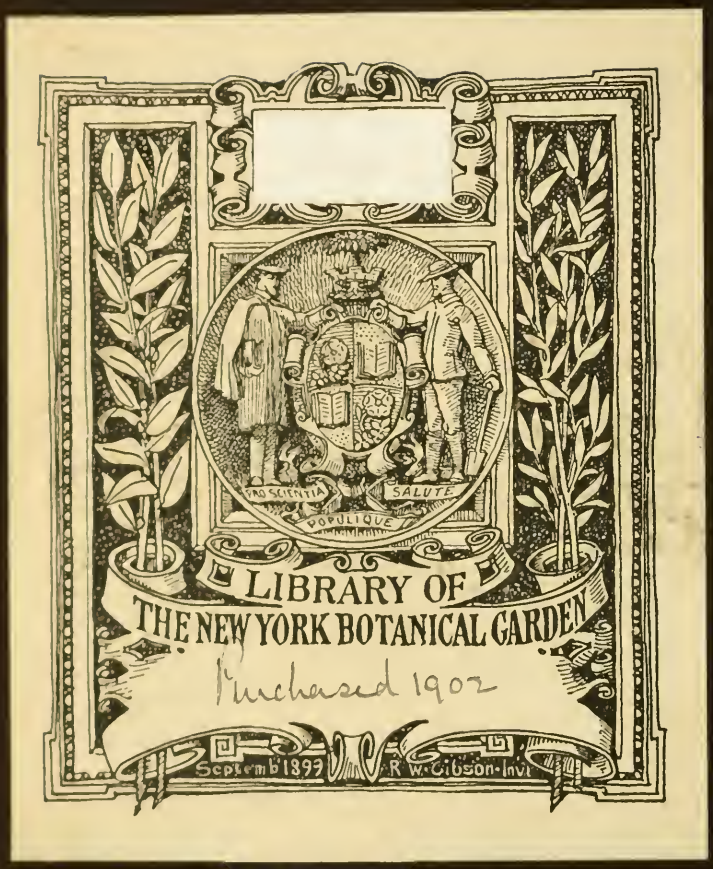
TEXT-BOOK

OF

BRITISH FUNGI

W. DELISLE HAY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ELEMENTARY TEXT-BOOK OF BRITISH FUNGI.

AN ELEMENTARY TEXT-BOOK

OF

BRITISH FUNGI.

ILLUSTRATED.

BY

WILLIAM DELISLE HAY, F.R.G.S.,
AUTHOR OF "BRIGHTER BRITAIN," ETC., ETC.

"To give and preserve to our use the kindly fruits of the earth,
so as in due time we may enjoy them."

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PREFACE.

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My interest in Fungi began in boyhood, but it has been mostly within the last ten years that I have been able to carry out diligent study, so far as the exigences of a struggling life afforded opportunities for it. It has never been my privilege, as yet, to meet with any person versed in Mycology from whom I could derive instruction. My shortcomings, therefore, may perhaps be forgiven on that score, since I have had to rely on unassisted practical labour,

PREFACE.

The purpose and intention of the present work are set forth in the opening chapter. It is designed to be an elementary introduction to the study of Fungi, chiefly in those aspects which most readily engage popular attention. Beyond that, it is intended to cover, as comprehensively and accurately as possible, the entire subject of Fungi considered as aliment. I am well convinced that such information is often vainly sought for, that it is needed, and that it will prove useful.

Every succeeding year shows that intelligent lovers of Nature are inclined to take an increasing interest in Fungi. There are, as I know from past experience, but few means open to such persons of acquiring the knowledge they are desirous of being possessed of, and there is no small difficulty in obtaining access to the recorded results of mycologists' labours. It has been my object to meet popular requirements, so far as my ability went, and I have not allowed myself to entertain the presumption of trying to do more.

My interest in Fungi began in boyhood, but it has been mostly within the last ten years that I have been able to carry out diligent study, so far as the exigences of a struggling life afforded opportunities for it. It has never been my privilege, as yet, to meet with any person versed in Mycology from whom I could derive instruction. My shortcomings, therefore, may perhaps be forgiven on that score, since I have had to rely on unassisted practical labour,

only directed and inspired by a wide acquaintance with mycological literature. But, so far as "toadstool-eating" goes, I believe I have a right to speak with authority, since my own gastronomic experiments have been many, frequent, and varied.

Four years ago, when I had achieved the not slight task of writing the "Textbook," a scheme for its production was proposed which I found myself obliged to abandon subsequently. But this long delay will have proved advantageous to my friends and correspondents, since they will now have the book in an improved form, revised, shorn of redundant rhetoric, and with various additional details. And, through the enterprise and cordial co-operation of the Publishers, the illustrative portion of the work has been carried out even beyond the limits I had assigned to myself in the text.

With these explanations I now place my work in the hands of the critic and the reader, trusting that my honest efforts to satisfy the former, and to supply hitherto obscure information to the latter, will meet with the approval and acceptance of both.

W. DELISLE HAY.

London, *Oct.*, 1886.

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CHAPTER I.

General Introduction.

The present work is a treatise upon Fungi; but it does not extend to the whole survey of this department of Botany. It is limited to an examination of what, for want of a better term, we must be satisfied to call "the larger Fungi." It does not touch upon the minuter tribes—the moulds, mildews, blights, and multitudinous small parasites, most of which can only be studied with the aid of a microscope [1]; it is confined to forms of appreciable size. The student will find here the means of attaining a full botanical knowledge of the orders and genera into which the larger Fungi have been classified. The amateur naturalist, anxious to acquaint himself with certain notable species, will here be guided in doing so. But the main object of the work has been to collect information relating to such Fungi as have an economic value, either as esculents or poisons. The scope of the treatise is confined to Great Britain.

The study of Fungi, particularly from an economic point of view, has been greatly neglected in this country. There exists a mighty prejudice among Englishmen directed against these plants, which seems to forbid the intelligent public from taking any interest in them, or endeavouring to acquire any knowledge concerning them. It is a national trait, for no other nation evinces it. On the contrary, the various peoples of the continent of Europe bestow a great deal of attention on Fungi, regarding them in quite a different light from that customary among us.

Notwithstanding prejudice, however, advancing knowledge has brought with it some increase of favour as extended to Fungi. A desire for information is more widely expressed, and the old dislike to plants of this class seems to be slowly giving way. The few English mycologists are increasing in numbers, and more attention is popularly directed to the subject. During one year,

[1] Except in the Plates illustrating the Genera.

the author accumulated a vast number of cuttings from newspapers on subjects connected with Fungi. They manifested an inconceivable amount of ignorance, it is true, but it is evident they may be regarded as evidencing an awakening of popular interest.

Since Dr. Badham published, in 1847, his famous treatise on "The Esculent Funguses of England," there have appeared several works of a similar kind, intended for popular use. But, for the most part, they have added little to what Dr. Badham had advanced. English mycologists, among whom shine conspicuous the names of Berkeley, Cooke, and Worthington Smith, have done good work in forwarding the botanical knowledge of Fungi, particularly in the microscopic departments. But chemical investigation and examination into the physiological properties of fungous principles have been relegated almost entirely to the scientists of other countries. This domain has had most attraction for the present writer, and he has gathered into these pages such information of the kind as he has been able to collect. It is probably that part of the study of Fungi likely to be most popular, as being of most practical service.

In this work the designation *Mushroom* is used in a wide generic sense. It is intended to express any of the larger Fungi, in contradistinction only to those small though numerous forms that might similarly be broadly styled *Moulds*. Taken in this sense, the word *Mushroom* is an equivalent for the French *Champignon*, or for the German *Pilze* and *Schwämme*. We cannot very well employ the word *Fungus* in this relation, because that title has a wider signification.

The classification follows the system propounded by the illustrious Swedish botanist Fries, which is now universally adopted. Some trifling variations have been permitted, which will be referred to in their place. Details of information have been gathered from a great variety of sources, and, in the course of a study necessarily of a practical kind, it may be that the author will be found to have added something of his own.

Some of the titles used in Mycology have a little etymological interest. "Fungus" is a word found in Ovid, but seems to have been the designation of a particular species. "Mushroom" has been referred to various roots. The most probable seems to be the Welsh, or old British, *maes*, a field, and *rhum*, a knob, from a combination of which words it is said to have come, being originally "mushrump," and then "mushroom." It is also said to have been

a corruption of *mousseron*, a name specifically applied by the French. But it seems to be of older usage, and therefore the first explanation is the more plausible. The name has always been very loosely applied in England, centring most about the meadow plant, that is here almost the only popular edible. "Mould" comes from a Scandinavian word having the same signification. The vile and pernicious nickname of "toadstool" has not the derivation ordinarily supposed. It is the Saxon, or old English, *tod*, meaning a bunch, cluster, or bush. The word is used by Coleridge,—

"The ivy *tod* is heavy with snow."

The second syllable, *stool*, is readily supplied, the form of most terrestrial Fungi suggesting it.[1] Evidently the word was first applied to those clusters of Fungi often seen on tree-roots and elsewhere. The erroneous idea connecting toads with these plants seems to be due to Spenser, or to some poet before him possibly. Once received, it became converted into "paddickstool" in the North, paddick being the name there given to the toad.

Some of the botanical names of Fungi had a classical usage, though their ancient signification was not the same as their present application. Thus Galen speaks of "amanita," and Dioscorides of "agaricon"; but we do not know what they intended so to specify. "Hydnum" is used by Theophrastus apparently to indicate truffles; and "tuber" seems to have meant puff-balls. "Boletus," on which Martial wrote epigrams, was so well described by Pliny, that we know the plant thus designated was that now called Amanita Cæsarea. The name "boletus" has now a very different use. To conclude, "Mycology," the study of Fungi, has been formed from the Greek μύκης, a word which is presumed to have been applied to some kinds or kind of mushroom.

[1] Or it may have the signification in which gardeners apply it, meaning the suckers and shoots about the root of a plant.

CHAPTER II.

On the General Features of Fungi.

The Vegetable Kingdom is naturally divided into two grand divisions. These are the Phænogamia, or flowering plants, and the Cryptogamia, or flowerless plants. The difference between these two divisions is readily perceived, though it must be said that the border-line between them is obscure. There are plants that none but a skilled botanist could certainly determine as belonging to one side or the other. Belonging to the Phænogamia are the trees, shrubs, and various herbs most useful to man. The second division appears to contain little that is of value to us, and is therefore less appreciated popularly. But we have now to do with it.

The Cryptogamia, or flowerless plants, are recognised as forming two comprehensive classes—Acrogens and Thallogens.[1] The technical division is constituted by the characters of the fructification. But as this would need elaborate explanation, it will be enough, in this place, to remark a more simple distinction.

Acrogens are plants of more or less herbaceous character; they possess foliaceous appendages, and exhibit a green tint. In these respects they approximate to Phænogams. They comprise the Ferns, Mosses, Horsetails, Liverworts, etc.

Thallogens are plants without any foliage; they are leafless, and they are rarely of a green tint. They are subdivided into Algales and Mycetales. The first of these, the Algales, are plants deriving nutriment from water, in which they are submerged. Sea-weeds are the type most readily recognisable. Mycetales comprise Lichens and Fungi, the main difference between which is that Lichens derive their nutriment principally from the air, whereas Fungi draw nourishment chiefly from the substances on which they grow.

[1] Berkeley: *Cryptogamic Botany*.

Fungi come between Algæ and Lichens. Between the central forms or types of each class—between Sea-weed, Mushroom, and Lichen—the difference is obvious enough. But there are forms, as in the greater divisions of the Vegetable Kingdom, which come so close to the border of their class that they may easily be taken as belonging to another. There are Fungi closely approximating to true Lichens, and others which seem almost Algæ.

Fungi, therefore, are flowerless and leafless plants. They never possess the chlorophyll which produces the ordinary green tints of other vegetables. They fructify by means of cells separated from the tip of certain filaments, or produced within the cavity of the protoplasm. They derive nutriment from the substances on which they grow. It is their natural office to promote chemical change in organic structures, and to some extent in inorganic matter as well. They are therefore found accelerating decomposition; according to ignorant belief, springing from it. They help to regulate the balance of atmospheric constituents. They are fertilizing agents, providing nutriment proper for phænogamous plants. They serve as food for innumerable insects and larvæ. They also check exuberant growth, appearing in many forms as parasites on living vegetable and animal structures. Some of them offer highly nutritious food to men, and others contain essences having medicinal and other properties.

The forms in which Fungi appear are very numerous, enabling botanists to classify them into a great many orders and genera. These we shall study in their place. But there is an arbitrary and unscientific method of subdividing the class, which it will be convenient to adopt, in so far as it serves the purposes of this book. This is to consider all substantial, comparatively large, and fleshy Fungi as being comprehended under the name of Mushrooms, and to employ the title of Moulds to cover all minute forms. It is with the first of these divisions that the present work is concerned.

Moulds comprehend the larger number of species. Over two thousand British species of them are known. For the most part they can only be studied under the microscope. The mildew which comes on articles of food, and is familiar to every one, is seen under the microscope to be an aggregation of elegant and perfect plants, infinitesimal in size, but subject to laws of growth as in higher plants. These minute forms are of infinite variety, and are grouped into numerous orders and genera. Few among them have

any economic value. Yet there is Yeast, a minute Fungus of the class of Moulds. Its pabulum is fermenting, starchy, and saccharine matter, and its office is to promote the chemical changes known as fermentation. Then there is Ergot, a minute parasite which fastens upon the grain of growing rye. This is a drug of wonderful properties, now largely used in medicine. Perhaps others of these minute kinds may be found equally valuable one of these days.

The larger kinds of Fungi, which we have consented to call Mushrooms generally, make themselves prominently apparent to the most casual observer. At certain seasons they are seen springing up in gardens and by roadsides, in shrubberies and hedgerows, in fields and meadows, among moss and fern, in moorlands and wastes, in woods, copses, plantations, and forests, alike beside the footprints of men and in the depths of the wilderness. They grow upon the ground, upon half-buried roots, on trees living, dying, and dead, on stumps, old posts, dunghills, and amid the *débris* of decaying vegetation, as well as in the cornfield, the meadow, or the flower-bed. They come up singly, or in little groups, or in rings, or in bunches, clusters, and tufts. Some are of delicate and membranaceous texture, fragile little things. Others are stout and flesh-like. Yet others are leathery, corky, fibrous, or woody in substance.

Among this vast family of plants, belonging to one class, yet diverse from one another, comprising more than a thousand distinct species indigenous to these islands, there is but one kind that Englishmen condescend to regard with favour. All the rest are lumped together in one sweeping condemnation. They are looked upon as vegetable vermin, only made to be destroyed. No eye can see their beauties; their office is unknown; their varieties are not regarded; they are hardly allowed a place among Nature's lawful children, but are considered something abnormal, worthless, and inexplicable. By precept and example children are taught from earliest infancy to despise, loathe, and avoid all kinds of "toadstools." The individual who desires to engage in the study of them must boldly face a good deal of scorn. He is laughed at for his strange taste among the better classes, and is actually regarded as a sort of idiot among the lower orders. No fad or hobby is esteemed so contemptible as that of the "fungus-hunter" or "toadstool-eater."

This popular sentiment, which we may coin the word "Fungo-

phobia" to express, is very curious. If it were human—that is, universal—one would be inclined to set it down as an instinct, and to reverence it accordingly. But it is not human—it is merely British. It is so deep and intense a prejudice that it amounts to a national superstition. Fungophobia is merely a form of ignorance, of course; but its power over the British mind is so immense, that the mycologist, anxious to impart the knowledge he has gleaned to others, often meets with scarcely credence or respect. The superstition strikes deep. He who would write or lecture about Fungi can scarce find readers or hearers. The English scientist investigates every domain of Nature, but leaves this one coldly alone. The English medical man disdains to inquire into the chemical constitution of Fungi, and is indifferent to, and unknowing of, their relations in regard to medicine, toxicology, diet, or hygiene. It is surely high time that English intelligence should rise superior to this peculiar phase of ignorance!

Fungi are a class of plants governed by modifications of the same laws that control the development of all other vegetables. The study of them should be approached from a similar point of view. They ought never, under any circumstances, to be regarded in one common light. Each species has a separate existence, and its nature, characteristics, constitution, and inherent properties may vary very greatly from those of even its nearest congener. Fungi do not spring up indiscriminately, spontaneously, or uncertainly. Each species obeys fixed laws of growth and development, and is not transmutable into others. Each species has its own particular locality and habitat, and its characteristics are precisely definable; nor are these liable to greater variation than is the case in flowering plants. The species are naturally arranged in larger and smaller groups, called families, orders, and genera.

The modes by which Fungi are fertilized have yet to be discovered. Some are propagated by means of the mycelium to a certain extent, but the universal method of reproduction is through the medium of spores, which correspond to the seeds of flowering plants. These spores are of infinitesimal size, even in the largest Fungi, and are generated in inconceivable multitudes by each plant. They become productive only when they reach their proper pabulum. The conditions under which they become productive have yet to be learnt. These spores are disseminated in countless myriads by the air, which is ever loaded with them. Some kinds of Mould, for example, it is almost impossible to

exclude from their special nidus. Other kinds are apparently disseminated by water, by the sap of plants, by the blood and excreta of animals, birds, reptiles, or insects, and in yet other ways.

The geographical distribution of Fungi is not determined by precisely the same conditions which govern the distribution of other plants. To begin with, the Mycology of a great part of the world is totally unexplored. Only a few general remarks can be hazarded on this head. The temperate and sub-tropical zones appear to be the most prolific in variety and abundance of species. Many Fungi are found almost universally. Others are restricted to their zone. The least proportion are confined to special localities. Migrations seem to be going on. Parasites follow the migration of their foster-plants. But not only this: independent forms change their location. The Fungi of North America are more nearly akin to those of Europe than is the case with other plants. In fact, America possesses most of the species inhabiting Europe. Great Britain has generally the same Fungi as the north of Europe, the peculiar species of countries being very few. Mycological regions differ according to degrees of humidity and heat. Forests are more prolific than open plains; and there is a difference between forests of Coniferæ and those of other trees, in the Fungi inhabiting them. Some species confine themselves to limited habitats, and the laws of their migration and diffusion are yet unknown.

CHAPTER III.

On the Discrimination of Fungi.

The first lesson it is necessary to impress upon the student of Mycology is to advocate the importance of exercising the faculty of Discrimination. It is peculiarly needful to enforce this upon English people, because their extraordinary disdain of Fungi makes them almost unable, at first, to acknowledge the line of demarcation between one species and another. The predisposition to regard Fungi as one collective whole is so strong that it is by no means easy to eradicate it. And yet the first principles of Mycology cannot be understood until this is done. It is needful to supplant it with a comprehension that Fungi consist of a vast number of individual and independent species. Little groups of these individuals are more or less linked together; but still each species preserves independence. There is some characteristic feature or property which identifies and individualizes each species, separating it from its nearest congener.

It seems absurd to insist upon this point, which is such an obvious truism. But the fact is there are many English people to whose appreciation Fungi appear only in the mass. The idea of Fungus species is to them hardly a reality. Their conception is only that of variation among members of one common stock. They find it difficult to understand the diversity existing among Fungi, and still more difficult to comprehend the immutability of species from parent to offspring, and the radical, insuperable, and everlasting differences between one species and another. To enable such minds to grasp the full meaning of the word Discrimination is the object of this chapter.

Those who enter upon the study of Fungi purely as a branch of Botany will scarcely require to be urged to adopt discriminating views, for the mode of their investigations necessitates differentiation. It is to persons wishing to acquire some slight and superficial knowledge of Fungi—what may be termed a *popular*

knowledge—that we must lay especial stress upon this feature. If a right understanding of it be first of all implanted in the mind, then any one may learn to recognise a few of the notable species safely and surely. The simplest rustic finds no difficulty in apprehending the obvious differences between various trees, between the sundry flowers and pot-herbs of the garden, or between the weeds of the roadside. Yet people of good intelligence commonly confuse all Fungi together, not regarding them in the same way that they do other plants. It is here that the ground must be cleared to begin with. People must be taught to consider one species of Fungus as quite a different plant from another, to look upon Fungi as they do upon the aggregation of plants in a garden, a field, or a wood, as comprising many different kinds of vegetable, distinguished from each other by many essential characteristics, as well as by mere external shape and colour.

When the economic use of Fungi is the main object of inquiry, then Discrimination must be practised most rigorously. It is not alone necessary that this should be done in order that noxious plants may not be mistaken for wholesome esculents, but for the sake of even more refined distinction. There are a great many species of Fungi which we may use for food, but they have very various values. Two species may be equally wholesome, but, in a culinary sense, or in a gastronomic sense, they may differ as widely as does an apple from a cabbage. There are multitudes of diversities among the Fungi that are fit for food. Similarly, among those kinds which we call collectively "poisonous," there are all sorts of differences. The noxious principles they contain respectively have widely different action. The degree of their hurtfulness varies. Some are readily freed from their unwholesome essences, while others retain theirs under all circumstances.

