept up, and as the patient was now in a rather low condition, he was anaesthetized for the third time and perineal drainage of the prostatic pouch was established. After this his condition improved, but his temperature still continued fitful. On November 24th a paravesical collection of pus was evacuated under anaesthesia by reopening the suprapubic wound, which had quite healed by this time. From then on recovery was uneventful but slow, and, except for urethral dilatations on four subsequent occasions, nothing more was done. The patient left hospital quite recovered from his prolonged illness and without fistulae. I have lost touch with him since then.

Description of Calculi.

The vesical stone measured 5.3 cm. by 2.5 cm. It was rough and spiculated on its surface, as rapidly growing phosphatic calculi often are. It was laminated, the outer laminae fracturing easily in flakes.

The prostatic calculi were twelve in number. Two of the largest measured 2.2 cm. by 1 cm. and 2 cm. by 1.8 cm. respectively. The smallest was 0.7 cm. One was almost as round and smooth as a small marble, but it, too, like the others, bore the

faint but distinct marks of two facets. The rest were of various shapes and sizes; they fractured easily, and carried different shaped facets, many of which were saddle-shaped. One of them presented as many as four facets; several contained three or two; even the smallest had at least one facet. They were somewhat rough on their non-articular surfaces. Some fractured fairly easily; others were harder and more compact. When dry they presented a mottled appearance, and were stained a patchy light yellow.

Chemical Composition of the Calculi.

The vesical calculus and one of the prostatic calculi were sent to Mr. C. T. Symons, to whom I am indebted for the following analysis:

The vesical calculus consisted of a dense inner core, which contained mostly urates, with some calcium phosphate. The next layer, which was looser, contained the same mixture, but not so much urate. The outer loose layer contained calcium phosphate, with a trace of calcium carbonate, but no urates. The prostatic calculus was composed in its central part largely of urates; the outer portion contained, in addition, a considerable proportion of calcium phosphate.

Judging from the history of this case, I am inclined to think that the large stones shown in the figure were formed primarily in pouches communicating with the prostatic urethra. This form usually occurs in young men. The case previously reported by me also comes under this category. What the origin is of the pocket that predisposes to this stone formation it is difficult to say; perhaps in this case it was congenital in the first instance, and then, as the stones gradually formed, they excavated for themselves roomier recesses by irritation round stagnating deposits, thus preparing the way for further deposits and faceted calculi. Chronic abscesses of the prostate may, it is true, open into the urethra and create a pocket in which a calculus may lodge or form; but there is no reason to suspect such an origin in this case, as there was no antecedent history of prostatic trouble; his earliest symptoms were urethral discharge and a burning sensation on micturition, which were no doubt the result of calculus irritation and not the cause of their formation. The composition of the core of the prostatic stone—urates—may suggest the view that a renal calculus formed the nucleus of the stone, but there is no evidence to support this in the absence of preceding symptoms of renal colic or discomfort. There is surely no reason why calculi having other composition than phosphates or carbonates should not be formed lower down the urinary tract than the kidney; a recess opening into any part of the urinary channel, or the part immediately behind a stricture, is quite capable of catching up or filtering off any urinary sediment, whether organic or mineral. The view that obtains with some that only phosphatic stones are formed *in situ*, and that urate, uric acid, and calcium oxalate stones found in diverticula must necessarily come from above, does not seem at all feasible.

If we look at the symptoms in this case we find that the main ones were great frequency and pain on micturition and a purulent urethral discharge. The highly nervous state of the patient was also a striking symptom which I noticed in my previous case; it is due as much to pain and loss of sleep and rest as to the peculiarly unnerving nature of prostatic stimuli. The evidence of this case seems to point to the conclusion that stones may form in the prostate and give rise to no great symptoms until secondary infection or projection of the calculi into the urethra or against the vesical neck cause symptoms of urgency.

