had no sleep that night; the tongue next day was moist, but inclined to be brown; the pulse was regular, but feeble; he perspired freely. He complained of great pain, extending from the back down to the hip, which he described as "like a knife stabbing him".

May 22nd. He had had no sleep, and had vomited several times during the night. The bowels had not acted. Soda water and brandy was given. He continued to get worse during the next four days. The countenance became haggard; he was half insensible; the tongue brown and dry; the skin hot and parched; the breathing somewhat hurried. He complained of pain in the region of the kidneys, and the water contained blood. He could get no sleep without large doses of opium. Nourishment was freely given, and his sufferings were somewhat alleviated by opium; but he sank from day to day, and died on May 31st, the eleventh day after the accident.

On *post mortem* examination, the body of the twelfth dorsal vertebra was found crushed, separated into two parts, and torn away from that of the eleventh. The arches also were broken. The parts were quite moveable; but there was not much displacement, as the anterior common ligament was still entire. The medulla was crushed, inflamed, and soft opposite the injured vertebra. The lungs, kidneys, and peritoneum, were healthy. The bladder was much inflamed, ulcerated in parts, and covered with phosphates.

CASE V. *Fracture of the Spine about the Eleventh Dorsal Vertebra: Recovery.* John P., aged 29, a labourer, was admitted under the care of Mr. Birkett on November 26th, 1858. He was a healthy man, and not addicted to drinking. He was working in the hold of a ship, and, while in a stooping position, and attempting to lift a sack, another heavy sack, weighing about 2½ cwt., fell from a height of eight or nine feet, striking him on the loins, and throwing him down. The head was not struck. On attempting to rise, he found that he had no use of his lower extremities, and could not feel his legs at all. On admission, he was perfectly paralysed in the lower extremities, and complained of pain in the loins and nates. The right knee was contused, swollen, and painful on pressure. There was either absolute or comparative hyperæsthesia in the whole of the right leg, it being very sensitive to the least irritation, such as slightly pulling the hair upon it. The left leg had no sensation in it. He was obliged to have his water drawn off, but could retain his motions. He was quite sensible. Goulard lotion was applied to the knee. Beef-tea and arrow-root were given. Next day, there was a little more sensation in the left leg, and the right was not quite so sensitive: indeed, the injury to the knee seemed quite sufficient to account for any excess in sensation. He had not slept during the night. The pulse was quiet; the tongue clean. There was much thirst. He was conscious of the bladder being full, but unable to pass water. The urine was ammoniacal, and rather thick from admixture of mucus. The calf of the right leg was very tender, owing to a varicose vein.

November 29th (third day). Sensation was quite perfect in both legs. The bowels were costive, so that purgatives had to be given.

December 1st. The bowels were still costive; the bladder was injected with tepid water twice a day.

December 4th. It is noted that he felt pain in the loins when the bladder was quite full, and that the right knee was somewhat painful. The pulse was firm and good. He lay on a spring bed. The back was quite comfortable.

December 10th. Sarsaparilla with bichloride of mercury was ordered.

December 14th. He felt occasionally "a shooting and starting" in the legs, and the knees were sometimes drawn up suddenly.

On the following evening, when the bladder was full, he succeeded in passing some water by his own exertions; and, on December 17th, it is noted that the water was passed quite voluntarily. The treatment consisted in tonics (steel, quinine, and calumba), with opium at night. He complained occasionally of pain in the belly and loins, which was relieved by aperient pills; but on the 28th, as he still had a good deal of pain in the loins, he was ordered calomel and opium every six hours.

January 2nd, 1859. It was first noticed that he was able to move his toes slightly; those of the left foot the most; and on January 7th (fifth to sixth week), this movement was found to be improving. He was now turned on his face, to examine the back. The spinous process of the eleventh dorsal vertebra was found to be much displaced, and drawn upwards to the one

above it, and considerably to the right side. This was the only deformity to be detected.

January 12th. He was able to move the left instep, and the movements in the toes of the right foot were stronger. He had still much pain in the loins. The bowels continued to be costive. Two grains of opium at night were required to produce sleep.

January 17th. He could move both insteps freely. He was ordered quinine mixture, full diet, four ounces of sherry, and two pints of porter, daily.

January 21st. He could bend his left knee, and draw the limb up to the body; but he could not straighten it again. Soap liniment was ordered.

February 5th. It is reported that, for the last two or three nights, he had been disturbed by the left leg jumping just as he was going off to sleep. The right leg did not move much. He still suffered a good deal of pain in the back.