The fact that no proper notion has been popularly entertained respecting the total dissimilarity of species has led people to ask if there were not some general rule or test by which edible mushrooms could be at once distinguished from noxious ones. To meet this desire, sundry sets of precepts have been promulgated. Of them it is sufficient to say that, being based on ignorance, they are invariably erroneous and delusive. Some of them have been given, too, on the authority of persons one would have expected to find better informed. Any principle of selection of an arbitrary sort can only have a very limited application, and is seldom without exceptions to it. Among Fungi we must judge of the

suitability to our needs, or otherwise, of each species separately and alone. The qualities of one must not be confounded with or estimated by those of another. As is the case in every department of the Vegetable Kingdom, closely related species will be found, one of which, if eaten, is wholesome and nutritive, and the other quite the reverse. It is therefore necessary that, when we regard Fungi, or indeed any other class of plants, from an alimentary point of view, we should consider each species as a distinct and separate entity.

What has been implied by the use of the term Discrimination will perhaps be now apparent. Whether one wishes to study Mycology deeply and scientifically, or whether one merely desires to make acquaintance with a few of the most prominent, common, and useful Fungi, it is equally necessary to begin by causing the mind to think of Fungi as a congeries of totally distinct plants, and not as a mere confusion of forms radically much the same thing.

The reader who intends to pursue a really thorough study of Mycology is recommended to master the details set forth hereafter, particularly as regards the structural anatomy and classification of Fungi. He may then, after acquiring all the information set forth in this work, have recourse to others,[1] remembering that study of this sort can only be efficiently pursued by conjoining practice to theory. To those, however, who merely wish to acquire some slight practical acquaintance with common Fungi, modified advice is offered. They should endeavour to realize the distinguishing characters of the chief orders and genera, and should practise interpreting descriptive terms. Some comprehension of structure is, of course, needful in order to effect this, and the eye should be accustomed to trace the distinctive characters of different species. This will be readily accomplished by an ordinary intelligence, and then the particular plants it is desired to recognise and make use of may be sought for and easily identified from the descriptions of them given. If recourse is had to plates or illustrations of Fungi, it should be borne in mind that hasty and superficial comparisons are dangerous. There is no surer way of identifying a hitherto unknown species than by carefully comparing its several parts with a written scientific description.

[1] The following English works will be most useful to students:—Berkeley's *Cryptogamic Botany*, and *Outlines of Fungology*, Berkeley and Cooke's *Fungi*, Cooke's *Handbook of British Fungi*, Lindley and Moore's *Treasury of Botany*, etc.

It is a striking instance of the confused popular notions of Fungi in England, that hardly any species have or ever had colloquial English names. They are all "toadstools," and therefore are thought unworthy of individual baptism. Can anything more fully demonstrate the existence of that deep-rooted prejudice called here "Fungophobia"? Could anything make more apparent the need of laying emphasis upon the principle of Discrimination, as a first step towards popularizing any knowledge of Fungi? In the countries of the Continent the greater number of species have each their particular local names. Even the Redskin of America and the Maori of New Zealand have specific names for their common Fungi. Only we prejudiced Britons have none!

Some attempt has here been made to remedy this want. A few names have already been in use among amateur mycologists. Others have been derived from French or German sources, or from the scientific nomenclature, or have been coined from some distinguishing peculiarity.

CHAPTER IV.

On the Economic Use of Fungi.

Fungi are, as a class, of greater economic value than any other of the Cryptogamia. The chief use of them, however, is alimentary. The essential principles of one or two have made them useful in medicine. Of these Ergot is the best example. The value and utility of Yeast is well known, and an analogous fermenting agent is found in another Fungus, the so-called "vinegar-plant." Some kinds have been utilized as dyes. Several of the large Polypores were formerly much used in the preparation of Amadou, or "German tinder"; and their prepared fibrous substance forms an article like soft leather, which has been used in sundry ways. Probably chemistry has yet to reveal many fungoid principles that can be rendered serviceable.

But these uses are trifling compared with the employment of Fungi as articles of food. A great many species are wholesome, extremely nutritive, and more or less palatable. Sundry kinds of the larger Fungi—Mushrooms—have been used among the ancients; and there does not appear to be any nation, civilized or savage, among whom some species are not recognised articles of diet. While the greater number have been principally made use of by the peasantry, other kinds have been esteemed as delicacies by the rich, and some of these have therefore become of commercial importance. Among these latter is the large orange-yellow Amanita Cæsarea, called by the French the Oronge. This mushroom is greatly esteemed on the Continent at this day. It was considered the best of dainties by the epicures of imperial Rome. They imported it from Gaul and Germany, and it is the only mushroom out of sundry eaten by them of which they have left us a description we can recognise. Other kinds that were in use during classic and mediæval times cannot now be precisely identified, since no clear descriptions of them have reached us.

Now-a-days an immense bulk of mushrooms, comprising a

great many different species, is eaten in the various countries of Europe. In many localities, particularly in forest regions, the peasantry look upon Fungi as furnishing a most important item of daily food, while the gathering of certain choice sorts for market affords profitable employment. The titles of "manna of the poor," "fruits of the earth," etc., as applied to Fungi, have in such countries no fanciful meaning. They are, at any rate, more strictly suitable than "food of the gods," which was how the ancient Greeks loved to extol their favourite mushrooms.

In England the pasture Pratelles are the only kind of mushroom popularly and generally considered eatable. All others are supposed to be more or less noxious. Doubtless some readers of this will be surprised to learn how much wider is the consumption of Fungi in other countries. In many of the chief cities of the Continent mushrooms are excisable commodities, and inspectors are appointed to overlook the market and watch that no deleterious species should accidentally be admitted. During recent years much attention has been paid in England to the cultivation of a variety of the pasture Pratelle. There is now a considerable demand for it, and the occupation of growing it for market is very lucrative. One may hope, from this, that the old prejudice against other sorts of Fungi will in time be weakened.

Doubtless we have a few more or less ardent mycophagists—fungus-eaters—scattered about the country, who make use of one kind and another to a small extent. Foreigners, too, appear to have introduced a usage of certain species in some localities. Truffles are, or were, collected about the New Forest; the Morel has some friends in Northamptonshire, Hertfordshire, and Durham; the Blewit is favoured in Cambridgeshire; the Oread in Kent and Sussex; and the so-called Red Truffle in the vicinity of Bath. In excursions round London the author has often met French, Germans, Swiss, and Italians, probably waiters and the like, out for a holiday, who were filling their handkerchiefs with fungus dainties to carry home for supper.

Throughout the countries of Europe there are upwards of two hundred species of Fungi commonly used for food in various ways. France, Germany, Austria, and Russia appear to consume them most abundantly; then come Italy, Switzerland; and after them the remaining countries. The greater number of these edibles occur in England also, where they are suffered to rot where they grow year by year.

Going still farther away, we shall find that certain of their indigenous Fungi are used as food by the inhabitants of Siberia, Persia, Afghanistan, India, Cochin-China, Java, and elsewhere in Asia. The Japanese and Chinese seem to employ many kinds. The latter even import a tree-fungus from New Zealand and the Pacific Islands, to the amount of several thousand pounds' worth annually. The Australian blacks eat several kinds of Fungi, as also do the Maori and Polynesian tribes. In Tasmania there are several species used by settlers, a legacy left them by the vanished aborigines. Travellers speak of certain mushrooms which are consumed in Madagascar, South Africa, and again in Central Africa. The Tierra del Fuegian regards a certain kind of tree-fungus as one of his staple articles of diet. In South America some appear to be made use of, and the Europeans who have peopled the United States find there many of the esculents they knew in the old home.

It is therefore evident that Fungi, of one kind or another, are almost universally accepted as dietary articles. As a fact, the chemical composition of the flesh of Fungi shows it to be admirably adapted for human food, and indeed to contain the elements necessary to nutrition in even a higher degree than any other class of vegetables. More is the pity, then, that English people should be so fixed in their prejudice against Fungi! Tons innumerable of excellent food are suffered to waste every year because of it.

During summer and autumn our parks, pastures, woodlands, and plantations abound with a profusion of esculent Fungi. The neglect of this aliment is serious, when we reflect on the poverty and want surrounding us. Though scarcity of food is less felt at those seasons than in winter, it may be remarked that this is no excuse for the national improvidence, since most kinds of edible mushrooms may be stored by salting, pickling, drying, and so forth. It is also to be noted that there are sundry abundant kinds of superior excellence and flavour, best suited for the rich man's table. If these were known, there would soon arise a demand for them, they would become of commercial value, and would give increased means of livelihood to a good many individuals.

The fear of being poisoned by eating "toadstools" is a grossly exaggerated apprehension in this country. It arises chiefly from the singular popular incapacity for individualizing fungus species.

They are all confounded together in the mind, and are not regarded separately, each kind by and for itself, as are other plants. An ordinary Englishman's only idea of gathering wild Fungi is to make a heterogeneous collection of everything fungoid that comes in his way, Put into practice this will obviously result in mistakes. Some deleterious plant will be gathered along with wholesome ones, and a case of poisoning is the result. Then the doctors will blame, not the stupidity or carelessness of the gatherer, but the mushrooms indiscriminately, and the local newspaper will contain a solemn warning against all sorts and conditions of Fungi.

The first step towards dispelling public ignorance and apprehension must evidently be to drive the idea of discrimination into the public mind. This can be best effected by no longer speaking of "Fungi" or "Mushrooms" under those general designations, but by popularizing the use of specific names, such as will be found in other chapters of this book. When people become able to familiarize their notions of Fungi with various titles, as they familiarize trees with particular names, such as beech, elm, oak, etc., these difficulties and dangers will vanish. The recognition of the common esculents is easy enough to learn, once the mind has grappled the idea of discrimination. On the Continent children are taught to recognise those kinds of Fungi locally appreciated, and they will select such and such a species, with which they have become familiar, unhesitatingly from amid a thousand others. Surely English children are as quick as those of the Black Forest or Lorraine!

The information offered to the public is not mere speculation, but well-attested fact; it is not the recent discovery of rash enthusiasts, but the collected evidence of past ages and various peoples. During the present century systematic botany has been applied to Fungi, first by Persoon and his followers, afterwards by Fries and the present school of mycologists. Though much remains to be discovered, systematic classification enables us to appreciate and make use of all that we do know. Our acquisitions of mycological knowledge are no longer confined to haphazard folklore, but can be tabulated and arranged, verified and corrected.

There exists a curious notion which has apparently helped to prevent a wider use of Fungi in this country. It is that there is no certainty in the qualities of Fungi; that a species which is wholesome eating in one country may, when growing in another,

provide itself with a noxious principle; consequently that we cannot depend upon the qualities of an English mushroom, although the identical species may be invariably wholesome and good in France. No proof that this is so has ever been producible. There is only vague and erroneous assertion to back it. And if it were to be indisputably demonstrated that such change of character was really true, it could only be set down as a peculiarity of the one species in which it had been observed, and could not be applied to all kinds indiscriminately. The idea arises from the lack of discrimination. When Fungi are regarded properly, each species as a thing by itself, as we should regard an oak, an apple-tree, and a gooseberry-bush, then such a notion is seen to be not only without analogy in the Vegetable Kingdom, but also incompatible with common sense.

Little as English people know about esculent Fungi, that little is illumination compared with all they know on the subject of fungus poisons. In that field there is almost total darkness. But the subject will be treated of in a separate chapter on the chemistry and toxicology of Fungi, which the author particularly recommends to the notice of the medical profession.

CHAPTER V.

On the Structural Anatomy of Fungi.

In order to comprehend the classified arrangement of Fungi into orders and genera, and to enable any one to understand descriptive terms, and by the help of them learn how to identify species, it is necessary to become acquainted with the form and structure of Fungi, and with that of the several organs and parts of an individual fungus. The student is recommended to familiarize himself with all varieties of these plants that come in his way, until he is master of the expositions set forth in this chapter. After that he will find classification no difficult task.

To denominate terrestrial Fungi "fruits of the earth" is not altogether fanciful. If we dig up the soil about the base of a mushroom, or if we examine the structure upon which parasitic kinds are growing, we shall find what appears to be a quantity of white mould, or of little delicate threads. This matter is called the **Mycelium**, or "spawn," of the plant, and actually constitutes its vegetative tissue, being thus analogous to the roots, branches, and foliage of herbaceous plants. From this Mycelium the mushroom is thrown up, it being the organ which develops the reproductive cells. The office of a mushroom is therefore analogous to that of a fruit. In description, however, it is convenient to speak of the mushroom as if it were the whole plant in itself.

Fungi of different orders possess various features, and are not all provided with the same parts or organs. The greater number of mushrooms possess a **Hymenophore**. This is a cellular or filamentous structure, comprehending the substance of the mushroom. It may either be borne upon a stem, distinct from it, or may include the whole apparent bulk of the plant. Upon the surface of either the whole or a part of the Hymenophore is spread the **Hymenium**, which is the fructifying or spore-bearing organ of the fungus. In the orders Agaricini, Hydnei, Polyporei,

and a section of the Elvellacei, the Hymenophore is disposed as a cap or **Pileus**, the most prominent feature of the mushroom. When identifying plants we first note their Habitat, or place of growth, their Season, or time of appearance, and their Mode of growth, whether solitary, in groups or rings, or in tufts or bundles, etc. These points must not be neglected. Next, the Pileus presents itself for examination.

THE PILEUS.

This organ includes the upper surface and substance of the mushroom. It may either be raised upon a stem, central or lateral, or may spring directly from the base. In each species it has distinctive size and shape, colour and appendages, of which observation must be taken. Certain Fungi divide into branches, each of which bears a small Pileus. These little caps are called **Pileoli.** The exterior appearance of the Pileus in different species is described by the following terms :—

Ascending, when directed upwards from a lateral stem.
At length, or **then**, meaning when more mature.
Campanulate or **Campaniform**, shaped like a bell.
Clammy, surface slightly moist to the touch.
Conchate, shaped like an oyster-shell.
Conical, in form of a cone.
Concave, hollow on surface, margins slightly elevated.
Convex, surface rotund.
Corrugate, surface irregularly crumpled.
Costate, surface somewhat ribbed.
Crisped, curled up from the margins.
Cuspidate, tapering upwards to a sharp point.
Cyathiform, shaped like the bowl of a wine-glass.
Delicate, slight and fragile.
Depressed, the centre somewhat sunk irregularly
Dilate, extended from side to side.
Dimidiate, divided into two halves or lobes, usually of unequal size.
Disc, the central or uppermost flat surface.
Dry, devoid of sensible moisture.
Elastic, regaining shape when pressed and released, springy.
Even, surface having no elevations or depressions.
Expanded, spread open, nearly flat.

Farinose, covered with white floury powder.

Fibrillose, covered with fine loose fibres or threads.

Fimbriate, bordered with a fringe.

Flabelliform, shaped like an open fan.

Flaccid, relaxed, wilted.

Fleshy, substantial, but soft like flesh.

Floccose, Flocculose, covered with soft woolly hairs which depend in tufts.

Gibbous, having irregular convexities or swellings.

Glabrous, surface devoid of hair, down, scales, warts, or other appendages.

Globose, round like a ball, with or without a stem attached.

Glutinous, surface sticky to the touch.

Granular, covered with minute grains.

Hemispherical, the top equally rounded, like half a ball.

Horizontal, level, plane.

Hygrophanous, translucent when wet, opaque when dry.

Imbricate, applied to Pilei overlapping one another, or to scales on the surface similarly.

Immarginate, without any definite edge.

Irregular, various individuals dissimilar in outline.

Infundibuliform, funnel-shaped, the centre sunk below the elevated margins.

Inverted, the common form reversed.

Laciniate, fringed with cracks or fissures in the substance.

Lobed, Lobulate, divided as it were into small rounded prominences.

Moist, surface damp to the touch.

Nodulose, covered with pimples or knots.

Obtuse, rounded, with blunt, thick, convex margin.

Opaque, tinted with a dead colour, not polished or clear.

Orbicular, rounded like a ball, circular.

Ovate, oblong, egg-shaped, broadest at the lower side.

Ovoid, egg-shaped.

Pallid, of an indistinct, watery, or dirty white colour.

Papillate, covered with minute soft tubercles, like a tongue.

Plane, quite flat.

Polished, surface smooth and shiny.

Pruinose, surface covered with a whitish bloom, like grapes, or as if frosted.

Pulverulent, surface dusty.

Pulvinate, cushion-like, thick and soft.

Radiate, streaks or ribs diverging over surface from the centre.

Reniform, kidney-shaped, like a crescent with rounded apices.

Repand, spreading out with an uneven margin.

Resupinate, the upper surface turned downwards by twisting growth.

Revolute, rolled backwards at the margin, out of the ordinary direction.

Rigid, firm, stiff, unyielding.

Rimose, Rimulose, surface broken by chinks and cracks.

Rivulose, surface finely channelled or grooved.

Rounded, rotund, with blunt margin.

Rugose, Rugulose, covered with wrinkled lines, the interspaces being convex.

Satiny, glossy like satin.

Scabrous, rough to the touch.

Scaly, covered with scales, which are usually fibrous.

Sericeous, Silky, covered with close matted hairs, silky to the touch.

Sessile, without any stem.

Sinuate, having the margin deeply waved.

Sleek, smooth and glossy on the surface.

Smooth, surface presenting no inequalities; usually glabrous, but not necessarily so.

Soft, very tender and yielding to the touch.

Spatulate, shaped like a spoon or spatula.

Squamose, Squamulose, covered with coarse or fine scales.

Squarrose, surface rough with projecting scales.

Stipitate, provided with a stem.

Sub, a prefix diminishing the force of terms, meaning *slightly*.

Sulcate, the margin furrowed, indented like the milling of a coin.

Tesselate, when the surface appears cracked into little squares.

Thin, when of slight substance throughout.

Tuberculose, covered with little irregular pimples.

Umbilicate, having a slight central depression on the top.

Umbonate, having a slight elevation or boss on the centre of the upper surface.

Undulate, surface waved and uneven.

Velvety, having the surface like velvet.

Verrucose, surface covered with adherent warts.

Villose, covered with long weak hairs.
Viscid, covered with a sticky exudation.
Wrinkled, surface contracted and crumpled.
Zoned, concentric bands of colour on surface.

THE CUTICLE. This is the skin, peel, or external epidermis of the upper surface of the Pileus. Its aspect is generally described by sundry of the foregoing terms. It is also spoken o as being **Adherent**, or **Adnate**, when firmly attached to the flesh; **Separable**, when it can readily be pulled off; and **Areolate**, when broken up into little angular spaces.

THE MARGIN. The border or outward edge of the Pileus. Some terms describing it, not already included among those previously given, are the following:

Arcuate, arched and curved in outline.
Blunt, thick and rounded.
Broken, jagged and fissured.
Depressed, directed downwards, away from the disc.
Even, of clean and equal outline.
Flanged, turned out flatly, like the brim of a vessel.
Flexuose, of wavy outline.
Grooved, deeply and irregularly furrowed.
Incurved, folded flatly and slightly downwards upon itself.
Involute, rolled tightly in upon itself.
Patent, spreading directly outwards.
Pellucid, clear and translucent.
Pendulous, hanging loosely down.
Plicate, plaited lengthways in little folds.
Pubescent, covered with fine down.
Split, cracked and fissured.
Striate, finely streaked, imperceptibly *sulcate*.
Tomentose, covered with very evident down.
Waved, irregularly bent in outline.

THE SCALES. These are flattened flakes formed upon the surface of the Cuticle in some species, and also sometimes covering the Stem externally. Some terms already given may be used in describing them; others are the following:

Concentric, when arranged round the centre of the disc thickly, becoming large and scattered at the Margin.

Granulous, when small, like coarse dust.

Fibrillose, when formed of little tufts of hair or down, fibrous.

Fibrilloso-squamose, scaly accretions of fibre. Used in describing the Mushroom.

Reflexed, when the points of the Scales project a little.

Revolute, when the Scales are strongly curved back, or rolled up on themselves.

WARTS. These are excrescences covering the Pileus of some species. Warts are not a part of the Cuticle, though adherent to it. They are patches of the broken Volva, a sheath which inclosed the mushroom in an earlier stage. The character of the Warts helps to indicate different species, particularly among the important Amanites. Warts are described as being **Large, Small, Mealy, Angular, Scattered,** etc., terms which explain themselves. They are said to be **Acute,** when pointed on the top; **Floccose,** if of woolly texture; **Fugacious,** if easily brushed off, and if disappearing as the plant attains maturity; or **Persistent,** when firmly attached and lasting.

THE STEM.

This feature is present in the majority of pileated species, but not in all. When there is no distinct Stem, but a mere base, the plant is termed **Sub-sessile.** When the Stem is entirely absent, it is **Sessile.** The interior of the Stem will be examined when we come to speak of the mushroom in section. At present we confine our attention to its *external* aspects. Its appendages will be considered immediately afterwards. The varying characters of the Stem in different species are described by many terms which explain themselves, such as **Hard, Smooth, Bent,** etc.; also by terms already defined in connection with the Pileus, such as **Squamose,** etc. Terms not yet noted are the following:

Attenuate, tapering upwards, or downwards if specifically so described.

