ON THE PLUGGING OF MINUTE VESSELS IN
THE GREY MATTER OF THE BRAIN,
AS A CAUSE OF THE DELIRIUM AND STUPOR IN SEVERE
FEBRILE DISEASES; AND ON OTHER SYMPTOMS
OF THE "TYPHOID STATE".

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THE patient who was the subject of the following observations was admitted into University College Hospital, under my care, on December 28th, 1868, whilst I was temporarily doing duty for Dr. Wilson Fox.

*History.**—He was a large and apparently strong, man, a gate-keeper, but formerly had been a policeman; accustomed to drink a good deal of late. On Dec. 20th, he was getting into a Hansom cab, when he fell, and cut his head on the kerb-stone. On the 23rd, his forehead and face began to swell, and became red; the part first affected being in the neighbourhood of the cut. He was obliged to give up work on the 24th. The inflammation continued to spread over his face and head; and on the 27th he became delirious.

On admission into the hospital on the 28th, a cut was seen behind and above his left ear, from which issued a slight purulent discharge. His face and head were much swollen, and of a deep red colour; the redness disappearing imperfectly on pressure. The erysipelatous inflammation affected both sides of the face, and extended round the neck behind the ears. The eyelids were much swollen, so that the eyes could not be seen. He was put to bed with difficulty; since, being in a low delirious state, he offered some resistance. Pulse 124, weak, and compressible; respirations 36; temperature 100°. F. He was very delirious all night, could not be kept in bed, and was, therefore, tied down. The next morning, he talked a good deal, and occasionally shouted out "Police" and "Murder". He was not violent, but very restless and talkative. He took food and stimulants well. A dose of calomel had been administered on admission, which acted freely; and, after that time, he took thirty-minim doses of tincture of perchloride of iron in saline mixture every four hours. On the afternoon of the 29th, four minims of tincture of aconite were added to each dose of his mixture. The patient became much quieter during the latter part of the day; at night, he became comatose; and he died at 4 A.M. the next day (Dec. 30th). The patient struggled so much, that it was found impossible to carry out the thermometrical observations. The temperature seemed, however, to rise after the examination on the 28th, when it stood at 100° F.

three of the branches of the middle meningeal arteries on each side were somewhat prominent, and seemed partly filled with some colourless substance, though pale in colour, they did not collapse or flatten when the back of a scalpel was passed over them. The sinuses were not much distended with blood; and what they did contain was mostly dark and fluid, though there were also some not very large yellowish gelatinous clots in the longitudinal sinus. The arachnoid was healthy, and there was no increase of fluid beneath it. All the minute vessels of the pia mater were much injected, though there was no trace of anything like lymph in its meshes. The consistence of the brain seemed uniformly good, with the exception of the fornix and adjacent parts, which presented a "wet" appearance, and were easily lacerable. All parts of the brain showed a decidedly abnormal amount of vascularity, and this was particularly evident on the venous side of the circulation. The veins of the surface of the lateral ventricles and those of the choroid plexuses were all notably distended with dark blood, though there was no obstruction in the *vena magna Galeni*, or in the straight sinus. The lateral ventricles, however, contained only a small quantity of pale serum. The "red points" were very abundant wherever sections were made through the white substance of the hemispheres. The heart was healthy, and contained some dark fluid blood in its right cavities, together with a large yellowish gelatinous clot in the ventricle, partially adherent to its walls. The lungs were congested, especially at the bases, though otherwise healthy; on section, they poured out a thick, blackish-looking blood. The liver was congested; consistence about normal; mottled with pale fawn-coloured patches here and there. The kidneys were large, with a pale groundwork, almost hidden by well-marked vascular injection, which gave the surface a tolerably uniform purplish aspect.

On *microscopical examination* of some minute vessels and capillaries taken from the grey matter of the convolutions, every specimen looked at showed minute embolic masses in various parts of the course of the small arteries and capillaries, of a most unmistakable nature, though apparently of recent origin. Distinct masses, of irregular shape and size, could be seen, made up of an agglomeration of white blood-corpuscles. In some cases, the masses were small, and formed by the union of three or four white corpuscles only; whilst, in others, large irregularly shaped aggregations could be seen within some of the bigger vessels, which may have been made up by the mutual adhesion of two or three hundred of such corpuscles. The largest mass actually measured was $\frac{1}{100}$ " long by $\frac{1}{200}$ " broad. In other parts, large rounded bodies were seen, whose nature was not at first sight so obvious; though, after a little careful examination, I became convinced that these had, in all probability, been formed by the complete fusion of corpuscles into a single mass, which had afterwards undergone more or less of a granular degeneration. (Fig. 3.) All intermediate grades could be detected between masses

