When mammary abscess occurs after lactation has been carried on for several months, this is almost certainly because the system has been so reduced that it is no longer fit to keep up the function.

Simpson described (*Med. Times and Gaz.*, 1861) *super-involution of the uterus* as a morbid state the opposite of *sub-involution*. It is produced when the disintegrating process set up after delivery goes on to such an excessive degree as to reduce the uterus to a size decidedly below its normal dimensions in the unimpregnated state. He relates a case of a woman aged 20, who never menstruated after her first labor. Two years after labor she was admitted to the Edinburgh Infirmary. There was amenorrhœa, great constitutional disturbance, frequent attacks of diarrhœa, which she believed to be most severe at recurring monthly intervals, the dejections being sometimes tinged with blood. The mammæ were shrunk and flat. The uterus was small; its cervix much atrophied, os contracted. Sound penetrated 1.5″. Albuminuria and dropsy preceded death. The uterus was one-third below the natural bulk; the ovaries were atrophied, showing no Graafian vesicles.

Sometimes atresia from cicatricial closure of the uterus is followed by a true amenorrhœa—not simply retention. Dr. Lizé reports such a case in the *Union Médicale*, 1863. The uterus seems to become atrophied from obstruction to the performance of its functions.

In various parts of this work, this process of hyper-involution or premature atrophy is referred to. I believe it is far from uncommon. Sometimes, as in the case quoted from Mr. Walter Whitehead (see p. 411), it may go to the extent of removing the uterus.

I have encountered it sometimes with partial success by the use of the galvanic pessary.

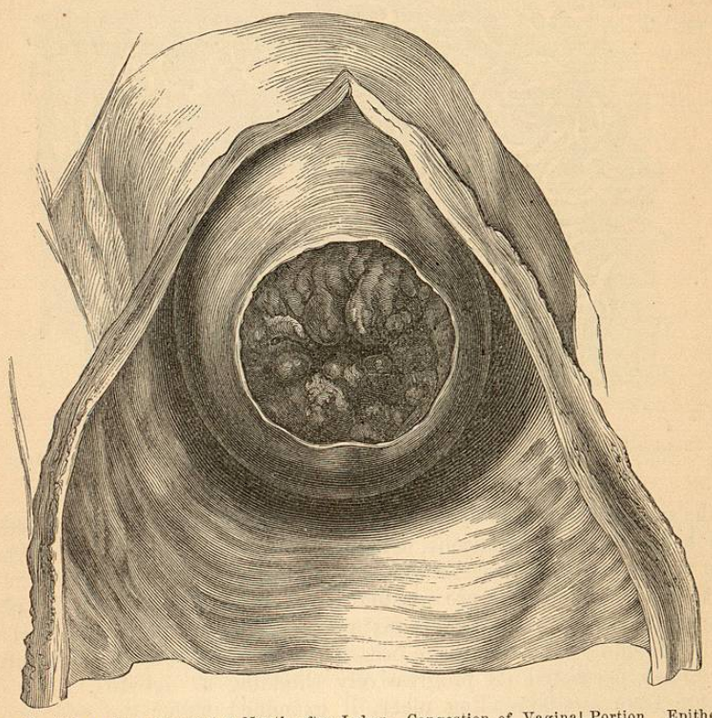
RESULTS OF INJURY TO CERVIX UTERI DURING LABOR.

If we pursue the clinical, and, in this instance, the historical order, in the study of the most common morbid conditions of the uterus, we shall find succeeding the first stage of tumefaction, ecchymosis, and congestion of the mucous and sub-mucous tissues of the cervix, and the shedding of the bruised epithelium, the following condition. The whole cervix, especially the vaginal-portion, is sensibly enlarged, tumid, gorged with blood, œdematous; for a definite area around the os, the part is bared of epithelium, giving a pulpy granulating appearance to the part; this part is further divided into lobes or prominences, the result of the small lacerations which took place during the passage of the child; this bared part is red, angry-looking from the villi being full of blood, bathed with viscid and purulent-looking secretion; the part of the vaginal-portion, beyond the line of epithelial denudation, looks bluish-red, owing to the gorged bloodvessels being seen through the epithelial investment. The vaginal-portion in this state easily bleeds under examination, under coitus, and under any exertion or emotion. Leucorrhœa is generally copious. Lumbar pain is constant. General prostration certainly attends. Some degree of prolapsus is rarely absent.