Blunt, Obtuse, base terminating abruptly, neither tapered off nor enlarged.

Bulbous, having enlarged base. May or may not be attenuate above.

Canaliculate, traversed by deep channels.

Compressed, flattened or pinched in at some part.

Connate, two or more stems united below.

Contorted, much twisted about, irregularly.

Cylindrical, round, implying that the Stem is not compressed anywhere.

Elongate, lengthened out; tall, or long.

Equal, of the same thickness throughout, neither attenuate nor bulbous.

Excentric, not fixed to the centre of the Pileus, but more to one side.

Filiform, very slender, almost thread-like.

Flexuose, zigzagged; of wavy outline.

Furfuraceous, covered with scales or particles having the appearance of bran.

Grooved, somewhat furrowed longitudinally.

Incrassate, swollen; usually applied to signify a bulbous base.

Lacunose, surface pitted with shallow holes.

Lateral, growing horizontally, and attached to one side of Pileus.

Naked, without any ring or remains of Veil on it.

Oblique, growing in a slanting or lopsided fashion.

Obsolete, wanting in many individuals of the species, or absent in maturity.

Punctate, covered with spots and dots of colour.

Reticulate, marked like a net, by meshed fibres.

Rooting, having very evident roots or rootlets.

Rufescent, tinged with reddish colouring.

Scrobiculate, surface broken by deep irregular pits.

Strigose, covered with little bristles.

Swollen, Thickened, enlarged at some part of its length.

Twisted, having a spiral tendency in its fibres.

THE RING AND VEIL.

These features must always be noted, or their absence remarked. In the earliest stage of development many mushrooms are invested with the Veil. It is a thin membrane or filamentous shield, attached to the top of the Pileus or its folded Margin, and extending to the Stem. It thus forms a covering over the young Hymenium. In this stage the mushrooms may be styled "buttons." As the plant grows and expands, the Veil is broken up. Fragments remain on the Margin, but in most cases soon disappear.

The part of the Veil attached to the Stem now forms a sort of collar upon it, which is called the **Ring.** In some species this disappears as the plant matures, in others it remains. When no Ring is ever found on the Stem of a species, the Stem is described as being **Naked**; when there is a Ring, it is **Annulate.** Various characters of Veil and Ring are described by terms readily understood, or that have been sufficiently interpreted in the previous pages. Others are the following:

Arachnoid, Veil and Ring of woven threads, like spider-web.

Ascending, Veil, when in youth its Stem attachment is below the level of its Marginal one. In this case the Ring is called **Inferior.**

Deflexed, Ring, when drooping or hanging down on the Stem.

Descending, Veil, when in youth its Marginal attachment is below the level of its Stem insertion. The Ring is then **Superior.**

Distant, Ring, when much below apex of Stem.

Distinct, Ring, when well marked and fully apparent.

Entire, Ring, when its edge is clean cut, not torn or jagged.

Evanescent, Veil or Ring, when disappearing at a very early stage.

Fugacious, Veil or Ring, when liable to disappear before or at maturity.

High, Ring, when near apex of Stem.

Medial, Ring, when about middle of Stem.

Moveable, Ring, when it can be slipped up and down on the Stem.

Radiate, Ring, when spread outwards in rays.

Reflexed, Ring, when its edge curls upwards.

Torn, Veil or Ring, when ragged.

Universal, Veil, when it extends over the whole Pileus in infancy.

Woven, Veil and Ring, when composed of woven fibres.

THE VOLVA.

A limited number of species possess this feature. It is a strong membrane, stouter than the Veil, and it invests the entire mushroom in infancy, as the shell of an egg incloses its yolk. The developing plant eventually bursts the Volva at the top, and rises out of it, retaining the lower part like a cup about the base of the Stem, and, in some species, carrying fragments of the Volva at-

tached to the Pileus in the form of Warts. The Volva must be well noted, for, as we shall hereafter see, it is a distinguishing characteristic of some very important Fungi. The Warts have already been alluded to. When they are present, the Volva is termed **Imperfect.** It is **Elongate,** when the cup stands high about the Stem; **Fugacious,** when soon disappearing; **Obliterate,** when only a rim on the base of the Stem remains in the developed plant; and **Vaginate,** when closely sheathing the base of the Stem.

THE SECTION.

This is to be effected by cutting with a sharp knife right across the top of the Pileus, down through the centre of the Stem to the base, dividing the mushroom into two vertical halves. This enables us to observe the characters of the Flesh, the interior of the Stem, and the Hymenium.

THE FLESH. This is the substance of the Pileus. Its varying character often aids in the identification of species. Its **Tint** must be observed, and whether that undergoes any **Change** by exposure. It is further desirable to note whether the Flesh is **Thick** or **Thin, Hard** or **Soft, Tough** or **Tender, Dry** or **Juicy, Compact** or **Unsubstantial, Leathery** or **Brittle,** whether in fracture it can be described as **Cheesy, Mealy, Membranaceous, Waxy,** or **Translucent.** Its odour and taste must also be observed.

INTERIOR OF STEM. Of this it is desirable to note, first, whether its substance is **Confluent** or not with that of the Pileus, or whether it be **Heterogeneous** from it; that is, whether Pileus and Stem are evidently of different substance and easily separable. Second, if Stem and Flesh are confluent, we must observe whether they are confluent and of **Homogeneous** substance, or confluent but of heterogeneous substance. Next, we shall see if the Stem be **Solid,** or if it is **Fistulose,** that is, containing a hollow cavity, or if it is **Stuffed,** that is, filled up with a light pith. We must determine the character of this pith, as to whether it can be described as floccose, fibrous, spongy, etc. The section also shows whether the Stem has any distinct outer coat, and if that is **Fibrous, Cartilaginous,** or otherwise. All these trivial points are of value in assisting the identification of species for the first time.

THE HYMENIUM.

This organ consists of an extremely fine membrane which is spread over certain parts of a mushroom. Upon its surface there are developed innumerable quantities of Spores, perceptible only in the aggregate as impalpable dust. Among the larger Fungi the Hymenium is of great superficies, because it is spread over a large number of processes. These processes vary in character in different orders, and will consequently have to be separately studied. The first with which we have to do are the **Gills** of the order Agaricini.

GILLS. These are a distinctive characteristic of the order Agaricini. They consist of thin, lamellar plates, set vertically upon the under side of the Pileus, radiating from the Stem to the Margin. They are really extremely fine prolongations of the substance of the Pileus, coated throughout by the Hymenium. The interior substance of Gills is called the **Trama.** When the Section has been made we are able to see the flat side of the Gills, and to note their disposition, which is an important feature in the identification of species. The Gills are, for the most part, coloured by the Spores produced upon them, which will be presently adverted to. Their conformation, when seen in the Section of a mushroom, is described by terms of which the following are those not yet explained, or generally comprehensible. The end of the Gills nearest the Stem is called **Posterior,** or **Behind**; that nearest the Margin is styled **Anterior,** or **In Front**; while the part or edge affixed to the Pileus is looked at inverted and described as **Below,** or **Beneath,** the outside or apparent edge being **Above.**

Acute, terminating in a point at either end.

Adnate, the posterior end squarely set and fixed on the Stem.

Adnexed, the posterior end fixed to the Stem, but not squarely set.

Anastomosed, united one to another by irregular junctures.

Approximate, the posterior end almost adnexed to the Stem.

Arcuate, arched from posterior to anterior.

Ascending, from the Margin to the Stem.

Attenuate, tapered off at either end.

Branched, dividing from the sides; also styled **Furcate,** and **Forked.**

Broad, wide or deep vertically, as seen on section.

Close, packed closely side by side; also styled **Crowded.**

Connate, conjoined at the posterior end.

Crenulate, the edge incised with rounded notches.

Decurrent, the posterior end running some distance down the Stem.

Denticulate, the posterior end having a little tooth or spur.

Deliquescent, melting into liquid as maturity advances.

Distant, wide spaces between the Gills.

Emarginate, Sinuate, having a sudden notch or vertical curve at the extreme posterior.

Entire, the edge quite devoid of serrature or notch.

Equal, all Gills of the same or nearly the same regular length from back to front.

Eroded, the edge ragged, as if torn.

Fixed, rigidly adherent on the upper edge.

Free, ending posteriorly at a little distance from the Stem, and not at all attached to it.

Lanceolate, tapering by a rounded curve vertically at either end.

Linear, narrow, and the upper and lower edges almost parallel.

Moniliform, contracted at intervals in the length.

Narrow, of very slight vertical width.

Obtuse, rounded off at either end, vertically; also **Rounded.**

Pointed, either end finishing in a point.

Projecting, the anterior end jutting out beyond the Margin.

Remote, terminating behind some distance from the Stem.

Rugulose, the sides wrinkled.

Serrate, Serrulate, the edge more or less finely and sharply notched or toothed in its length.

Simple, not branched, divided, or connected together.

Straight, the edge plane and even.

Truncate, terminating abruptly and squarely at either end.

Unequal, short imperfect Gills interspersed among the others. The common condition.

Venate, Veined, intersected by swollen wrinkles or veins, below and on the sides.

Ventricose, vertically widened or bellied out in the middle, before, or behind.

TUBES. Mushrooms of the order Polyporei have Tubes in place of Gills, which are vertically set upon the under side of the Pileus. Their superficial orifices, when seen on inverting the

plant, are styled **Pores.** The Tubes are displayed on section. They are coated internally by the Hymenium. The external colour of the Pores is often different from that of the Tubes internally, and is to be observed carefully. It will be necessary, for the purpose of differentiating species, to note the disposition and character of the Tubes, as seen on section. They may be **Angular** or **Cylindrical** and **Rounded,** densely packed together and **Numerous, Short** or **Shallow, Long** or **Elongate,** comparatively **Large** in diameter or **Minute,** of nearly **Equal** length or of **Irregular** length. Special descriptive terms are the following:

Adnate, Tubes nearest the Stem attached to it in their whole length.

Alveolate, Pores looking like honeycomb.

Compound, Tubes running into one another. The reverse condition is called **Simple.**

Decurrent, Tubes coursing some way down the Stem.

Depressed, surface of Pores sunk inwards in places.

Even, not curved in their length.

Free, no Tubes attached to the Stem.

Remote, Tubes a little apart from the Stem.

Sinuate, Wavy, Tubes undulating in their length.

Torn, Pores rough and jagged superficially.

SPINES. These characterize the order Hydnei. They are numerous little prickles, teeth, or needles, set on the under side of the Pileus or of the Pileoli. They are covered with the Hymenium, and fulfil the same function as Gills, or Tubes. It is needful to observe their colour, whether **Long** or **Short, Fixed** or easily **Detached, Acuminated** or **Blunt** at the tips, etc.

SPORES. These are the fructifying agents of mushrooms, and are produced upon and disengaged from the whole surface of the Hymenium. To the eye they are only perceptible as fine dust. Under the microscope they are seen to consist of minute bodies, whose form varies in every species. By the microscopic investigation of Spores, therefore, it is possible to identify species when all other means fail. And as Spores generally are unaffected by circumstances which destroy the structure of the plant producing them, such as decay, digestion in the stomach, cooking, and so on, it is evident that the microscope supplies a test that might be of importance sometimes.

The colour of the Spore-dust will be seen hereafter to be a valuable aid in establishing the species of Agaricus. The tint of the Hymenium is usually the same as that of the Spores, in maturity; but it is not invariably so by any means. To determine the tint of Spore-dust, therefore, we remove the Stem of the mushroom, and place it, Gills downward, on a sheet of clean paper. It is then to be covered with a glass or cup and left untouched for a night or so. On removal, the Spore-dust will be found deposited on the paper. Dry and mature specimens give the best results.

PILEATED BUT NON-SPORIFEROUS FORMS.

The Morels and Helvels, and others of the order Elvellacei, together with some of the Phalloidei, possess a Pileus and Stem, but are otherwise different from the forms already spoken of. In these the Pileus is not expanding, but rests on the Stem like a close-fitting hood or mitre. Both Pileus and Stem are usually much corrugated, but are describable by terms already given. The Hymenium is, in these species, spread over the external surface of the Pileus. The Spores produced on it are not, however, free. They are contained in cells, called **Asci**, are termed **Sporidia**, and cannot be examined without the microscope (Pl. XLIX.). Their mode of disengagement is mostly through the putrefaction or deliquescence of the plant.

NON-PILEATED TYPES.

We must now pass to forms of Fungi which are not provided with a Pileus, of which there are several types.

PEZIZA. This a large genus of the order Elvellacei. The general form is that of a shallow, stem-less cup. Some are large, others minute, some terrestrial, others parasitic. A few have a short base, almost a Stem, and they are convolved into various shapes, as of a horn, a trumpet, a snail-shell, an ear, etc. For merely structural definition we may include with them some species, as Bulgaria, Craterellus, etc., which belong to different orders. All these are to be examined with reference to their habitat, size, colour, and appearance on external and internal surfaces. We shall also find, on section, what the character of the

flesh may be. The Hymenium covers the interior of the cup, and is usually of brighter tint than the outside surface. The Spores are not free. Descriptive terms as already explained can be applied to these mushrooms.

CLAVARIEI. These are mostly nothing but Stems. They consist of solid fleshy masses of branches and branchlets, or are **Simple**, that is without branches, merely little fingers or clubs. Most are terrestrial, some are small, mere little filaments; others are of considerable bulk. A few grow solitary, others in clumps. Tints vary. The Hymenium covers the surface. A few fresh terms, not hitherto explained, will be used in describing these species, and are also applicable to certain Hydnums and Polypores.

Bundled, many stems bunched together.
Dichotomous, the branchlets in equal pairs.
Divaricate, straggling, spread about irregularly.
Fusiform, spindled, twisted, with tapered ends.
Laciniate, split into a sort of fringe.
Ligulate, the ends flattened like a strap.
Obovate, ovate but inverted.
Petaloid, like the petals of a flower.

PUFF-BALLS AND TUBERS. These are globose bodies; the former grow above ground, the latter are subterranean. The colours are various shades of white, yellow, brown, and black. The outside bark or rind, the **Peridium**, must be examined to note its peculiarities. Some kinds have one or more inner coats. On section the character of the internal substance, or **Capillitium**, will be seen. Puff-balls have a homogeneous flesh until arriving at maturity, when the substance develops into a mass of dust (Spores), which are ejected by the top of the Peridium bursting. Terms already given will be used in describing these forms.

AMORPHOUS TYPES. Of these we shall have occasion to notice principally the Tremellini. They are shapeless, jelly-like bodies, mostly parasitic. Habitat, colour, and other particulars have to be observed.

After this explanation of the typical forms of Mushrooms, that is, of such Fungi as come within the scope of this work, we may now go on to the Classification of them.

CHAPTER VI.

On the Classification of Fungi.

All Fungi belong to one or other of two grand Divisions; namely, **Sporifera**, in which the Spores are developed naked; and **Sporidiifera**, in which the fructifying agents are inclosed in cells, and called for distinction's sake *Sporidia*. The first of these Divisions is arranged into four Families, the latter into two. The six Families are the following:

Hymenomycetes, having an exposed or naked Hymenium, as in Agaricini.

Gasteromycetes, having an inclosed Hymenium, as in Puff-balls.

Coniomycetes, having little or no Mycelium, and Spores forming a dusty or gelatinous mass.

Hyphomycetes, consisting of sporiferous threads.

Ascomycetes, Sporidia developed on an exposed Hymenium.

Physomycetes, Sporidia developed on threads.

We shall only find *Mushrooms* contained in the Hymenomycetes, Gasteromycetes, and Ascomycetes; therefore the remaining three Families need not engage our attention further at present, as they are outside the domain considered in this book.

HYMENOMYCETES.

This Family contains six orders, characterized respectively as under:

The Order **Agaricini**, Hymenium spread upon *Gills*.

" " **Polyporei**, Hymenium lining *Tubes*.

" " **Hydnei**, Hymenium spread over *Spines*, *Teeth*, or *Tubercles*.

" " **Auricularini**, Hymenium spread over an *Even* surface, usually inferior, and confluent with Hymenophore.

" " **Clavariei**, Hymenium spread over vertical stipes and stipules.

" " **Tremellini**, Hymenium covering an amorphous gelatinous structure.

THE GENERA OF AGARICINI.

These are nineteen in number, and will be described severally as follows:

I. **AGARICUS.** (Pl. I. fig. 1, 2, 3.) Fleshy plants, putrefying in age, not reviving after being dried; not deliquescing; not coriaceous nor woody. Gills membranaceous, persistent, with acute edge, their surfaces separable, the trama filamentous and derived from the flesh. Some four hundred and fifty species are recorded as occurring in Great Britain.[1] Of these about eighty are edible, and some thirty are more or less poisonous. The Genus is divided into a number of **Sub-genera**, as under. The first distinction to be noted is the colour of the Spores. It is referable to one or other of five groups, White, Pink, Brown, Purple, or Black. This definition must be primarily attended to, as the Sub-genera are linked together otherwise by particulars of form. They will be taken in the order of their general correspondence of habit, the bracketed letters prefixed indicating that relationship, the bracketed colour after the name of each Sub-genus being that of the Spores. (See the Tables illustrating the Subgenera of Agaricus.)

(*a.*) **Amanita** (White). Terrestrial. Large. Pileus and Stem distinct. Possessing a Volva. Pileus bearing warts. Most species bear a Ring. Gills free.

(*a.*) **Volvaria** (Pink). Terrestrial, or parasitic. Pileus and Stem distinct. Possessing a Volva. Pileus scarcely, or not, verrucose. Gills free, soft, moist.

(*b.*) **Lepiota** (White). Terrestrial. Large. Pileus and Stem distinct. Bearing a Ring. Pileus scaly or shaggy; tall and expanding. Gills free, or remote.

(*b.*) **Chamæota** (Pink). Terrestrial. Pileus and Stem distinct. Stem hollow, and annulate. Pileus fleshy. Gills free.

(*b.*) **Psalliota** (Purple). Terrestrial. Large. Pileus and Stem distinct. Annulate. Veil thick, fibrous or silky. Gills free, rounded behind.

(*c.*) **Pluteus** (Pink). Mostly parasitic. Pileus and Stem distinct. No Ring. Gills free, crowded, soft and cohering.

(*c.*) **Pilosace** (Purple). Pileus and Stem distinct. Ringless. Gills free. No British species.

(*d.*) **Armillaria** (White). Parasitic and terrestrial. Pileus and

[1] According to Cooke, in the *Handbook of British Fungi.*

Stem confluent and homogeneous, latter fleshy. Annulate. Veil partial. Gills adnate, or decurrent.

(*d.*) **Pholiota** (Brown). Mostly parasitic. Large. Pileus and Stem confluent and homogeneous. With a Ring. Veil distinct and woven. Pileus mealy, spotted, or rough. Stem central. Gills free.

(*d.*) **Stropharia** (Purple). Terrestrial or parasitic. Stem confluent and homogeneous with Pileus. Veil viscid or scaly, ring-shaped on Stem. Gills adnate.

(*e.*) **Tricholoma** (White). Terrestrial. Stem naked, confluent, and homogeneous with Pileus. Gills sinuate behind.

(*e.*) **Entoloma** (Pink). Terrestrial. Stem naked, confluent, and homogeneous with Pileus. Usually rather thin and brittle. Gills sinuate, adnate, or adnexed.

(*e.*) **Hebeloma** (Brown). Terrestrial. Gregarious. Stem and Pileus confluent and homogeneous. Ringless. Gills adnate and sinuate.

(*e.*) **Hypholoma** (Purple). Parasitic. Gregarious. Stem and Pileus confluent and homogeneous. Obscurely annulate. Veil adhering to margin. Gills adnexed or adnate.

(*e.*) **Panæolus** (Black). On dung. Stem and Pileus confluent and homogeneous. Stem naked, or obscurely annulate. Margin projecting. Pileus not striate. Gills not decurrent nor deliquescent.

(*f.*) **Clitocybe** (White). Terrestrial. Pileus and Stem confluent and homogeneous. Ringless. Pileus at length depressed. Gills decurrent.

(*f.*) **Clitopilus** (Pink). Terrestrial. Pileus and Stem confluent and homogeneous. Ringless. Pileus pruinose. Gills decurrent.

(*f.*) **Flammula** (Brown). Parasitic or terrestrial. Pileus and Stem confluent and homogeneous. Veil filamentous. Annulate. Gills adnate or decurrent.

(*g.*) **Pleurotus** (White). Parasitic. Stem absent, or lateral, confluent and homogeneous with Pileus. Gills sinuate, denticulate, or decurrent.

(*g.*) **Claudopus** (Pink). Parasitic. Stem absent, or lateral, confluent and homogeneous with Pileus. Gills sinuate, decurrent.