At the *Autopsy*, which was made thirty-six hours after death, the skin and subcutaneous tissue of the scalp were found to be enormously thickened, more especially over the back part of the head, where the depth of both, on section, was about one inch. The inner two-thirds of this depth of tissue was composed of a purulent lymph-like material, not diffuent, but of a soft gelatinous consistence. There was no increased vascularity of the pericranium, which was firmly adherent to the bone, and with no trace of pus beneath. The calvaria presented no unusual characters. The dura mater seemed somewhat thick and opaque, but there was not the slightest increase of vascularity. Two or

which were so distinctly made up of aggregated white blood-corpuscles as to allow each individual corpuscle to be recognised, and those last spoken of, where the fusion was complete, and degeneration had commenced. Thus masses might be seen in which the corpuscles were partly distinct and partly fused, and others in which fusion of all the corpuscles had taken place, so as to produce masses similar in general appearance to that of the white corpuscle, and in shape and size to those of Fig. 3, though without the granular degeneration which these last displayed. In many cases, the masses of white corpuscles were impacted in the small arteries and capillaries after the fashion of real embolisms, and the vessels behind were gorged with blood for some distance. In very many cases, however, the masses were seen in vessels which they were too

* For these notes of the case, I am indebted to Mr. Chayne, Dr. Fox's assistant.

small to occlude; but then it should be recollected that these vessels had been forcibly torn from the convolutions; and that the strain exerted upon them, communicated to the fluid with which they were distended, would be quite adequate to dislodge many of them from the situations in which they had been impacted. It is, of course, obvious that such masses as those seen in Fig. 1, if they had not previously been impacted in an artery, must have been on the very eve of being so at the time of the man's death. Vessels from all parts of the convoluted grey matter showed similar occluding masses within.

An examination of portions of the *liver* showed the cells of the organ to be uniformly large and distended with granules; whilst here and there were to be seen areas in which actual fatty degeneration had taken place. In the thin sections which were made, several of the hepatic arteries were seen to contain masses of white blood-corpuscles similar to those in the vessels of the brain; and a condition of thrombosis was seen in many of the portal veins; that is to say, in the sections of some of these, there was seen within them (instead of the well-formed red blood-corpuscles, mixed with masses of white corpuscles, which were recognisable in others) only a dark reddish granular *débris*, such as results from the breaking up of red blood-corpuscles, together with intermixed single and aggregated white blood-corpuscles.

The *kidneys* presented appearances in every way analogous. Both organs were extremely congested. The renal epithelium throughout was granular and swollen, so as almost completely to fill the tubules; and many of the vessels were blocked up with aggregated white corpuscles, like those in the liver; whilst others showed evidences of a mere arrest of blood, and subsequent disintegration of red blood-corpuscles.

The *spleen* was, unfortunately, not examined.

It should be distinctly understood, however, that, whilst the vessels of the pia mater and other parts presented in their interior these irregular aggregations of white corpuscles, they showed no appearances (such as a lining of these next the walls of the veins) which could be considered in any way characteristic of inflammation of the part itself.

(To be concluded.)

SOME PHENOMENA OF ANÆSTHESIA BY PROTOXIDE OF NITROGEN.

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THE topic of anæsthesia being at the present time before the medical profession, I send a few notes, that may prove interesting to those who have the subject under consideration, on the anæsthesia following the administration of protoxide of nitrogen.

It is curious to remark how often, as unconsciousness comes on, the ruling idea is one of noise and motion combined. Some patients think they are seated in, or running after, an omnibus; but many more imagine themselves in a railway carriage, travelling faster and faster, till they suddenly seem to enter a dark tunnel, and then all is a blank to them. Sensual emotions are not unfrequently excited in both sexes. A man, who had been married about three months, stated, on awaking, that he had been dreaming of his wife; and an unmarried hysterical girl certainly gave evidence, by her movements, that she was quite aware of one of the duties of married life; and, moreover, in this case, the idea was still present when she was able to speak, for she addressed the administrator in terms far fonder than the occasion warranted; while another girl, who had behaved in a similar manner, said, "I hope I have not said anything naughty." Both these cases brought forcibly to one's recollection, many trumped-up cases of felonious assault, and how extremely inadvisable it is to have recourse to anæsthesia without a third person being in the room.

At a recent meeting of the Odontological Society, it was stated that the nitrous oxide had been administered in a few cases of pregnancy; but, delivery not having at that time taken place in any one of these cases, the fetus *in utero* was unknown. A lady, one of the above cases, whom I put fully under the influence of the gas twice during the eighth month, has just been confined with a fine healthy boy; so that, in this case at least, the gas cannot have interfered with the nutrition of the child, for it weighed at birth eleven pounds and a half.