A similar state exists throughout the cervical canal. The rugæ are prominent, bared at least in part. The surface is bathed in viscid, clear,

or turbid mucus. The canal is more patulous than usual. Intensely vascular, and the vessels badly protected by delicate new epithelium, which is being shed as fast as formed, the intra-cervical surface easily bleeds, so that metrorrhagia is common. All this can be easily seen through the metroscope, or even in part through the bivalved speculum, whose blades, made to diverge, open the os externum. At this stage the

Fig. 101.



Shows Condition often observed a Month after Labor. Congestion of Vaginal-Portion Epithelia Denudation around the Os (R. B.). (From Nature.)

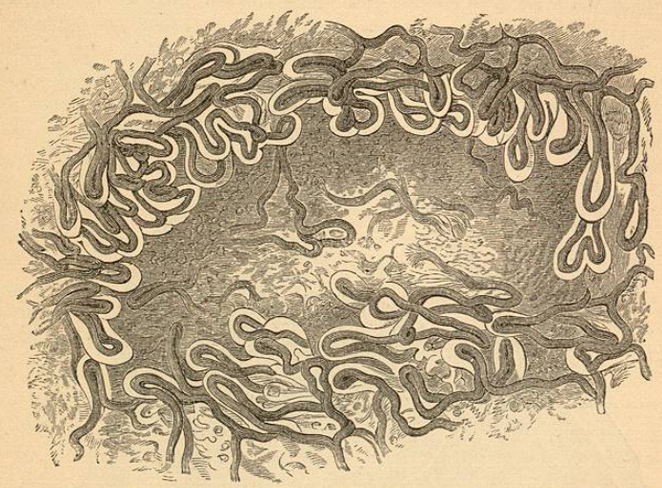
glands on the vaginal-portion, sharing in the local congestion and inflammation, are apt to get obstructed. One may often see them as dark-red nodules shining through the granulations bared of epithelium. These persist often after the surrounding structures have recovered, and may become the foci of fresh irritation. They may be cured by lightly pricking them.

Some of these objective conditions are fairly illustrated in Fig. 101, drawn from Nature from a case observed about a month after labor. This drawing shows also the enlarged relaxed state of the fundus of the vagina which attends this stage of the affection. The microscopical condition of such a case is represented in Fig. 102.

By some this condition is called "*inflammation*;" and the state of the os uteri, bared of epithelium, is called "*ulceration*." In some cases,

undoubtedly, inflammation intervenes; and the question of ulceration is one of doctrine. What is ulceration? If we consult the most recent authorities for an explanation, we find Simon (Holmes's *System of Surgery*) defining ulceration as a destructive process of inflammation: "It

FIG. 102.



Showing Loss of Epithelium, leaving Villi of Os Uteri bare, and partially Eroded. (After Hassall and Tyler Smith.)

is the process by which holes are made through the surface-textures of the body (cutaneous, mucous, articular, or serous), and hence perhaps into deeper parts; a process which differs from gangrene mainly in the fact that it proceeds more gradually and molecularly. At the place where an ulcer exists, the absent texture perished as truly as by gangrene; but while gangrene would have occasioned its abrupt separation in mass, ulceration permitted its progressively shedding as detritus. The discharge from any spreading ulcer, if examined under the microscope, invariably exhibits particles of disintegrating tissue; and the so-called foulness is but gangrene on a smaller scale."

Macleod (Cooper's *Surg. Dict.*, 1872) gives a similar explanation. He says, "Ulceration is a result of inflammation, and consists in the molecular death and removal by minute disintegration and solution of the superficial vascular particles of the inflamed part. There is a minute atomic division of the particles of the affected tissue, and these molecules are removed in the 'ichor' or discharge which escapes from the surface of the sore or 'ulcer' which forms. The terms desquamation, or excoriation, or abrasion, are applied to the removal of epithelium alone, while ulceration implies a deeper penetration of the destructive action."

