in some of the American rivers; those are the *Inia* and the *Pontoporia*. Of these animals, unfortunately, no skeletons have yet reached the museum. The *Squalodon*, a toothed whale, occurring in the Miocene period, seems to have been, at least in dental characters, of a more generalised type than those nearest allied to it are which now exist.

The last group of the toothed whales are the *Physeteridae*. This contains the sperm whale and its allies. There are no teeth available for functional purposes developed in the upper jaw; but, in the mandible, well-developed teeth are present. In no member of this group are the sternal ribs ossified. The ribs are attached to the vertebrae in a different manner to what takes place in the delphinidae, in which the diapophyses to which the ribs are attached throughout the whole series of the anterior vertebrae are higher up on the neural arch, but gradually descend towards the posterior dorsal vertebrae till, finally, they are attached to the centra of the vertebrae. In the *Physeteridae*, the diapophyses parapophyses of the anterior vertebrae articulate with the angles of the ribs, while their heads are attached to the bodies and neural processes of the vertebrae. The posterior ribs articulate with the diapophyses by thin heads, and have no attachment to the centra.

The *Physeteridae* are divided into two subgroups—viz., the *Ziphioidae* and the true *Physeter*. Of the first, the hyperoodon is a familiar form. A specimen of it was dissected and figured by John Hunter with very great care. It attains the length of twenty-five or twenty-six feet; the males are larger than the females. It is rarely found on our coasts; and, when found, it is usually a female and young one, apparently migrating to the Arctic coasts, where they go during the summer months. The only English name for this animal is the bottle-nosed whale, a term applied to several species. The head is round, and the pectoral fin is small. The back of the skull is raised behind the blow-holes. The maxillary crests are very thick and greatly developed—so that they almost meet in the middle line. Between and in front of these crests lies a large mass of fat. There are no teeth developed in the upper jaw, which penetrate the gum, though there is one rudimentary tooth at the anterior extremity of the lower jaw.

The *Mesoplodon* is another genus of the ziphioid whales. It is peculiar in having only one tooth developed on each side of the lower jaw. The size of this tooth varies. In *Mesoplodon Layardii* it attains an immense size, the tooth of the one side sometimes growing upwards over the animal's snout until it meets that of the other in the middle line, so that the animal is unable to open its mouth. The cartilage between the maxillaries in the centre of the skull ossifies into very hard bone, and forms the ziphioid rostra so often met with in the fossil state.

The sperm whale or cachalot, *Physeter macrocephalus*, is an inhabitant of the temperate and tropical seas. It is principally found in the Pacific Ocean, though occasionally met with in the seas of the warmer latitudes all over the world. The male attains a length of from fifty-five to sixty feet. The female is, however, much smaller, having never been found to measure more than half that length. The lower jaw is long and narrow, with a row of teeth on each side. In the upper jaw, the teeth are entirely absent. The soft parts of the head rise perpendicularly upwards from the anterior extremity of the upper jaw. The skull is long and narrow, flat in front, and rising posteriorly into a great crest, in front of which is an enormous reservoir of liquid fat called spermaceti, which is contained in large cells. This spermaceti chamber forms the whole anterior portion of the head of the animal. It is homologous with the large development of fat in the front of the skull of the porpoise. The height to which the supra-occipital crests rise causes great want of symmetry in the skull, especially about the nasal passage.

A peculiar fin-whale recently discovered is the *Kogia*. It somewhat resembles the sperm-whale, but differs from it particularly in the form of the head, which is very short. Of this species, there are two skulls in the museum.

The earliest cetacea in time known at the present day belong to the genus *Zeuglodon*, which existed as far back as Eocene times. Its teeth resemble somewhat those of *Squalodon*; the hinder ones are double-rooted. The brain-cavity is small and narrow; the snout is long; the nasal bones are more like those of ordinary mammals. The small brain-cavity is characteristic of all the other animals existing at a corresponding period, and indicates that in the cetacea, as in them, there has been a gradual increase in the size of the brain and its cavity, as ages have rolled on till the present time. *Zeuglodon* seems to be perfectly distinct from all other known forms of whale, and must, therefore, be put in a group by itself.