(*g.*) **Crepidotus** (Brown). Parasitic. Stem absent, or lateral, confluent and homogeneous with Pileus. Pileus excentric, resupinate. Flesh soft. Gills various.

(*h.*) **Collybia** (White). Mostly parasitic. Tough. Enduring.

Stem cartilaginous, confluent with Pileus, but heterogeneous from it. Ringless. Gills adnexed.

(*h.*) **Leptonia** (Pink). Terrestrial. Small. Stem hollow, cartilaginous, confluent with Pileus but heterogeneous in structure. Disc umbilicate. Gills denticulate.

(*h.*) **Naucoria** (Brown). Terrestrial or parasitic. Small. Stem cartilaginous, confluent but heterogeneous from Pileus. Veil marginal. Ringless. Margin incurved. Gills adnate.

(*h.*) **Psilocybe** (Purple). Terrestrial. Gregarious. Stem cartilaginous, confluent but heterogeneous from Pileus. Ringless. Margin incurved. Gills adnate, emarginate or ventricose.

(*k.*) **Mycena** (White). Mostly parasitic. Small. Stem hollow, cartilaginous, confluent but heterogeneous from Pileus. Pileus umbonate. Margin straight. Gills sinuate.

(*k.*) **Nolanea** (Pink). Terrestrial. Small. Stem more or less hollow, cartilaginous, confluent but heterogeneous from Pileus. Pileus papillose, straight. Gills adnexed.

(*k.*) **Galera** (Brown). Terrestrial. Small. Stem hollow, cartilaginous, confluent but heterogeneous from Pileus. Margin straight. Gills adnate, or denticulate.

(*k.*) **Psathyra** (Purple). Terrestrial and parasitic. Small. Stem cartilaginous, confluent but heterogeneous from Pileus, naked and hollow. Margin straight. Gills adnate.

(*k.*) **Psathyrella** (Black). Terrestrial. Small. Stem cartilaginous, confluent but heterogeneous from Pileus. Pileus striate. Margin straight, not projected. Gills adnexed, or free.

(*l.*) **Omphalia** (White). Parasitic. Small. Stem cartilaginous, confluent but heterogeneous from Pileus, and fistulose. Gills decurrent.

(*l.*) **Eccilia** (Pink). Terrestrial. Small. Stem hollow and cartilaginous, confluent but heterogeneous from Pileus. Margin incurved. Gills decurrent.

(*l.*) **Tubaria** (Brown). Parasitic. Small. Stem hollow and cartilaginous, confluent but heterogeneous from Pileus. Margin incurved. Gills decurrent.

(*l.*) **Deconica** (Purple). Parasitic on dung. Small. Stem hollow, naked, cartilaginous, confluent but heterogeneous from Pileus. Veil marginal. Margin straight. Gills decurrent.

II. **COPRINUS** (Black). On dung and rank soil. Large. Fleshy but fragile. Rapid in growth. Gills deliquescing. Pileus mostly conical. (Pl. I. fig. 5, 6.)

III. **BOLBITIUS** (Pink). Terrestrial. Small. Ephemeral. Pileus mostly conical. Gills moist, becoming powdery. (Pl. III. fig. 1.)

IV. **CORTINARIUS** (Rust-colour). (Pl. II.) Terrestrial. Large and small. Veil arachnoid, very distinctive. Divided into six Subgenera, as follows:

Phlegmacium. Pileus having continuous pellicle, viscid when moist. Veil and Stem dry.

Myxacium. Pileus glutinous. Veil and Stem viscid, or polished when dry.

Inoloma. Large and handsome. Pileus fleshy, subcompact, dry, silky. Stem bulbous.

Dermocybe. Pileus thin, dry, not hygrophanous, downy and then glabrous. Stem thin, not bulbous. Gills changeable in colour.

Telamonia. Mostly large. Pileus moist, hygrophanous. Stem annulate and woolly.

Hygrocybe. Pileus thin, glabrous, hygrophanous, not viscid. Cuticle not lacerate. Stem rigid, cartilaginous, naked, smooth.

V. **LEPISTA**[1] (Pallid). Margin involute. Terrestrial. Gills decurrent, persistent. Trama horny. Large. (Pl. III. fig. 3.)

VI. **PAXILLUS** (Brown). Terrestrial and parasitic. Whole plant ferruginous. Margin involute. Stem and flesh confluent. Gills tough, soft, without trama, decurrent. (Pl. III. fig. 2.)

VII. **HYGROPHORUS** (White). Often brilliantly coloured. Terrestrial. Irregular conical habit. Pileus becoming waxy and hygrophanous, and becoming detached from granular trama. Gills sharp-edged. (Pl. III. fig. 4.)

VIII. **GOMPHIDIUS** (Green-grey, then black). Terrestrial. Habit peg-shaped, thick. Stem and flesh confluent. Veil universal, glutinous. Gills soft, mucilaginous, decurrent. (Pl. III. fig. 5.)

IX. **LACTARIUS** (White, and pale yellow). Terrestrial. Stem without bark, naked, fleshy, blunt. Substance not fibrous. Gills unequal, sub-decurrent, exuding milky juice. (Pl. IV. fig. 1.)

X. **RUSSULA** (White, and pale yellow). Terrestrial. No veil. Stem stout, blunt, polished, spongy. Pileus expanding upwards. Gills equal, rigid, brittle, juiceless. (Pl. IV. fig. 2.)

XI. **CANTHARELLUS** (White). Terrestrial mostly. No veil.

[1] Included in Paxillus by Fries. Separated by W. G. Smith.

Stem and flesh confluent. Habit irregular. Gills decurrent, folded, thick, swollen, branched. Trama floccose. (Pl. IV. fig. 3.)

XII. **NYCTALIS** (White). Parasitic on some dead Agarics. Small. Veil universal, floccose, pruinose. Pileus fleshy, pulverulent, confluent with Stem. Gills broad, thick, juicy. (Pl. IV. fig. 4.)

XIII. **MARASMIUS** (White). Parasitic or terrestrial. Small and slender. Tough. Wither with drought and revive with moisture. Not putrefying. Gills tough, thick, distant, confluent below, adnexed. (Pl. I. fig. 4; IV. fig. 5.)

XIV. **LENTINUS** (White). Mostly parasitic. Pileus fleshy, tough, hard when dry. Stem absent, or confluent, hard. Gills tough, simple, thin, acute-edged, denticulate, without trama. (Pl. IV. fig. 6.)

XV. **PANUS** (White). Parasitic. Pileus lateral, or unequal-sided, tough, drying up in drought and reviving in rain. Stem confluent. Gills thin, tough, entire, acute-edged, with floccose trama. (Pl. V. fig. 1.)

XVI. **XEROTUS** (White). In peat. Pileus membranaceous. Stem confluent. Gills dichotomous, sub-decurrent, tough, obtuse edge. (Pl. V. fig. 2.)

XVII. **TROGIA** (White). Parasitic. Small. Pileus cup-shaped, sessile, soft, dry, flaccid. Gills folded, forked, crisped. (Pl. V. fig. 4.)

XVIII. **SCHIZOPHYLLUM** (White). Parasitic. Pileus sessile, not fleshy, dry. Gills tough, branched, edges split and revolute, with downy pellicle above. (Pl. V. fig. 5.)

XIX. **LENZITES** (White). Parasitic. Pileus hard, corky, sessile, dimidiate. Gills hard, branched, anastomosing, long-lived. (Pl. V. fig. 3.)

THE GENERA OF POLYPOREI.

There are eight Genera in this Order, characterized respectively as follows:

I. **BOLETUS.** Terrestrial. Fleshy. Pileus circular, pulvinate. Stem central. Tubes separating from Pileus and from each other. No trama. (Pl. VI. fig. 1.)

II. **STROBILOMYCES.** Terrestrial. Tough. Pileus scaly. Tubes adherent and coherent. No trama. (Pl. VI. fig. 2.)

III. **POLYPORUS.** Mostly parasitic. Pileus amorphous, often very large. Sessile, or with short lateral stem. Tubes insepar-

able. Trama between tubes, which is dissimilar from the flesh. (Pl. VI. fig. 3, 4.)

IV. **TRAMETES.** Parasitic. Corky or woody. Sessile. Dimidiate. Tubes concrete with Pileus, and the trama homogeneous with substance. (Pl. VI. fig. 5, 6.)

V. **DÆDALEA.** Parasitic. Woody. Sessile. Trama continuous with substance. Tubes irregular, labyrinthiform. (Pl. VII. fig. 4.)

VI. **MERULIUS.** Parasitic. Structure expanded, resupinate, waxy. Tubes incomplete, no more than shallow, winding folds. (Pl. VII. fig. 1.)

VII. **POROTHELIUM.** Parasitic. Resupinate. Membranaceous. Hymenium papillose, at length becoming obscurely tubular. (Pl. VII. fig. 3.)

VIII. **FISTULINA.** Parasitic on oaks. Fleshy, juicy, soft, and large. Sessile. Hymenium inferior, at first papillose, then tubular. (Pl. VII. fig. 2.)

THE GENERA OF HYDNEI.

To this Order belong seven Genera, distinguished as under. (Pl. VIII.)

I. **HYDNUM.** Terrestrial and parasitic. Hymenium inferior, covering awl-shaped Spines, which are distinct at the base. Plant mostly fleshy. Central-stemmed, lobed, or branched.

II. **SISTOTREMA.** Terrestrial. Spines irregular, somewhat waxy, jagged, tooth-like, distinct and separable. Plant fleshy or membranaceous.

III. **IRPEX.** Parasitic. Tooth-like Spines, disposed in rows, and concrete with the Pileus. Plant corky, almost woody.

IV. **RADULUM.** Parasitic. Hymenium covering waxy elongated tubercles.

V. **PHLEBIA.** Parasitic. Resupinate. Soft. Gelatinous. Hymenium spread over waxy, crest-like wrinkles.

VI. **GRANDINIA.** Parasitic. Soft, spreading, incrusting. Hymenium covering waxy, rounded, crowded granules.

VII. **ODONTIA.** Parasitic. Fibrous mycelioid plants. Hymenium covering crested, papillose, or spiny warts.

THE GENERA OF AURICULARINI.

To this Order belong nine Genera, distinguished as follows. (Pl. IX., X.)

I. **CRATERELLUS.** Terrestrial. Fleshy, becoming putrescent. Hymenium distinct, skin-like, smooth, even, or rugose. Pileus and Stem continuous.

II. **THELEPHORA.** Terrestrial and parasitic. Pileus fibrous, destitute of cuticle, tough. Hymenium tough and fleshy, striate or papillate, becoming rigid, at last flocculent.

III. **STEREUM.** Parasitic. Pileus with cuticle. Hymenium tough, thick, concrete with Pileus, naked, not beset with bristles.

IV. **HYMENOCHÆTE.** Parasitic. Dry and leathery plants. Hymenium even, and beset with short, stiff bristles.

V. **AURICULARIA.** Parasitic. Hymenium spread upon distant, reticulate folds, and becoming gelatinous in wet.

VI. **CORTICIUM.** Parasitic. Hymenium fleshy, even, swollen in wet, collapsed in dry weather. Surface often rimose.

VII. **CYPHELLA.** Parasitic. Minute. Cup-shaped. Submembranaceous. Hymenium inferior.

VIII. **SOLENIA.** Parasitic. Minute. Tubular cups, with narrowed mouth.

IX. **KNEIFFIA.** Parasitic. Soft and fleshy, collapsing and flocculent when dry. Hymenium rough with little bunches of stiff bristles.

THE GENERA OF CLAVARIEI.

To this Order belong five Genera, distinguished as below. (Pl. XI.)

I. **SPARASSIS.** Terrestrial. Fleshy, frondose, laciniate. Rather large.

II. **CLAVARIA.** Terrestrial. Simple or frondose. Stem indistinct. Fleshy. Hymenium dry.

III. **CALOCERA.** Parasitic. Small. Cartilaginous when moist. Horny when dry. Hymenium viscid.

IV. **TYPHULA.** Parasitic. Minute. Filiform. Stem and club distinct. Hymenium waxy.

V. **PISTILLARIA.** Parasitic. Minute. Stem and Club distinct. Waxy, then horny. Cellular or fibrous.

THE GENERA OF TREMELLINI.

This Order contains eight Genera, particularized as follows. Like some of the preceding Genera, however, which have been described as *minute*, there are several of the Tremellini that can scarcely be designated Mushrooms, but should belong to the microscopic list. (Pl. XII.)

I. **TREMELLA.** Mostly parasitic. Gelatinous, tremulous, immarginate, lobate. Hymenium universal.

II. **EXIDIA.** Parasitic. Tremulous. Margined. Hymenium superior and granular.

III. **HIRNEOLA.** Parasitic. Gelatinous when wet, horny when dry. Cup or ear-shaped. Hymenium wrinkled. Outer surface velvety. Large.

IV. **NÆMATELIA.** Parasitic. Solid nucleus covered with gelatinous substance, upon which Hymenium is universal.

V. **DACRYMYCES.** Parasitic. Minute. Homogeneous. Gelatinous. Arranged in chain-like rows.

VI. **APYRENIUM.** Parasitic. Minute. Gelatinous shell, involving a floccose and hollow interior. Hymenium smooth, collapsing.

VII. **HYMENULA.** Parasitic. Minute. Effused, thin, spotlike.

VIII. **DITIOLA.** Parasitic. Stem supporting patella. Hymenium on disc.

GASTEROMYCETES.

This Family comprehends five orders, viz.—

Hypogæi. Subterraneous. Spores free. Hymenium permanent, not becoming dusty, or liquescent.

Phalloidei. Terrestrial. With Pileus and Stem, or Receptacle. Possessing a Volva. Hymenium deliquescent.

Nidulariacei. Peridium containing several rounded or flattened bodies, on which the Spores are produced.

Trichogastres. Terrestrial. Peridium inclosing a cellular substance which eventually breaks up into a dusty mass of spores and threads.

Myxogastres. Mostly parasitic. Gelatinous or pulpy at first, then Peridium filled with a mass of dusty spores and threads.

Nidulariacei and Myxogastres need not occupy us further. In the first the Genera contain only minute species, and in the second mostly so. Genera of Myxogastres containing somewhat larger forms afford nothing coming within the range of this work, and may therefore be passed over.

THE GENERA OF HYPOGÆI.

The Genera contained in this Order are six in number. They

are all particularized below, though only two possess species of the slightest economic value. (Pl. XIII.)

I. **MELANOGASTER.** Globose. Peridium adhering to fibres, which wander over its surface. Cells pulpy at first.

II. **RHIZOPOGON.** Peridium traversed and adherent to creeping fibres. Cells empty at first.

III. **HYDNANGIUM.** Fleshy. Small. Peridium thin. No base. Cells empty at first.

IV. **HYMENOGASTER.** Globose. Fleshy or soft. Peridium running down into an absorbing base. Cells empty at first.

V. **OCTAVIANA.** Small. Cottony. Peridium running into sterile base. Cells empty at first.

VI. **HYSTERANGIUM.** Peridium separable. Substance glutinous. Cells empty at first.

THE GENERA OF PHALLOIDEI.

In this Order are three Genera, described as follows. (Pl. XIV. fig. 1, 2, 3.)

I. **PHALLUS.** Pileo-stipitate. Pileus hood-shaped, reticulate, free all round, perforate at apex.

II. **CYNOPHALLUS.** Pileo-stipitate. Pileus hood-shaped, smooth, adnate to Stem, not perforate.

III. **CLATHRUS.** Consisting of a Receptable, forming a globular lattice-work, or net, the branches of which are of cellular structure.

THE GENERA OF TRICHOGASTRES.

This is the Order in which the various Puff-balls and their immediate kindred are comprised. There are eight Genera, as follows. (Pl. XIV., XV.)

I. **BATARREA.** A pileiform receptacle, carried on a Stem, which is mucilaginous within. The young plant inclosed in a universal Volva.

II. **TULOSTOMA.** A globose receptacle, carried on a Stem, which is pithy within. Peridium thin, and separating.

III. **BOVISTA.** Globose. Peridium thin, papery, persistent. Outer coat shelling off. No sterile base visible on section.

IV. **LYCOPERDON.** Globose or pear-shaped. Peridium thin, soft, becoming flaccid or rupturing at length on the top. Bark persistent or warty. With sterile base.

V. **SCLERODERMA.** Globose. Peridium firm, with innate

bark. Capillitium (interior substance) dark, veined by flocci adherent to Peridium.

VI. **POLYSACCUM.** Pear-shaped. Peridium rigid, inclosing cells filled with minute rounded bodies.

VII. **CENOCOCCUM.** Small. Peridium black, naked, eventually hollow.

VIII. **GEASTER.** Globose. Double Peridium, of which the outer one splits and expands in stellate lobes.

ASCOMYCETES.

This is the only one of the two sporidiiferous Families which contains Fungi that can be considered as what we have concluded to term *Mushrooms.* The arbitrariness of this designation is here manifested; for, though there are six Orders in the Family, we can only select two, and of their Genera only a few, as comprising plants of the kind so entitled. The two mushroom-containing Orders are:—

Tuberacei: Subterranean. Hymenium waved and sinuate, often complicated and closely packed.

Elvellacei: Fleshy, waxy, or gelatinous. Hymenium exposed.

It will be remembered that, in this Family, the Sporidia are contained in minute cells, called Asci, and are not appreciable to the naked eye.

THE GENERA OF TUBERACEI.

There are eleven Genera in this Order, but only two of them come within our range, and are particularized as follows. (Pl. L. and LI.)

I. **TUBER.** Peridium rough, warty, tubercled, rarely smooth. No definite base. Substance marbled.

II. **ELAPHOMYCES.** Globose. Peridium hard and thick, papillate, or granulate. Substance soft and juicy in youth, dusty in age.

THE GENERA OF ELVELLACEI.

In this Order are twenty-two Genera, of which we shall select ten for particularization as under. (Pl. XLIX.)

I. **MORCHELLA.** Terrestrial. Pileo-stipitate. Large. Pileus impervious in the centre, deeply folded and pitted.

II. **HELVELLA.** Terrestrial. Large. Pileo-stipitate. Pileus having free margins, drooping irregularly. Hymenium even.

III. **VERPA**. Terrestrial. Pileo-stipitate. Pileus hollow below, folded, inflated, or conical and adpressed. Hymenium rugulose.

IV. **LEOTIA**. Terrestrial. Pileo-stipitate. Pileus supported centrally by Stem, margin revolute, smooth, and viscid.

V. **GEOGLOSSUM**. Terrestrial. Club-shaped. Small. Hymenium surrounding the club.

VI. **GYROMITRA**. Terrestrial. Pileo-stipitate. Pileus inflated, bulging, rough, with raised gyrose ribs.

VII. **SPATHULARIA**. Terrestrial. Pileo-stipitate. Pileus erect, compressed, running down into the Stem at the sides.

VIII. **RHIZINA**. Terrestrial. Crustaceous. Effused, then bulging and inflated. Underset with root-like fibrils.

IX. **PEZIZA**. Terrestrial and parasitic. Receptacle cup-shaped, concave, soon expanding. Hymenium within cup. Sessile or substipitate.

X. **BULGARIA**. Parasitic. Receptacle orbicular, then truncate, closed at first. Hymenium or inner surface, smooth, even, viscid.

We have now particularized all the Families, Orders, and Genera of Fungi, to which such plants as can be termed *Mushrooms* belong. To those who would go further there is a wide field open, and an exceedingly interesting one, which will be found to some extent illustrated in the Plates appended to this volume. The microscope will introduce us to a whole new world of plants, presenting forms, and means of fructification, most strange and remarkable, bewildering from their multitude and diversity. But this branch of Mycology is beyond our present purpose.[1]

[1] The reader desirous of more extended information is referred to Cooke's *Handbook of British Fungi*, which is a catalogue, illustrated and descriptive, of all known species indigenous to England. Unfortunately, like all the more copious works on Mycology, the Handbook is not easy to obtain, and is somewhat costly. But there is a small work by the same author, on *Microscopic Fungi*, which can readily be obtained.

CHAPTER VII.

On some Common Species of Eatable Mushrooms.

The purport of the present chapter is to bring into prominent notice such of our esculent Fungi as are really best suited to become popular articles of food. In a succeeding chapter will be found an exhaustive catalogue of British Edible Fungi. But in that list, which comprises two hundred and odd species, there are a number which could scarcely become popular, for one or other of the following reasons. Some are not easy to identify; others are of rare occurrence, or seldom appear in any quantity. Some are small; others not particularly pleasing to the palate. Some can only be used for the special flavours they will impart to soups or meat dishes; others require to be boiled, or otherwise prepared, to render them nice, wholesome, and fit to cook—and so forth. So we see that the principle of Discrimination must be employed even among esculent mushrooms.