If we next examine what is meant by inflammation, we find Simon giving the following account of what takes place in this process:—

"The capillaries allow fluid to sweat through their coats from the liquor sanguinis to the tissues. In this way they minister to growth. If the

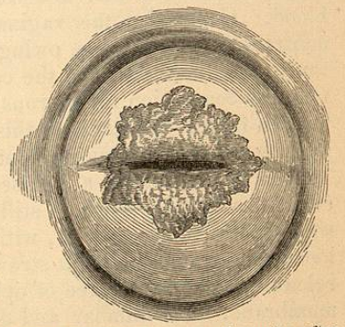
membrane be ruptured or dissolved, normal transudation is at an end, and capillary hemorrhage takes place.

"The arteries are more relaxed, carry a profusion of blood. The veins carry more blood than usual; but not all that the arteries carry into the tissues: something is left behind in the tissues."

Now, in the typical case before described, is there not greater relaxation of the arteries? do they not visibly carry more blood? do not the veins carry more blood? and is there not something left behind in the tissues? It is impossible not to answer all these questions in the affirmative. And so of ulceration: is there not gradual shedding of tissue as detritus? does not the discharge exhibit particles of disintegrating tissue? is there not a hole through the mucous surface-texture? Or is this breach of surface the result of gangrene? According to the historical and clinical points of view from which I have regarded the condition, it appears to be a combination of the two processes of gangrene and ulceration. The first step is traumatic; the mucous membrane is really killed by the bruising it underwent, and the partial severance from the deeper textures upon which it grew. Hence it is cast off by a process which cannot be distinguished from gangrene. It is remarkable that the area of epithelial denudation is almost always strictly limited.

There is a more or less indented irregular line of demarcation where the epithelium stops abruptly at a distance of about half an inch from the centre of the os uteri. This line represents accurately the extent of the mucous surface which fell under the crushing of the passage of the head. The fissures very seldom go beyond this line. Nor does the area of denudation tend to spread beyond it. In this respect the case differs from that of surface-ulceration. If there be ulceration it must be by destruction of tissue within this circumscribed area; that is, in depth. Of such action, however, there is usually very little. Probably the eroded appearance of the bared villi accurately, as I know it is, represented in Hassall's drawing (Fig. 102), is also due, like the casting of the mucous surface, to traumatism and necrosis. I do not think that the destructive process is commonly progressive in depth any more than it is in superficies. The process is essentially and truly one of repair; often, indeed, arrested by the excess of congestion of the part, and by the general blood-degradation of the system. But still it is a rare event for this process of arrested repair to pass into the opposite condition of extending destruction. The hypothesis of ulceration has been favored by the aspect of the denuded part, which strikingly simulates that of a granulating ulcer on the skin. But the observations and figures of Dr. Hassall, in Tyler Smith's *Memoir on Leucorrhœa*, conclusively show that the apparent granulations are really the projecting villi jutting out irregularly on the surface, hav-

FIG. 103.



Epithelial Abrasion several weeks after Labor. Tendency to Hypertrophy. (R. B.) (Ad. nat.)

ing lost the projecting epithelium which bound down smoothly all surface inequality.

After all, it may be said, this is a dispute about words. A condition which so closely corresponds to the classical definition of ulceration may fairly be called ulceration. This might be conceded, were it not that the common, vulgar as well as professional, conception of ulceration embraced the idea of a spreading, eroding action; and that thus the word bears a more formidable significance to the patient than the reality justifies. Now, we all know that the morbid surface is not so affected. There is a bared, secreting, easily bleeding surface trying to heal. It is often slow to heal. It may take weeks and months to recover its normal investment of epithelium; but during all this time ulceration cannot be said to go on, otherwise than in the most languid imperceptible form.