The animals constituting the order *Cetacea* are thus highly specialised, and strongly differentiated from other mammals. It is very difficult, if not impossible, in the present state of our knowledge, to say to which of the other groups they are most nearly related.

ON HÆMORRHAGE AND EXCESSIVE SICKNESS DURING PREGNANCY: AND ON ABORTION, IN CONNECTION WITH INFLAMMATION OF THE UTERUS AND OF ITS CERVIX.

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IN the first edition of my work on *Inflammation of the Uterus*, published in 1845, I brought forward facts, new to the profession, respecting the frequent existence of inflammation of the neck of the uterus during pregnancy, as a cause of hæmorrhage and of abortion (page 63, *et seq.*). I stated that this fact, first brought to light by Messrs. Boys de Loury and Costilhes at the St. Lazare Hospital, Paris, and confirmed by my own experience, threw considerable light on the diseases of pregnancy.

In the second edition of my work in 1848, in the third in 1852, and in the fourth in 1861, I extended this clinical remark to the body as well as to the neck of the uterus; and applied it to the entire period of pregnancy, to parturition itself, and to the subsequent or puerperal state. I developed also, at considerable length, the clinical, pathological, and therapeutical data on which these doctrines were founded. They have guided me, during a long professional career, through the difficulties of practice, and have proved the key to many obscure morbid phenomena, as also to their successful treatment. I am anxious to give this final testimony to their correctness and value. As far as I know, they have not penetrated as yet into gynæcological and obstetric practice. I have found little or no notice of them in the various recent works on diseases of women which I have consulted.

The field covered by the title of this essay is so vast that it would easily give material for a dozen interesting memoirs; but I am obliged to confine myself all but entirely to the mere enunciation of clinical facts, and of the necessary therapeutical deductions.

It is now universally admitted that the pathological facts, which I was one of the first to announce in 1845, are true—viz.: that the mucous membrane covering the cervix uteri, its cavity, and that of the uterus, and the mucous follicles of which they are the seat, are frequently attacked by inflammation and by inflammatory ulceration. I had formerly a hard battle to fight to establish this fact, and encountered an amount of opposition amounting almost to persecution; but that is a matter of the past. I, and those who sided with me, have succeeded in establishing uterine surgery as a branch of general surgery, having as good claims to recognition as anal, rectal, or vesical surgery.

A great clinical fact—to which I drew forcible attention in the successive editions of my work, and which I have constantly taught—is: that many women become pregnant while suffering from inflammatory and ulcerative disease of the uterine cervix, or from chronic inflammatory disease of the body of the uterus. Thence arise a whole train of erratic and morbid phenomena, modifying the usual course of pregnancy, of parturition, and of the subsequent puerperal state. We will examine briefly the influence of such concomitant disease in each of these three periods of the child-bearing phase of female life.

During Pregnancy.—The ordinary result of uterine inflammation, during the pregnant state, is to give rise to what is termed laborious pregnancy; to intractable sickness; to abundant leucorrhœal discharges; to erratic, periodical, or constant hæmorrhage; to the formation of moles or blighted ova; to abortion, and to its concomitants and sequelæ.

Under such a morbid condition, the pregnancy is truly laborious—that is, attended by all kinds of aches and pains, and by all kinds of sympathetic reactions. If the patient have had previous healthy pregnancies, she recognises at once the difference, and will say herself: "I am very different from what I was during my former pregnancies." This difference in the patient's condition, as recognised by herself, is an important element in diagnosis. The state of general suffering is especially marked when chronic inflammation exists in the body of the uterus; but is constantly met with when the cervix alone is the seat of inflammatory disease. Sickness, intractable sickness, in my experience, is one of the most constant symptoms of uterine inflammation. Without wishing for a moment to question the influence of other causes, I maintain that diseased conditions of the uterus, very frequently of the cervix, are among the commonest causes of intractable sickness during pregnancy. They are so common, that every woman thus suffering should

be carefully examined if the sickness do not give way, or moderate, under ordinary medicinal treatment. This is the more necessary, as the sickness generally does give way, or becomes bearable, if inflammatory lesions be discovered and cured. I have saved very many women from abortion, and even from induced abortion, as a last resource, by the application of this knowledge.

