aqua potassæ was therefore introduced into each eye; and in two days, when the inflammation it produced had disappeared, the application was repeated, and continued thus at intervals for some weeks.

The result was very gratifying: the dryness gradually lessened, the conjunctiva becoming more moist and soft. On the 27th of July the cure of the right eye was completed; and when the boy gave up attending, some weeks thereafter, that of the left was all but finished.

Encouraged by this result, I tried the same remedy in a bad case of corneal xeroma, but, I regret to say, without effect.

Article III.—*Further particulars of a Case of Intestinal Concretions, formerly Reported; with Remarks.* By Robert Turner, M.D., Keith.

In *The Monthly Journal* for September 1841, the case is recorded of Alexander Gordon, a small farmer on the estate of Cairnfield, in this county, who passed fourteen intestinal concretions, and had completely regained his former health and strength in May of that year, when the report was taken. The same individual has since passed other eighteen of these bodies; and his case being thus, it is believed, without a parallel in the history of this affection, the following brief detail of the circumstances of his second attack may be interesting to the profession.

The patient's straitened circumstances not admitting of the sweeping alimentary reform recommended to him, or, indeed, of any material change in this respect, his dietary became, at an early stage of his convalescence, in every particular the same as before—*two-thirds*, at least, of the solid ingesta consisting of *oatmeal*.[1] A tolerable measure of health was notwithstanding attained, and he continued in the uninterrupted enjoyment of it till towards the end of 1843, when a train of symptoms occurred identical with those of his previous illness. Impaired appetite, disturbed sleep, with gradual loss of flesh and strength, were those first complained of. The bowels again became sluggish, and, although recourse was frequently had to castor oil and other laxatives, a stool could seldom be procured oftener than once or twice a-week. After a time, this state began to alternate with, and eventually it altogether gave place to, diarrhœa of a watery character, sparingly mixed with feculent matter, as in his first attack. Tormina and meteorism, arising from an hour and a half to two hours after meals, and partially relieved by eructations and vomiting, recurred with progressive severity; and the abdominal tumour again became perceptible, occupying its former situation, inducing the same feeling of tension across the umbilical and hypogastric regions, and rapidly increasing in size. From November of 1845, till about the beginning of September 1846, he was constantly

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[1] In the abstract of my former communication to the Journal regarding this case, which is given in Vogel's Pathological Anatomy (Dr Day's translation), p. 379, *pulse* is erroneously stated to have formed part of Gordon's diet.

confined to bed, with marked aggravation of all his symptoms, and emaciated to an extreme degree. Early in September of last year, he began to pass the concretions. The entire mass was felt, as formerly, to descend, all at once, from the situation it had occupied since it was first detected to the anus, occasioning an insupportable sensation of weight, with almost incessant straining; and all the foreign bodies (eighteen in number) were discharged in three days. Three of these, passed on the first day, are described as being about as large as hens' eggs, and the remaining fifteen, voided on the two following days, are said to have varied from the size of partridge's eggs to that of filberts. Immediate relief from suffering of no ordinary intensity followed their discharge.

The man's recovery has been complete. I saw him on the 17th of April last, in robust health, and fully equal to his laborious "han'-darg." On this occasion, he walked a distance of some miles at the conclusion of his day's work, to meet Mr Grant, surgeon, of this place, and myself.

From causes which it is unnecessary to mention, remedial measures had been adopted only at an advanced period of this attack. They consisted in the daily exhibition of an emollient enema, and the administration of opium; to which last appliance the patient awards the credit of bringing about his second recovery also, and, seemingly, not without reason, as the descent of the concretions was again observed to coincide with the establishment of the free physiological action of this drug. In what form or dose it was taken, I have not been able to ascertain, not having had an opportunity of seeing the patient during his recent illness. The foregoing account is, in substance, that given me by himself, confirmed in its objective details by his relatives, as well as by his clergyman, the Rev. Mr Wilson of Enzie Chapel; and, although thus necessarily imperfect, I believe its accuracy may be relied on.