After this date, he slowly improved; but, as he did not progress so rapidly as he could wish, he left the Hospital, in ill temper, March 5th, 1859.

Original Communications.

THE VEGETABLE PARASITES OF THE HUMAN SKIN.

By Jabez Hogg, Esq.

[Read before the Medical Society of London, January 24th, 1859.]

I PROPOSE on the present occasion—*first*, to offer a hasty sketch of the history of parasitic vegetable growths in diseases of the human skin; *secondly*, to inquire into the truth of the theory founded on the observations of foreign physicians, which attributes certain forms of skin-disease to the ravages of a vegetable parasite, as their origin, cause, and pathognomonic character; and *thirdly*, to offer a few remarks on the natural history of vegetable parasites, with a view to illustrate the subject by analogy.

It is now more than twenty years since Bassi of Milan discovered the vegetable character of a disease which caused great devastation among silkworms; and, about the same time, Schönlein of Berlin was led to the detection of certain cryptogamic vegetable formations belonging to the order *Fungi*, accompanying the development of certain diseases of the skin. The observations of this distinguished man have been confirmed by Gruby, Remak, Langenbeck, Robin, Küchenmeister, and other continental writers; as well as by Dr. Hughes Bennett of Edinburgh, and Drs. Jenner, Gull, and other English physicians, most of whom have attempted to identify the fungus with the disease believed to be produced by it, and in this way to separate and detach some four or five of the most common chronic skin-diseases from the rest, and to regard them simply and exclusively as *fungoid* or *parasitic diseases*. Thus the parasite supposed to be peculiar to and productive of each disease has been minutely described, and honoured with a name derived generally from the name of the disease which it is supposed to have originated, as appears in the following table.

Willan.	Basin.	Wilson.	Parasite.
Porrigo favosa and lupinosa.	Tinea favosa.	Favus.	Achorion Schönleini.*
Porrigo scutulata.	Tinea tonsurans.	Trichosis furfuracea.	Tricophyton tonsurans.
Porrigo decalvans.	Tinea decalvans.	Alopecia.	Microsporon Audouini.
Mentagra	Tinea sycosa.	Sycosis.	Microsporon mentagrophytes.
Pityriasis versicolor.	Pityriasis.	Chloasma.	Microsporon furfur.

* From *achor*, the old term given to a favus crust by Willan, and the name of the discoverer Schönlein, and so on with all the rest.

This very tempting theory involves an important principle of pathology, inasmuch as it places the pathological fungi above described in a category by themselves, and invests them with characteristics entirely at variance with those of the natural history of the family of fungi, whose leading feature appears to be that of selecting disease and decay as the soil which is essential to their existence; whereas this hypothesis describes them as preying upon healthy organised matter, and thereby establishing specific diseases.

In examining into the truth or fallacy of this theory by the light of physiology, we must bear in mind that the surface of the human body is supplied with a delicate covering, one office of which is to excrete, and another to eliminate or exude, effete matter from the blood. The excretion consists chiefly of microscopic epithelial scales; and the exudation is composed of gaseous matter, which sometimes becomes condensed and dried on the surface of the epidermis. The scales are friable and separable under very slight friction during health; and the transpired fluid makes its free escape, under ordinary circumstances, without any assistance from without. But want of cleanliness, deficient exercise, and, much more frequently, a cachectic condition of the fluids of the body, interfere with the natural processes of elimination; and then the skin becomes diseased, and in this diseased condition is often infested with parasitic fungi, the filaments and spores of which are found imbedded in the epithelial scales of the epidermis, enveloping the hair-bulbs, and often traversing the hair itself, which is then more or less abnormally secreted, and deficient in organic matter.

Is this diseased condition the result of the ravages of the parasite? or is the parasitic vegetation the result of disease? This is the question into which I now propose to enter, and the question is one of some practical importance; for, if the disease is produced by the parasite, we have only to destroy the latter, and the disease will be perfectly eradicated, and cease. If, on the other hand, the parasite only acts the part of a scavenger, whose effect it is to remove the *materies morbi*, then we have to rectify the condition on which the disease depends, and the parasite will starve for want of nourishment.