An abundant leucorrhœal discharge during pregnancy, especially if it be yellow or purulent, is a very suspicious symptom, and should lead to a surgical examination, especially if the general health suffer. Even if it do not, such a discharge should be traced to its cause and cured, as it may give rise to purulent ophthalmia in the new-born child; indeed, it is the most frequent cause of this terrible disease. Purulent leucorrhœal discharges, in the parturient female, are often occasioned by inflammatory and ulcerative disease of the cervix.

Slight or severe erratic or more or less regular hæmorrhage, during pregnancy, both in its earlier and later periods, is constantly the result of inflammatory ulcerative disease of the cervix. A mere excoriation at the time of conception soon assumes, as pregnancy advances, a fungoid bleeding character. As the cervix and uterus enlarge, the granulations of the ulcerated surface become larger, more vascular, and assume, by the third or fourth month, quite the fungoid character—bleeding at the slightest touch. Thus, marital connection, exercise, jolts, the hæmorrhagic nîsus of the menstrual period, still slightly felt during the early months of pregnancy, all give rise to hæmorrhage, more or less abundant. A great deal that has been written on this subject, in treatises on the diseases of pregnancy, is altogether erroneous and fanciful, for want of a knowledge of these facts. I myself have nearly always traced the so-called "menstruation during pregnancy" to this cause: the unsuspected existence of inflammatory disease of the cervix, the origin of the bleeding. Before concluding this memoir, I purpose giving a remarkable case illustrating these facts, which occurred to me abroad last winter. Hæmorrhage from inflammatory disease of the body of the uterus is usually the precursor and concomitant of abortion. Inflammatory disease of the body of the uterus is more frequently a cause of the death of the ovum, leading to the formation of moles, than inflammatory disease of the cervix. I have, however, frequently known the latter to be followed by such a result—death of the ovum, retention and growth of the membranes, and the formation of an intra-uterine tumour or mole.

Lastly: abortion, or premature parturition, is a constant result of the existence of chronic disease of the cervix or body of the uterus. Indeed, I may safely say that, in my experience, following up my cases as I have always done, both before and after parturition, it has been the most frequent cause of abortion.

During Parturition.—I believe that I am fully warranted in stating, that many of the accidents of parturition are owing to the coexistence of uterine inflammation. The most prominent are: hæmorrhage, rigidity of the os, laceration of the cervix, retained placenta, *post partum* hæmorrhage. It stands to reason that, if the cervix, at the time of confinement, be the seat of a large fungoid bleeding ulceration, the loss of blood is likely to be much increased; and so it is. I have frequently examined women, confined under my care, six weeks after the confinement, because they had lost much more blood than they should have done during the labour, and have found extensive ulcerative disease of the cervix, previously unsuspected by myself or by others. In all cases of rigidity of the os uteri during labour, I have followed the same course. I have examined my patients six weeks after confinement, and have so constantly found chronic inflammatory disease of the cervix, hypertrophy and induration, and often laceration of the cervix, that I am led to the belief that rigidity of the os is nearly always to be thus explained. If I am right in this opinion, there is a deal to modify or erase in most works on midwifery.

My private midwifery practice, during the active period of my career, was all but confined to consultation cases, and to attendance on females whom I had previously attended for uterine disease, generally inflammatory affections. Among these, retention of the placenta, from adhesion to the uterine walls, was so common that I quite expected it. My line of practice was to wait an hour, and then to remove the placenta, which I nearly always found attached to the uterine walls. In those cases, and sometimes in others in which no interference was required, *post partum* hæmorrhage was frequent and troublesome.

