taken in the air to those found among plants and decaying vegetable matter, that with a power of three hundred diameters we readily detect a striking analogy between them. The *achorion Schönleinii* in particular, and many of the vegetable moulds recognised under the generic terms of *penicillium* and *aspergillus*, very closely resemble each other—in fact, are forms of the same family of fungi. The botanical characters of the *penicillium*, one of the commonest of the fungi forming and spreading itself as a greenish mould on decaying vegetable substances of all kinds, may be summed up in a few words. It simply consists of a mycelium of interwoven filaments, articulated and terminating in a plume-like head of minute globular spores, yellowish or bluish in colour according to age. The *aspergillus* of Greville differs only in some slight particular, the form of its spores, which are ovoid. These are borne in erect filaments, and terminate in irregular tufts. If the spores of either are sown on a glass slide and kept slightly moist, they quickly germinate, and their habits may be readily studied. On living plants they are more familiarly recognised by such names as *smut*, *brand*, *bunt*, etc. I have seen them converted into algæ, and grow in distilled water; and the mushroom spores differ only in size, being larger.

"Wonderful is the minuteness of the origin of these cryptogams; and when their spores find a proper nidus, wonderful is their development. The old sawn stump of a tree after a warm rainy night and showery day in autumn, will be found covered with agarics. We have seen a spotless verdant meadow in Glamorganshire covered within forty-eight hours with puff-balls, most of the individuals were as large as a man's head, and none were smaller than that of a child. Think of the power of cellular development able to produce such monsters in so short a space of time, from invisible particles of 'puff-snuff.' Such a development of this fungus is by no means unusual." (*Frazer's Magazine*, January, 1859.) We are told of snow covered countries being changed in a night from white to red by a *gory dew*, the *protococcus nivalis*, (red snow) of the northern regions. The muscardine of the silkworm is precisely similar to the species of fungus which infests the potatoe, the mycelium and sporules of which appear on the respiratory surfaces, when its fluids become acid. Again, the *mycophyton Cohnii*, found in the blood of the house-fly, appears externally as a mould; the first symptom observed is a milky appearance of the blood, and there is no doubt that an acid condition precedes or accompanies the production and growth of the *oidium* in muguet or thrush, as well as of vegetable parasites in skin-diseases.

The parasitic fungi found on animal structures resemble these and each other so closely, that it would be sufficient for my purpose to say that these also consist of cylindrical or flattened filaments, terminating in sporangia enclosing spores. But, to be more accurate, the following are the botanical characters of the *achorion Schönleinii* given by Robin. "The mycelium is soft, pellucid, floccose, filaments very slender, not jointed, very much branched, mostly fixed in a granular stroma; receptacle formed of thicker filaments composed of elongated cells somewhat branched, distinctly articulated, joints unequal, irregular, terminating in a sporidium; sporidia, round, oval, or irregular, germinating at one or several joints. It is closely allied to the *oidium*." The *microsporon mentagrophytes*, he says, differs from the *microsporon Audouini* only in the size of its filaments, and their ramifications; and the spores are somewhat larger. So that, whether we turn to animal or vegetable produced fungi, we are struck with the great resemblance they bear to each other. Another fact, which may in a degree account for the ravages of the fungi (a fact of great interest to the naturalist), is that the whole tribe give out carbonic acid and absorb oxygen, and they all contain a large proportion of nitrogen.

It cannot be denied that the single fact of the universality of distribution of the fungi, is of itself a very strong argument in my favour, and leads to the belief that they are ever ready to fix themselves where disease has set up disorganisation, or where, from other circumstances, the powers of life have become enfeebled. Should it not be as I have stated; then I maintain it still remains to be ascertained, how great a share these microscopic parasitic organisms have in the causation of disease.

But if we now turn to the etiology of cutaneous diseases, we find this simple fact; that when the spores of the fungi have become fixed, they take their food from the tissues (soil) which surround them, and perhaps extrinsically from the surrounding medium (the air); and the fitness of the soil is doubtless increased by humidity, which greatly assists in their germination, and is particularly favourable to all parasitic growths. Do we not find here also, an example of the law which must be obeyed, in the lowest forms of vegetable life as in the highest, whenever plants are to prosper; viz., "the choice of the locality depends upon the peculiar properties of the soil sought for or avoided by the various species of plants"? The species to which our attention has been particularly directed, make choice of the animal cutaneous surfaces; and a knowledge of all the circumstances which favour their growth, may enable us to arrive at some general theory of the treatment to be adopted. It appears that we have chiefly to look to a change in the soil in which they grow, and to bring that to a state in which they cannot thrive, to ensure the destruction of these parasites. What, may I ask, has been already done to effect so desirable an object?

