

For the sake of argument let it be assumed that—

(1.) All iron salts when taken medicinally are converted into the ferric condition.

(2.) Ferric oxide is formed in the presence of a saccharine or albuminous compound, and is thus rendered soluble in alkaline fluids.

Starting thus with theory, the question arises, are we acquainted with ferric oxide in a state of solution?

When an alkali is added to a ferric solution, an insoluble precipitate is the result; but by fusing ferric oxide with either potassic or sodic hydrates a compound is formed, in which, according to Graham, the ferric oxide "acts the part of a feeble acid."

If a solution of either caustic soda or potash is added to a cupric salt an insoluble precipitate is produced, but in the presence of many organic substances, such as grape sugar, tartaric acid, &c., the precipitate dissolves. Now, although iron and copper are not classed by chemists in the same group, yet an analogy exists in the behaviour of certain of their salts with re-agents. For if a ferric solution is mixed with tartaric acid, or sugar, the subsequent addition of an alkaline hydrate determines the formation of precipitate, soluble in excess of the precipitant.

The presence also of albumen in cupric solutions renders the cupric oxide soluble, and hence it is always removed before testing for sugar in diabetic urine.

In the case of ferric compounds, albumen is stated to act in a similar manner.

It has been mentioned above, that the presence of sugar in a ferric solution prevents the precipitation of ferric hydrate, and a few remarks on the resulting compound may not be uninteresting. It is best prepared as follows:—Liquor Ferri Perchl. fortior is mixed with a strong syrup of cane sugar, and a concentrated solution of an alkaline caustic added until the precipitate first formed is redissolved. The resulting solution is of a dark claret colour. It is not precipitated by alkaline carbonates or bicarbonates, and does not give a blue precipitate with potassic ferrocyanide, agreeing therefore in some respects with a compound of ferric oxide and acetic acid described by Péau de St. Gilles, in the *Année-de-Chimie*. The cane sugar employed in making this compound appears to be converted into glucose.

An attempt was made to prepare a soluble ferric carbonate, by substituting a carbonate for an alkaline hydrate, but without success. It would therefore appear, at first sight, that the presence of a caustic alkali is necessary for the existence of this soluble form of ferric oxide; or "saccharated ferric oxide" as it may be conveniently termed.\*

On passing carbonic acid through a solution of saccharated ferric oxide, the caustic alkali is converted into carbonate or bicarbonate, as the case may be, without ferric hydrate being precipitated, shewing therefore that the presence of a caustic alkali is not necessary. Saccharated ferric oxide has no astringent metallic taste, and may they thus prove an useful addition to our materia medica.

As to the exact chemical composition of saccharated ferric oxide there is but little information to offer. G. Riffard, in the *Pharmaceutical Journal Transactions*, refers to it as "modified peroxide of iron," and proposes a method of estimating sugar by means of iron, which depends on the non-precipitation of ferric hydrate by ammonia in the presence of sugar.

It is well-known that sugar has the power of dissolving many oxides, of which the "saccharated solution of lime" ( $C_{12}H_{22}O_{11}CaO$ ) is a familiar example; it is therefore reasonable to suppose that saccharated ferric oxide is an analogous compound  $Fe_2O_3$ , being substituted for  $CaO$ .

It may be that all salts of iron before being absorbed into the blood, are converted either into saccharated ferric oxide, or some similar compound into which albumen enters.

Many objections can be raised against this attempted explanation of the way in which iron enters the circulation. It may be urged that there is no alkaline hydrate in the body to produce a precipitate of ferric hydrate, and hence saccharated ferric oxide could not be formed. In the laboratory a red heat is required to decompose salts of the alkalis with vegetable acids, but in the human body the same change is effected at a temperature below  $100^{\circ}$  Fahr.

BHAGULPORE, 10th August 1876.

NOTE.—We have received from Dr. Warden a specimen of the "Saccharated ferric oxide" solution as prepared by him. There was no precipitate in the 2oz. phial; the colour is a dark claret; it is palatable, or rather not disagreeable to the taste; and it remains unchanged in a solution containing tannin. The preparation promises to be a useful one, and we hope that Dr. Warden and others will try its properties in disease, as compared with those of the other preparations of iron.—EDITOR.

## A MIRROR OF HOSPITAL PRACTICE.

### MEDICAL COLLEGE HOSPITAL.

#### ABDOMINAL ABSCESS; COMMUNICATION WITH GALL BLADDER EXTRACTION OF THREE BILIARY CALCULI: RECOVERY.

By J. F. P. McCONNELL M.B., *Resident Physician*.