During the Puerperal State.—Following out the practice I have described, examining (six weeks after parturition) all my midwifery patients who had had uterine accidents of any description during the puerperal period—hæmorrhage, metritis, puerperal fever, phlebitis, prolonged red or purulent lochial discharge, prolonged inability to stand or walk—I have been able to connect these pathological phenomena, in very many instances, with the previous existence of cervical

or uterine inflammatory disease. The cervical lesions, however, are by far the most frequent. Nor is it singular that such should be the case, if the uterus, cervix or body, be actually the seat of inflammatory mischief at the time of parturition. How can we expect a diseased organ to safely pass through all the ordeals and changes connected with parturition? Often, the confinement fires the train, as a match does gunpowder. The disease of the already inflamed cervix—bruised, torn, lacerated—is much aggravated. Chronic inflammation becomes acute, extends to the uterus and ovaries; and we have acute metritis as a result, if it extend to the body of the uterus; phlebitis, if it extend to the veins and lymphatics; hæmorrhagic and purulent discharges, if it be confined to the mucous membranes. In all these cases, the physiological process of involution is arrested; and the uterus, instead of fining down to an ounce and a half, remains at eight, six, four, three ounces, followed by inevitable displacements.

The connection between these morbid phenomena and uterine inflammatory disease cannot be traced at the time of parturition, or in the first few weeks that follow. If, therefore, the attendant take leave of his patient soon after the confinement, as is usually the case, the existence of such disease is not recognised. Sometimes, no doubt, parturition acts therapeutically. Lesions, which may have existed before, during, and after parturition, are spontaneously cured by nature alone. As she sets the human tenement to rights, after the great volcanic eruption, she removes and cures the previously existing mischief. I am persuaded, however, from long observation, that such is not usually the case; that, in the great majority of cases, the inflammatory disease of the cervix or uterus, which existed before pregnancy, persists after parturition and the puerperal state, assuming the chronic form, and usually reappears in an aggravated shape.

Thence the following rule of conduct, which I always followed. On taking leave of my patient, I used to say to the husband: "Your wife's confinement, being a natural function, ought to do her good. Two months after it, she ought to feel at least as well, if not better, than before the pregnancy. She ought to walk and stand as well, to be properly menstruated, and to have no pains. If she do not attain this standard, send for me, and we will talk the matter over. During her confinement, she may have received some internal injury, not appreciable at first, but easily recognisable later. Any such injury can easily be treated and cured a couple of months after a confinement. If, on the contrary, it be allowed to continue untreated for months or years, it will undermine her health; and, when she is at last forced to apply for assistance, it will prove most difficult to cure." This advice was generally followed; and thus I saved my own patients from the years of uterine suffering which often follow labours that appear, at the time, to be the most favourable, and in every sense satisfactory.

The pathological facts which I have enumerated would be merely questions of theoretical interest, had they not a direct bearing on practice; but that direct bearing they most decidedly have.

The questions which at once present themselves are these: Are we justified in surgically examining pregnant women, to ascertain whether or not they are suffering from uterine inflammation, either of the cervix or of the body of the uterus? If such disease be found to exist, are we warranted in resorting to surgical treatment during pregnancy, in order to cure the disease? To both these questions, I gave, thirty-six years ago—and now, after a life-time of observation, again give—an affirmative answer. Not only are we thus justified to interfere, but surgical interference, if required,—is a positive duty, as by it only, generally speaking, can existing inflammatory disease be treated, controlled, subdued. If not treated, it develops itself *pari passu* with the uterus; and, what is a mere slight lesion at the epoch of conception, becomes extensive, serious, formidable disease; later on, giving rise to one or more of the morbid conditions and symptoms enumerated. Once the pathology of uterine inflammation during pregnancy, as above developed, is accepted, the necessity of surgical examination for diagnosis and treatment follows, as a necessary sequence.

A digital examination alone will show whether the uterus is the seat of chronic local inflammation; but the speculum is necessary to elucidate the condition of the vagina, cervix, and its cavity. Owing to the relaxation of the vulva and vagina, which accompanies pregnancy even in its early stages, either a full speculum, or a conical bivalve speculum, such as the one I formerly introduced through Coxeter, is required. With the ordinary bivalve, the vagina, passing between the valves, obscures vision after the second or third month. I consider that my conical bivalve is the best instrument for pregnant women. By its power of expansion, it separates the lips of the cervix when diseased, hypertrophied, or ulcerated, and allows the eye to penetrate into the morbidly dilated cervical canal. By its conical form, it effectually holds back the vagina when the instrument is expanded; it thus

enables the cervix to be fully exposed up to the seventh month of pregnancy.