Mr. Hunt's experience—and this has been very large—proves that, as a rule, we must not rely upon local applications to effect the cure, or even arrest the disease, without at the same time endeavouring to produce a blood-change. To improve the general health is also of the very utmost importance, and this can only be done slowly and by the most judicious application of our remedies. Perhaps, the best of all our therapeutic agents to employ in these diseases, one indeed based upon scientific data, both pathological and chemical, and for the safe and effective administration of which we are indebted to the researches of Mr. Hunt, is arsenic and its preparations. This drug appears to be a specific for most of the forms of skin-disease of which I have been speaking, although it is not always essential; for some cases of porrigo, mentagra, etc., even when infested with their parasites, have yielded to cod-liver oil, preparations of iron, with purgatives or alteratives, as the case may require, without any topical application whatsoever.

In conclusion, I have to call attention to the fact that there is no natural phenomenon more curious than that of parasitic life, both animal and vegetable. We find even the earth-worm haunted by a parasite (*gregarina*) living within and upon it; and numerous mollusks and insects with entozoa pertaining to each. It is not an anomaly we look upon, but a part of creative intent; an expression of that great design which makes organised life in one form everywhere subserve to the maintenance of another. Minute though these objects are, and inaccessible to all unaided sense, there is no part of natural history which strikes deeper roots into the secrets of the living creation.

Their universal distribution over the face of earth, air, and water, undoubtedly points to design; and it will be found that the fungi have a purpose to fulfil in the economy of life; and so far from being parasitic pests, as some look upon them, these, the lowest and earliest forms of life in the vegetable kingdom, have been from the beginning designedly intended to be what they certainly are, useful scavengers in creation: and thus ever are they to be found growing among disease and death, for no other purpose than that of removing all festering matters from the presence of the living, which if allowed longer to remain, must prove alike destructive to health and life.

Here also is presented for our admiration, a striking and curious example of the ever varying phases of life, and its resurrection from the ashes of decay and death. Nothing is allowed to remain idle, useless, or uncared for, in all the wonderful changes which are ever at work around us for the good of the whole, and for the purpose of maintaining this spot of earth in a state fit for the whole families of God's creatures. "All things indeed work together for their good"—and yet is the one fact constantly obtruding itself to our gaze; "that life is inseparably linked with change, and that every arrest is temporary death; and that only through incessant destruction and reconstruction can vital phenomena emerge;—an ebb and flow of being."

CASE OF PLACENTA PRÆVIA.

By CHARLES P. STEVENS, F.R.C.S., Biggleswade.

I WAS requested to see Mrs. Davis on February 26th, four miles distant, and arrived there at 2 P.M. She is the mother of four children. She told me that, for six weeks past, she had suffered more or less from sudden and great losses of blood, and for that period had not been free from hæmorrhagic discharge at any time. The full term of gestation was expired. Pains came on an hour before I arrived. They were now slight, and occurring about every ten minutes, with profuse hæmorrhage going on. The vagina was full of clots; the os uteri was

dilated to the size of a florin; the placenta was *centrally* presenting; and the posterior portion was *partly* detached from the cervix. The fœtal presentation was unknown. I plugged the vagina with lint saturated with cold vinegar and water, and applied napkins dipped in cold water to the vulva; and gave directions to the nurse to use pressure with her hand on the perinæum, especially during a pain. Six hours afterwards, at 8 P.M., I removed the napkins: there was no hæmorrhage. I administered a stimulant, and proceeded to remove the plug. Little or no hæmorrhage occurred, and very few small coagula followed. The os uteri was now dilated to the size of a small teacup, and very dilatable; the whole circumference was covered with placenta. I then adopted Dr. Barnes's method, by separating the *whole* circumference of the placenta from its uterine attachment as high up as I could reach with my index and middle fingers, having found it necessary to pass my hand gently into the vagina, from the os being highly situated. I did not resort to the plug after this, but waited. Pains continued regularly; there was no more hæmorrhage. On my next examination, I felt a portion of the posterior part of the placenta protruding through the os. I then felt for the presentation, but could not detect it until, by further separating the posterior portion of the placenta, I reached the membranes, and found it a footling case. I then immediately ruptured the membranes (a great quantity of liquor amnii escaping); and, pushing the posterior part of the placenta towards the anterior surface of the uterine cavity, I succeeded in seizing one foot, which proved to be the right; and with gentle traction secured it at the external orifice, though with the toes to the mother's abdomen. The strength of the mother and her good pulse induced me to attempt to save the child by delivering with one foot, as recommended by a certain high authority. Pains continued regularly; and, gentle traction being used, I gradually rectified the position of the child *in utero*, by rotating the thighs and pelvis so as to bring the toes towards the sacrum of the mother. Presently, the breech and the other leg were delivered: the umbilical cord still pulsated, and I, acting a little more briskly; the trunk, arms, and shoulders, were expelled, and, by depressing the chin and elevating the occiput, the head quickly followed, quite unattended with any amount of hæmorrhage. During this period, external pressure was kept up. The child sobbed slightly; and, on pursuing Dr. Marshall Hall's plan for resuscitation, it very soon gave auricular demonstration that it was alive: I then separated the funis. The mother's pulse flagging, I administered another small quantity of brandy; and, on passing my finger along the funis, I found the placenta detached, and lying in the vagina. By moderate traction, and making her use slight expulsive efforts, it came away with the membranes entire, and little or no hæmorrhage. On removing a few coagula from the vagina, I found the mouth of the uterus firmly and securely closed. The placenta was of the usual size; about a fourth of its maternal surface was dark coloured, with clots adhering, indicating where premature separation had taken place. I then proceeded to bind up the abdomen, and administered a drachm of tincture of opium, and left her to repose. In an hour's time, she complained of feeling faint. I administered a dose of ether and sal volatile, and saw her again before I left, when she was comfortable.

