imbedded in, and terminate by open mouths upon the surface of, the skin. These glands are formed of convoluted tubes, which are supplied freely with vessels, and through their excretory duct the perspiration is thrown off from the body. But in birds no such apparatus as this has been discovered, consequently this class is not susceptible of the cooling effects of evaporation. De Blainville says, "I am not acquainted with a single bird that perspires through the skin." (*Cours de Physiologie Générale et Comparée.*) Indeed, not only is the perspiratory apparatus absent in birds, but a provision exists whereby their temperature is preserved—the feathers. Is not this, then, an important source of the striking difference of temperature in some of the mammalia and birds? There are certainly many circumstances which demand investigation in connexion with this question, especially the extent to which birds, like the dog, have the power to cool their bodies through the mouth and fauces, but since such a means of cooling is chiefly in relation with heat engendered by exercise, while the temperature of animals is supposed to be measured for scientific purposes during repose, it is not materially affected in its proposed bearings.

But the application of this question is not limited to the above considerations; it comes in aid of a far more extended review of the subject. If, as the high authorities admit, a larger quantity of air is deteriorated during respiration by birds, than mammals, in proportion to their organization; if, consequently, a higher temperature is generated in the former, (a more complete decarbonization of their blood taking place,) how, but by the absence of a perspiratory system, and addition of feathers, could a temperature raised to so high a grade be sustained? It is well known to physiologists that the temperature of the mammalia is but little raised by exposure to heat; a fact only to be accounted for by the effects of evaporation.

NOTES AND ILLUSTRATIONS OF THE DISQUISITION ON PUERPERAL FEVER.

By EDWARD BLACKMORE, M.D.

(Continued from page 355.)

From a study of the facts which I have seen, and of the testimony and opinions of writers of the highest authority, I derive the positive conclusion, that the disease is truly an exanthematic fever, (although the period of the origin of the febrile element is not always well marked, and the local element appears often to be coincident with it,) the efflorescence being situated in the abdomen, instead of the skin or lymphatic glands, as in other exanthemata.

2d. The local inflammation is of the erythematic species; and not merely erythematic, as modified by peculiarity of the constitution of the individual, or by

the peculiar natural circumstances of the lying-in state, but by the specific exciting cause. The lying-in state does probably modify all inflammatory diseases. Phlegmonous inflammation may never appear in that condition as it does in other females and in the male. But in puerperal fever the inflammation is, I think, never phlegmonous, although the practical fact is established, that in a few cases of this disease, in certain epidemics, as at Leeds, large bleeding, and other means of lowering vascular action are successful. The distinction of the species of inflammation given by nosologists, as Cullen, is not a refined pathological speculation; we see, indeed, both in the phlegmonous and erythematic, enlarged blood vessels, a congestion of blood, effusion of serum and of other humours, and gangrene; yet the difference is highly practical. Its diffusiveness and attendant effusion chiefly mark the erythematic species; and these are the grand characteristics of the puerperal inflammation. The erythema may be attended by high action of the vascular system, as in the case styled phlegmonous erysipelas; but the action is not so powerful, nor so long sustained, as in the phlegmonous species. In puerperal fever the inflammation is always high, if a tendency to extensive and extreme congestion and effusion, and suppuration and gangrene, be considered a criterion of its measure; but the powers of the constitution are quickly exhausted; and this is the feature which distinguishes the puerperal-fever local affection from other puerperal inflammations.