Specimens of the concretions were preserved for my inspection. They closely resemble, in outward appearance and in internal structure, as seen under the microscope, those of 1841, so carefully analysed by Dr Douglas Maclagan, and described by him in his excellent paper, "On the Constitution of Intestinal Concretions."[1] In those of latest formation, the identity of the fibrous matter, of which they chiefly consist, with the hairs of the caryopsis, and fragments of the envelopes of the oat, is as obvious as in the others. Like them, too, they are seen, on section, to be studded with minute crystals, are smooth, and of greatest density at the surface, and their arrangement in concentric laminæ around a calcareous nucleus is the same. In some instances, these layers have been so loosely coherent as to have separated on the body being broken into. A specimen in my possession, one of the largest, and weighing 520 grains, is marked externally by ten cup-like depressions, evidently formed by the apposition

[1] Monthly Journal for September 1841.

of as many other concretions. Some of the smaller ones also present inequalities on their surface, doubtless from the same cause.

To the production of this singular form of pathological epigenesis in man—the *fungus bezoard* of Fourcroy and Vaquelin, but more appropriately designated, by Dr Maclagan, the *fibrous concretion*—four conditions appear requisite:—1. Torpor of the large intestine. 2. The presence, in the diet, of oatmeal in considerable quantity: or perhaps occasionally—as in the example related by Braconnot and Champion, as well as in that recorded by Denis[1]—of some other article of food yielding vegetable fibre. 3. The presence, in the intestine, of a nucleus of greater density than the body of the concretion, around which the latter is deposited in concentric layers. This nucleus may consist of a biliary calculus (Dr T. Thomson), or of a fruit-stone, or seed (Clark, White, Hay, Thomson, Children), a portion of bone (Coe, Hooke, Thomson, Laugier), a nail (Haller), or other extraneous substance; or, as in the case of Gordon, it may be composed of "a thin shell of phosphate of lime,[2] the probable source of which will be afterwards considered.—4. Constriction of the tube below the seat of atony.

The weakened propulsive power of the colon, or loss of the healthy consentaneous action of the muscular fibres in some part of it, was a prominent condition in Gordon's case, and had, in both attacks, constituted the first of the series of diseased actions, preceding the formation of the concretions, it may be presumed, many months. The same state has been noticed as occurring early, in various other examples of this affection; and it seems probable that, had clinical observation of *the disease* been prosecuted with that assiduity which has been brought to the task of determining the chemical composition of *its product*, impaired contractility of the large intestine would have been generally recognised as the first appreciable link in the chain of morbid sequences. This condition persisting, and the contact of the excrementitious portion of the alvine contents with the mucous surface, above the inactive part of the tube, being thereby unduly prolonged, irritation here would ensue, signified, as in the case under consideration, by tormina and muco-serous diarrhœa. A state of matters would then exist resembling that which has been sometimes observed as the result of ordinary constipation; "that singular condition of the bowels," to employ the language of Dr Abercrombie, "in which fluid feces may be discharged regularly and freely, and apparently in abundant quantity, while there is going on, for a length of time, an immense accumulation of feculent

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[1] Annales de Chimie et de Physique, tom. xx.; and Archives Générales de Médecine, tom. xvii., quoted by Dr Maclagan.

[2] Not the *carbonate*, as stated by Vogel (loc. cit.) *Vide* Dr Maclagan's essay in the Monthly Journal, already referred to.

matter, in a very hardened state, extending through the whole of the colon."[1]

