REVIEWS.


Mycologists and medical men have to thank Dr. Fox for the comprehensive and elaborate treatise before us, the first original one on the subject in the English language. It treats only of vegetable parasites on man, which would seem to be a not very extensive field for observation; yet, limited though it may appear, it has been so neglected or inadequately treated hitherto, that its condition was little better than chaotic; and this too, in a very few years, for thirty have not passed since Schönlein first described the fungus which causes favus, and which now bears his name. Though the knowledge of the parasites is so recent, many of the diseases to which they give rise have been long recognised, and were treated of by the ancients. It may be also mentioned in connection with the history of the science, that Leeuwenhoek, in his 'Arcana Naturæ,' published near the end of the seventeenth century, has figured the Leptothrix buccalis, a small organism which grows on the decaying food between the teeth and papillæ of the tongue.

The author is already known in connection with the subject of vegetable parasitic disease, by a paper he published in the 'Lancet' (1859, p. 283), in which opinions were broached of a very novel kind, but which are similar to those he now advocates in the present work. That he should still (in 1863) stand firmly on the same ground which he occupied in 1859, after much additional research, is, of itself, no slight proof of the validity of his views.

The parasitic vegetables of man are not, it must be confessed, at first sight, a very enticing field for the researches of the botanist; and thus it has happened that those which
have been observed and described owe their discovery and description to medical men, who, as a rule, do not possess sufficient knowledge of the lower forms of vegetable life, in general, to undertake the proper examination and classification of these parasitic growths. Thus, to use the words of Mr. Berkeley, it has come to pass that "parts of plants have been described as whole, undeveloped fungi referred to algae, though agreeing with them neither in habit nor physiology; the commonest moulds, altered by situation, have been described as new; whilst in numerous instances slight variations of the same fungus have been treated as separate species." Moreover, it must be remembered that few medical men have the inclination to work at minute botany, even if they could spare sufficient time to compare the plants with already published descriptions; test their specific differences, or the contrary, by artificial cultivation; and thoroughly investigate the limits of their variation; by which course alone the errors detailed above can be avoided.

Yet though the mere student of fungi may feel an antipathy to the contagious diseases in which these minute organisms occur, the organisms themselves will well repay a thorough microscopic examination. It is merely necessary to refer to the excellent plates* of Dr. Fox's book (to the accuracy of which the writer of this article is enabled, in many cases, to testify), to prove that to the microscopist the subject is by no means devoid of interest.

The work before us is divided into two parts. The first treats more especially of the diseases caused by the growth of parasites; and though this Journal is not the place to discuss medical matters, it may be mentioned that the author well establishes his chief point—the essential difference between eruptive and parasitic disease. The physician will also be indebted to Dr. Fox for the very simple classification of these parasitic skin diseases under one generic title of Tinea, as follows:—1, Tinea favosa; 2, T. tonsurans; 3, T. circinata; 4, T. sycosis; 5, T. decalvans; 6, T. varicolor; 7, T. Polonica; 8, T. pilaris; 9, T. tarsi. He places at the end that interesting disease of India, the podceleoma, or fungus foot, which has lately attracted considerable attention. Many of these, it may be mentioned, have been considered as different forms of the same disease by writers; and Dr. Buzen, in his 'Lectures on Parasitic Affections of the Skin,' reduces them to three:—T. favense, T. tonsurante (including T. circinata and Plica

* The author tells us in his preface that many of the figures are by a new process—Kerography—which, in some cases, answers better than wood for microscopic appearance.
polonica) and T. pilade (including T. sycosis and T. decalvans). The author also considers that the only state of the organism which will afford a fitting soil for the growth of fungi is what he calls the "tuberculous or non-specific eruptive crisis or tendency;" but though this may be generally true, it is not universally so, for the writer of this has seen T. sycosis more than once in persons certainly affected also with syphilitic eruptions; indeed, Dr. Fox himself says (p. 41) that the two diseases (parasitic disease and syphilis) may be associated.