The species now to be shortly adverted to are peculiarly commendable on several grounds. For example: each of them can be readily identified, possessing distinctive characteristics of feature, and, once known, could be sought for and gathered by the merest child, without fear of mistakes being made. Each of them is of common occurrence, and grows plentifully. Each of them is perfectly wholesome, and, if properly dressed, will afford a repast both palatable and nourishing. Furthermore, nearly all of these species have been taken into favour by English fungus-eaters, from Dr. Badham and Mrs. Hussey down to the present day; and of each and all of them the author has had considerable personal experience, gastronomically.

The species here mentioned are spoken of by English titles that have been coined for them respectively. The bracketed numbers refer to those in the catalogue, where each species is minutely described. They must be identified in the first place by those descriptions; but some hints are added here as to the *points* in

each kind which it is useful to bear in mind and observe carefully when picking, as a safeguard against mistakes.

The Pratelles (59–65). These comprise the species familiar to English people under the vague title of "common field mushroom." Newspaper writers are fond of adding:—"as everybody knows, the only kind that is safe and reliable." As matter of fact, everybody does *not* know the Pratelles; nor are they by any means the only safe or excellent edibles among Fungi. There are a number of species that it is much easier to learn how to recognise, for the Pratelles are somewhat changeable in habit. The "common field mushroom" is, in point of fact, a group of six or seven distinct varieties, so well-defined and separated that it has been considered expedient to give them specific places in this book. They are all esculent, but by no means identical in point of flavour or digestibility. The best of them is probably the **Red Pratelle** (64), distinguished by the reddish blush which comes upon cut or broken surfaces. The next in point of flavour, and the best known, is the **White Pratelle** (60). This kind seldom attains a very large size. It is at its best when the gills are still pink, the plant having just expanded. Then it should be rather under than over-cooked, to be properly appreciated. In the "button" stage it is insipid, but is then best for pickling. When the gills get brown and black it is rather too coarse and strong for epicures. The cultivated mushroom is a variety of this Pratelle, perhaps rather to be regarded as a distinct species. It is neither so well-flavoured nor so digestible as the meadow plant. A very distinct species is the **Giant Pratelle** (59), often called "horse-mushroom" by rustics. Frequently the "button" of this species grows larger than an orange before expanding. It is very meaty, quite wholesome, but decidedly inferior in flavour to those mentioned before. The **Brown Pratelle** (63), which inhabits wet and swampy pastures, is usually too watery, but has a good flavour. The **Shaggy Pratelle** (65) is rich, luscious, and strong in flavour. Some suspicion has attached to it, but probably only because people have been sick from eating too freely of it. The author has found it perfectly wholesome, and of excellent flavour.

The Puffballs (190–197). Every one who has gathered Pratelles in the meadows is sure to have seen Puff-balls. They are globose white objects, varying in size from that of a marble up to that of a small pumpkin. In youth they are solid, in age full of dust. All are good eating, and the most digestible of mushrooms. The

only point to observe is, to cut each individual through, and *reject all specimens that are not perfectly white and solid throughout;* for when they begin to ripen they become nauseous, and possibly unwholesome. Both large and small kinds are alike good to eat raw, with bread and salt. If cooked, they must be dressed in ways suitable to them, not like Pratelles. Recipes are given in a special cookery appendix.

The Oread (114). This is a meadow mushroom, slender in habit, buff in colour, and gregarious. It will be readily recognised as the chief inhabitant of the so-called "fairy-rings." It is a capital dainty, and so plentiful that it may often be gathered almost by the cart-load, small as it is. It can be very readily dried and kept. In distinguishing Oreads from other small kinds frequently growing among them, it is necessary to observe the following points. *A uniform pale buff or cream colour. Gills that are broad, distant from each other, and free from the stem, the same colour as the cap, or only a shade lighter. The Stem solid and fibrous, and not hairy at the base. A strong, peculiar, and aromatic scent.* The Oread can scarcely be too highly extolled as an esculent.

The Blewit (112). This appears also in meadows, generally about the time when Pratelles are ceasing to come up plentifully. It is a large, fat, dirty-white Agaric, growing in clusters or rings. Attention must be paid *to the lilac or violet stains upon the stem,* occasionally also on the cap or gills. The Blewit is as good as a veal cutlet, which it may be dressed to resemble. It is not to be gathered when at all watersoaked or gone; for in this species the early stage of putrefaction, or even swelling with water after rain, seems to develop deleterious qualities. When fresh and dry, however, Blewits are most wholesome and excellent.

The Wood Blewit (111) is quite as good, but is only found in limited localities.

The Oak-tongue (174). This is a mushroom easy to identify and impossible to mistake for any other. It is a large fleshy excrescence, found solely upon oak-trees. It is red in colour, soft and sticky to the touch, and its surface when young looks like that of a bullock's tongue. When old it becomes brown like liver, but is still full of copious red juice which can be utilized. Its large size, perfect wholesomeness, and wonderfully nutritions qualities make the Oak-tongue one of our most valuable economic Fungi, though it must yield in point of flavour to some other kinds.

It can be cooked so as to resemble beef-steak; and its juice can hardly be distinguished from beef-gravy. If persons who profess vegetarian principles would teach our peasantry how to make use of Oak-tongues, many a poor man's table might be supplied with a substitute for beef, almost identical in taste and quality, and costing nothing.

Legendary history relates that the ancient Druids were wont, at certain seasons, to cut some parasite off oak-trees with golden sickles and much ceremony. This parasite is always called mistletoe. Now, who ever saw *mistletoe* growing on the *oak?* It never does grow on that tree—except in the year of the Greek Kalends, perhaps! Has not the name of the parasite been wrongly translated? Doubtless! The author conceives that it was the Oak-tongue which the Druids cropped, not the useless Mistletoe. And he has little doubt that many a rare feast on its succulent flesh used to be held by the Druids in the mystic recesses of their forest temples!

The Spindleshank (26). This species is easy of recognition, and is thoroughly good and wholesome. It grows in dense tufts about the foot of trees, chiefly of oaks. The points that distinguish it are:—*A dark chestnut brown colour of Pileus and Stem; pale umber or drab-coloured gills, which are serrated and crowded; and a Stem which is long, spirally twisted, large in the middle, and tapered off at both ends.* When the Spindleshank is to be prepared fresh, the caps only should be used; but stem and cap can be used when it is pickled. It is an excellent mushroom, and is both common and plentiful.

The Chantarelle (81). Few mushrooms can be so readily recognised as this, and once known it is impossible to mistake any other for it. The Chantarelle grows in woodlands and parks, and its distinguishing features are these: *An irregular shape; gills like wrinkled folds or plaits; a uniform bright, golden-yellow colour; a scent like that of plums or apricots.* It is a supremely excellent viand, in high estimation among mushroom epicures. In Continental markets it fetches a high price, though plentiful there as here. Finding it often in quantities near London, the author has sometimes presented basketfuls to his French and German friends in the metropolis, to their great gratification. But when he has proffered it to his own countrymen, he has usually encountered contemptuous scorn; so deep is the fungophobic superstition. An English lady once told him that Chantarelles "*looked* so awfully

poisonous." Well, blessed are those that know better, for they shall eat and rejoice exceedingly!

The Urchin of the Woods (153). This is a very desirable species. It grows in much the same place as the Chantarelle, and about the same season. It is of a pale creamy buff tint. **The Red Urchin** (154) has a reddish-brown cap, but is otherwise almost identical with its congener. The shape is irregular, and the stem rarely in the centre. The point to be especially observed is *the Hymenium*. On inverting an Urchin, it will be found that the inferior surface of the cap is set with *spines*, having the appearance of a brush, or of a hedgehog or sea-urchin's coats. They are easily brushed off. The Urchin is not considered so good as the Chanterelle on the Continent. However the author esteems it quite as highly. These two species require quite a different style of cookery from the Pratelles, which will be elsewhere entered into.

The Parasols (35–44). These are a group of species like the Pratelles, which may be regarded as one from a culinary point of view. They grow in grassy places, and are to be distinguished by the following points. *The stem is tall, bears a ring, has a bulbous base, but has no volva. The Pileus is shaggy or scaly, and has a central boss on the disc. The Gills are remote from the stem. The whole plant has the shape of a lady's parasol.* **The Pasture Parasol** (43), the **Slender Parasol** (38), **the Flaky Parasol** (37), **the Silky Parasol** (40), **the Grey Parasol** (44), **and the Bossed Parasol** (41), is the order of relative gustatory merit, according to the author's opinion. He has made some converts to fungus-eating by means of dishes of Parasols; for they are really more delicate and better flavoured than the familiar Pratelles.

Spring Mushrooms. So early as the end of March, if the weather be propitious, a certain number of good edible species appear. They continue till the end of May or first weeks of June, but not later. Some have a second season in late autumn, but the majority are solely of spring growth. The chief of them are the following:

The Morels (206–208). The three species of Morel may be confounded with each other, but can scarcely be confounded with anything else, unless it be the equally wholesome Helvels. To begin with, they appear only in spring. The description of them is given in the catalogue, there being no special points that need be particularized. They are of very local growth, but where they

have fixed a habitation they are usually plentiful, and recur annually. They are hardly less dainty or nutritive than Truffles, and are esteemed only second to them on the Continent. It is truly a treat to partake of them.

The Helvels (201–204). Two or three species of Helvel are spring mushrooms, although they appear again in autumn with the rest of the tribe. The appearance of a Helvel may be roughly but graphically described as being like a piece of a brown kid glove, crumpled up, and stuck on the top of a short, worm-eaten cabbage-stalk. They have not the solid, lumpy look of Morels, and are indeed of quite different formation. They are excellent eating, some of them not much inferior to Morels.

The St. George (71). This species is the best of spring Agarics. It is so named because it has been observed to appear about St. George's Day (April 23rd). It lasts to the end of May. The St. George grows in groups and half circles among grass near copses or woods. It is thick and solid, a clumsy-shaped, dirty-white mushroom. Observable points are, *the narrow, crowded, white gills; the bulging, thick stem; and a strong fungic-musky scent.* A kindred species is **The Big St. George** (77), a larger and coarser kind; and we may also regard **The Muscat** (67) as identical in a culinary sense. The last-named is smaller and more delicate, but is uncommon. There is practically no other species appearing at the same time and site which could be mistaken for these. Therefore there need be no hesitation in gathering mushrooms answering to the descriptions of them given in the catalogue. They are very excellent eating when fresh, and may be readily dried for storing. The St. George is not met with everywhere; but where it does appear, it is generally in heavy crops.

The Mousseron (23), and **The Orcelle** (22). The main distinction between these species is that the first appears only in spring, whereas the latter comes up in late summer and autumn. Both grow in woods and under bushes in straggling groups. The Mousseron is pretty regular in shape, whereas the Orcelle is lobed and one-sided. The first smells of fresh meal, the latter has a scent like syringa or cucumber rind. They have these points in common: *A solid stem, not very thick; a cuticle exactly like white kid; and narrow, crowded, decurrent, salmon-pink gills.* Both species are capital eating, very delicate, and pleasant in flavour. When gathering the Mousseron in spring, it is essential to guard against the white Amanita verna, a poisonous species which appears

at the same time and in the same localities. This Amanite is taller than the Mousseron, and has white gills, never decurrent; besides which it possesses a ring and volva. The most ordinary intelligence can discern the difference at a glance.

The Blusher (4). This is another species of Amanite, but of different qualities to that one just alluded to. The Blusher is first-rate eating, perfectly wholesome, and makes a remarkably good ketchup. In most woodlands it is profusely abundant, from early summer to late autumn. And it is large and substantial. It has a brown cap studded with whitish warts; white gills; a bulbous stem with a deep ring, and some remains of the volva. But attention is to be chiefly paid to *a reddish stain which suffuses the stem more or less, and which blushes upon the white substance directly it is broken.* This at once separates the species from other Amanites. Of course the Fly Amanite, whose cap is *scarlet*, with white warts, will not be mistaken for the brown-capped Blusher. The *blush* is the distinctive and unmistakable feature of this good esculent.

The Grisette (6). Also an Amanite, but of different habit from the rest, the Grisette is unmistakable once it has been recognised. But it may be that the species will be found less readily identifiable from description than most of the preceding. *The grey-fawn glossy cap, with its sulcate margin; the long, slender, nodding stem rising out of the volva, but destitute of a ring; and the generally fragile habit*, are the points most remarkable. But the description in the catalogue must be closely studied. The Grisette is very choice eating, in fact, quite a delicacy. It requires very light cooking, and is so delicate that it is spoilt by even a few hours' keeping. It is common.

The Stump-tuft (7). This species grows in dense clumps upon stumps and tree-roots. Its characters should be carefully noted, as some dangerous kinds grow similarly. But no mistake is possible if the distinctive points are observed. The cap of the Stump-tuft is *a dull, dirty buff, inclining to honey colour, and scaly; its stem is tall, firm, elastic, and stuffed, bearing a broad, expanded ring; its gills are dirty white, and adnate. When the plants grow closely the lower ones are profusely powdered with the white spores shed by the higher ones.* The Stump-tuft is wholesome and plentiful, but rather acrid to the taste. To make it palatable, it should be steeped for some hours in vinegar and water, and then be well scalded before being dressed. It is much eaten about Vienna.

The Paxil (119). This is one of the commonest of all mushrooms. It is large, substantial, and wholesome, therefore it merited insertion here. But like the Stump-tuft, it requires treatment before cooking to make it nice. It is tough and of poor flavour. Yet these two kinds are so plenteous, substantial, and nutritive, that they ought to be advocated. Poor peasants on the Continent make large use of them. The Paxil has *a mottled clay-brown cap, the margin strongly involute; the gills are whitey-buff, crowded, branched, and decurrent; the substance of the pileus and the short stem is homogeneous, pale buff, and dry; all parts turn rusty wherever wounded.*

The Inkcaps (82–85). These are mushrooms inhabiting rank places, dunghills, etc. They are distinguished by *white conical caps, and gills black and liquefying.* **The Inkcap** (82), and **The Maned Inkcap** (83) are the best. When young, before the gills are more than brown, they make a nice dish, but need a very short time on the fire. Their ketchup is worthless.

The Oyster (55). A species growing chiefly on the trunks of ash, apple, and laburnum trees. It looks not unlike a bunch of oyster-shells hanging on the tree. Many plants grow in an overlapping cluster. Colour above is grey buff. *The gills are white, and very decurrent on the short stems.* There are several allied species described in the catalogue, which are equally wholesome and palatable eating. Only the young plants should be taken from a cluster. The older ones are tough. If we remark the white decurrent gills, there is no chance of mistaking anything else for the Oyster and its congeners; and they make an excellent dish if prepared as is elsewhere directed.

The Virgin (99), **The Ivorine** (95), and **The Snowdrop** (96). These three species of small white Hygrophores appear very often on lawns in autumn, as well as elsewhere. They are very reliable, and, if in sufficient quantity, make excellent dishes. The first is satiny-white, the second larger and ivory-white, the third very small and snow-white. All are distinguished by the irregular hood-shape peculiar to Hygrophores; *the waxy, hygrophanous substance; and the few, distant, decurrent gills.* If once tried, the experiment will be repeated. To be dressed like Oreads.

The Redmilk (101). Wherever there are plantations of fir or pine this species may be looked for in the grass about them. It is a large salmon-red mushroom, of thick and substantial appearance. Its distinctive character is that, *when wounded, a bright orange-red*

juice exudes, which soon changes to a dull olive-green on exposure. This juice makes the Redmilk perfectly easy to identify. It is common enough, and often comes up in enormous crops, as the author has seen it, among the Cleveland Hills, and elsewhere. Its qualities can only be described in superlative terms. It is wholesome, nutritive, most delicious, and lends itself well to preservation in salt. In Russia, which is a great fungus-eating country, the Redmilk is esteemed as "fit to set before the Czar." Yet here it is suffered to rot unheeded by the ton.

The Kidney (109). This is a congener of the preceding, both being Lactars. It is large, thick, and substantial, of a rich, golden-brown tint; the cap has been compared to the top of a Warden pear. *The gills are white, and the juice which exudes is white like milk, very copious, and changes to a dull brown on exposure. The stem is stout.* This mushroom tastes like lambs' kidneys when similarly dressed, and is altogether a first-class esculent. It does not seem to be common in this country. Care must be taken not to mistake other Lactars for it. The distinctive points have just been italicized. In Lorraine children gather it, selecting it from all others with ease, and stuff themselves with it raw. Its wholesomeness cannot be gainsaid.

The Bisotte (126). This, and the succeeding species, are the only two of the esculent Russules which can be safely included in the present list, as being readily distinguishable. The Bisotte is a pretty large and substantial mushroom, growing in scattered groups under beeches and other trees. *Its cap presents a dull, mottled green, never at all tinged with red, smooth, even, and easily peeled; the gills are white, equal, crowded, and adnexed; the flesh is thick, white, brittle, and dry; the stem is short, blunt, stout, and naked.* This is a very excellent and common kind. It tastes agreeably when raw, and makes admirable dishes.

The Verdette (130). Probably this species is quite the best of the Russules, all the edible species of which are, however, very good eating. The Verdette of course presents the general features of the genus. Given these, we shall find it remarkable for *a cap coloured a light verdigris-green, the cuticle areolate; that is, split up into numerous checks upon the surface.* It is not so common as the Bisotte, but does occur very plentifully in some places. It makes a dish that epicures will enjoy.

The Clavarias (132–146). All the species seem to be esculent, certainly all the white ones. The yellow kinds have been regarded

with suspicion; why, it is hard to say, since there is no evidence except in their favour. The author eats them all indiscriminately, and is inclined to pronounce the **Golden Spindlespike** (140) his particular favourite. It is often found in large bundles, and is hence more substantial than the others, which are mostly small and troublesome to pick and clean, though they are very nice to eat, and well repay the trouble they give. The Spindlespike is a trifle tough and fibrous, unless well sweated with butter. But it possesses a peculiarly agreeable piquant flavour. The Clavarias generally are thoroughly commendable, and pickle well.

The Bolets (155–173). This genus is one that the author is particularly anxious to popularize, because Bolets are large, substantial, common, and abundant. They are readily known by their big, round, cushiony caps, and by the porous, spongy surface below the cap. A considerable number of species are harmless, and therefore edible, and they are considerably more plentiful than their noxious congeners. It would be evidently very desirable if we could discover some common feature, the recognition of which should serve to distinguish good Bolets from noxious ones. Dr. Badham thought he had hit upon some such a test, and various writers since have perpetuated his mistake. It is this. Certain species, when bruised or broken, immediately assume a blue or blackish colour in the wounded part. All such species were declared to be deleterious, while esculents were said to show no such feature. The author has succeeded in proving that this change of colour does in no way serve to distinguish bad Bolets from good ones, though it may help to indicate some species. There are various entirely wholesome Bolets in which the change of colour takes place most markedly. Trying to find some surer substitute for this fallacious rule, the author believes he has established a more useful one in the following. *Any Bolet possessing primrose-yellow pores may be regarded as esculent, with one rare exception, that in which there is also a stout, entirely scarlet stem.* But there are also two excellent species in which the pores are of dirty-white colour. Nor can it be said with certainty that *all* those in which the pores are brown, tan-colour, pink, or crimson are noxious, though the known poisonous Bolets are found among them. After all, it is better to discriminate each species by itself, as has been previously insisted on. This, more especially, because although we have about a score of species of Bolet which are wholesome and nutritive, they are severally very different in

degree of gustatory excellence. For example, there are three species growing in fir-woods, distinguished by being of uniform yellow colour. These are edible but not commendable, being soft and of glutinous texture. In countries where they are used, they are chiefly boiled down into soup, probably with garlic and onion, or other flavourings and ingredients. Most Bolets can be readily dried, and so kept for winter; and in some countries, especially Russia and Italy, this seems to be largely practised. It is noteworthy that the worst kinds lose all their noxiousness after being dried, and become quite harmless. In the two catalogues all the British species of the genus, with but unimportant exceptions, are described, so that the reader may be fully informed in respect of them. The most commendable species will now be severally indicated.

The Summer Bolet (155). This species is the first to appear. It may be found so early as the end of May, and continues till the beginning of August. It is very large and substantial, and is altogether one of the best eatable mushrooms. The species is large and irregular in shape. Next to its early season, the most distinctive point is *the cuticle, which is fine, soft, and silky, of a dull brown, shaded and streaked with grey or black.*

The Dainty Bolet (161). This species is fairly well known to English fungus-eaters, and is probably the most delicious of the Bolets. Its general characters are described in the catalogue. Perhaps the most noteworthy distinctive point about it is *the delicate tracery, or network of fibres, seen on the upper part of the thick white stem.* There are two marked varieties of the Dainty Bolet, differing in the colour of the Pileus. In the first the cuticle is of a *light buff tint.* This kind is chiefly found amid grass, in and about corners of pastures, near copses in parks, etc. If there be any difference in flavour, the palm is borne off by this variety. In the second the cuticle is *brown, more or less dark and dull.* This kind is found more in the shade of woods, often on bare ground among dead leaves.