But another process is certainly going on. This is exudation. The gorged vessels, through which their contents are only imperfectly propelled, leave something behind in the tissues. "Exudations," says Druitt, (Article "Inflammation," Cooper's *Surgical Dictionary*, edition 1872), "cannot remain dormant. They rapidly undergo changes either in the way of development or degeneration." In this case the tendency is towards development. This means hyperplasia and hypertrophy. The connective tissue, or fibrous tissue of the cervix especially, becomes increased in quantity; the cervix becomes after a time denser; it elongates. This latter part of the process, the conversion of exudation into permanent tissue, may be averted by subduing the vascular engorgement, and healing the denuded surface.

The *treatment* of this condition has been described in the preceding chapter. It consists essentially in "rest," tonics, good diet, and local astringents.

If a cure be not effected at this stage, the case will often become more obstinate. The natural tendency to heal can hardly be trusted to if the powers of the system are sensibly reduced. If there be evident anæmia and attendent impairment of nutrition, repair cannot be expected to proceed in a part exposed to constant disturbances, and periodical fluxes of blood. Generally, the vaginal-portion loses in bulk; some degree of contraction takes place, owing to the absorption of the fluid element of the exuded material, and the condensation of the plastic element ensuing upon its conversion into fibrous tissues. The abraded area looks smaller, and, in fact, is smaller, but this is often not so much the result of actual healing, as of the general contraction of the vaginal-portion. (See Fig. 103.) There is still a free secretion of mucus, viscid, coming from the cervical cavity. There is still more or less vascular engorgement, and some infiltration of tissue, with recent exudation. The denuded area looks red, granular, like a strawberry or raspberry. The vagina is still relaxed, and some degree of epithelial shedding goes on from its mucous membrane. The lumbar and dorsal pains persist. There is often pain in the seat of one or other ovary, generally, as Bennet says, in the left.

The *treatment* is still the same as for the earlier stage. The denuded surface should be lightly touched every five or six days with nitrate of silver, or tincture of iodine, and the like application should be made to the interior of the cervical canal. Occasionally the solid sulphate of zinc may be substituted. Vaginal lotions of zinc, alum, bark, or tannin should be used daily. If there be any prolapsus, a Hodge pessary will be of essential service in maintaining "rest," and diminishing the local engorgement.

Under this treatment, the denuded surface will often get covered in in a few weeks, and the excessive vascularity will be reduced. But exudation has taken place; and exudation has been followed by new growth. This hypertrophy, or hyperplasia, even although not attended by much increase of bulk, so as to induce prolapsus, or dragging, or pressure upon surrounding organs, is almost always attended by irritation, which keeps up increased attraction of blood, hypertrophy of the glands, and free leucorrhœa. Pain continues to wear the nervous centres. Healthy nutrition is impeded.

At this stage, the application of potassa cum calce, or the actual cautery to one or the other lip of the os uteri, will often exert the most beneficial influence. The mode of applying these agents will be described under the treatment of chronic metritis.

The further history of hypertrophy, or fibroid degeneration of the cervix uteri, will be traced in connection with that of prolapsus.

CHAPTER XIX.

CONDITIONS MARKED BY ALTERED VASCULARITY OR BLOOD-SUPPLY: FLUXION; HYPERÆMIA; CONGESTION; INFLAMMATION; METRITIS; ENDOMETRITIS OR UTERINE CATARRH; TUBERCULAR AND SYPHILITIC ENDOMETRITIS; INTRA-UTERINE MEDICATION; CYSTIC ENDOMETRITIS; SOFTENING AND INDURATION OF UTERUS; SENILE CATARRH.

THE vascular system of the genital organs and the proportion of blood supplied may be in excess or deficiency.

The conditions characterized by excess may be distinguished as—1. *Fluxion or simple determination of blood.* 2. *Hyperæmia.* 3. *Congestion or Engorgement.* 4. *Inflammation.* The conditions characterized by deficiency are summed up in *Anæmia.*

Whilst fluxion, hyperæmia, or congestion may each stop short, inflammation implies the previous existence of fluxion and congestion. It may be regarded as the climax of the first three conditions.

1. *Fluxion* in its simplest form may be defined as a transitory flow of blood to the parts. One example of it may be compared to the rush observed in the cheeks under the emotions of shame or anger. The uterus and ovaries are certainly subject to similar determinations of blood under