Chapter 5, which contains a microscopic description of the fungi themselves, is, as stated in the preface, mostly a condensation of the diffuse descriptions in Kuchenmeister's manual. It also contains some useful hints for examination of the fungi by the microscope, and shows how they may be distinguished from foreign bodies which imitate their appearance. The characters of the different kinds of fungi are of little importance, as Dr. Fox shows that they are insufficient for diagnosis and liable to variation. The chapter on the appearances presented under the microscope by the lesions produced, will be read with interest by all who, interested in the science of medicine, care to know something more of disease than how to cure it. The plants never grow except where the hair-follicles are present, a little way down which is their primary seat, where all the conditions most favorable to their development are to be found.

Fungi are found pretty commonly on and in both man and the lower animals. Our author mentions several papers and books on the subject, and an interesting account may be added of some very singular forms of fungi found in the intestines of species of Julus and allied genera, by Dr. Leidy, of America, who has paid a good deal of attention to the subject; it will be found in vol. v of the Smithsonian papers, published in 1853.

A list of those which have been described and named by various authors as growing on man will be interesting; it is from the fifth chapter of the book in review. Parasitic fungi are Epiphytes or Entophytes, as they occur on the skin and its appendages or the mucous membranes and internal parts of the body respectively.

A. Epiphytes.—1, Achorion Schonleini (parasite of Tinea favosa); 2, Trichophyton tonsurans (of Tinea tonsurans and T. circinata); 3, T. sporuloides (of T. Polonica); 4, T. ulcerum; 5, Microsporon Audouini (of T. decalvans); 6, M. mentagrophytes (of T. sycosis); 7, M. furfur (of T. versicolor); 8, Puccinia (favi of Austen; found growing in cases of T.
favosa, tarsi, and versicolor; also in the disease called acne); 9, The nail fungus (referred to Aspergillus, Achorion, and Microsorium, by different authors); 10, Mucor (Mucedo); 11, Aspergillus (several kinds); 12, Penicillium (glaucoma); 13, Chionyphe Carteri (Berkeley; the fungus which causes podocoma in India).

B. ENTOPHYTES.—1, Torula (Cryptococcus cerevisiae); 2, Sarcina (Merismopodia ventriculi); 3, Oidium albicans (in thrush and diphtheria in the mouth); 4, Leptothrix buccalis (including some found on other mucous surfaces besides that of the mouth); 5, Leptomitus (probably one species, but described as several, viz., L. urophilus, Hannoveri, uteri, oculi, and one unnamed); 6, Bennett's lung fungus (probably Oidium); 7, Cholera fungi of Busk and others (perhaps Torula; many were foreign bodies); 8, Lowe's fungus of diabetic urine (an early condition of Aspergillus).

To this list may be added Dr. Farre's Oscillatoria, found in the intestines, of which an account is to be seen at the end of Dr. Lankester's translation of Küchenmeister's manual, the paper having been read before the Microscopical Society in 1842. It was probably introduced into the body with drinking-water, but has as good a claim to be recorded as many in the above list, especially since Sarcina is considered by some as the spores of an Oscillatoria. If one is to be guided merely by the position of the fungi on the body, it is not evident why, in the list just given, Mucor and Penicillium are to be reckoned amongst Epiphytes whilst Bennett's lung fungus and Leptomitus urophilus, though growing in similar situations, are considered Entophytes.

A consideration which we consider of importance does not appear to be so regarded by Dr. Fox—the essential distinction, that is, between true and false parasites. In the second part of the treatise before us, Dr. Fox, speaking of the difference between Epiphytes and Entophytes generally allowed to exist, says (p. 149)—"I confess I do not comprehend the distinction here pointed out; in either case the fungi require each its own particular soil for growth, which latter takes place in consequence of the implantation of the germs upon a suitable habitat; and the properties and tendencies of the vegetations are the same in the two cases." Now, the distinction of Epiphytes and Entophytes is pretty nearly that of true and false parasites; Tricophyton ulcerum and Puccinia only among the former being false, and Oidium albicans, and possibly Sarcina, among the latter, true parasites; so that the above quotation may be considered as expressing the author's
view of the alleged distinction. But though his view is true as far as the parasite is concerned, how different it is for the patient on whom it grows, whether the fungus is luxuriant absolutely on his tissues, or merely on some effused morbid product, on which it grows as it might on any other decayed matter. As Dr. Fox well shows, the growth of the fungi which cause tinea requires the existence of a peculiar soil, which depends on a particular diathesis and condition of blood; whereas it is evident that such fungi as the forms called Leptomitus, Mucor, Bennett's lung fungus, Leptothrix, Cryptococcus, and perhaps Sarcina, require no such blood-condition; but, with Tricophyton ulcerum and Puccinia, are to be considered as merely accidental phenomena growing on soil external to the human body and foreign to it, such as dried pus or mucus, decaying food, acid fluids, and the like; they cause no lesion, and are not parasites on the human body in the true sense of the word.