According to my own experience, it is difficult to thoroughly bring into view the diseased cervix, and to separate its lips, in a pregnant woman, in any other position than in the dorsal or lithotomy one, with a good low natural light. The pelvis can be easily raised on a hard pillow, so as to allow a flood of daylight to penetrate to the bottom of the instrument. I am not myself satisfied, unless I can see the entire cervix as well as the palm of the hand, and recognise a diseased follicle no larger than a pin's head.

The most frequent lesions are inflammatory conditions of the vaginal and cervical mucous membranes, as is the case in all parts of the human economy where a mucous membrane exists, excoriation, ulceration of the cervix, and of its cavity.

Inflammatory disease, once recognised, should be treated exactly as in the non-pregnant woman, by emollient and astringent injections, by vitality-modifying caustics—such as nitrate of silver, nitric acid, or acid nitrate of mercury. In the third and subsequent months of pregnancy ulceration of the cervix uteri is apt, as I have stated, to be attended with the formation of fungoid granulations, which bleed on the slightest contact. This bleeding, indeed, is so free, that the mineral acids, cautiously used as they always should be, are of no use at first; they are washed away by the blood. The best plan is to introduce the full non-expanded speculum, so as to cover the granulating surface; and then to work a piece of solid tough nitrate of silver over the granulations, so as to form a kind of blood and caustic magma over the surface. This can be washed away with wet sponge before the speculum is removed. Two or three applications of this kind, at five days' interval, will generally clean the granulating surface, destroying the fungoid granulations, and leaving a clean ulceration; and then we can use the nitric acid, or, rather, the acid nitrate of mercury, after seven days' interval. The cicatisation generally proceeds rapidly, more so than in the non-pregnant woman. The use of the nitrate of silver is always followed by free bleeding for several days, which I meet by strong alum and zinc injections; that of the acids never occasions bleeding, but is generally followed by a serous discharge.

I may incidentally mention that, when I first went to Paris in 1836, forty-four years ago, I found the acid nitrate of mercury generally applied in the hospitals to ulcerated states of the uterine neck, as also to the fauces and elsewhere. It was preferred to pure nitric acid, because it did not fume, and because it was thought to be a better detergent. I myself tried all the acids, especially the nitric and the acid nitrate of mercury, and abandoned the habitual use of the former for the reason given, which I thought correct. But I have, during all my professional life, used pure nitric acid whenever I had not the other at hand. I explained these facts at length in the second edition of my work (1848), describing the application of the acids in the uterine cavity. Thus, the use of fuming nitric acid, either to the cervix or to the uterine cavity, cannot be said to have originated with the Dublin School of Gynaecology. I may add, that I have never once, during forty-four years' experience, seen a case of salivation from the use of the acid nitrate of mercury, although I have seen it applied, or applied it myself, I may say, thousands of times. Such cases have occurred, but so rarely as to be merely curiosities of medical practice.

When the cervix is healthy, but the uterus itself is the seat of disease, of partial localised chronic inflammation, the knowledge acquired by examination, although valuable, does not lead so directly to curative treatment. The region of the uterus, which is the seat of disease, not being accessible surgically, we are confined, in a great measure, to general treatment, and to expectancy. It is a valuable factor, however, even in general treatment, to be aware of the nature of the case, to be acquainted with the exact cause of the "laborious pregnancy", and of all its painful symptoms. We are both forewarned of, and forearmed against, all the accidents that are likely to take place in the nine months' journey of a damaged vehicle, with the tire off, the spokes broken, or the axle-tree damaged.

In these cases, as in those of simple cervical disease, unaccompanied by hæmorrhage, I have repeatedly applied leeches to the cervix, when unacquainted with the existence of pregnancy; and that not only without any harm resulting, but with decided benefit. Still, I am not prepared to advise their application as a means of treatment in such disease, even in the early months of pregnancy. I consider such a course allowable, but each case must be judged by itself.