GIRISH CHUNDER MOOKERJEE, aged 50, admitted 10th May 1876. Was a patient at this hospital about two years ago, under Dr. Crombie. The records of his case show that he was admitted then with a large tumour-like swelling in the abdomen occupying the right hypochondriac, lumbar, and a portion of the umbilical regions. This swelling had come on within a month. For the previous eight months had suffered from intermittent fever. The appearance of the tumour was ushered in by severe rigors, and local pain during three days. It had gradually but steadily increased. The diagnosis was a *parietal abscess*, possibly communicating with the liver. It was tapped with Dieulafoy's aspirator on the 5th of May (1873), and 10 ozs. of whitish, thin, extremely fetid pus evacuated. The abscess cavity was then "washed out with a weak solution of carbolic acid," but the pain experienced immediately after this procedure was so severe, that the patient nearly fainted, and in about an hour's time a very severe rigor came on, "the bedstead even shaking," and his temperature which was  $100.1^{\circ}$  F. that morning, rose to  $107^{\circ}$  F. (the thermometer being kept in the axilla for ten minutes), and terminated by profuse sweating at 5 P.M., when the thermometer marked  $98.8^{\circ}$ , having fallen to  $103^{\circ}$  at noon.

The next day no pain existed, and the temperature was  $100.1^{\circ}$  F. in the morning,  $101.4^{\circ}$  F. in the evening: some fluctuation, however, could still be felt in the tumour. This increased quickly, the swelling becoming tense and very painful, rendering it necessary to "tap" again on the 10th instant. No injection was apparently employed on this occasion.

The abscess refilled within a week and was again "aspirated," but as no benefit ensued, it was cut down upon with the scalpel, and a drainage tube introduced. The tumour now began to subside rapidly,—a counter-opening at a distance of two inches from the first had however to be made, and through both these free drainage was maintained. The patient gradually improved in health; the first puncture quickly healed, and the discharge from the second became daily more and more scanty. The patient at his own request was discharged on the 18th July 1873.

On readmission (10th May 1876) he states that the sinus which was left in the abdominal parieties never closed, but that during the whole period of the last two years it has been discharging pus in small quantities. Within the last week the first puncture, which had healed completely, has become painful, and a little purulent oozing from the same has appeared. There are thus now two fistulous openings at the surface, the larger one situated two inches above the umbilicus, a little to the right of the median line; the other an inch and a half to the right of the first and on about the same

\* This solution of saccharated ferric oxide, in which the caustic alkali has been converted into a bicarbonate, is a very palatable preparation, and can be prescribed with substances containing tannic acid, &c., without being decomposed.

level. A director can be readily passed into the former, and the sinus traced upwards and backwards towards the lower margin of the liver for a distance of quite four inches. The opening of the second fistula is so small that even the point of a probe cannot be made to enter it. These openings are found at about the centre of a hard brawny swelling evidently involving the whole thickness of the abdominal wall, and in size and shape the tumour is very like an inverted saucer. Its boundaries are distinct, rounded off, and abrupt: above, the costal arch is not reached, but a marked sulcus exists between it and the upper margin of the tumour; below, the lower border of the same lies on a level with the umbilicus. The swelling is firm and resistant to the feel, and gives no impression of fluctuation. Hepatic dulness extends downwards continuously in the mammary line, for nine inches from the 5th rib above to the lower boundary of the hypochondriac tumour; no bowel sound is elicited by percussion even over the sulcus that separates the latter from the lower ribs.

There is nothing else remarkable about the patient; he appears to be in fair health notwithstanding the continuous discharge for two years from the abdominal fistula. There is no evidence now of intestinal irritation, but he suffered from dysentery once, about twenty years ago. Habits temperate. No history of syphilis. Four or five years ago had several attacks of colicky pain in the abdomen, attributed to constipation. Has once been jaundiced; cannot state exact date, but remembers that it was not associated with any of the paroxysms of colic. Has never passed gall-stones by the bowel. Has no jaundice at present and the stools are properly coloured.

