tion? As far as my own experience goes, I believe that generally interference is prejudicial in whatever stage of the labour the convulsions may occur. Most assuredly, during gestation, and before labour has commenced, it will be universally conceded as admitting of no dispute, that until labour has commenced, any interference on our part would be highly injurious; so that, in convulsions during pregnancy, we have, as Gooch says, "nothing to do with the uterus, but solely to attend to the convulsions." It will also be equally admitted that, in the first or early stage of labour, should convulsions come on, every attempt, by the finger or other artificial means, to dilate the os uteri, ought to be avoided; as it will be found not only to bring on convulsions, but generally to increase them in violence. Denman assures us, that he "attempted gently during every pain to assist in the dilatation of the os, but he was soon convinced that the convulsions were not only brought on and continued, but increased in violence; he, therefore, desisted, and left the work of delivery to Nature." Thus, then, before labour comes on, or in the first stage of labour, I consider interference wholly inadmissible, and only tending to increase the danger. But, in the second stage, when the head has come well down into the pelvis, and within reach of the ordinary short forceps, if, after free bleeding and the use of the other remedies, the convulsions were not manifestly lessened, provided the restlessness of the patient could be controlled, I would at once apply the forceps and bring away the child; as this may now be easily accomplished, and is the only expedient left on which reliance can be placed for the permanent removal of the convulsions.

With regard to turning, I consider the operation a very questionable practice under any circumstances; as I should fear that the irritation occasioned by the introduction of the hand would do far more harm than would be compensated by the benefit derived from emptying the uterus. If it be attempted, it ought to be confined to that stage in which the os is fully dilated, while the membranes are unruptured, so that there may be as little increase of irritation as possible; for, if the uterus closely embrace the child, as it does after the escape of the waters, or the os be not fully dilated, the danger of the operation will be very great. But, unfortunately, the mere emptying the uterus does not always arrest the progress of the disease; for I have known cases where the fits have continued unabated for several hours after delivery; and a case will be detailed, in which the first fit occurred some hours after a favourable and easy labour, showing some other cause for their continuance than mere uterine irritation. I would much prefer and would recommend watching the result of repeated bleedings; and if it were found that the return of the convulsions had been prevented, or even that they were lessened in violence, I would refrain from immediate delivery, and perhaps this forbearance would be followed by natural delivery, the progress of which, it should be remembered, is always more rapid under convulsions. It hence requires constant watching, lest, as has happened in many instances, the patient has been delivered unknown to all, and the child lost. This rapid progress of labour under convulsions is an argument in favour of some consideration when so doubtful an operation as turning is contemplated. But, besides these objections, it will be found to be an unquestionable fact, that far more women die when they are officiously delivered by artificial means of whatever nature, than when they are left to their own resources.

I conclude these remarks by giving in detail some cases corroborative of my views; merely observing that, if I had been deterred by the fear of poisoned blood, and had had no fear for my patient's brain, in my treatment of puerperal convulsions, I would have had less favourable results to record.

CASE I. Convulsions during the Eighth Month of First Pregnancy: Mother Saved.—I was requested by a medical friend in this neighbourhood to visit his wife, who was near her confinement of her first child, on the forenoon of May 18th, 1855. He stated that for some weeks past she had been complaining of headache, of occasional faintness, and pain at the pit of the stomach; that during the previous night she could not sleep in consequence of its severity; that she rose early in the morning and walked restlessly about, grasping her head, then lay down, and shortly afterwards became convulsed. He had only applied cold to her head. I saw her at 1 P.M. She was then quite conscious, but her husband did not think her altogether in her ordinary state. Her face was flushed; the pulse full and hard. She complained much of her head, which was hot. The limbs were much swollen, and her face about the eyelids was oedematous. The urine was scanty. She had felt no motion of the child for two or three days past. There was no indication of labour. She was immediately bled to thirty ounces, and ordered to have a smart purgative of senna and salts, with cold applications to the head, and to live on gruel and tea.