Authorities are not wanting on either side of the question. Dr. Hughes Bennett maintains that all such vegetable formations are secondary, and always arise in living animals previously diseased. Dr. Gull contends, on the contrary, that the parasite is the sole cause of the disease; and Dr. Jenner has committed himself to the same opinion. Mr. Wilson differs again, and entirely ignores the existence of vegetable parasitic growths in skin diseases; and endeavours to prove—somewhat imperfectly, I think—that the cylindrical tubes “seen under the microscope are nothing more than a splitting up of the middle or fibrous layer of the hair, and its oval shaped cells, closely packed together, and arranged in a linear order.” Had Mr. Wilson submitted his specimens of disease to a closer examination, and employed polarised light with the microscope, I have no doubt he would have convinced himself that his view of the diseased hairs was not quite correct.

The question, however, must be determined, not by authorities, but by further observations.

During the last two years, with a special view to this question, I have been engaged, with my friend Mr. Hunt, in making microscopical examinations of the products of cutaneous diseases appearing in the patients attending his practice at the Western Dispensary for Diseases of the Skin; and the result is, that I feel strongly inclined to the opinion that the vegetation found on the skin and hair is not primarily the cause, but rather the result, of disease.

I will now endeavour to show on what grounds this conclusion has been arrived at.

1. If there be any exceptions to the general law, that parasites select the subjects of debility and decay, such exceptions are not found among vegetations belonging to the order *fungi*, which invariably derive their nutriment only from matter in a state of lowered vitality, passing into decomposition, or wherein decomposition has already proceeded to some extent.

2. That the growth of these fungi is not necessarily pathognomonic of a special disease, is obvious from the fact of their having been observed in nearly all kinds of chronic skin-disease. Thus, out of twenty cases of lepra and psoriasis, in which the products were examined, evident traces of fungoid vegetation were observed in ten. The same growth was noted in two out of three cases of lichen, also in four out of six cases of eczema, in one case of ichthyosis, and in one of spilus. None of these diseases have been supposed to be caused by fungi; and yet fungi were present in the greater number of the specimens examined.

3. Others observers, some of them highly competent, have not been able to find them in the diseases they are believed to engender. Thus Malherba, Cazenave, and Wilson, deny the existence of a vegetable fungus in porrigio scutulata (the common ringworm), although this is described and depicted under the name of *trichophyton tonsurans* by trustworthy observers. Cazenave, Didot, and Wilson, deny the existence of the *achorion Schönleini* in favus or cupped ringworm. Wilson and Cazenave deny the existence of the *microsporon Audouini* in porrigio decalvans. In reference to the statements of the latter observer, Cazenave, it must be borne in mind that he candidly acknowledges his ignorance of the microscope; and, not to make an unfair use of this negative argument, I must confess that I have seldom been disappointed in finding some kind of fungoid growth in all the diseases supposed to be produced by them. Nevertheless, such is the general similarity of form and growth of the fungi in the specimens examined, that I have failed to make out any relation between the special variety of parasite and the particular disease whose name it bears. Thus, in a case of porrigio in a girl of 16, which had existed for nine years, from neglect and dirt, I found, not a poriginous variety, but the fungus described by Robin and Küchenmeister as peculiar to plica Polonica—a disease almost unknown in this country. Again, in a case of *tinea tarsi*, I found sporules of the fungus described by Ardsten as the *puccinia favi*. Robin also found in favus the puccinia occurring together with the *Achorion Schönleini*; the latter presenting itself as a constituent of the cups or crusts, while the puccinia occurs afterwards on the desquamation of the epidermis. And this is thought by some to warrant the opinion that the *achorion* is only the spermagonial form of the *puccinia favi*. But, further, it is broadly asserted by others that the several morbid conditions observed in chronic diseases of the skin are mutually convertible; and that lichen, eczema, impetigo, psoriasis, lepra, mentagra, etc., are but modifications of one and the same disease, resulting from accidental conditions, and not always found perfectly distinct: nay, so often are they combined and complicated with each other, that dermatologists have assigned special names to some, indicative of their mixed character, such as *eczema impetiginodes*, *eczema leproides*, *lichen urticatus*, *erythema papulatum*, etc.

It may be said, that most of the cases examined by Mr. Hunt and myself should be referred to the last named forms of disease; and, therefore, the finding of parasitic fungi might have been, *à priori*, expected; indeed, ought to have been found. Having had this contingency in view, Mr. Hunt gave me specimens taken only from well marked cases; and the morbid products of these were conjointly examined and sketched under the microscope; well executed drawings from which were made by Mr. Arthur Hunt, for the purpose of illustrating this paper.

The objects were examined both wet and dry, with reflected and with transmitted light, rendered achromatic and carefully arranged to avoid error by distortion, etc., and with a magnifying power of from two hundred to four hundred diameters in almost every case. The products were obtained, in scaly diseases, by gently removing the half-detached scales; in most eruptions, by simply placing the discharge on a slip of glass; in diseases of the hair, either of scalp or beard, by uprooting the hairs, and examining with as little disturbance as possible.