On the 12th, a director having been passed into the larger sinus it was enlarged by incision with a probe-pointed bistoury and a drainage tube introduced. The discharge however was still scanty; it continued from the smaller fistula also, and no very evident relief was afforded. On the 14th, therefore, the patient was placed under chloroform, and a probe was now passed with some difficulty into the smaller fistula and found to communicate at a depth of about two inches with the larger sinus. The intervening bridge of very hard, cicatricial-like tissue was freely divided with the knife, and the opening filled with carbolized lint. Not more than half an ounce of thick, reddish pus was evacuated. On the 16th, on probing the wound—now wide and gaping,—a metallic click was heard, and something hard and stony felt at the very bottom of the same. With some considerable difficulty this "foreign body" was extracted, and found to be a biliary calculus the size of a large hazel-nut! Two others, now, having become loosened, were also removed. All three were about the same size, markedly faceted, and on section seen to be composed of concentric laminae of biliary colouring matter, the nucleus very dark, and the outer layers of a brownish-yellow colour. From this date the patient rapidly recovered, the wound healing most kindly, and the circumferential hard margin of the abscess cavity gradually softening, and apparently undergoing absorption. The patient was discharged on the 6th of June, 28 days after admission, in good health, and with a firm linear cicatrix only, at the seat of operation. The peripheral hardness and condensation of the abdominal parietes although much diminished had not disappeared, and will probably never do so altogether.

*Remarks.*—The chief interest of this case turns upon the question of diagnosis, that is, whether the abscess was from the first hepatic, or became so only subsequently, being at the onset merely parietal? On his first admission there was much doubt, and the pus then evacuated seems to have had all the qualities of that usually met with in purely parietal or superficial abscesses. When admitted last month, however, there was not much room for doubt; the purulent discharge from the fistulae was thick, creamy, reddish and very characteristically hepatic. A director could be passed from the surface upwards and backwards for quite four inches, rendering it more than probable that the liver was reached. The discovery and extraction of the biliary calculi of course solved all difficulties; and, reviewing the whole history of the case the course of the disease seems to have had the following relations:—

1st.—A parietal abdominal abscess, situated in close proximity to, but not absolutely connected with the liver. Abscesses arising thus, in deep as well as superficial muscular interspaces, are common enough events in the course of, or as sequelae to the prolonged intermittents of Bengal. 2ndly.—A limited peritonitis due to the injection of carbolic acid lotion on the occasion of the first "tapping" of the abscess, as a

consequence of which the lower margin of the liver became adherent to the abdominal wall in the situation of the abscess. 3rdly.—Extension of the inflammatory process to the hepatic parenchyma in the neighbourhood of the gall bladder, and subsequent implication of the latter. The catarrhal irritation thus set up in the gall-bladder would facilitate (as is well known) the decomposition of the biliary secretion, and the precipitation of its colouring matter so as to form concretions of the character described. 4thly.—These in their turn, acting as "foreign bodies" would tend to prolong irritative action, and a continuance of discharge from the fistulae; and, on their extraction the latter have permanently closed, and the patient has thereby been completely relieved.\*

A somewhat similar case was in this hospital, a few months ago, under the care of Dr. Chandra, by whose kind permission I am enabled to give the following particulars:—

"The clinical abstract" has been prepared by Assistant Surgeon Rakhal Das Ghose, late House Physician.

Koylash, a Bengali merchant, aged 40, was admitted on the 9th December 1875.

Stated that about eight months ago he had an attack of remittent fever which yielded to treatment. A month and a half after, he noticed pain in the right hypochondriac region. He has suffered from this pain off and on ever since, and latterly (within the last ten days) has noticed a swelling in this situation. His habits are temperate, and he has never had dysentery. The liver is enlarged to two inches below the costal arch; the margin of the organ can be readily felt by the fingers. A swelling, about the size of the closed fist, is observed in the right hypochondrium. Distinct fluctuation exists; temperature 99.8°F; pulse 94. On the 10th December the tumour was punctured, and two ounces of healthy-looking pus evacuated by means of the aspirator. This pus was examined microscopically, but nothing remarkable in its constitution could be distinguished. No hepatic cells and very few red blood globules could be seen; the pus corpuscles were well formed and abundant.

The abscess cavity again filled, and on the 23rd December was punctured for the second time, but with a large trocar. Four ounces of pus escaped and free drainage was then established. The patient's health now began to improve; the cavity underwent contraction, and only a small sinus remained, through which a little discharge, at first thick, but gradually becoming thinner, glairy and pale ("glycerine-like") continued. As no further indications of healing appeared after more than two months, the sinus was "slit up" on the 12th February. The next day strong fever set in (temperature 104°F.), with much tenderness in the right lumbar and hypochondriac regions, gradually extending over the whole of the abdomen, which became tense and tympanitic, and the patient died on the 17th.