Dr. George Fordyce, who, as a pathologist and practical physician has not been surpassed by many of a later age, says, "That erythematic or erysipelatos inflammation differs from phlegmonous more than any two varieties of the same disease differ from one another. It is a spreading inflammation, with weakness and irritability, and relaxed vessels. The phlegmonous is circumscribed and attended with irritability and strength and tone. The difference of the two species is not a difference of the parts affected merely; there is a great irritability in both; tonic in one, atonic in the other. The erysipelatos tends to the effusion of serum rather than of pus: it takes place in weak habits. When the specific disease called erysipelas takes place in strong habits, it is of a phlegmonous character. The erysipelatos inflammation is more common in great towns and warm climates; and in the autumn; and in weak irritable habits. It is this sort of inflammation that takes place in violent fever, (*i. e.* typhus.) Both phlegmonous and erysipelatos inflammations are found in the interior of the body. In the erysipelatos there is swelling and redness of the part, but not so circumscribed as in the other species; and the redness is more intense; it shifts itself from one part to another, and there is soreness rather than pain; the parts are very tender.

"It produces symptoms of great irritation in the system, and depression of strength, frequency of pulse, without fulness or hardness. It terminates in effusion of serum, and in gangrene. In cold weather, and in stronger habits, it approaches in character to the phlegmonous. In pure erysipelatos inflammation, bleeding does no good in general. It does not diminish it, but by increasing the irritability of the system, makes it more apt to end in gangrene; and purging is apt to produce metastasis of it to the intestines, which

generally proves fatal! Topical emollients are hurtful in erysipelas; astringent and sedative applications, with alcohol, are useful. Bark, which takes off the irritability of the system, takes off the irregular erysipelatous inflammation, and prevents its metastasis. This sort often arises in nervous and violent fevers. Stimulants, by increasing the action of the whole system, take off this inflammation from the part affected."

I shall be pardoned in quoting these extracts on the elements of pathology to practitioners, because at the bed-side the different nature of cases really inflammatory is often lost sight of.

It is clear that Dr. Fordyce regarded the inflammation in puerperal fever, although he does not use the name fever, as of the erysipelatous kind, the properties of which are fully exemplified in that disease. He did not place the fatal puerperal affection among fevers, either pure or exanthematous, in his course of lectures, but among topical inflammations, representing it as peculiar in its character, and practically different from common inflammation. He considered the uterus the chief seat of the disease. He says nothing of a specific contagion as the exciting cause, but that it is connected with suppressed lochia, and that it is a disease only met with in puerperal and miscarriage women. His view of the nature of the local part of the disease,—an erysipelatous inflammation, which induces extreme constitutional irritation and depression of the vital powers,—is confirmed by all subsequent observations, and it is practically a most important doctrine; yet it is not unimportant to determine also whether this be the whole of the disease; if it is, it would not indeed disprove the contagiousness of the disease, but the range of the contagion would then precisely resemble that of hospital gangrene,—communicable by inoculation, and also capable of becoming a very confined atmospheric influence. The facts on this question, however, appear to constitute strong presumptive evidence, that the disease arises from a poison which assumes a gaseous state, and spreads and operates beyond the range of personal communication with the sick; and then the disease must be essentially a fever, of which the local inflammation is an invariable accompaniment, though not properly an effect of the fever alone; some peculiar circumstances of the puerperal state may be the cause of the disease in the system concentrating itself so powerfully in the uterus and intestines; and yet it is also possible, that this poison has an elective affinity with those parts, just as that of variola has with the skin. As to the treatment of the disease, Dr. Fordyce's pathological view and that set forth by Dr. Gooch, Dr. J. Clarke, and others, and adopted by me, may have nearly the same bearing, or the doctrine of the former might make us more urgent in the treatment of the local affection.

How far the local disease in puerperal fever, in any case or any epidemic, may partake of the phlegmonous disposition, must be determined by considering the constitution of the patient, the season of the year, and the character of associate diseases. I have not observed that this malady is ever prevalent when sthenic diseases have been rife.

The seat of the local affection has a slight relation to the essential character of the disease; the practical nature of a case is not altogether, nor even chiefly,

determined by the texture affected. The uterus alone may be inflamed; its several textures may be distinctly affected; or this organ may be sound, and the serous and mucous textures of the intestines be inflamed; the state may be one of simple vascularity, or of congestion with effusion, or of gangrene and vascularity; and with these various morbid conditions, the cases may be, in a practical regard, the same sort of cases. Possibly, a real though slight difference in the nature of the cases does exist, when the mucous membranes are more affected than the serous.