I will now enter on a short analysis of the cases examined.

Favus. At the head of my list stands favus—a disease better known to continental writers than to us, and said by them to be caused by the *achorion Schönleini*. In this country it is so rarely seen, that neither at Mr. Hunt's Dispensary nor in private practice have I been able to meet with a case for examination; so that this disease, which we find most carefully described, and the vegetable nature of which Schönleini has the merit of having been the discoverer, as also of exhibiting the fungus in the form of mycelium filaments and granulated stroma,—I am compelled to dismiss with this brief notice.

Alopecia (Porrigio Decalvans). In eleven cases of alopecia, the hair on the margin of the bald patch was submitted to examination under the microscope. In three of these cases, one of which was the product of syphilis, no fungoid growth could be found. In the other eight cases, filaments and sporules were most unmistakably present.

Porrigio Scutulata (Tinea Tonsurans). In nine cases of porrigio scutulata, the hair was examined. Fungoid vegetations, or vestiges of them, sometimes with sporules, sometimes without, were observable in each of these cases, but in three of them they were imperfectly developed.

It may here be observed, that the filaments of the *trycophyton tonsurans*, said to be the cause of this disease, are described as found in the substance of the roots of the hair, and spreading longitudinally upwards; whereas the *microsporon Audouini*, the supposed source of the porrigo decalvans, forms a tube round each hair *outside* the follicle, not in the substance of the hair. I have not been able to verify these distinctions. On the contrary, on comparing many specimens of these diseases with each other, I have always found filaments springing up from the bulb, and then growing up around or along the hair, sometimes longitudinally in bifurcating branches nearly straight, sometimes in tortuous or spiral forms, with or without spores. In both diseases, the bulbs of the hairs and the hair itself were variously decayed and deformed.

Pityriasis Versicolor (Chloasma). Seventeen cases of this disease contributed specimens for examination, in all of which vegetations were observed, and in several of them the fungus named *microsporon furfur*, supposed to be the cause of the disease, was clearly identified. This fungus is said to have been discovered by Eichstädt in 1846, and is described as exhibiting spores piled up in groups or heaps; and, although Robin himself could not find this parasite, I acknowledge that the characteristic grouping of the spores has been distinctly marked in most of the specimens I have examined. But, although this piling up of the spores may be in some measure identified with the disease, it does not follow that the disease is caused by the fungus, which may merely find in this form of disease a suitable soil for its growth and fructification. The fungus may be destroyed again and again by soaking the skin with a nitrous acid or mercurial lotion; but, unless attention is paid to the state of the blood, no lotions will cure the disease.

Mentagra (Syccosis Menti). The hairs were examined in six cases of this disease, and in all were broken or bent, and covered by fungoid growths. The roots of the hairs were closely invested with spores and filaments, sprouting longitudinally outwards and upwards. Both the filaments and spores are described as larger than those of the *microsporon furfur*, and they are said to form a sort of vegetable sheath to the hair below the skin only. This latter description is graphic and true; but I should hesitate to admit that the mere size of a vegetation can entitle it to be considered a separate species; for it may depend on the age, the growth, or on some peculiarity of the soil, just as the *polypodium filix mas*, or common male-fern, may appear in a dry barren soil as a delicate plant, and yet, in a damp and shaded situation, with a congenial soil, it may assume the appearance of a gigantic shrub, several feet in height. Moreover, the hair itself, as well as its follicles and root, was found in several instances, exhibiting tufts of fungi growing on its surface.

Psoriasis. Thirteen specimens were examined. In seven of them, filaments and sporules were clearly discernible; in the other six, epithelial scales only. These filaments and sporules were in no respect distinguishable from those found in the various diseases already described, and to which they have been said to be peculiar.

Lepra. Seven specimens were examined: there were found filaments and sporules in five of them, and in two of them epithelial scales only. These vegetations also were similar to those found in psoriasis—another name, in fact, for the same disease.

Ichthyosis. In one case of this disease, filaments were found, clearly showing that a congenital disease or malformation may, under certain circumstances, prepare a soil for fungoid growths.

Lichen. In two cases out of three, fungoid growths were visible, similar in character to those already described.

Spilus. In two cases examined, one exhibited very fine hairs, with peculiar masses of a fine pigment surrounding the shaft of the hair, and others were covered by granular matter; another had filaments of a fungus, with a few spores scattered over the masses of epithelial scales.