The Red-Crack Bolet (159), and **The Yellow-Crack Bolet** (171). These are two woodland species, whose top-heavy caps are supported on stems that are tall, lean, twisted, and blotched with red or brown. Both are liable to turn slightly blue where wounded. The brown cuticle is apt to split and crack, and the interstices become red in one species and yellow in the other. They are both wholesome, and fairly good eating.

The Dingy Bolet (167). This species closely resembles the brown variety of the Dainty Bolet, mainly differing from it in *not having a reticulated stem, and in turning bluish where wounded.* It is often very abundant. The author has found it to be wholesome, and fairly good eating.

The Orange Bolet (172), and **The Rough Bolet** (170). This pair are distinguished by possessing *dirty-white pores*, and by both having *tall, thick stems, ridged and corrugated, extraordinarily rough.* In the first the cap is of orange colour; in the second it is dark brown. Otherwise they are almost identical. Both are very large and substantial, and get rather tough when mature. But while young they are excellent viands, and perfectly wholesome. They mostly inhabit woods, and grow singly.

The Elf-cups (209–218). This series of species cannot be considered of great economic value. Yet they are very useful in the composition of sundry *entrées*, and hence deserve mention here. **The Chalice** (209) is the best, and is not uncommon, occurring often in some quantity. The brilliant **Orange Elf-cup** (210) is less to be esteemed than the sober **Snail-shell** (212), though both are equally wholesome and common. Other kinds will be found referred to in the catalogue.

The Truffles (220–221). We have at least two species of these well-known luxuries, which are of excellent quality. They have been found in various localities, and the inference is that they are widely diffused and probably plentiful. But as they are entirely of subterranean growth they cannot be successfully hunted for without the help of a certain breed of little dogs, which have a faculty for scenting truffles. An experienced truffle-hunter, with his dogs—or even with trained pigs—might find it a paying thing to search English woodlands. But these are Fungi, that, however desirable, it is clearly impossible to bring within the reach of people generally.

CHAPTER VIII.

A Comprehensive Catalogue of Esculent British Fungi.*

ORDER AGARICINI.

Genus AGARICUS. Sub-genus AMANITA.

(1.) **AGARICUS ASPER; Amanita asper**; The Rough Amanite.

Habitat. In woods; on bare ground under beeches. Solitary.

Season. June to October. Common.

Pileus. Two to three inches across, livid, greenish or brownish grey; verrucose, convex, obtuse, at length expanded, nearly plane. Warts white, small, acute, persistent. Margin even.

Stem. Two to three inches high, white, silky, attenuate upwards, thick, striate above, bulbous and scabrous below. Ring broad, entire, white, deflexed, distant. Volva obliterate.

Section. Flesh white, brownish under cuticle, unchanging, thick, compact. Stem stuffed, at length hollow. Gills white, broad in front, rounded behind, numerous, perhaps denticulate, free. Odour slight. Taste mild, saltish. Spores white.

Obs. I have eaten it, and regard it as wholesome. But it is not commendable, having a briny taste even after cooking. It may be mistaken for Am. rubescens, if the unchanging white flesh is not noticed.—*W. D. H.*

(2.) **AGARICUS CECILIÆ; Amanita Ceciliæ**; The Cecilia.

Habitat. Airy glades and high ground in woods. Solitary.

Season. August and September. Common.

Pileus. Three to four inches across, mouse-grey, border becoming yellowish; ovate in the volva, then campanulate, convex. Warts torn, grey, loose. Margin sulcate, smooth, perhaps fringed with warty fragments.

* This catalogue is in so far comprehensive that it comprises all British species whose esculent properties have been certified, to the extent of the author's information. It may very well be that additions to the list will have to be made in the future.

Stem. Four to six inches high, white or pallid, thick below, attenuate upwards, silky and rimulose above, below squamulose, naked. Volva grey, torn, imperfect, thick, not vaginate.

Section. Flesh white, unchanging, thickish. Stem stuffed, spongy. Gills white, thick, veined, perhaps furcate, rather distant, free. Odourless. Taste sweet. Spores white.

Obs. Not much is known of it, but it has the reputation of being esculent. If it be the A. murinus of Roques, it has also been deemed deleterious. I have eaten it with Am. vaginata, which it closely resembles, the distinction lying in the stuffed stem and imperfect volva.—*W. D. H.*

(3.) **AGARICUS CESAREUS**; **Amanita Cesarea**; The Orange.

Habitat. In pine and fir woods. Solitary, or grouped.

Season. July to October.

Pileus. Three to six inches across, orange-yellow; at first orbicular and inclosed in white volva, then convex, expanded, plane, not viscid, not verrucose. Margin striate, rimose, sometimes incurved, even.

Stem. Three to six inches high, yellow, smooth, thick, attenuate upwards, bulbous below. Ring deflexed, thick, broad, yellow. Volva large, white, vaginate.

Section. Flesh thick, white, yellow under cuticle. Stem hollow, white within. Gills yellow, thick, broad, unequal, free. Odour slight. Taste bland. Spores white.

Obs. This is not yet an established British species. But its renown, both of ancient and modern date, induced me to include it here. It occurs throughout North Europe and North America, and ought to grow in England. Report says it has been found here, and perhaps it may yet appear in quantity, or be introduced. It is an esculent of high merit.—*W. D. H.*

(4.) **AGARICUS RUBESCENS**; **Amanita rubescens**; The Blusher.

Habitat. In and about woods, near trees in parks, etc. Solitary, or in little groups.

Season. June to October. Very common.

Pileus. Three to six inches across, tawny-brown, more or less reddish-brown, but never the least scarlet or orange; convex, at first smaller than bulb, with incurved edges, then expanding, plane, even, depressed in wet weather. Warts numerous, scattered, dirty-white, mealy, washed off by rain. Margin scarcely striate.

Stem. Two to five inches high, at first a mere bulb, then attenuate upwards, white, stained with brick-red below, and where bruised, cylindrical, bulbous and rough below, squamulose above. Ring white, or stained with brick-red, broad, deflexed, striate. Volva obliterate, or nearly so.

Section. Flesh thick, soft, white, rapidly blushing brick-red where exposed. Stem stuffed, becoming fistulose. Gills white, blushing if bruised, broad in front, narrow behind and rounded, numerous, straight, unequal, free or adnexed. Odour slight. Taste rather saltish. Spores white.

Obs. I have referred to the Blusher in chapter vii. It is easily identified by its trick of blushing, and if this be attended to, there can be no fear of mistakes. Having often eaten it, I recommend it to all lovers of mushrooms. It is well known to fungus-eaters.—*W. D. H.*

(5.) **AGARICUS STROBILIFORMIS; Amanita strobiliformis;** The Fir-cone Amanite.

Habitat. High ground in woods, borders of copses. Solitary.

Season. August to October. Uncommon.

Pileus. Five to nine inches across, white or grey-white, at first hemispherical, then convex, expanded, nearly plane. Cuticle satiny. Warts numerous, greyish, large, angular, floccose at their edges, persistent, arranged like the exterior of a fir-cone. Margin even or rimose, extending beyond the gills.

Stem. Four to seven inches high, white, thick, firm, floccose, bulbous. Ring large, torn, fugacious. Volva fugacious, leaving circular rim on bulb.

Section. Flesh thick, white, firm, unchanging. Stem solid. Gills white, unequal, rounded behind, free. Odour slight, fragrant. Taste sour, but agreeable. Spores white.

Obs. It is eaten abroad, and is esteemed preferable to the Blusher. Here it is not often met with. But being very large, two or three specimens make a substantial dish. It must, however, be carefully studied in comparison with the white poisonous Amanites.—*W. D. H.*

(6.) **AGARICUS VAGINATUS; Amanita vaginata;** The Grisette.

Habitat. In woods, parks, under trees. In groups, or solitary.

Season. June to November. Common.

Pileus. Two to four inches across, fawn, greyish-fawn, greyish-

white; campanulate at first, then convex, expanding, nearly plane; smooth, sleek, polished, viscid when wet, sometimes carrying loose fragments of volva. Cuticle separable. Margin markedly striate.

Stem. Four to eight inches high, white, slender, fragile, attenuate upwards, silky, cylindrical, slightly incrassate below, naked. Volva large, brownish, vaginate, elongate, often buried.

Section. Flesh thin, fragile, white. Stem stuffed, cottony, at length fistulose. Gills white, unequal, numerous, broad in front, ventricose, perhaps imbricate, free. Odourless. Taste pleasant. Spores white.

Obs. Referred to in chapter vii. A most commendable mushroom. The volva must be always looked for, and the other points studied, as there are some nasty species not unlike it.—*W. D. H.*

Genus AGARICUS. Sub-genus ARMILLARIA.

(7.) **AGARICUS MELLEUS**; Armillaria mellea; The Stump-tuft. (Pl. I., fig. 3; Tab. I., fig. 3.)

Habitat. On dead stumps and rotten roots of living trees, etc. In dense tufts.

Season. July to November. Very common.

Pileus. Two to five inches across, buff, dirty-ochre, wax-yellow, brownish; at first convex, then plane, sub-umbonate, covered with brownish, fibrillose, reflexed scales converging round disc. Margin scarcely striate, rather sinuate, depressed, or lobulate. Cuticle separable, pruinose in undermost plants.

Stem. Two to eight inches high, pale dirty buff, fibrillose, slender in the middle, firm, elastic, tomentose and slightly enlarged at the base. Ring large, pale buff, floccose, high, patent.

Section. Flesh tough, thin, pallid. Stem stuffed, spongy. Gills pallid, unequal, rather distant, broad, serrulate, perhaps spotted with brown, adnate, or denticulato-subdecurrent. Odour slight. Taste bitter and astringent. Spores white, profuse.

Obs. Described in chapter vii. Common and wholesome, but of inferior quality.—*W. D. H.*

(8.) **AGARICUS MUCIDUS**; Armillaria mucida; The Beech-tuft.

Habitat. On dying or recently felled beeches. In clusters.

Season. September and October. Uncommon.

Pileus. One to two inches across, white; at first hemispherical, then expanding; thin, soft, elastic. Margin very fine, incurved. Cuticle clammy and wrinkled.

Stem. One to three inches high, white, very slender, subincrassate below, often crooked. Ring white, striate, persistent, patent or reflexed.

Section. Flesh white, very thin. Stem stuffed, almost solid, juicy. Gills white, broad, distant, rounded behind, almost decurrent, serrulate. Odour faintly aromatic. Taste bitter. Spores white.

Obs. An esculent, but uncommon, small, and of peculiar flavour.—*W. D. H.*

Genus AGARICUS. Sub-genus CHAMÆOTA.

(9.) **AGARICUS CRETACEUS; Chamæota cretacea;** The Chalky-cap.

Habitat. Gardens, orchards, and grass-fields. Solitary.

Season. July and August. Not uncommon.

Pileus. Two to three inches across, dead white; convex, then nearly plane; smooth or squamulose, disc sometimes tinged with fawn. Cuticle separable.

Stem. Two to three inches high, cylindrical, elastic, evenly attenuate, enlarged below, thick, white. Ring horizontally reflexed.

Section. Flesh white, thickish. Stem hollow. Gills broad in front, numerous, unequal, remote, white at first, soon rosy. Odour faint. Taste bland. Spores pink.

Obs. It is probably often eaten by mistake, people supposing it to be the White Pratelle, which it resembles. It is quite as good eating, however.—*W. D. H.*

Genus AGARICUS. Sub-genus CLITOCYBE.

(10.) **AGARICUS CERUSSATUS; Clitocybe cerussata;** The White-cap.

Habitat. In woods of fir and pine. In groups or rings.

Season. April to September. Not uncommon.

Pileus. Two to three inches across, white; convex at first, soon plane, obtuse, even, not umbonate; smooth, sleek, moist.

Stem. Two to three inches high, white, not stout, tough, elastic naked, incrassate, rooting slightly.

Section. Flesh thickish, white, tough, unchanging. Stem solid, spongy. Gills white, numerous, thin, crowded, acutely adnate. Odour faint. Taste agreeable. Spores white.

Obs. Sometimes plentiful in its own habitat, particularly in Spring. It is wholesome, and of pleasant flavour. Much eaten in some countries.—*W. D. H.*

(11.) **AGARICUS CYATHIFORMIS; Clitocybe cyathiformis;** The Goblet.

Habitat. Amongst moss in woods. In groups.

Season. October and November. Not uncommon.

Pileus. Two inches across, dull dark umber, smooth, moist, hygrophanous; disc depressed. Margin raised, even, sometimes involute at first. Cuticle separable.

Stem. Two or three inches high, pale brown, cylindrical, slender, reticulated with loose fibres, attenuate, elastic, naked.

Section. Flesh brownish, thin, membranaceous. Stem stuffed. Gills dingy, whitey-brown, distant, sub-decurrent, sometimes anastomosed behind. Odourless. Flavourless. Spores white.

Obs. A species of little value. It has neither flesh nor flavour, nor is it plentiful. It is useful only to add to a dish of other kinds.—*W. D. H.*

(12.) **AGARICUS DEALBATUS; Clitocybe dealbata;** The Cream-clot.

Habitat. Grassy spots in woods. Fields. Old beds where A. hortensis has been cultivated. In clusters.

Season. August to October. Common.

Pileus. One or two inches across, white, creamy, pinkish; smooth, polished; at first convex, then plane, or revolute and cyathiform. The variety on mushroom beds is crisped and lobed.

Stem. One inch high, white, slender, often curved, mealy, naked.

Section. Flesh thick, white. Stem stuffed, fibrillose. Gills white, rather broad, brittle, crowded, thin, adnate. Odour like Pratelles. Flavour of flour. Spores white.

Obs. First-rate eating, and often plentiful. It has long been known to English fungus-eaters. If the conditions of its growth on old mushroom beds were noted, it might perhaps be successfully cultivated, and as an esculent it would well repay the trouble.—*W. D. H.*

(13.) **AGARICUS FRAGRANS; Clitocybe fragrans;** The Anisette.

Habitat. Amongst moss and grass, in woods. In groups.

Season. August to October. Common.

Pileus. One inch or more across, pallid or ochry; at first convex, then plane; smooth, even, hygrophanous. Margin at first involute, thin, transparent.

Stem. Two to three inches high, pallid, slender, attenuate, tomentose below, elastic, naked.

Section. Flesh whitish, membranaceous. Stem stuffed, becoming fistulose. Gills pallid, broad, crowded, distinct, sub-decurrent, Odour sweet, like anise. Flavour strong, peculiar, agreeable. Spores white.

Obs. If enough are found, they can be cooked alone, like Oreads, and are a nice relish. But this is one of those species of little substance but strong flavour, whose best use is to impart the latter to stews and hashes, which the addition will greatly improve. They are so used on the Continent, and might well be introduced into English kitchens.—*W. D. H.*

(14.) **AGARICUS FUMOSUS; Clitocybe fumosa;** The Smoke-cap.

Habitat. On high grounds in pine woods, and in wastes. Solitary, or in groups.

Season. September to November. Uncommon.

Pileus. Two to three inches across, smoke-colour, bistre; at first convex, then expanding, the centre somewhat raised, rounded, smooth. Cuticle thick, adherent. Margin thin, sometimes waved.

Stem. One to three inches high, half an inch thick, whitish, smooth, perhaps mealy above, elastic, naked.

Section. Flesh white, thick centrally, toughish. Stem stuffed, fibrous. Gills pallid, crowded, adnate. Odour slight. Taste agreeable. Spores white.

Obs. This species is variable in habit. It may easily be taken for A. nebularis. It is equally wholesome, but much inferior in quality. Nevertheless, it is a good deal eaten in some countries. I should recommend cooking it like the Paxil.—*W. D. H.*

(15.) **AGARICUS GEOTROPUS; Clitocybe geotropa;** The Funnel-cap. (Tab. I., fig. 5.)

Habitat. In and near woods, in woodland pastures. In groups or rings.

Season. August to November. Not uncommon.

Pileus. Four inches across, white, tinted with fawn or buff; at first convex, rounded, even, then forming a broad funnel with an umbo in the centre; surface smooth, satiny. Margin even, or sub-involute.

Stem. Six inches high, one inch thick, enlarged below, white, fibrillose, perhaps villose below, naked.

Section. Flesh white, thick, compact. Stem solid, compact. Gills white, then buff, crowded, numerous, simple, pointed at both ends, decurrent. Odour farinaceous. Taste bland. Spores white.

Obs. A species readily identified, wholesome, and good. It requires rather long cooking, with plenty of moistening. There is nothing bad bearing any close resemblance to it. Funnel-caps have been well tried and much commended.—*W. D. H.*

(16.) **AGARICUS GIGANTEUS**; **Clitocybe gigantea**; The White Giant.

Habitat. Grassy banks, hedge-sides, in meadows. Grouped.

Season. July to October. Not uncommon.

Pileus. Six to nine inches across, white, opaque; infundibuliform, not umbonate; flocculose, slightly viscid in wet. Margin incurved, at length sulcate.

Stem. Two to three inches high, one inch thick, equal, obtuse, minutely flocculose, cylindrical, naked, diffused into pileus.

Section. Flesh white, thick, firm. Stem solid. Gills white, at length ochreish; narrow, serrulate, forked behind, at length rounded, shortly decurrent. Odourless. Taste bland. Spores white.

Obs. The difference between this and Cli. maxima (19) appears to me to be so entirely nominal, that I have given them the same English name. They seem to be equally wholesome, and identical in a gastronomic sense.—*W. D. H.*

(17.) **AGARICUS INFUNDIBULIFORMIS**; **Clitocybe infundibuliformis**; The Tan-cap.

Habitat. On bare ground, amongst moss or leaves, in and about woods. Solitary or in groups.

Season. July to October. Common.

Pileus. Two to three inches across, pale tan or cinnamon; at first convex and umbonate, then funnel-shaped, with an umbo; dry, elastic, covered with a close web of down. Margin involute, tomentose, then lobulate.

Stem. Two to three inches high, brownish white, slender, thickened below, soft, elastic, cylindrical, naked.

Section. Flesh thickish centrally, brownish, tough. Stem stuffed, fibrous. Gills pallid, or brownish; narrow, thin, unequal, numerous, pointed at both ends, decurrent. Sweet-scented. Taste rather astringent. Spores white.

Obs. Much like Cli. cyathiformis; perhaps a trifle more commendable. It dries well. The two species are not unlike some suspicious Clitocybes, and great care is necessary in distinguishing them, which would tend to deter from attempting to use them.—*W. D. H.*

(18.) **AGARICUS LACCATUS; Clitocybe laccata;** The Little Violet.

Habitat. Among dead leaves. In small groups.

Season. June to October. Very common.

Pileus. One to two inches across, violet, mauve, or dull magenta, even yellowish; pruinose in dry weather, dark and brilliant in wet, fading when dry; convex, disc depressed. Margin incurved, often sinuate.

Stem. One to six inches high, colour of pileus, slender, equal, but a little incrassate at base, fibrous, tomentose, naked.

Section. Flesh thin, membranaceous, colour of pileus. Stem stuffed, fibrous. Gills colour of pileus, broad behind, thick, distant, unequal, adnate or sub-decurrent. Odourless. Taste mild. Spores white.

Obs. Plentiful enough, though small. May be dressed like Oreads, though inferior to them.—*W. D. H.*

(19.) **AGARICUS MAXIMUS; Clitocybe maxima;** The White Giant.

Habitat. In woods and wastes; on old hedge-banks in meadows. In groups or rings.

Season. July to October. Not uncommon.

Pileus. Six to fourteen inches across, or more, white, or dirty white; broadly infundibuliform, disc much sunk. Cuticle silky, becoming squamulose. Margin sub-sulcate, thin, irregular, rimose.

Stem. Two to three inches high, white, brownish where bruised, firm, smooth, thick, naked, incrassate below.

Section. Flesh white, thick centrally, firm. Stem solid, hard, Gills white or creamy, close, crowded, serrulate, forked, decurrent. Odour farinaceous. Taste bland. Spores white.

Obs. The two species of White Giant and the Funnel-cap are probably most

valuable food-fungi. They are very large and substantial, and occur in quantity in many localities. They are much eaten on the Continent, and are highly recommended. But they are somewhat coarse, and, though of excellent flavour, are not of dainty and delicate substance. I have not had sufficient experience of them myself, or I might have placed them in chapter vii.—*W. D. H.*

(20.) **AGARICUS NEBULARIS; Clitocybe nebularis;** The Cheese-cap.

Habitat. Among dead leaves in woods. In irregular rows.

Season. August to November. Uncommon.

Pileus. Three to five inches across, cinder-grey, disc darkest; depresso-convex at first, then expanding, plane, centre umbonate within depression. Margin at first incurved and farinose.

Stem. Two to five inches high, greyish white, nearly an inch thick, firm, naked, striate. Base enlarged, curved, held to surrounding objects by cottony down.

Section. Flesh very thick, compact, white, unchanging. Stem solid, soft within. Gills white or creamy, narrow, crowded, unequal, curved, decurrent. Odour precisely like new cheese. Taste unique. Spores white.