Anatomical statistics of the cases, founded on a view of the morbid appearances taken severally, appear of smaller value in a pathological regard, than a view of the various lesions taken in connexion; *e. g.*, the relation of effusion to inflammation of the intestinal peritonæum; that of uterine phlebitis to disease in the mucous membrane of the organ, which produces morbid humours, by the absorption of which the veins become inflamed; the connexion of gangrene in the ovaries and uterus with softening of the solid abdominal viscera; and the relation of disease in the interior of the uterus to the formation of abscesses in the cellular tissue of the trunk and limbs, and in the lungs and liver.

There is a striking similarity in the morbid appearances of the various cases of an epidemic, as Dr. Lee has well remarked. In one epidemic the general peritonæum is chiefly inflamed; in another the substance and veins of the uterus; and the cases in which the former condition is seen presented more of a sthenic inflammatory character, and the latter was connected with a typhoid aspect, and is generally that form seen in hospitals. These varieties of epidemic character are attributable to certain atmospheric conditions then existing, and to local circumstances that favour the concentration of the exciting causes of the disease.

The relation of puerperal fever with erysipelas is so important, that further remarks on it will not, I hope, be thought tedious. It has been already observed that these diseases have prevailed together in the same hospital, and the same district of a country; a fact which if it do not establish a positive identity of the affections, certainly points out a great similarity in their remote causes. It has also been observed by Dr. Lee, I think, that when puerperal fever was prevailing, children attacked with erysipelas were very liable to peritonæal inflammation, which supplies analogical evidence of the erysipelatous nature of the puerperal inflammation. Yet, I do not conclude that every puerperal case of peritonæal inflammation, incident when erysipelas is prevailing, is either erysipelatous or an instance of puerperal fever. We have simple puerperal peritonitis, which is very like peritonitis in the male sex, (allowing, that is, for the modifying influence of sex and of the puerperal state,) from ordinary exciting causes. But, so far as my observation has gone, when erysipelas was prevailing, most cases of abdominal inflammation in both sexes were modified in character. No one, probably, has ever seen a case of peritonitis in the male which exhibited all the usual phenomena of puerperal fever, and which could be attributed to the poison of erysipelas. The following is as exquisite an example of internal erysipelatous inflammation in the male, as has ever occurred to me:—A negro, aged 27, subject to abdominal pains.

referrable to a reducible hernia, was attacked July 16, 1827, with acute pain in the head and epigastrium. On the 17th he took two doses of ipecacuanha wine, which vomited and purged him; on the 19th he walked to my house, complaining of the same pain, more acute in fits, with vomiting and purging; the tongue white; the pulse not to be felt at the wrists. Eight leeches, effervescing salines, and a poultice. 21st, ninth day of illness, a convulsion in the night; the vomiting and purging stopped since the remedies; much pain in the epigastrium; a feeble pulse; a dry white tongue; little heat of skin; urine high coloured; restlessness; the leech-bites still bleeding. Small doses of calomel and an aperient. In the evening, convulsions, apparently from severe stomach pains; respiration very quick; belly very tender; sweating; great thirst; no stool. Senna tea given. Then delirium, and death in a few hours. He was ill only seven days; confined to bed only sixty hours!

Inspection.—The abdomen very tumid and elastic; much air in the peritonæum, and in the stomach and intestines; a diffuse livid vascularity at the exterior inferior part of the stomach, duodenum, and jejunum. The mucous coat of these parts, and of the colon, softened, thickened, and of a leaden hue, in some parts like the soft polypus of the nostrils; the secretions of the alimentary canal very morbid; the right lobe of the liver very soft, and of a leaden hue; the left more healthy; no hernia down.