When administered to a girl, aged 19, with cavities in the apices of both lungs, the patient was insensible at the end of forty-five seconds. The respiration suddenly became very shallow and panting, while, instead of the rosy hue which generally appears over the face and lips on the removal of the face-piece, the lips and face became more dusky before the red tint appeared; the pulse was not affected, but the respiration, for more than half an hour afterwards, was very shallow and hurried.

CASES OF EXTRAUTERINE FÆTATION, DETECTED AT AN EARLY STAGE OF GESTATION.

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THERE are some diseases of such rare occurrence, that a physician with large opportunities never meets a case throughout a life's practice; whilst his acquaintance with them is restricted to their histories, as reported in the repertories of rare medical cases, or allusions to them in popular systems. I am about to draw attention to some cases of this kind which I have had an opportunity of observing and detecting during life—an opportunity that rarely offers, as their general recognition is delayed until after death. The cases to which I allude are those in which the human germ is found *without*, instead of *within*, the uterus.

The first case of the kind which I met in practice was in the year 1829. A young woman, supposing herself pregnant for about three months, was attacked with excruciating pain in the region of the uterus, spreading over the abdomen, with fullness and tension in the seat of the uterus. On a careful examination, the distension was found greater than should have been, according to the period of her supposed pregnancy. The pulse was small and rapid; the countenance pallid and shrunken. The uterus, on vaginal examination, was not enlarged in a manner corresponding to the period; but a doughy resistance, or feeling like a soft tumour, was perceptible on pressing towards the upper floor of the vagina. The tumour in the region of the pelvis increased gradually in size for two days. The pulse became smaller and more rapid; sickness of stomach occurred; gradual prostration, with bloodless aspect, followed; and she expired, with all the appearance of a patient dying from internal hæmorrhage. On examination shortly after death, the cavity of the pelvis was found filled with clotted blood, which rose considerably above the pubes. The uterus was but little enlarged, and was pressed downwards and forwards towards the pubes; and an ovum was found, corresponding to about the ninth week, imbedded in the clot. The right Fallopian tube, with the tissues of the broad ligament torn and jagged, exhibited a dilated cyst, in which had rested the ovum.

This case, which I give from memory, as it occurred immediately after my entering the profession, naturally became impressed deeply on my mind; and, I doubt not, the impression it made prepared me to expect the occurrence of similar cases. I was not fated to be long delayed in my search for its analogue; and of it I took accurate notes at the time, which I now reproduce, but abbreviated.

On November 1st, 1830, I was summoned to see Mrs. —, and was informed that she had miscarried about a fortnight before, at which time she had had some hæmorrhagic discharge, and a clot came from the vagina. She was then bled by Dr. Madden of James Street, in consequence of complaining of severe pain in the lower part of the abdomen. She had so far recovered from the attack as to be able to be up, going about her house. She was again attacked on the night before my visit with violent pain over the pelvic region; on examining which, a tumour could be distinctly felt, occupying the place of the distended bladder, but firm, solid, and painful to the touch. The pain was constant, but sometimes very violent for a few minutes, and extended round to the back and loins. Her countenance was pallid, and expressive of extreme distress and suffering. The pulse was 112, and small. She made frequent attempts to pass urine, which came away with pain and in small quantities. The bowels had been acted on, from saline medicine taken the day previously. Leeches were now applied over the abdomen, and a full anodyne administered. Early on November 2nd, I was sent for in haste, and found her suffering from extreme pain in the abdomen and loins, and vomiting. The pulse was 130, and scarcely perceptible; her countenance was exsanguine, her lips blanched, her extremities cold, and her body covered with clammy perspiration. The tumour in the abdomen was more perceptible. There was now a fullness observed generally over the lower part of the abdomen, which gave a doughy sensation on pressure. I now formed the idea that my patient was sinking from hæmorrhage. But the question arose, Whence was the hæmorrhage? On a vaginal examination, the os uteri was found tilted back and towards the right side; and so completely was it displaced, as to escape detection for some time. It, however, was open; and the tip of the finger could, without difficulty, be insinuated within it. Nor did it at all exhibit the characteristics of an impregnated uterus. The upper part of the vagina could be, at the same time, felt pressed down into the pelvis by some semi-solid substance, giving exactly the idea of clotted blood. The patient had stated that she reckoned herself about six or eight weeks pregnant, and did not know accurately whether the ovum had come away when she was ill a fortnight