To this stage I would refer the production of the calcareous nucleus. "The liquid evacuations of persons suffering from diarrhœa," says Vogel,[2] "almost invariably contain precipitates, consisting of ammoniaco-magnesian phosphate, and phosphate of lime." "The formation of many intestinal calculi," he elsewhere remarks,[3] "is due to an exudation of fibrin, or a coagulum of blood retained in the intestinal canal, and undergoing further changes, the constituents soluble in the intestinal fluid being gradually removed, and merely the insoluble portion—the calcareous salts—remaining. Such calculi consist, for the most part, of protein compounds, coagulated fibrin, mixed with salts of lime and fragments of food; they are formed after inflammatory exudation of the intestinal mucous membrane, and after hemorrhage into the canal. To this class belong the concretions which were analysed by Dublanc. They were discharged by a child after inflammation of the bowels, ... and consisted of fibrin, with a trace of fat, and phosphate of lime. . . . . A second kind of intestinal concretion consists, principally, of earthy salts (phosphate and carbonate of lime, ammoniaco-magnesian phosphate, and phosphate of magnesia)."

I infer, then, that the nucleus of phosphate of lime, in the case of Gordon, was derived from the exudation of irritated mucous membrane, and produced in the manner described in the above extract. It is true that the salt is contained in oatmeal; but the supposition that any portion of this "shell" was supplied by that article of the diet, is altogether irreconcilable with the circumstance of the deposit being unmixed with the fibrous part of the oat, and occupying the centre of the concretion; and the fact, that the "thin shell of phosphate of lime" enclosed "some animal matter resembling dried blood, also points unequivocally to exudation into the canal, consequent upon irritation of its lining membrane, as the source of this central portion of the concretion. I am further inclined to regard the proportion of the phosphate, found by Dr Maclagan in the body of the concretion—20 parts in 100—as too large to have been supplied wholly by the ingesta, although unquestionably derived from them in part; for a specimen of ordinary oatmeal examined by him, afforded in 100 grains only gr. 0·6 of phosphates. When it is considered, too, that the amount of fibrous matter in the concretion did not exceed 36 *per cent*, the disproportion between the actual quantity of phosphates it contained, and that which could with any degree of probability be supposed to have been supplied by the food, becomes still more evident. But it is easy to conceive that the fibrous matter, while being deposited, would, by reason of its porous structure, ab-

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[1] On Diseases of the Stomach, and other Abdominal Viscera, Second Edition, p. 341.

[2] Op. Citat., p. 377.

[3] Ibid. p. 376.

sorb a part of the diarrhœal discharge in which it was bathed, and retain in its interstices the crystals of the earthy salts which it had imparted a disposition to the fluid to precipitate. Its pores thus, in time, becoming filled, it would no longer imbibe the liquid coming in contact with it, but would still attract to its surface the crystalline deposit, until coated over with this, which the mucus from the discharge would render adhesive; and we have here, probably, the *rationale* of the greater density of the surface than that of the substance of the concretion; a condition uniformly existing in the case of Gordon, and due—so far as microscopic examination enables me to judge—to the larger proportion of calcareous matter in the former situation. In this way we may also account for the presence of the "external crust of phosphate of lime, mixed with animal matter," observed in some of the concretions in Professor Monro's collection. "On the surface of a few," adds Dr T. Thomson, who analysed these specimens, "were noticed crystals of the phosphate of ammonia and magnesia;" the salts just enumerated being precisely those mentioned by Vogel as of "almost invariable" occurrence in liquid alvine discharges.

A nucleus once supplied, the deposition of the fibrous laminæ appears to proceed rapidly; and, in retaining these accumulations, the influence of the loss of propulsive power in the large intestine is reinforced by the supervention of another condition—constriction of the tube below the seat of impeded or suspended peristaltic action;—a state which also occurs as a distinct disease, depending on intestinal irritation, and has been described by authors under the name of spasmodic stricture of the rectum. Reasons for assuming its agency in Gordon's first attack are offered in my former paper, and the same grounds exist for concluding that this spastic closure of the tube was present also in his recent illness. In both, the situation occupied by the mass of concretions, before its descent to the anus, seems to indicate the lower part of the sigmoid flexure of the colon, or upper extremity of the rectum, as the limit of the constriction superiorly; and the result, each time, shows that this condition of the intestine may exist long without inducing structural change, and still amenable to treatment. It may, in fact, be doubted whether a really permanent constriction of the gut is so constant an anatomical character of the affection, leading to the formation of the fibrous concretion, as is generally believed. It is possible that observers have here, as in analogous circumstances, mistaken a normal for a pathological condition,—a source of fallacy pointed out by Dr Abercrombie in his remarks on the post-mortem appearances of ileus:—"In a fatal case," he observes, "we generally find one part of the intestine in a state of distension, and another part empty and collapsed—presenting nearly the form of a cord; and there has been supposed to be a difficulty in determining which of these is the primary seat of the disease . . . . . but *the collapsed state, in which it assumes the*