May 19. The bleeding had completely relieved the headache; and she expressed herself as feeling freer of discomfort than she had done for a long time. The medicine had acted freely.

May 21. She had a return of headache this morning, but not severe. Towards the afternoon the headache increased, with flushing and restlessness. She was bled again to twelve ounces with immediate relief. The medicine still operated. In the evening labour pains came on, and she was delivered of a dead child in a few hours.

May 22. She had no headache during the labour, nor any uncomfortable feeling. She slept tolerably well. The urine was more abundant, and the oedema less.

In this case the urine was not examined, but it may be fairly presumed, from the great extent of oedema of the whole body, not excepting the abdominal parietes, that albumen would have been found in abundance. The dropsical symptoms entirely disappeared by the third day, and she made a good recovery. This lady has had a second child, but with no return of these symptoms.

CASE II. Convulsions before Labour in the Ninth Month of First Pregnancy: Child Alive.—A patient of mine called on the morning of March 5, 1859, to ask me to see his sister, Miss —, aged 21, who had unfortunately become pregnant, and who had, an hour before, had some sort of fit. I saw her at 8 A.M. She was in bed, conscious, yet confused in her manner, and wondered what had brought me so early. She was not aware that she had been ill. I learned that she had had a violent convulsion about an hour before while moving about in her room; that a medical man had seen her; that he had ordered an anodyne draught and left her. While I was talking to her she stared wildly, tried to sit up, and immediately became convulsed. Her face was livid, and pulse slow; breathing stertorous, and limbs rigid. I at once bled her until she became sensible; twenty-five ounces were taken. I directed her to have cold applications to the head, and as soon as she could swallow, to have a smart dose of senna and salts. I also requested a consultation in an hour with the medical gentlemen who had seen her. We met at 10 A.M. He approved of the treatment, admitted that he had never seen a similar case, believing it to be hysterical, and that he had dreaded bleeding from the weakness of her pulse. There was no oedema.

March 6. There was no return of convulsions, but she had been restless. The bowels were scantily opened; pulse fallen. In the evening she had some headache. The purgative was ordered to be repeated, and cold to be applied to the head.

May 7. She slept quietly the first part of the night. Towards morning labour commenced, and proceeded favourably and rapidly; but, just as the head was about to be born, she had another convulsion of shorter duration. She was again bled, but to a smaller amount (twelve ounces). The placenta came off in a few minutes. The child was alive and healthy. She had no further attack, made a good recovery, and nursed her child the usual time.

In this case there was no oedema. She was a little spare woman, and, as far as I could learn from her friends, she had been in perfect health until the moment of the attack.

(To be concluded.)

PREPARATION OF NITROUS OXIDE.*

By ALBERT R. LEEDS, A.M.,

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WHATEVER be the particular form of the apparatus employed in the manufacture of nitrous oxide, it must always consist of three essential parts: the generator, purifier, and receiver of the gas.

1. Generator.—The simplest form of generator is a plain glass retort. Those with glass stoppers are objectionable on several accounts; they are more costly than plain ones; it is difficult to make the opening impermeable to gas, and the dropping of fragments of fused nitrate of ammonia directly upon the thin bottom of the retort is apt to fracture it. The generator should be of glass, on account of the formation of vapours of nitric acid along with the nitrous oxide. These acid vapours would corrode a metallic vessel, and be themselves converted into deleterious fumes of nitric oxide. A retort of the capacity of one pint affords ample room for the safe decomposition of three-quarters of a pound of the nitrate, either fused or crystallised: one containing a quart for any amount under two pounds.

In order to obviate the great liability to fracture, which attends the direct application of flame to the bottom of the retort, and in order to communicate the heat gradually and equally, the retort should be set in a sand-bath. And it is well also to cover the neck of the retort with five or six square inches of sheet zinc or iron, bent into a cap, for the same reason.

* From the "Philadelphia Dental Cosmos", June 1866.