On making a *post-mortem* examination abundant evidences of general peritonitis were found, and with respect to the special lesion, my notes are as follow:—In the anterior wall of the abdomen, on the right side, two openings are seen. One, an inch in length and half an inch broad, is situated a finger's breadth below the costal arch; the other, an inch below the latter, is sufficiently large to admit an ordinary drainage tube. Both these openings lead into a small abscess cavity between the skin and the abdominal muscles, having a smooth, vascular lining. At the upper part of this cavity a rounded opening is seen, through which a director can be readily passed, and a sinus thus traced, running in a direction upwards and backwards between the abdominal muscles to the lower margin of the liver, and thence a probe can be carried into the substance of the right lobe which feels soft and boggy. On further dissection, it is seen that the lower margin of the liver descends just below the ribs, and is here pretty firmly adherent to the anterior abdominal wall over a limited space; the whole of its surface being merely glued to the diaphragm, the lower ribs,

\* I am well aware that a somewhat different interpretation of the main features of this case might be given, viz., that the formation of the biliary calculi was the first stage of the disease; that these by their presence, and consequent irritation, led to inflammation and suppuration in their neighbourhood, and the development of an abscess in the right hypochondrium, which was thus from the first not truly parietal. This was my own impression for a time, but, on reviewing the history, and by repeated examination and cross-examination of the patient, the conclusions above set forth seemed to accord more closely with the course of the disease. The swelling (abscess) had only existed for a month at the date of the patient's first admission; its appearance had been ushered in by severe rigors and acute local pain, and the accounts of "attacks of colicky pain" and "jaundice" are extremely vague and uncertain.

and intercostal spaces by soft, recent lymph. The hepatic parenchyma at the spot where the probe reaches it, is in a state of red softening; this condition surrounds the gall bladder which has been implicated. Its walls are much thickened and highly vascular. It contains about a drachm of thick, opaque, whitish-yellow, purulent-looking fluid (? altered bile). At its upper part, a calculus, oval in shape, the size of a horse-bean, and composed of almost pure cholesterine is found, but it does not completely obstruct the orifice of the cystic duct.

In no other situation did the liver exhibit any inflammatory softening or suppuration. The organ was larger and heavier than normal, (weighing 4lbs 10ozs.), dark and vascular, and the lobular structure throughout ill-defined.

August 7th, 1876.

## CAMPBELL HOSPITAL, CALCUTTA.

### CASE OF TETANUS TREATED BY HYDRATE OF CHLORAL AND QUININE: RECOVERY.

By Assistant Surgeon DENO BUNDHOO DUTT, *Officiating Teacher of Materia Medica.*

DOMRIE, a Mahomedan groom, aged about 25 years, was admitted into the second physician's ward, Campbell hospital, with symptoms of acute idiopathic tetanus, on the 6th January 1876, the attack having been brought on by exposure to cold about 3 or 4 days previously. All the symptoms of the disease were present; there was marked opisthotonos, and the fits were strong, occurring at short intervals. On admission he was ordered to have draughts of chloral hydrate (dose grs. xx gradually increased to 40 grains,) every four hours, but notwithstanding these large doses of chloral, the tetanic fits continued unabated in their frequency, though they were diminished in their intensity, until quinine in 10-grain doses, was administered every morning commencing from the 11th January, after which they became less frequent than before, and occurred after long intervals. Under this treatment the patient continued to improve steadily, though slowly, and was able to leave the hospital perfectly cured on the 19th February 1876.

Besides quinine and chloral hydrate internally, the patient had frictions with stimulant and antispasmodic liniments, and alternate applications of hot and cold sponges to the spine. He was fed with milk, sago, bread, nourishing soup and wine.

### CASE NO. II.—HEPATIC ABSCESS WHICH BURST INTO THE BOWELS: DEATH.

By Assistant Surgeon DENO BUNDHOO DUTT, *Officiating Teacher of Materia Medica.*

Bhola Nath Das, a labourer, aged 40 years, was admitted into the second medical ward, Campbell hospital, on the 25th May 1876. He had, about 2 years ago, an attack of intermittent fever said to have been of the quotidian type; the occasion of the fever being marked by some dull tensive pain in the right hypochondriac region. After suffering for more than a fortnight, he convalesced under the treatment of some anti-periodic medicine, and the pain abated. Remaining well for a time he again began to feel indisposed, and the symptoms were slight feverishness towards evening, loss of appetite, and irregularity of the bowels. Two months previous to his admission into the hospital, the fever manifested itself with great violence, coming on every evening with shivering and leaving him towards the latter part of the night, with copious perspiration; at the same time the fever was accompanied by pain in the hepatic region, not dull and tensive as before, but apparently lancinating and darting in character, and by sympathetic pain in the right shoulder. It was only since a fortnight, before he came into the hospital, that he suffered from dysenteric symptoms. He was in the habit of drinking alcoholic liquors.