Dr. Fox's view on the vexed question of Sarcina ventriculi is that it is never a cause of disease (i.e., it may be called a false parasite). He adduces a good deal of evidence on his side, but the question cannot yet be considered as settled. The writer has seen two cases of continual vomiting during life of a fluid full of Sarcinæ, and no lesion could be detected after death. (A case in point is also recorded in the 'British Medical Journal' for February 5th, 1859.)

But the real value of the treatise under review is in the record of the results which the author has arrived at by experiments and observations on the relations subsisting between the various so-called species of parasitic fungi, both Epiphytes and Entophytes. These results are contained in the second part of the work, and may be summed up thus:—Starting with the proposition, which he proves, that there is no such thing as spontaneous generation of fungi, and that the same fungi may exist in various forms under different conditions of soil, medium, and the like, Dr. Fox shows conclusively how inadequate are the published descriptions of the parasites to distinguish one from another, and how they assume one another's forms. He remarks that there is "no want of descriptions of the various parasites found; but when the attempt is made to apply them practically, many will indicate as well one as another fungus" (p. 115). Moreover, he demonstrates that the distinctions of the different kinds of tineæ are those of degree, not of kind; and he firmly declares that the fungus which produces them is one and the same, merely modified in appearance by its seat and the soil, the
latter being always of the same kind, but more or less favorable to the growth of fungi.

The proofs of the identity of the various fungi are too numerous to give a digest of them here. This diagram, however, from p. 176, gives a general idea of their connections, Torula being the centre round which they group themselves.

Leptothrix is not included in this diagram by Dr. Fox, though he considers it allied to Torula.

These difficult experiments consisted in growing the fungi in saccharine solutions and other media, carefully excluded from the air; they were frequently examined, and the plants were seen to pass through many forms generally considered as distinct. As in such experiments great exactitude is rightly demanded before implicit faith can be placed in the results obtained, Dr. Fox states that more details can be forthcoming, if necessary. Supposing everything correct—and we firmly believe so from the great care evidently bestowed on his experiments by the investigator, and from what he says in the preface—absolute proof of the identity of these fungi is given.

There is only one fallacy into which we think it possible Dr. Fox may have fallen, and that is, the mistaking of similarity for identity; we are reminded of this by figures 8, 10, 11, and 13, of plate ii, which represent the results of an experiment proving that Sarcina can be produced from the aggregation of the spores of Pœnicillium. These quaternate aggregations of spores certainly present some similarity to Sarcina; but, if correctly figured, scarcely seem to be identical. It is possible, though by no means proved, that Sarcina may be the spores of a fungus, as Mr. Berkeley observes, (Gardner's Chronicle, 1857)—though why it should never develop a Mycelium under the most favorable circumstances for such development is not evident—but that every quaternate
aggregation of spores is Sarcina, does not follow; indeed, that aggregation has anything to do with its formation is very problematical.

Many of the diseases (tinea) have been made to produce one another, and more proof of this kind could be brought, but Dr. Fox rightly objects to turning his patients' skins into miniature botanic gardens.

An excellent and philosophical theory of the treatment of tinea in accordance with the views propounded concludes the work.

The author says (preface, p. vi), "I claim for my facts the character of trustworthiness, since everything has been rejected which repeated observation has not, in my mind, shown to be the truth." This character of trustworthiness is evidenced throughout the treatise, which also shows unmistakably the great care and research bestowed on its preparation. We hope that the subject will not be considered as exhausted, but that the appearance of Dr. Fox's book will lead to further observation on the parasites of man, both by botanists and medical men.

We may mention that the book is well printed and got up by Mr. Hardwicke, and that only two misprints were observed by the writer of this article.