February 27th. I found the patient comfortable. She had passed urine twice. The lochia were going on, and not in excess. No further hæmorrhage had occurred. She complained of feeling light headed, and wanted sleep. I repeated the laudanum.

February 28th. She was going on favourably.

March 1st. She was going on favourably, except complaining of want of sleep. I ordered her to take ten minims of liquor opii sedativus at bed-time, and a dose of castor oil in the morning.

March 2nd. The pulse was quiet. The bowels had acted. The opiate procured rest. Light and nutritious diet was ordered. The mother and infant were doing well.

March 3rd. In every respect, the patient was going on satisfactorily. She had suffered very little from after pains. There was a good secretion of milk. The lochia were normal in quantity. Beef-tea was ordered.

REMARKS. By the use of the plug in the first instance, to gain time for more full dilatation, and then employing the means recommended by Dr. Barnes, there was much less hæmorrhage than I have witnessed in most cases of ordinary labours. The loss from the introduction of the plug to the completion of the labour, I can assert did not exceed eight ounces, if so much.

Transactions of Branches.

BIRMINGHAM AND MIDLAND COUNTIES BRANCH.

THE VITALITY OF THE TEETH, AND ITS RELATION TO CARIES.

By THOMAS HOWKINS, Esq., Birmingham.

[*Read February 10th*, 1859.]

MR. PRESIDENT,—I feel somewhat diffident in bringing before the notice of your Society any remarks connected with the physiology and pathology of the teeth. Not that the subject is by any means a barren or uninteresting one, but because, from some reason or other, it seems virtually to have been shelved by the great majority of medical men, or consigned over *in toto* to the care of the practitioners of dental surgery. It has often been a matter of regret to me that such should be the case; and frequently in practice I have seen the ill effects resulting from this neglect of the subject by medical men, in a want of that general knowledge of the various symptoms and effects to which certain diseases of the teeth are liable to give rise. It is no part, however, of my intention to bring before you anything relating to the diagnosis or therapeutics of the diseases coming within the domain of dental surgery, but rather to present for your consideration some thoughts relating to the vitality of the teeth, and the part this plays in that pathological condition known as dental caries. This question of the vitality of the teeth has been a more fertile source of controversy than has perhaps any other in dental physiology, and certainly there is none which has given rise to more erroneous theories of dental caries. Perhaps, at the outset, you will just allow me to recall to your recollection the three component elements of the teeth—the enamel, cement, and dentine, each of which differs from the others in structure, vitality, and function.

The *Enamel*, or outer covering, which is the least organised of the three, contains only about 3½ per cent. of animal matter, which is built up with the calcareous salts into the form of parallel prismatic fibres, arranged vertically to the surface of the tooth. It appears to be totally devoid of sensibility; and no provision, so far as the microscope has yet revealed, is made for its nutrition; and whether, when once fully formed, it remains so to the end of its existence, or, like the more vital structures, has its component molecules removed from time to time, and their places supplied by fresh matter, is a point we cannot at present determine.

The *Cement*. This is the structure which forms the outer covering of the fang, and is the most highly organised of the three. In intimate structure, it very nearly resembles bone: in fact, the cement from the tooth of an animal, according to Tomes, bears a pretty constant relation to the bone of the same animal, especially in the shape of the corpuscles or cells. Whenever found in sufficient thickness, it is, like bone, traversed by vascular canals. It forms the bond of vital union between the denser unvascular constituents of the tooth and the bone in which it is implanted.

We come now to the *Dentine*, or proper tooth-substance, which makes up the great bulk and body of the tooth, giving to it its peculiar shape and size. It is composed of a mass of tubules, united together by an "intertubular substance"; the tubules radiate from the central pulp-cavity, have an undulating course, and in general direction are vertical to the surface of the tooth. The walls of these minute tubules are composed of organic incorporated with calcareous matter; the tubules themselves, in the healthy state, are usually empty, though sometimes they may contain minute granules. With regard to the vascularity of the dentine, using this term in the ordinary sense, as signifying the permeation of a structure by vessels carrying red blood, we must pronounce it unvascular, though the opposite of this view was maintained by Fox, Bell, and others, and is at the present time the opinion of writers of the highest repute on the subject in America. Undoubtedly, there are specimens in which vascular canals can be traced in the dentine; but, though these may have been seen in some few instances, they are undoubtedly exceptional cases, and the teeth may fairly be said to be,—as Owen, Tomes, and Nasmyth, say they are,—extravascular bodies.

Such is just a general outline of the structure of the component elements of the tooth. What evidences have we, then, of