form of a cord, appears to be the natural state of healthy intestine when it is empty." [1]

The combined action on the growing mass of concretions, of the *vis a tergo*, exerted by the preternaturally excited intestine above, and the resistance *a fronte* at the constricted part, would gradually dilate the intermediate portion of the tube; but this dilatation, owing to the comparatively unyielding nature of the perpendicular muscular bands of the intestine, would not be uniform; and the result would be an exaggeration, simply, of the natural sacculated appearance of the colon,—sufficient in degree, however, to constitute the "pouches," lodging the concretions, described by Monro—the "diverticula or coarctations" of Vogel. The compression sustained by the mass, before the individual concretions had attained their greatest hardness, would occasion the inequalities of their surface above described; and the whole would at length become firmly impacted in the dilated portion of the bowel, down to the seat of stricture, presenting to external examination the appearance of an even and scarcely moveable tumour. Meanwhile the liquid excrementitious matter straining through the interstices of the fibrous substance of the several concretions, while yet pervious, and the interspaces of the aggregated mass, would find an outlet at the constricted part, although this would retain all solid matters.

At this advanced stage of the disease, digestion and absorption of the chyle could take place but very imperfectly; indeed, before relief was obtained on each occasion, in the case on which these remarks are founded, assimilation appears to have been reduced as nearly as possible to the minimum amount compatible with the maintenance of the powers of life. The immense degree of distension which the intestine must have suffered, where it surrounded the concretions, was manifested by the bulk and rounded form of the tumour; and the severe and oft-recurring tormina, eructation, and vomiting, bore evidence of the great and prolonged efforts of the irritated tube to expel the foreign bodies, as well as the powerful nature of the obstacle opposed to their expulsion.

The imperfect state of our knowledge, as applied to the *diagnosis* of this affection, was adverted to in my former communication on the subject; a practical illustration in point is supplied in the following statement:—"Upon the very bold operation of cutting out these concretions, when lodged in the colon, proposed by Dr Monro, senior, we think it our duty to state, that the diagnosis is so difficult, that in one case, where the operation was strongly advised, it turned out, upon dissection, that the disease was *a scirrhous pylorus.*" [2]

It is not, perhaps, exceeding the truth to assert, that received opinions, as to the means of distinguishing this affection, are as much the fruit of mere conjecture as of observation at the bed-side, for

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[1] Op. citat. p. 145.

[2] Edinburgh Medical and Surgical Journal, No. 33, p. 112.

which, indeed, but few opportunities appear to have been enjoyed. That little or no progress has been made in this direction within the present century, is rendered evident by the fact, that one of the latest systematic writers [1] on the disease, confines himself to laying down a series of propositions, embodying the substance of Professor Monro's observations, published in 1811, and refers, for fuller information, to the work itself.