*Symptoms on admission.*—Patient emaciated and anæmic, complexion sallow, countenance anxious, conjunctivæ pale, no cough or vomiting since the attack; bowels loose, the motions being mixed with blood and mucus; gets fever with slight shivering every evening. Slight bulging of the intercostal spaces of the right hypochondrium observable. The area of hepatic dullness extends from the sixth rib to about an inch above the umbilicus, and posteriorly there is also an increased area of dullness on percussion.

*Progress of the case.*—Notwithstanding all our efforts no improvement took place in the condition of the patient; the diarrhœa continued unabated, the motions consisting chiefly of hepatic pus mixed up with mucus and blood; hectic fever supervened and the patient began to pass restless nights; appetite failed; circulation became soft and feeble; cold clammy perspiration set in profusely; and on the evening of the 7th June, he died of sheer exhaustion after a stay of 14 days in the hospital. The lowest ranges of temperature in this case were almost always below the normal standard.

*Treatment.*—Diffusible stimulants, *viz.*, spirit of chloroform, ammonia, and brandy, were administered from the beginning; also astringents to check the colliquative diarrhœa and anodyne enemata to relieve tenesmus. He was fed with soup, milk, bread, &c., and externally large linseed meal poultices were applied over the liver.

*Autopsy.*—On opening the abdomen, the right lobe of the liver was found to be very prominent or bulged, and firmly adherent to the diaphragm by its convex surface. On trying to separate this adhesion the liver substance gave way and about 2½ pints of hepatic pus escaped. By its under-surface it was firmly attached to the hepatic flexure of the colon, and here there was a communication between the gland and the gut. The abscess was a large unilocular one; the rest of the liver substance was healthy, and there was nothing abnormal in the chest except a few ounces of serous fluid in the pericardial cavity. The posterior surface of both lungs were congested.

## CASES OF EYE OPERATION.

By G. C. HALL, *Civil-Surgeon, Futteghur.*

THERE is no doubt that nothing tends so much to the just appreciation of European surgery by the natives of India as successful eye operations, and this the more especially as eye diseases, involving complete loss of sight, such as cataract, leucoma, &c., repairable by operation, are so very common among them, and their real nature and treatment are so little understood by their own Hakims. Notwithstanding this however they cling to their own class, and it is only after long residence, or after one is known to have had success that they will trust themselves to an European: they much prefer going to their *Sutteas* and having their eyes destroyed. The reason for this is that, perhaps, not very many Civil-Surgeons care to take eye cases.

I have made a point of operating on every eye when I got a chance, knowing that success would come, if I only persevered, and that they would be induced to see that English operations could compare very favorably with native couching. Almost all the cases I have had, in about two months, have either had one eye operated on by couching, or there has been a leucoma occluding the pupil and requiring an iridectomy—an operation which the *Sutteas* do not attempt. Apparently various trivial circumstances tend to a more or less successful operation. I refer more especially to circumstances affecting in-patients, and principally females, such as getting into low spirits, frequently crying (as one of my iridectomy cases would do) and worrying themselves because they did not get their food as usual, and were not in their own houses. Two such cases were failures, and solely on this account. Notwithstanding these drawbacks, I believe there is not the slightest doubt that if eye cases were more looked to in our dispensaries, the success attending linear extraction of the lens in cataract cases, and various other eye operations, would soon be known. The ignorant native Hakims would be quite driven out of the field, for up to the present they have met with hardly any opposition. I now append notes of some of my cases, which were all more or less unpromising owing to the fact that in each case one eye had already been operated upon and the result had been panophthalmitis with more or less damage to the other eye.

### CASE 1.—CATARACT.

20th February.—An old woman who had had one eye destroyed by couching was operated on by a lower flap; lens came out entire; operation then looked most promising, but after she had recovered a little from the effects of chloroform, she vomited so violently as to displace the pad, and protrusion of the vitreous resulted; she never afterwards showed signs of doing well; sloughing of cornea occurred. Vision—*nil*.