The diagnosis of these cases would not be difficult if one kept in mind the possibility of their occurrence and made routine rectal prostatic palpation a rule in the examination of all genito-urinary cases. It is on the rectal feel that the diagnosis is made, and this may be confirmed by the sound only when the stone projects into the urethra. The x ray is, of course, invaluable.

As regards the operation performed in this case I was no doubt ill advised in the choice of my route. The tardy convalescence and the need for operative interference on four separate occasions proves conclusively that the perineal route should have been the route of choice in this instance, as it would have afforded the best means of draining the prostatic pouch and diverticula left after removal of the stones, in which fetid urine and pus collected and caused infection to spread along cellular planes, giving rise to para-rectal and para-vesical abscesses.

CASE II.—*Forty-six Seedling Calculi of the Prostate, Combined with Urethro-Rectal and other Fistulae, and Strictures of the Penile and Bulbous Urethra.*

S. A., 35, Cingalese, cultivator, came into hospital on January 31st, 1914, complaining of great difficulty in micturition; he had also two urinary fistulae, one scrotal and one perineal, and a urethro-rectal fistula. There was frequency of micturition to the extent of about eight times during the day and five to six times at night. Whenever he urinated there was also an inclination to defaecate; he sometimes felt that urine dribbled through the anus. Micturition was most easily accomplished by resting on one or other buttock, especially the left, and coaxing the urine out by stroking the skin at the peno-scrotal junction. Even at the end of micturition he never felt that he had completely emptied his bladder. Whenever the inclination to micturate was strong there was some incontinence, the urine flowing out in drops at the fistulae and meatus. He states that for the last three years he has not had seminal emissions during coitus, an act which he is, however, capable of performing. He is the father of a child aged 4 years, but has had no children since.

His present illness dates from twelve years ago, when he had an attack of gonorrhoea, which lasted for about eighteen months, and was complicated by a left epididymitis, which terminated in a small focus of suppuration; this attack left him with disordered micturition, there being great frequency—at one time almost hourly—and considerable difficulty in passing water; he states there were times when each act lasted about half an hour. Some months ago there was a profuse discharge of pus through the rectum.

Operation.

On February 18th, 1914, Wheelhouse's operation was done, as the bulbous stricture was an impassable one; there was also a penile stricture and a prostatic urethro-rectal fistula. The scrotal and perineal fistulous tracks were dissected down to the urethra and removed. On inserting a Wheelhouse's probe into the bladder a sensation of grittiness was communicated to the hand; this led to the discovery of a large number of minute stones—forty-six stones were removed with a scoop; the largest were about the size of grape seeds, the majority about the size of cardamom seeds. A rubber catheter was passed from the external meatus into the bladder and tied in; the urethra was partially mobilized and the deficiencies left in it by the dissection of the fistulae were repaired with catgut. No attempt was made to dissect up and suture the recto-urethral fistula, as manipulation was difficult in the position it occupied, namely, in the prostatic region. The patient left hospital six weeks later relieved of his symptoms, but with the urethro-rectal fistula still persisting.

Description of the Calculi.

Forty-six were removed in all, a few being probably left behind. Four or five of the biggest were about the size of grape seeds; the others averaged about half the size. They were smooth and of various shapes; some were rounded, most flattened; the majority were more or less faceted. They came away in clusters, cemented together by a glutinous material. It was difficult to say whether they occupied separate pockets or were agglomerated together in a single one.

Mr. C. T. Symons's report on one of the largest of these was as follows: It consisted mostly of calcium phosphate, with a trace of another compound, probably oxalate. It contained no urates.

This was a case in which antecedent gonorrhoea seemed to play an important part. There were strictures and fistulae; there was undoubted evidence of persistent infection of the prostate, as shown by epididymitis with suppuration, and the fact that a prostatic abscess burst years later into the rectum establishing a recto-urethral fistula. In the infected prostate and the recesses left by foci of suppuration in it seedling calculi, the so-called true prostatic calculi, formed.