The case of Gordon, although it cannot be received as a certain basis for any general conclusion, tends to throw doubt upon the correctness of the last-named authority's position, that "when two or more concretions are lodged within the intestines, they may be made to strike against each other." It might, besides, be urged against the diagnostic value of this sign, even if its occurrence were certain, that in some cases of ordinary colic, the abdominal parietes undergo a peculiar state of contraction, giving them—in the language of Cullen—"the appearance of a bag of round balls." It must have occurred to every practitioner, to meet with cases, particularly in emaciated subjects, in which common scybala presented to external examination the semblance of distinct globular masses, capable of being pressed against each other, and of great apparent hardness. In a recent example, occurring in my practice, a state of irregular contraction of the large intestine exactly simulated the presence within it of solid spherical bodies. The case was one of scirrhous disease of the rectum—which was so contracted about two inches above the anus as with difficulty to admit a small-sized urethral bougie,—and consequent fecal accumulation. For months before death, well-defined round swellings, usually three or four in number, and about an inch apart, were generally perceptible at a particular time of the day, between the umbilicus aud left iliac region; and their resemblance to hard moveable balls was perfect. Post-mortem examination, however, disclosed nothing beyond distension of the entire colon, and upper part of the rectum, with ordinary feculent matter, of solid, but by no means hard consistence.

The appearance referred to, then, so far from countenancing, may rather be held to negative the supposition, that intestinal concretions are present, or is, at best, a deceptive indication of their existence.

But the difficulties surrounding the diagnosis do not appear to be absolutely inherent. They are probably, in a great measure, capable of being surmounted by strict inquiry into the patient's previous history as regards the habitual state of the alimentary canal, and nature of the diet, and by careful observation of the disease in all its stages. The peculiar cord-like feeling of tension across the abdomen, if not a pathognomonic symptom, I am disposed to consider as pretty certainly distinctive of the affection, when accompanying the other symptoms noted in the case under consideration, and when the abdominal tumour is at the same time perceptible. Important aid in

[1] Dr Symonds, in the Library of Medicine, vol. iv. p. 123.

the investigation might be obtained from exploration of the intestine, by means of Dr O'Beirne's defecation tube, or the esophagus tube of the stomach pump, which measures would also form part of the appropriate *treatment.* To secure the full action of the opium in producing muscular relaxation, it appears necessary to administer it (or its alkaloid, morphia) in large doses, repeated at intervals of half an hour, till a state verging on narcotism is induced. If the constriction were thus overcome, and the presence of the foreign bodies ascertained by means of the tube, the colon might next be distended with tepid water, or a stimulating injection, and the expulsion of the concretions be thereby promoted. The action of the narcotic might, if requisite, be aided by the exhibition of belladonna as an enema, ten grains of the extract dissolved in as many ounces of water,—in which form and dose I have twice employed it (once successfully) in ileus. The condition of the patient, in all cases of intestinal concretions, would probably render the use of tobacco, and other powerfully depressing sedatives, inadmissible.

This second deliverance of the patient Gordon without operative procedure, affords the same argument as the first, and doubly cogent by repetition, against the adoption of the proposal of Monro, Secundus; and the practice of Richerand and Maréschal,[1] of dividing the sphincter ani for the removal of the concretions, when they have descended to the lower part of the rectum, seems equally unnecessary; since these bodies, if of the fibrous variety—which is that most likely to occasion difficulty on account of size—could be broken down, in this situation, with ease and safety, and brought away piecemeal should their extraction entire be impracticable.

The efficacy of *preventive* measures in this affection, does not require to be dwelt upon. The subject of the foregoing report appears now to be fully impressed with their importance. His diet, since his last illness, has been chiefly animal; and he has hitherto avoided, and undertakes to eschew religiously, in all time coming, his ancient enemy the oatmeal. Although, as already mentioned, his general health was excellent when I last saw him, an inactive condition of the bowels remained, for which I prescribed an occasional dose of the *compound aloes pill,* and the regular use of the infusion of *Chiretta,* a recent addition to our Materia Medica which seems to deserve its Indian reputation as a tonic, specially serviceable in costive habits.

ARTICLE IV.—*Case of Extensive Scrofulous Ulceration, with Abscess bursting into the Trachea.* By JAMES FRAZER, Surgeon, Glasgow.

(*Read before the Glasgow Medical Society,* 19*th Oct.* 1847).

ABOUT eighteen months ago D. M., an engineer, æt. thirty-six, of temperate habits, married, and the father of six apparently healthy children, consulted

[1] Cooper's Surgical Dictionary, sixth edition, p. 21.