In selecting a retort, one should be chosen with a beak of not less than an inch in diameter. If the beak has been drawn out by the glass-blower to a smaller bore than the above, it should be broken off at the proper point. This is effected by filing around a portion of the circumference of the beak with a sharp-cornered file, and administering a decided rap. The sharp edge of fracture should afterwards be rounded by fusion in the flame of a lamp. When the beak has the above width, the nitrate drops in easily and glides gently down into the bottom of the retort.

The retort may be connected with the purifier in two ways. A cork is fitted tightly into the beak of the retort, and pierced with a glass tube. This is the simplest method, and would probably be the best, if it were easy to get and retain a close fit with cork. But this is difficult, and especially so when the opening of the beak widens inward. It is better, therefore, to obtain about a foot of rubber tubing, which is large enough to stretch over the opening of the beak. This large tube may be connected with the smaller one, which passes to the purifier, by an adapter. The latter is easily made by drawing out one end of a glass tube, which has about the same diameter as the opening of the beak.

2. *Purifier*.—The gas is washed in one or more quart bottles. Through the cork, an ingress-tube is passed, reaching nearly to the bottom of the vessel, and an exit-tube which stops short of the washing-liquid. If the gas is collected in a bell over water, one wash-bottle is sufficient; if in a rubber bag, two had better be employed.

3. *Receiver*.—The receiver ordinarily has a capacity of thirty or forty gallons. India-rubber bags are generally employed, but they are not as serviceable perhaps as a floating bell. They are liable to decay from the action of acid vapours; and the mellowing of the gas when allowed to stand in them for a day or more, is probably due to the absorption of acid by the rubber, and is obtained at the expense of the bag.

A cylindrical bell, of galvanised iron, two feet six inches in height, and eighteen inches in diameter, contains about thirty-three gallons, and is of convenient shape and dimensions. The top of the bell is a cone of about two inches in height, and is terminated at its vertex by a stop-cock. Such a bell weighs about sixteen pounds. It is counterpoised by three nine-pound weights, fastened at the end of as many fixed pulleys. The wheels of the pulleys are arranged on top of three standards, which are riveted at equal distances around the side of the tank, and rise two feet seven inches above it.

When fresh water is run into the tank, it absorbs, at common temperatures, about its own volume of laughing gas. The water loses its gas very slowly, however, and the rate of subsequent absorption is correspondingly slow. This form of gasometer has the very great advantage that it finishes the purification of the gas. It is a matter of question, whether gas which has been allowed to stand for a number of hours over water in such a gasometer would not be pure enough for inhalation without the aid of a single wash-bottle; certainly, one wash-bottle for conversion of whatever nitric oxide, which has been formed, into nitrous oxide, is sufficient.

Materials.—The crystallised appears to answer as well as the fused nitrate of ammonia, and is from fifteen to twenty-five cents per pound less in price. A pound of either may be safely heated to ebullition in twenty minutes. As the bulk of material diminishes, the boiling correspondingly increases, and must be restrained by cautious regulation of the temperature. If, as sometimes occurs, the steam which arises from the decomposition of the nitrate of ammonia is formed in alarming quantities, the flame should not be entirely withdrawn. It should be lowered, but not to such a point that bubbles of gas cease to arise from the ingress-tube of the wash-bottle. Otherwise, an unexpected condensation of steam in the retort will create a vacuum, into which the contents of the wash-bottle will be projected by atmospheric pressure. The retort is disconnected with the wash-bottle at the adapter, and this is done immediately on withdrawal of the heat. And the boiling is not pushed to dryness, which would be fatal to the retort.

Each particle of the nitrate of ammonia, when heated to a temperature of about 480 deg., is decomposed into two particles of nitrous oxide and four of water. In a pound therefore of nitrate there would be 28.8 gallons of gas, and a little over five ounces of water. This is not quite true in practice, since the temperature cannot be regulated with sufficient accuracy, and various amounts of nitric oxide and hyponitric and nitric acids are formed along with the laughing gas.