As to the mode of formation of these calculi and their relation to the corpora amylacea, it may not be out of place to summarize some views. Corpora amylacea are found in various organs of the body. Thompson says they are always present in the prostate after the twentieth year scattered throughout the gland, chiefly in the ducts about the verumontanum; in one prostate several thousands were present. They are microscopic as a rule. Their colour is a light yellow growing darker with age. Although like small uric acid calculi, they are not of urinary origin. Ziegler says they are due to degeneration of epithelial and connective tissue cells, others say to stagnation of gland fluid, calcified glandular epithelium, etc. Posner classes them as calculi, and English shares Posner's view, and says that a final cause of their formation is possibly a microbic invasion of the gland. The small bodies are mostly organic and the larger chiefly inorganic. According to Thompson the corpora amylacea, having attained the size of their enclosing follicle, act as foreign bodies, and in consequence of the general law that all mucous membranes

when sufficiently irritated throw out a deposit of calcium phosphate and carbonate, ultimately form calculi; the earthy matter they contain being from 45 to 85 per cent. They are associated with glandular hypertrophy and periacinous round cell infiltration; pressure atrophy may cause entire disappearance of the gland with the exception of the capsule. English points out that the paucity of symptoms is in striking contrast to the wide extent of disease in the gland, hence the great importance of physical examination. The complications apt to arise are abscess, fistula, incontinence or retention, and sexual disorders.

To return to the present case. On surveying the condition of things, we see that in addition to the prostatic calculi there were two strictures and several fistulae present; the symptoms, therefore, should be warily interpreted, as those caused by the calculi are almost hopelessly obscured by the other conditions. Most of the symptoms recorded were no doubt due to the strictures and fistulae rather than to the prostatic stones.

The absence of seminal emissions may have been due to:

1. Occlusion of the common ejaculatory ducts by the prostatic abscess, and stenosis of the vas and ducts of the epididymis on one side at least—the left—where an abscess is said to have formed. It is significant that there was no atonic impotence so often associated with chronic prostatitis.

2. The presence of urethral strictures and fistulae; these are of themselves sufficient to prevent any seminal fluid present from appearing at the meatus. The fact that a son was born to him about eight years after his initial attack of gonorrhoea and epididymitis is proof that the ducts from the testicle were not completely destroyed or occluded before that time. The events that occurred after this were (a) the prostatic abscess which burst into the rectum, and (b) the gradual tightening of the urethral strictures. It is therefore probable that the prostatic abscess was responsible for the absence of seminal emissions by destroying and occluding the openings of the ejaculatory ducts or by directing what little seminal fluid there was down the fistula into the rectum, the impassable bulbous stricture helping in this.

THE CAUSES AND TREATMENT OF SEVERE PRURITUS ANI.

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PRURITUS ANI is a peculiar complaint in that, with the exception of pruritus vulvae, to which it is closely related, it differs from all other forms of irritation of the skin. Other forms of skin irritation, though common enough, are never so localized nor so persistent; moreover, they are generally due to some constitutional condition. Pruritus ani is seldom due to a constitutional condition, and the worst forms never are. Diabetes is always given a prominent position in the textbooks as a cause of pruritus ani, but I have never yet seen a case of bad pruritus ani due to this cause.

In this paper I do not propose to deal with those cases of pruritus ani in which the irritation is only of an intermittent character and is relieved fairly easily, although perhaps only temporarily, by some simple application, but with the really bad cases in which the irritation is almost continuous and sufficiently severe to cause insomnia and serious interference with the patient's general health. In this category one must include all the cases of "paroxysmal pruritus ani" in which itching of an intense character comes on suddenly in violent paroxysms. It falls to my lot to see a large number of such cases, and the first thing that strikes one is that they are very difficult to treat successfully. This is shown by the fact that a very large proportion of such cases have been previously treated by many other practitioners, and often for years without any permanent success.

The causation of pruritus ani is a very difficult subject, and one has only to read a few of the textbooks on rectal