Eczema. In four out of six cases, fungoid appearances were observable; in one of them also were masses of spores; and in another a cast of a hair was observable, the hair having escaped, and the cast being composed of beautiful filaments, which had embraced and encircled the hair precisely after the fashion described in porrigo decalvans, although there was here no baldness. In fact, the arms, and not the scalp, were the seat of the disease.

Tinea Tarsi. In five cases of tinea tarsi, two out of which were associated with eczema in children, in three were found mycelia, filaments, and spores, associated with epithelial scales and granular matter; in one, an isolated spore of a fungus,

described by Ardsten as that of *puccinia favi*, the spores of which are almost if not quite identical with those caught on my glass slides suspended in the air.

As to the growth of these parasites on the *healthy skin*, most conclusive experiments have been made, the results of which go far to prove that the skin of persons in health and vigour does not afford the required conditions for them to take root in it; that inoculation succeeds only in those places where pustules have been previously formed. Remak and others repeated the experiment of inoculation over and over again, and found that it always failed in the healthy; but that in certain exudations, in peculiar states of the constitution, or where disintegrated matters existed which had undergone particular chemical changes, the *achorion* might be made to germinate, and produce a further growth of that identical fungi.

Seeing, then, that the fungi are characterised throughout nature by feeding on effete or decayed matter; that the fungi supposed to be peculiar to certain diseases of the skin, are also found in many other diseases of the cutaneous surface; that competent observers have not been able to find them in these peculiar diseases; that sporules and filaments described as the cause of one definite disease, have been found in the products of another definite disease supposed to have a peculiar and distinct parasite of its own; and that attempts have been made in vain to implant these parasites in a healthy skin; one cannot but conclude that special parasites, peculiar to, and productive of, special diseases, *do not exist*. And in this opinion we are, at least, confirmed by the therapeutical fact, that the alleged parasitical affections are rarely, if ever, cured by destroying the parasite; and that they can be cured by the due administration of appropriate alteratives and tonics which are capable of correcting the blood dyscrasia, which, in fact, originates the disease.

These views are countenanced by distinguished pathologists. Professor Bennett writes of favus: "I believe that the pathology of favus is best understood by considering it essentially to be a form of abnormal nutrition, with exudation of a matter analogous to, if not identical with, that of tubercle, which constitutes a soil for the germination of cryptogamic plants, the presence of which is pathognomonic of the disease. Hence is explained the frequency of its occurrence in scrofulous persons, and among cachectic or ill-fed children; the impossibility of inoculating the disease in healthy tissues, or the necessity for there being scaly, pustular, or vesicular eruptions on the integuments previous to contagion." And in some few experiments wherein it has been said that inoculation has succeeded in healthy persons, the following explanation may be offered, "that the material in which the vegetations grow, may at the commencement, in a molecular exudation, be formed either primarily or secondarily. That is, there may be want of vital power from the first, as occurs in scrofulous cases; or there may have been production of cell forms, such as those of pus, or epidermis, which, when disintegrated and reduced to a like molecular and granular material, secondarily constitute the necessary ground from which the parasite derives its nourishment, and in which it grows." (*Principles and Practice of Medicine*, page 807.)

Very nearly the same conclusions have been arrived at with regard to the propagation of the moulds among the vegetable tribes, which at one time it was said were originated by fungi. Mr. Henfrey, writing of the development and progress of vine-fungus, says, "that it is the cause and not the consequence of the murrain"; nevertheless, with some caution or suspicion of the truth, he adds, "there are various curious circumstances connected with it not at all understood, and it is very probable that peculiar atmospheric conditions induce predisposing states of the plants."

It scarcely admits of a doubt, that all the diseases observed of late years on plants, have been produced by a peculiar atmospheric condition, not yet understood, but which, when combined with want of vigour, or, in other words, unhealthy growth, arising from the loss of some chemical elements in the soil, that this has been the cause of the various "murrains", of which we have heard so much. It is a fact, now well known to microscopists, that during heavy moist, and other uncomfortable atmospheric conditions, the spores of various fungi can be caught by merely exposing a slip of glass in a current of air; but when the air is fine and dry, in that state usually recognised as bracing, in other words, favourable to health and life, then the fungi and their spores are very difficult to collect, and, perhaps, are not then floating about. Similar causes may, doubtless affect the microscopic characters of the products found in skin diseases; and so similar in appearance are the fungi

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 algae, 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 agaries. 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