In the obstinate sickness of pregnancy, it has always been a rule with me to examine the uterine organ, if ordinary medicinal treatment failed to control it. As already stated, I have generally found the above described morbid conditions of the cervix uteri accompanying, and evidently occasioning, the sickness. I say evidently occasioning, as, all but invariably, their removal has been followed by the subsidence of

the sickness. Sometimes, this result has been obtained by the application of the solid nitrate of silver to the cervix and to its cavity, when there has been merely erythematous inflammation of the mucous membrane. I have said to the cervical cavity, because I have never hesitated to apply either the solid nitrate of silver, or the mineral acids, to the cervical canal in pregnancy, if clearly required. I have never used the stronger caustics, my cylinders of potassa fusa, or the actual cautery, to a pregnant woman; I should fear the shock to foetal life.

I would here give a practical hint to those practitioners who may think proper to follow in my footsteps. It is well to tell the pregnant patients, when surgical examination and treatment of the uterine organs are initiated, that the foetus is perhaps dead at the time, or may die later, notwithstanding all our efforts to save it. Such being the case, if abortion, with or without hæmorrhage, occur during treatment, it must not be attributed to the means of treatment used, but to the actual disease for which it is resorted to. Such a statement is perfectly true, and saves the practitioner from the imputation of having occasioned the abortion, should it occur. I have saved the life of scores of foetal children by the adoption of the above sound and rational treatment; but I have also had cases in which abortion has occurred during my ministrations, and in which this simple precaution has saved me from blame.

The following case, which occurred to me last winter at Mentone, will illustrate in a forcible manner some of the facts above described.

I was applied to in February, by a Polish lady, "to bring on abortion". She was thirty-six years of age, the mother of several children, and had nearly lost her life a year before, at Warsaw, from uncontrollable sickness, and constant and profuse hæmorrhage, during pregnancy. She had the best consulting advice to be obtained at Warsaw; and, after every ordinary means had been tried in vain, abortion was induced at the end of the sixth month to save her life, as she was rapidly sinking. She came south, partly to recruit. When she sent for me, she considered herself about three months gone, and had had bleeding for a month. Latterly, the loss had been hæmorrhagic, and she was becoming anæmic. There was constant sickness, and she was blanched and weak. All these facts were placed before me by her relatives, and my assistance demanded on the lines laid down by her previous Warsaw physicians. I refused to accede to the request until I had ascertained that such a course was imperatively necessary, demanding an examination. This was allowed; and I found a hypertrophied cervix, with fungoid bleeding ulceration. These lesions were treated as described. In a fortnight, the bleeding ceased entirely; in less than a month, the sickness had ceased; and in two, she was quite well, and in fair general health—five months gone in a then all but normal pregnancy; the foetus vigorous. She left me to go home in this state in April; and has since been happily confined of a live healthy child. Her obstetric physicians at home were much surprised at the treatment of her case, and at the results.

The existence of inflammatory lesion of the cervix or uterus, at the time of parturition, does not give the accoucheur any particular clue for any special treatment; but it prepares him for accidents. He should know that he has a bad case in hand; that rigidity of the os; slow, painful labour; laceration of the cervix; hæmorrhage, during or after parturition; adherent placenta; metritis; ovaritis; hæmorrhagic, purulent, long-continued lochial discharges—in a word, a bad labour and a bad getting up may be expected, in the natural course of things.

Such women often do well, however, for two or three weeks after their confinement, and then flag, and become weak, feverish, and ill. Six weeks or two months after their confinement, as I have stated, their uterine condition should be carefully investigated; and, if any disease exist, it should be treated and cured before they are restored to their ordinary duties, as I stated at the commencement of this essay. By always following this course, when actively engaged in midwifery practice, I shielded my patients from the illnesses which often follow confinements. In ordinary practice, I believe the accoucheur takes leave finally of his patients three weeks after the confinement, and hears no more about them.

Such are my opinions; such has been my practice. Both being, however, well known to the profession through my published works, I should not have now brought them before the Association, had I not reason to believe that they are not generally known or followed in obstetric practice. I am anxious to contribute, as far as lies in my power, to establish a code of doctrine for obstetricians in general, with reference to the questions I have discussed.

SLIGO WATERWORKS.—These works are rapidly progressing, and the sum of £28,000 (the money which will be expended) will be found to be ample for all necessary purposes.