This is a strong case of what may well be styled a malignant disease. The summer was unhealthy, and I believe that erysipelas was then prevailing. The resemblance of the morbid appearances in this case to the more malignant form of puerperal fever, is very obvious, and tends to confirm the doctrine propounded of the specific nature of the local affection in that disease. The practical fact is, that the local inflammation in puerperal fever, whatever organ or texture it affects, will not often bear the remedies of common puerperal peritonitis or hysteritis.

I would repeat my conviction, that the general character of a case is not derived from the inflammation being seated in any particular organ or texture of the abdomen; *e. g.*, in the case of disease in the interior of the uterus, "the anxious countenance, the suppressed or foetid lochia, the nervous prostration that may even supersede the symptoms of the uterine disease," are not referrible so much to the textures inflamed as to the character of that inflammation, which is in such cases more purely asthenic and erysipelatous.

The symptoms which are said to mark inflammation of the veins and absorbents of the uterus, *e. g.*, "lochia suppressed, rigors, vomiting, general uneasiness, hurried breathing, a saffron colour of the body," occurred in one of my cases in which the fibrous substance only of the uterus was softened and dark, and the ovary gangrenous.

Admitting, however, the general coincidence of the synochal form of the constitutional affection with peritonitis of the uterus and its appendages, and of the intestines; and the coincidence of the typhoid form with disorganisation of the uterus and inflammation of its veins and absorbents; the connexion of these various phenomena is not so invariable as to constitute a pathological relation. That is, the typhoid form of a

case is not the effect of the inflammation of the veins and fibrous and nervous texture of the uterus, but of the specific nature of the inflammation, as derived from the modifying influence of the individual constitution, and the accumulation of the morbid poison from which the disease originated. The constitutional affection, whether it be primary or secondary, will be of a corresponding character with that of the local disease, as is seen in the case of other diseases from morbid animal poisons; but it does not appear to be merely the result of the local affection; it certainly appears as a minor element until the local affection has become severe, and then it does appear to be from sympathy with the suffering parts. The shock to the nervous system, which some pathologists regard as the primary and greatest element of the disease, is shown at first only by the shivering, and some undefined uneasiness, before the pain and vomiting indicate that the abdomen is suffering. If the exciting cause be a gaseous animal poison, introduced first into the general circulation by inhalation, or by absorption from the mouth and stomach, (the infected saliva having been swallowed,) it would excite a primary fever, as in the case of the exanthemata; but if the poison be introduced per vaginam, one would suppose that, like inoculated hospital gangrene, it would cause a specific local disease, on which the constitutional affection would be an attendant and consequent. Thus it is seen, that the pathology of the disease and the question of its origin are mutually connected. The ascertaining of the exciting cause, therefore, has an important bearing on the pathology, as well as on the prevention of the disease. If it is from an infection, like the plague, it is like it, an exanthematic fever; and the high probability of such an origin, combines with the slight evidence drawn from the order of the symptoms, to confirm this view of it—when the extensiveness of the disease in various organs and the type of the symptoms are inadequate *per se*, to prove that it is not simply a local erysipelatous inflammation, as in the ninth of my published cases, and the evidence on the origin of the disease also shows that it is a fever specifically different from synochus and typhus, attended with a local inflammation from some natural or peculiar circumstances of parturition, as Dr. Osborne seems to have thought it. This source of evidence regarding the pathology would indeed be lessened if it were shown that erythematic inflammation of the peritonæum in puerperal women has existed, which could not be referred to contagion, *i. e.*, not merely when contagion was not ascertained, but when it must have been excluded. Has a disease, bearing the character of puerperal fever, ever shown itself in a single instance only at any time in one town, or in one accoucheur's practice? The various single cases that have appeared in the journals appear to me not to supply a conclusive answer to the question, for many of them are evidently mis-named cases of malignant puerperal fever, as Dr. James Hamilton has said of similar medical reports in his day.