Obs. In France, Paulet and Cordier have regarded this species with suspicion. Curiously enough, the more timid fungus-eating authorities in England cannot praise it sufficiently. I have had but slight personal experience of it, but that little is in its favour. The Cheese-cap should be gathered young, and should not be overcooked. It is certainly extremely nice.—*W. D. H.*

(21.) **AGARICUS ODORUS; Clitocybe odora;** The Sweet-cap.

Habitat. Among dead leaves in woods. In little groups.

Season. August to November. Uncommon.

Pileus. Two to three inches across, pale bluish green, perhaps splashed with white, smooth, not viscid; at first convex, then plane, inclining to repand, sub-umbonate. Margin thin, at first involute.

Stem. Two inches high, colour of pileus, slender, firm, flexuose, attenuate downwards, tomentose, naked, rooting.

Section. Flesh pallid, thin, tough. Stem stuffed. Gills pallid, pinkish, not crowded, broad, wavy, ruguloso-venate between, adnate, or sub-decurrent. Pleasantly fragrant. Taste mild. Spores white

Obs. Similar to the Anisette, in a gastronomic sense. Both help to make an omelette very tasty, and are useful to flavour meat dishes with.—*W. D. H.*

Genus AGARICUS. Sub-genus CLITOPILUS.

(22.) **AGARICUS ORCELLA**; **Clitopilus orcella**; The Orcelle.

Habitat. In and near woods, under bushes, near copses in pastures. In groups.

Season. June to October. Common.

Pileus. Two to four inches across, opaque white, smooth like kid leather, viscid in wet; at first convex, then plane, expanding irregularly, lobulate; the centre depressed, often dimidiate. Margin thin, sinuate.

Stem. One to two inches high, thickest above, smooth, white, at length excentric, firm, stout, perhaps curved, naked.

Section. Flesh white, thick centrally, brittle. Stem solid. Gills at first white, soon pale salmon-pink, close, narrow, unequal, pointed behind, decurrent. Odour of cucumber-rind or syringa. Taste bland. Spores pink.

Obs. Included in chapter vii. It is easily recognised, and is a most exquisite viand.—*W. D. H.*

(23.) **AGARICUS PRUNULUS**; **Clitopilus prunulus**; The Mousseron. (Tab. II. fig. 14.)

Habitat. In and near woods, trees in pastures, and in parks. olitary, or in groups.

Season. April to June. Not very common.

Pileus. Two to five inches across, opaque-white, or faintly greyish, dry, soft, smooth like kid leather, pruinose; at first convex, then depressed. Margin elevated, irregular, sinuate.

Stem. One to two inches high, white or faintly grey, sub-striate, naked, swollen and villose below.

Section. Flesh thick, compact, brittle Stem solid, firm, fissured in age. Gills at first white, soon salmon-pink, crowded, narrow, pointed, very decurrent. Odour farinaceous. Taste bland. Spores pink.

Obs. Included in chapter vii. Some authors contend it is identical with the Orcelle, but Fries admits the distinction. Badham evidently confounded it with the St. George. It is delicious.—*W. D. H.*

Genus AGARICUS. Sub-genus COLLYBIA.

(24.) **AGARICUS CLAVUS**; **Collybia clava**; The Rednail.

Habitat. On trunks and roots of pines and other trees. Solitary.

Season. April and May. Uncommon.

Pileus. Half an inch across, orange red; rounded, plane, even, slender, smooth. Margin smooth, even.

Stem. Two or three inches high, white, smooth, slender, naked. Base elongate, villose, rooting.

Section. Flesh white, or yellowish, thickish, tough. Stem stuffed, white. Gills white, numerous, crowded, emarginate, free or adnexed. Odour of radishes. Taste sharp. Spores white.

Obs. The flat head and long thin stem gives it a likeness to a nail. It is a good deal used on the Continent as a flavouring for sauces, etc. Scarcely of much account.—*W. D. H.*

(25.) **AGARICUS ESCULENTUS**; **Collybia esculenta**; The Nail-cap.

Habitat. On the ground in pastures, heathy commons, and woods. In groups and clusters.

Season. March to May. Tolerably common.

Pileus. Half to one inch across, fawn or clay-colour, rounded, nearly plane, smooth, not striate.

Stem. Two to three inches high, tint of pileus, slender, straight, equal, tough, smooth, elongate, rooting, naked.

Section. Flesh drab, thin, tough. Stem fistulose. Gills white, broad, close, pliant, adnate. Odour faint. Flavour bitterish. Spores white.

Obs. Much esteemed in Germany. It is brought to market in immense quantity, and is employed as a flavouring for sundry sauces and soups.—*W. D. H.*

(26.) **AGARICUS FUSIPES**; **Collybia fusipes**; The Spindle-shank. (Tab. I. fig. 7.)

Habitat. On stumps, and about the roots of trees. In dense tufts.

Season. June to October. Common.

Pileus. Two to four inches across, tan or chestnut-brown, darkest marginally; rounded at first, then irregularly convex and plane. Margin at first slightly incurved, soon expanding and splitting.

Stem. Three to six inches high, chestnut-brown, darkest below,

twisted spirally, grooved, contorted, the middle swollen, the top and bottom attenuate, spindle-shaped, naked, rooting.

Section. Flesh white, thick, tough. Stem fistulose, fibrous. Gills pallid, drab, or becoming brownish, sometimes rounded behind and free, or adnexed. Odour of nuts. Flavour agreeable. Spores white.

Obs. In chapter vii. Common, plentiful, a well-attested, excellent, and wholesome viand.—*W. D. H.*

(27.) **AGARICUS LONGIPES**; **Collybia longipes**; The Long-shank.

Habitat. In shady woods among leaves, on half-buried stumps. Solitary.

Season. August to November. Common.

Pileus. Two to three inches across, tan or pale brown; at first conical, then expanded, convex, umbonate; thin, dry, velvety. Margin even, patent, tomentose.

Stem. Three to eight inches high, buffish, attenuate, slender, sulcate, tomentose, velvety, villose below, naked, root long and twisting.

Section. Flesh pallid, thin, tough. Stem stuffed. Gills white, distant, broad, rounded behind, adnate. Odour faint, sickly. Taste harsh. Spores white.

Obs. I can say nothing in favour of this species, except that it has been classed among esculents both in France and America. Inexperience might confound it with A. velutipes, a congener of which nothing is known. These and other Collybias last long in mild winters.—*W. D. H.*

(28.) **AGARICUS RADICATUS**; **Collybia radicata**; The Rooting-shank.

Habitat. On stumps and buried dead tree-roots. Singly or in tufts.

Season. August to October. Common.

Pileus. Three to four inches across, dusky buff; convex, then plane, sub-umbonate, radiato-rugose, smooth, viscid, tough, elastic, perhaps inverted.

Stem. Three to eight inches high, pale brown, slender, twisted, attenuate, striate, furfuraceous, naked, rooting deeply.

Section. Flesh pallid, elastic, thin. Stem stuffed, brittle, juicy, splitting, rufescent, at length fistulose. Gills white, distant,

ventricose, adnate. Odour resinous. Taste astringent. Spores white.

Obs. A most unpromising species, which I only insert because it is reported as edible from America.—*W. D. H.*

Genus AGARICUS. Sub-genus ENTOLOMA.

(29.) **AGARICUS FRUMENTACEUS; Entoloma frumentacea;** The Wheat-cap.

Habitat. Damp grassy and mossy sites in woods. In groups.

Season. June to August. Uncommon.

Pileus. Two to four inches across, colour of ripe wheat, finely streaked, dry, smooth; plane, rather repand. Margin irregular, sinuate, arcuate.

Stem. Two inches high, tint of pileus, stout, striate, rimulose, unequal, naked. Base obtuse, tomentose.

Section. Flesh white, thick, brittle. Stem solid. Gills dull pink, broad, distant, emarginate, perhaps rounded behind, adnate. Odour farinaceous. Taste agreeable. Spores pink.

Obs. Curtis reports it esculent in America. I have tried it raw, and it seems good. But old specimens are rather nauseous. The sub-genus is a suspicious one.—*W. D. H.*

(30.) **AGARICUS RHODOPOLIUS; Entoloma rhodopolia;** The Waterskin.

Habitat. On the ground in woods. Singly, or in twos and threes.

Season. April and May, September and October. Uncommon.

Pileus. Two to three inches across, pale grey when dry, blackish or tawny when moist, hygrophanous, smooth, satiny; at first campanulate, then plane, depressed, sub-umbonate. Margin flexuose or broken.

Stem. Three inches high, smooth, white, nearly equal, stout, pruinose above, naked.

Section. Flesh white, watery, thin, fragile. Stem hollow. Gills rosy, unequal, distant, pointed in front, broad behind, denticulato-adnate. Odour farinaceous. Taste mild. Spores pink.

Obs. It has been fairly well proved to be wholesome, though it is certainly not commendable. It must be carefully differentiated from poisonous congeners. Ent. nidorosa resembles it, and may also be edible.—*W. D. H.*

(31.) **AGARICUS SINUATUS**; **Entoloma sinuata**; The Pinky-cap. (Tab. II. fig. 13.)

Habitat. In damp shady woods and shrubberies. Solitary.

Season. April and May, September and October. Rare.

Pileus. Four to six inches across, pale pink or buffish, smooth, dry, perhaps squamulose; at first rounded, convex, then depressed, expanded, lobulate, almost repand.

Stem. Two to three inches high, white, punctate with red, stout, firm, compressed, at first fibrillose, then smooth, incrassate below, naked.

Section. Flesh white, thick, compact. Stem stuffed, almost solid. Gills rosy, very broad, obtuse, emarginate, nearly free. Odour of burnt sugar. Taste mild. Spores pink.

Obs. Although Cooke and W. G. Smith regard this as poisonous, I insert it here because Cordier says not merely that it is wholesome, but also that it is *très bon à manger.* I have no personal experience of it. It must not be confounded with Ent. clypeata.—*W. D. H.*

Genus AGARICUS. Sub-genus HYPHOLOMA.

(32.) **AGARICUS CANDOLLIANUS**; **Hypholoma Candolliana**; The Esculent Hypholome.

Habitat. On the ground in shady woods. In tufts.

Season. April and May. Rare.

Pileus. Two to four inches across, buff, whitish marginally; at first campanulate or convex, then expanding, rounded; smooth, hygrophanous. Margin fimbriate with veil. Cuticle adnate.

Stem. Three inches high, white, fibrillose, slender, fragile, striate above. Ring white, lacerate.

Section. Flesh white, thickish. Stem hollow above, solid below. Gills brownish-violet, crowded, rounded behind, adnexed. Spores purple.

Obs. The only one of the sub-genus reported esculent. It is eaten in Southern Europe. But its close resemblance to sundry very bad congeners deters me from recommending it.—*W. D. H.*

Genus AGARICUS. Sub-genus LEPIOTA.

(33.) **AGARICUS ACUTESQUAMOSUS**; **Lepiota acutesquamosa**; The Scaly-top.

Habitat. In woods. In gardens and conservatories. Solitary.

Season. Summer. Rare.

Pileus. Two to three inches across, tawny, floccose, then squarrose; rounded, convex, slightly umbonate.

Stem. Three to four inches high, tawny, thickish, tomentose above, squamose below. Base bulbous. Ring white.

Section. Flesh white, tough, elastic, thick. Stem stuffed. Gills white, crowded, simple, pointed at both ends, free. Odourless. Taste mild. Spores white.

Obs. Enumerated among esculents by French authorities.—*W. D. H.*

(34.) **AGARICUS CEPŒSTIPES**; Lepiota cepœstipes; The Onion-stem.

Habitat. On tan and leaf-mould in gardens and conservatories. In tufts.

Season. August and September. Uncommon.

Pileus. One to three inches across, at first white, then primrose, becoming brown, darkest centrally, slightly squamulose; at first oval, then campanulate, lastly plane, umbonate. Margin thin, plicate, translucent.

Stem. Three to five inches high, white, velvety, slender, bulbous below, like an onion. Ring erect, filamentous.

Section. Flesh white, thin, delicate. Stem hollow. Gills white, unequal, numerous, broad, rounded behind, free. Odour not agreeable. Taste bitter. Spores white.

Obs. Edible, but poor in flavour, not plentiful, and slight of substance. Of little account.—*W. D. H.*

(35.) **AGARICUS CRISTATUS**; Lepiota cristata; The Crested Parasol.

Habitat. In fields and grassy woods, on lawns. Solitary, or in small groups.

Season. August and September. Common.

Pileus. Half to two inches across, white or yellowish, at first silky, then surmounted with a crest of granular reddish scales; expanded, umbonate, slender. Margin uneven.

Stem. One to two inches high, white above, brownish below, slender, smooth, even, equal, perhaps fibrillose. Base rooting. Ring entire, movable, evanescent.

Section. Flesh white, thin, firm. Stem fistulose, fibrous. Gills white, numerous, distant, unequal, broad in front, remote. Odour strong, unpleasant. Flavour peculiar. Spores white.

Obs. A very fair esculent. But it must not be confounded with forms of Am. excelsa.—*W. D. H.*

(36.) **AGARICUS CLYPEOLARIUS**; **Lepiota clypeolaria**; The Scented Parasol.

Habitat. In damp shady woods, in gardens and conservatories. Solitary or in groups.

Season. July to September. Not uncommon.

Pileus. Two to three inches across, white tinged with yellow, pink, or brown; at first ovoid, then plane, or depressed round umbo. Cuticle soon breaking up into reddish scales clustered about centre.

Stem. Two to five inches high, white or brownish, slender, not bulbous, smooth above, fibrillose below. Ring floccose, fugacious.

Section. Flesh not thick, pallid, soft. Stem fistulose. Gills white, numerous, broad, unequal, not close, free but approximate. Scent sweet. Tasteless. Spores white.

Obs. Some have suspected it, but Letellier calls it esculent. It is not worth much anyhow.—*W. D. H.*

(37.) **AGARICUS EXCORIATUS**; **Lepiota excoriata**; The Flaky Parasol.

Habitat. In pastures and fields, in woodland glades. By twos and threes.

Season. May to September. Common.

Pileus. Two to three inches across, fawn, disc dark; at first convex, then plane, umbonate, rounded. Cuticle thin, breaking up into small flaky scales. Margin and interstices silky.

Stem. One to three inches high, white, or pale fawn, slender, cylindrical, not bulbous, attenuate upwards, smooth, glossy. Ring wide, deflexed, movable, not fugacious.

Section. Flesh white, thickish, soft, spongy. Stem fistulose. Gills pallid, numerous, unequal, thin, unequally broad, projecting, perhaps forked, remote. Odour faint. Taste pleasant. Spores white.

Obs. In chapter vii. A thoroughly good, delicate edible.—*W. D. H.*

(38.) **AGARICUS GRACILENTUS; Lepiota gracilenta;** The Slender Parasol.

Habitat. Pastures and fields. Solitary.

Season. June to September. Not uncommon.

Pileus. Three to four inches across, buff-brown; at first campanulate, then expanded, obtuse, umbonate. Cuticle thin, breaking up into persistent dark patches. Margin and interstices silky.

Stem. Four or five inches high, white, or brownish below; elongate, attenuate upward, squamulose. Base enlarged. Ring thin, movable, fugacious.

Section. Flesh white, not thick. Stem hollow. Gills pallid, broad, remote. Odourless. Pleasant flavour. Spores white.

Obs. In chapter vii. It is a handsome species, and excellent eating.—*W. D. H.*

(39.) **AGARICUS GRANULOSUS; Lepiota granulosa;** The Mealy Parasol.

Habitat. Woodland glades, heaths, and pastures. In groups.

Season. June to September. Uncommon.

Pileus. Half to one inch across, dull reddish yellow, variable in tint; at first convex, umbonate, then plane, or depressed. Cuticle wrinkled, mealy, or granular.

Stem. One to three inches high, white and fibrillose above, brown and scaly below. Base enlarged. Ring flocculose, fugacious.

Section. Flesh white, thick centrally. Stem solid above, stuffed below, fistulose at length. Gills white, crowded, somewhat swollen, free but approximate. Odour faint. Taste pleasant. Spores white.

Obs. The wrinkled granular cap is a sure indication of the species. Its wholesomeness has been well attested, but it is only of inferior quality.—*W. D. H.*

(40.) **AGARICUS HOLOSERICEUS; Lepiota holosericea;** The Silky Parasol.

Habitat. Damp grassy woods. Solitary.

Season. August to October. Not very common.

Pileus. Three to four inches across, fawn, buff, or brownish, but uniform in tint; at first convex, then expanded, not umbonate, fragile; covered with silky down.

Stem. Two to four inches high, tint of pileus, thickish, soft, brittle, sericeous. Base bulbous. Ring superior, broad, pendulous, reflexed, persistent.

Section. Flesh white, thick, soft. Stem solid. Gills white, numerous, broad, ventricose, free. Odourless. Taste pleasant. Spores white.

Obs. In chapter vii. I esteem it as a first-rate esculent.—*W. D. H.*

(41.) **AGARICUS MASTOIDEUS; Lepiota mastoidea;** The Bossed Parasol.

Habitat. In woods. Singly, or by twos and threes.

Season. September and October. Not uncommon.

Pileus. One to three inches across, drab, or buff: at first ovate, then expanding, large umbo in depressed disc. Cuticle thin, breaking up into small dark papillæ.

Stem. Three to four inches high, white or buffish, slender, equally attenuate upwards, weak, villoso-squamose, bulbous below. Ring entire, movable.

Section. Flesh white, thickish, soft. Stem stuffed with cottony fibres. Gills yellowish white, narrow, remote. Odour faint. Taste pleasant. Spores white.

Obs. In chapter vii. Good, but not so succulent or well-flavoured as some of the others.—*W. D. H.*

(42.) **AGARICUS NAUCINUS; Lepiota naucina;** The Short Parasol.

Habitat. Pastures, grass in woods. Solitary.

Season. August to October. Uncommon.

Pileus. One to three inches across, white or whitish tan; at first convex, obtuse, then expanded, depressed, and umbonate; smooth, soft, silky. Cuticle thin, becoming granular.

Stem. One or two inches high, nearly white, attenuate, bulbous below, fibrillose. Ring large, thin, fugacious.

Section. Flesh white, thick, soft, spongy. Stem stuffed with fibres, almost hollow. Gills pallid, becoming rosy, numerous, unequal, free, but approximate. Odour mouldy. Taste agreeable. Spores white.

Obs. It bears some resemblance to A. cretaceus, owing to the short stem, similar site, and pink gills, and is about equal to it in point of esculent merit. But it is not often met with.—*W. D. H.*

(43.) **AGARICUS PROCERUS**; **Lepiota procera**; The Pasture Parasol. (Pl. I. fig. 1; Tab. I. fig. 2.)

Habitat. In pastures, and among grass on sandy and gravelly soils. Solitary, or in groups.

Season. July to October. Common.

Pileus. Four to eight or ten inches across, bistre, or red-brown; at first a rounded cone, then campanulate, expanding, parasol-shaped, umbonate. Cuticle velvety, broken up into broad scales, like brown shaggy leather. Margin whitish, or pinky, silky, fimbriate.

Stem. Six to twelve inches high, comparatively slender, cylindrical, attenuate, bulbous below, white, squamose with brown scales, deeply sunk into pileus. Ring strong, thick, movable, persistent.

Section. Flesh white, thick, soft, cottony at margin, rufescent when bruised. Stem fistulose, with interior fibres. Gills white, or creamy, ventricose, serrulate, remote. Odour farinaceous. Flavour pleasant. Spores white.

Obs. In chapter vii. One of the very best esculents. Probably superior to the Pratelle.—*W. D. H.*

(44.) **AGARICUS RACHODES**; **Lepiota rachodes**; The Grey Parasol.

Habitat. Pastures, in shady corners. Solitary.

Season. July to October. Common.

Pileus. Three to eight inches across, grey, the scales brown; globular at first, then expanding, depressed, and umbonate; velvety, shaggy. Margin shaggy.

Stem. Six to twelve inches high, white, slender, not squamose, attenuate, bulbous below. Ring torn, movable.

Section. Flesh white, rufescent where bruised, thick, soft. Stem hollow, containing fibres. Gills pallid, ventricose, serrulate, free. Odour farinaceous. Taste pleasant. Spores white.

Obs. In chapter vii. Perhaps it is fanciful to say this is any inferior to Lep. procera.—*W. D. H.*

Genus AGARICUS. Sub-genus MYCENA.

(45.) **AGARICUS PURUS**; **Mycena pura**; The Mauve-cap.

Habitat. Among moss and leaves in woods. In groups.

Season. August to November. Common.

Pileus. One or two inches across, of variable tint, rosy, violet, or brown-purple, moist; at first conical, then expanded, campanulate or plane, umbonate. Margin thin, striate, translucent.

Stem. Two to four inches high, tint of pileus, rigid, slender, smooth, polished, naked. Base villose.