The first wash-bottle should contain about a pint of saturated solution of protosulphate of iron, and a small quantity of free sulphuric acid. The nitric oxide yields up one of its two equivalents of oxygen to the iron, which is converted into sesquioxide, and passes out of the wash-bottle as nitrous oxide.

The free sulphuric acid is to facilitate the conversion of the sesquioxide of iron into persulphate.

If a second wash-bottle is used, it is filled with a pint of solution of

potash or soda to take up the acid vapours. It is well to allow the gas to stand for one or more hours over the surface of the water before inhalation.

My thanks are due to Mr. Walter Jackson and Professor Ellis for their kind assistance in the preparation of this article.

CARBOHÆMIA, THE ONE AND ONLY POSSIBLE SOURCE OF TUBERCLE AND TUBERCLE INDUCED MALADIES.*

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If the presence of pus, if waste nitrogen in the form of urea and uric acid, as accumulating in the blood, merit separate titles, assuredly the accumulation of waste and excrementitious carbon warrants a similarly distinctive appellation. I would commend, therefore, to the acceptance of all physiologists—in fine, to every one interested in a real as opposed to an absurd and spurious pathology—the term carbohæmia, as suggestive of a condition as real and distinct as are the several terms uræmia and pyæmia.

The kidneys are the great if not the only outlet of excrementitious nitrogen in the form of urea and uric acid, as they likewise are of the excrementitious phosphates; one resulting from the disintegration of the azotised soft parts, the other from that of the hard. On the other hand, the lungs are the main outlet, if not the only or exclusive one, for the excrementitious carbon furnished by the retrograde metamorphosis, or, in other words, the death of the animal tissues. There is no other source for the waste or excrementitious nitrogen and phosphates than the old or effete and dead particles of flesh and bone, removed during each several instant to make way for living and new. The blood which conveys away the old and used particles, also brings back the new. The excrementitious carbon itself is derived from the destruction of the living tissues. The blood, in fine, conveys away the old carbon and brings back the new.

The waste nitrogen, waste lime, and waste phosphorus have nothing to do except to get out of the economy with all convenient speed. This they do through the medium of the kidneys; but the waste carbon has yet something to do, another function to discharge, before it is got rid of. Just as West India planters burn the sugar-cane, the trash, when the sweet juice is squeezed out of it, in order to heat their boilers, so the excrementitious carbon, when the juice of life is squeezed out of it, is also burnt by wise Mother Nature, to keep up, cheaply and economically, the heat of the organism.

When certain abnormal states hinder the sufficient elimination of waste nitrogen, in the form of urea and uric acid, from the economy, then is the blood brought into the condition known to pathologists and practitioners in medicine by the term uræmia. When the accumulation proves excessive, there ensues speedy death to the entire organism; but when the accumulation is less urgent and excessive, we have that state of the economy which is called gout. The skin and kidneys do not discharge their duties sufficiently, and some of the waste azote is deposited in a dead and effete state in one or more of the joints, forming what the old physicians used to term chalk-stones, or what their successors have learned to designate as concretions of urate of ammonia.

If, again, pus find its way abnormally into the blood, we have the condition known by the name pyæmia. And, if this state of things do not prove immediately or speedily fatal, it very often happens that the pus-laden blood lays down its pus, now here now there throughout the organism; a fact too well known to need any demonstration or insisting upon by me. It was not always so, however. Time was, when this most important and interesting pathological fact was unknown utterly.

Not to advert more particularly to the occasional displacement of the lime phosphates, I now come to the more important matter, upon which I here more especially desire to insist, and which I claim to have first determined. The excrementitious carbon, in fine, by reason of insufficient oxidation, may gather unduly in the blood, and give rise to the condition which I would name carbohæmia. I have incurred ridicule, contradiction, and abuse for this statement, but let us look facts in the face and see wherein I err.

No one, I suppose, now-a-days, will venture to assert that the living tissues are not decomposed during each and every act of life. The waste nitrogen and waste phosphates take themselves off as I have said, but the waste carbon, what becomes of it? It is first burnt, that

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