Section. Flesh very thin, pallid. Stem hollow, fibrous, splitting. Gills pale, tint of pileus, broad, distant, unequal, projecting, venate behind, adnexed. Odour and taste of radishes. Spores white.

Obs. May be easily confounded with A. laccatus, but the two species may be gathered and eaten together, and are almost identical in flavour.—*W. D. H.*

Genus AGARICUS. Sub-genus OMPHALIA.

(46.) **AGARICUS GRISEUS; Omphalia grisea;** The Grey-bud.

Habitat. Grassy places in fir and pine woods. In groups.

Season. July to October. Common.

Pileus. Half to one inch across, grey, becoming leaden; campanulate at first, then convex; smooth, polished when dry, hygrophanous. Margin striate.

Stem. Two to three inches high, pallid, very slender, smooth, firm, straight, naked.

Section. Flesh membranaceous. Stem fistulose. Gills pallid, or greyish, distant, unequal, arcuate, venate, thickish, slightly denticulate, decurrent. Odourless. Taste insipid. Spores white.

Obs. Of very little account. These small species may sometimes be gathered in quantity, and made into a relishing dish. But they are hardly worth the trouble.—*W. D. H.*

Genus AGARICUS. Sub-genus PHOLIOTA.

(47.) **AGARICUS CAPISTRATUS; Pholiota capistrata;** The Ruffed-neck.

Habitat. On old elm trees and stumps. In tufts.

Season. Late summer and autumn. Rare.

Pileus. Two to three inches across, whitish when dry, livid, tawny, and viscid when moist; convex, rounded. Margin involute, sub-striate.

Stem. Three to four inches high, thick, nearly equal, subsquamulose. Ring large, entire, patent, persistent.

Section. Flesh thick. Stem stuffed. Gills pallid, becoming

darker, fleshy, crowded, decurrent. Odour slight. Taste unpleasant. Spores brown.

Obs. It has been reported esculent by English authorities. It seems to me to differ very little from Pho. cylindracea, as described by Fries, Letellier, and Cordier; a species not accounted British, but which is eaten in southern France. —*W. D. H.*

(48.) **AGARICUS LEOCHROMUS**; **Pholiota leochroma**; The Lion-tuft.

Habitat. On stumps and decaying roots of trees. In tufts.

Season. Autumn. Not common.

Pileus. Two to three inches across, bright tawny; convexo-plane, at length depressed; soft, smooth, not polished. Cuticle rivulose. Margin pale.

Stem. Three to four inches high, white above, pale brown below, nearly equal, slender, smooth, shining. Ring tawny, persistent.

Section. Flesh rather thick. Stem solid, fibrous, brownish below. Gills pallid, then cinnamon, rounded, ventricose, adnate. Odour slight. Taste mild. Spores brown.

Obs. Cooke speaks well of it as an esculent. I do not remember having tried it.—*W. D. H.*

(49.) **AGARICUS MUTABILIS**; **Pholiota mutabilis**; The Limetuft.

Habitat. Mostly on lime-trees, sometimes on other trees, and very rarely on the ground. In tufts.

Season. April and May, September and October. Common.

Pileus. Two to three inches across, cinnamon, pale when dry, disc often tawny; convex, then expanded, smooth. Margin thin, translucent, at first incurved.

Stem. Two to four inches high, whitey-brown, rigid, slender, smooth above, squamulose below. Ring distinct, woven.

Section. Flesh white, thickish centrally. Stem stuffed, at length fistulose. Gills pallid at first, then brown, broad, crowded, rounded, adnate or sub-decurrent. Odour faint. Taste harsh. Spores brown.

Obs. Of similar esculent value to the Stumptuft. To be prepared like it.—*W. D. H.*

(50.) **AGARICUS PRÆCOX**; **Pholiota præcox**; The Dappled-cap.

Habitat. On the ground in gardens and mossy meadows. Singly, or in groups.

Season. April and May. Sometimes common.

Pileus. One to three inches across, creamy, or yellow-tawny, perhaps tesselated, viscid in wet, soft, retaining impression of finger, like kid when dry; convex, then plane, rounded, smooth, even.

Stem. One to three inches high, white, slender, equal, at first sub-pubescent, then smooth, rooting strongly. Ring high, striate, deflexed, white, entire.

Section. Flesh creamy, thick, firm, watery towards margin. Stem at first stuffed, then fistulose. Gills pallid, creamy, at length brown, rounded, unequal, serrate, crowded, adnexed. Odour faint. Taste mild. Spores brown.

Obs. Not well known; but there is good evidence of its being esculent, and of fair quality.—*W. D. H.*

(51.) **AGARICUS PUDICUS; Pholiota pudica;** The Ingénue.

Habitat. On old tree-trunks, chiefly elder. Singly, or in tufts.

Season. June to October. Not uncommon.

Pileus. Two to four inches across, at first white, then buff, dry, smooth, perhaps rivulose; convex, then plane, rounded, even.

Stem. Two to three inches high, whitish, nearly equal, smooth, often excentric, or curved below. Ring entire, patent, persistent.

Section. Flesh thick, white. Stem stuffed, or solid. Gills at first pallid, then brownish, unequal, rounded behind, ventricose, adnate. Odour slight. Taste mild. Spores brown.

Obs. The best in quality of the edible Pholiotes. Much eaten on the Continent.—*W. D. H.*

(52.) **AGARICUS SPECTABILIS; Pholiota spectabilis;** The Tawny-tuft.

Habitat. On stumps and trunks of oaks. In tufts.

Season. August to October. Uncommon.

Pileus. Three to five inches across, rich tawny buff; compact, convexo-plane, dry. Cuticle broken up into broad, flat, silky scales, which become streaky towards the margin.

Stem. Four inches high, thick, tough, spongy, buff, swollen below, rooting. Ring brownish, powdered with spores, thick, deflexed, fibrillose below.

Section. Flesh buffish, thick, firm. Stem solid, spongy. Gills rusty-yellow, crowded, serrulate, narrow, adnato-decurrent. Odour unpleasant. Taste harsh and bitter. Spores brown.

Obs. Reported edible by Letellier, but certainly not enticing. Would require preparation like the Stumptuft, I should think.—*W. D. H.*

(53.) **AGARICUS SQUARROSUS; Pholiota squarrosa;** The Prickly-cap. (Tab. III. fig. 19.)

Habitat. On tree-trunks, mostly apple-trees. In tufts.

Season. August to October. Common.

Pileus. Two to four inches across, tawny-yellow, very squamose; at first sub-campanulate, rounded, then convex, expanded, obscurely umbonate. Margin inclined to be involute. Scales bright brown, revolute.

Stem. Three to six inches high, yellow, becoming brown, thick, cylindrical, attenuate below, smooth above, squamose below with brown, revolute scales. Ring high, radiate, cottony, bright brown.

Section. Flesh thick, compact, yellowish. Stem stuffed, pithy. Gills at first yellowish, then olivaceous, lastly brown, unequal, arcuate, crowded, adnate. Odour sickly. Taste of mouldy meal. Spores brown.

Obs. It has lain under undeserved reproach, on account of its appearance. It is however, wholesome enough, though not of first-rate quality. It needs to be "sweated," like the Urchin.—*W. D. H.*

Genus AGARICUS. Sub-genus PLEUROTUS.

Obs. There are no deleterious species in Pleurotus, though some are too tough to eat. The Subgenus is distinguished by white spores—a fact to be noted. Claudopus, which nearly resembles it, has pink spores, and there are some more or less poisonous species in that subgenus. All edible Pleurotes are to be gathered young, and dressed like the Oyster.—*W. D. H.*

(54.) **AGARICUS DRYINUS; Pleurotus dryinus;** the Spotty-sprout.

Habitat. On various kinds of tree. Solitary.

Season. September to November. Uncommon.

Pileus. One to three inches across, white, variegated with brown spotty scales; at first convex, then expanding obliquely, dimidiate, compact, hard. Margin perhaps involute, perhaps fimbriate with veil.

Stem. Two to three inches long, white, spotted, lateral, continuous with pileus, thick. Base attenuate, firm, woody. In youth bearing fragments of veil.

Section. Flesh white, yellowing where bruised, compact. Stem solid. Gills white, at length yellowish, unequal, curved, forked, narrow, decurrent. Odour and taste farinaceous. Spores white.

Obs. Pretty good whilst young. Like the Oyster to eat.—*W. D. H.*

(55.) **AGARICUS OSTREATUS**; **Pleurotus ostreatus**; The Oyster of the Woods.

Habitat. On old trunks of ash, apple, laburnum, and other trees. In imbricate tufts.

Season. March to May. September to December. Common.

Pileus. Two to six inches across, brownish, buff with grey shading, paling at length, glossy in dry weather, clammy in wet; sub-dimidiate, conchate, ascending. Margin involute, rimulose.

Stem. Absent, or short and lateral, continuous, small at base, at length tomentose.

Section. Flesh white, stained under cuticle, thick, firm. Stem solid. Gills white or pallid, unequal, distant, broad, decurrent to base and anastomosing. Odour aromatic. Taste agreeable. Spores white.

Obs. Included in chapter vii. Most excellent and commendable.—*W. D. H.*

(56.) **AGARICUS PETALOIDES**; **Pleurotus petaloides**; The Petal-sprout.

Habitat. On the ground or on buried stumps, in wastes and woodlands. Solitary or grouped.

Season. September and October. Rare.

Pileus. Two to three inches across, pallid or grey-buff, thin, dry, farinose; ascending, depressed, dimidiate. Margin sinuate, folded, spathulate, or petaloid. Cuticle separable.

Stem. Half to one inch high, white, compressed, flattened, lateral, continuous, channelled and wrinkled.

Section. Flesh whitish, thin, brittle. Gills pallid or greyish, narrow, crowded, decurrent. Odour and taste farinaceous. Spores white.

Obs. I have never seen it, but Cordier speaks well of its esculent qualities.—*W. D. H.*

(57.) **AGARICUS SALIGNUS**; **Pleurotus salignus**; The Willow-Sprout.

Habitat. Chiefly on willows, also on poplar and walnut trees. Solitary, or in imbricate tufts.

Season. October to January. Not uncommon.

Pileus. Four to eight inches across, white, becoming brown; sub-dimidiate or flabelliform, horizontal, convexo-plane, disc perhaps depressed, smooth or rimose.

Stem. Absent, or short, white, thick, tomentose, rigid.

Section. Flesh whitish, thick, spongy. Gills white, stained with brown at length, close, thin, broad, unequal, branched, pointed at both ends, eroded, decurrent. Odour and taste farinaceous. Spores white.

Obs. Somewhat inferior in quality to the Oyster, but like it.—*W. D. H.*

(58.) **AGARICUS ULMARIUS**; **Pleurotus ulmarius**; The Elm-Sprout.

Habitat. On tree-trunks, chiefly elms. Singly, and in tufts.

Season. October to January. Common.

Pileus. Four to eight inches across, or more, white, livid, perhaps spotted; smooth, rounded, convexo-plane, soft, moist. Cuticle inseparable.

Stem. Two to four inches long, white or greyish, cylindrical, bent, stout, rigid, naked, sub-tomentose, hard and large at base.

Section. Flesh white, soft, compact. Stem solid. Gills white, becoming stained, numerous, broad, irregular, hollowed below, adnate. Odour and taste farinaceous. Spores white.

Obs. Often abundant, and very fair eating. I have gathered a dish even in the heart of London—in the Mall, to be precise, where it often appears on the old wych-elms.—*W. D. H.*

Genus AGARICUS. Sub-genus PSALLIOTA.

Obs. This is the Sub-genus comprehending the Pratelles, the most familiar esculents in Great Britain. They are somewhat difficult to define, owing to their variable habit, and no two mycological writers agree in their descriptions of what they term the "varieties" of A. campestris. Some of these varieties are merely ephemeral and accidental, but others seem to be so fixed, and so uninterchangeable one with another, that I have thought it advisable to describe them here as distinct species, which I consider them to be. There are few of our rustic mushroom-gatherers who do not regard some of these forms with suspi-

cion, quite erroneously, and many a good "picking" is lost in consequence. The rules given in sundry cookery-books and rural handbooks are literally nothing but rubbish, when they seek to teach people by "rule of thumb" how to distinguish edible mushrooms from others.

Pratelles will appear wherever horses, cattle, and sheep are pastured, from the equator to the arctic circle, but they are most prolific in the warm temperate zones. They depend on the presence of the animals mentioned, and it seems as if the spores could not be fertilized without passing through the economy of horses, cattle, or sheep, more particularly the first. The fact has been well illustrated in Australia, New Zealand, and the South Sea. There, before the coming of the white man and his domestic animals, Pratelles were unknown, if the natives are to be credited; while now they are very plentiful. In New Zealand I have seen phenomenal crops; paddocks gleaming white with mushrooms, as if a snow-fall had occurred. Yet Maoris have assured me the Pratelle was unknown to them in olden times, a statement worth attention, since they are most minute observers of nature. I have further observed—at the instance of a Yorkshire farmer—that fields where stallions or bulls have been pastured are always the most prolific in Pratelles.

Though of universal growth, Pratelles are not universally regarded with the same favour as in England. In Italy, Hungary, and Iceland, the rustics are prejudiced against them. Fungophobists have made much of the fact, and have gone so far as to say that these mushrooms were actually deleterious when growing in those countries—a notion as absurd as irrational. Many people have borne evidence to the contrary from their own personal experience. It has been abundantly proved that, in whatever quarter of the globe Pratelles may grow, they are the same good, wholesome esculents. And looking at their wide distribution, and to the fact that one species of them can be easily raised artificially, there is no doubt that they are at present the most valuable of food fungi; though they may have to yield in daintiness to some others, and may not always remain the only cultivable kind.—*W. D. H.*

(59.) **AGARICUS ARVENSIS; Psalliota arvensis;** The Giant Pratelle.

Habitat. Raised ground in pastures; amid rank herbage in and near copses. In groups.

Season. July to October. Common.

Pileus. Two to twelve inches across, or more, snow white, perhaps becoming buffish, at first floccose, then smooth; in youth globose, with incurved margin invested with veil, then expanding, convex, plane, even.

Stem. Two to six inches high, white, stout, cylindrical, swollen below. Ring broad, thick, pendulous, double, exterior split and radiate.

Section. Flesh very thick, white, perhaps yellowing where wounded. Stem stuffed, spongy. Gills at first pallid, then grey-pink, then grey-brown, numerous, thin, attenuate before and

behind, unequal, broadest in front, free. Odour strongly aromatic. Flavour aromatic and agreeable. Spores brownish-purple.

Obs. In chapter vii. Very wholesome and good. Substantial, but not so dainty in flavour as either the White or Red Pratelles. Much eaten in some parts of the country, and looked upon with suspicion in others. There is a variety having flocculose scales of a pale earth-colour; they break up concentrically in maturity.—*W. D. H.*

(60.) **AGARICUS CAMPESTRIS**; **Psalliota campestris**; The White Pratelle. (Tab. IV. fig. 26.)

Habitat. In pastures. In groups, or scattered.

Season. June to October. Common in September.

Pileus. Two to three inches across, white, perhaps at length tinted with grey or brown, sericeo-flocculose at first, then smooth, glistening; at first almost globose, then expanding, obtuse, even, convexo-plane. Cuticle projecting a little, and curled up at the edge, separable. Margin at first involute, invested with veil.

Stem. Two to three inches high, white, smooth, silky, thick, slightly larger below, blunt. Ring medial, white, thick, often fugacious.

Section. Flesh thick, white, firm. Stem stuffed. Gills pink, pale at first, becoming purplish, then brown and almost black, numerous, broad, unequal, rounded behind, free but approximate. Odour and taste agreeable. Spores brown-purple.

Obs. In chapter vii. Usually accepted as the typical form. Perhaps it is on the whole the commonest. This form seldom becomes large. To be eaten at its best it should be gathered while the gills are still pink, not kept more than half a day, and subjected to much less cooking than is commonly the practice. —*W. D. H.*

(61.) **AGARICUS HORTENSIS**; **Psalliota hortensis**; The Garden Pratelle.

Habitat. On prepared beds in gardens and forcing-houses, etc.

Pileus. Two to three inches across, or more, dirty-white, brownish, flocculose at first, soon fibrillose or squamulose; at first globose, soon expanding, obtuse, convex, plane. Margin at first involute.

Stem. Two to three inches high, white, dirty-white, brownish, thick, rather fibrillo-squamulose. Ring fugacious.

Section. Flesh thick, white, firm, not juicy. Stem nearly solid.

Gills pale dull pink at first, soon brown, broad, rounded behind, free but approximate. Odour slight. Taste not marked. Spores brown, scarcely purple.

Obs. This is the common form of the cultivated Pratelle. But it varies a good deal. I have seen specimens approaching in character to the Giant Pratelle; others again come near the habit of the Hedge Pratelle. The flavour is always inferior to that of the White and Red Pratelles, and the cultivated plant seems to be less nutritious and not quite so digestible.—*W. D. H.*

(62.) **AGARICUS PILOSUS; Psalliota pilosa;** The Hedge Pratelle.

Habitat. Under trees, on hedge-banks, etc. Preferring marly and gravelly soils. In small groups.

Season. July to October. Not very common.

Pileus. Two to three inches across, light tan, or tawny brown, squamose; at first globose, then convex. Margin thick, incurved. compact, even.

Stem. Two inches high, whitish tan, darkest below, thick, rigid, bulbous. Ring whitish tan, thick, torn.

Section. Flesh white, thick, hard, compact. Stem nearly solid. Gills grey-pink, soon brown, broad, crowded, unequal, free but approximate. Odour earthy. Taste insipid. Spores brown-purple.

Obs. This may be identical with A. elvensis and A. campestris var. vaporarius of some authors. It is not commendable, being tough, flavourless, and indigestible.—*W. D. H.*

(63.) **AGARICUS PRATENSIS; Psalliota pratensis;** The Brown Pratelle.

Habitat. Wet, low-lying riverside pastures. In groups.

Season. August to October. Common.

Pileus. Three to six inches across, dull umber, mottled, fibrilloso-squamose; at first infolded, soon expanded, convex, rounded, uneven. Margin thick, split. Cuticle soft, separable, fragile.

Stem. Two to three inches high, pallid, thick, rigid, rugose, unequal. Ring filamentous, torn, brownish, evanescent.

Section. Flesh pallid, thick, watery. Stem stuffed, often fissured. Gills pale pinky brown at first, then brown, unequal,

uneven, narrow, close, ventricose, free but approximate. Odour faint. Taste insipid. Spores brown, scarcely purple.

Obs. It is good enough, but very watery. In chapter vii. Looks like A. grammopodius.—*W. D. H.*

(64.) **AGARICUS RUFESCENS**; **Psalliota rufescens**; The Red Pratelle.

Habitat. Damp rich pastures. In groups.

Season. August to October. Common.

Pileus. Three to six inches across, rufous brown, rough and fibrillose; at first globose, then expanding, convex, or plane. Margin thick, fimbriate with fragments of veil.

Stem. Two to three inches high, stout, white, unequal, tapered abruptly at base. Ring white, large, torn, fibrous.

Section. Flesh white, reddening where exposed, thick, juicy. Stem stuffed. Gills pale pink, then bright pink, lastly pinkish-brown, unequal, broad, rounded behind, free. Odour strong. Taste pleasant. Spores purple-brown.

Obs. In chapter vii. I consider it the best flavoured of the Pratelles.—*W. D. H.*

(65.) **AGARICUS VILLATICUS**; **Psalliota villatica**; The Shaggy Pratelle.

Habitat. On high ground in rich meadows. Solitary, or in small groups.

Season. August to October. Not very common.

Pileus. Six to eighteen inches across, tawny-white at first, then tawny or red-brown, fibrillose and shaggy; rounded, even, expanded, convex or plane. Margin fimbriate, sericeo-fibrillose.

Stem. Four to twelve inches high, white, perhaps brownish, silky or scaly, thick, swollen above the base. Ring large, entire, white, pendulous.

Section. Flesh white, reddening where exposed, thick, juicy. Stem solid. Gills pink, then red-brown, thin, numerous, attenuate at both ends, almost remote. Odour strong. Taste pleasant. Spores red-brown-purple.

Obs. Very fine flavoured and luscious. It has been somewhat suspected, but my experience is that it is quite wholesome. I believe it contains no deleterious principle, but perhaps may disagree with some on account of its richness.—*W. D. H.*

Genus AGARICUS. Sub-genus TRICHOLOMA.

(66.) **AGARICUS ACERBUS; Tricholoma acerba;** The Bitterlet.

Habitat. On the ground in woods. In small groups.

Season. August to October. Uncommon.

Pileus. Three to four inches across, yellowish-white, darkly spotted; convex, spreading, obtuse, smooth, sleek. Margin involute, sulcate.

Stem. One to two inches high, tint of pileus, even, slightly swollen below, sub-squamulose above, naked.

Section. Flesh whitish, not thick. Stem solid. Gills yellowish-white, pale at first, crowded, serrulate, sinuate, almost decurrent. Odour slight. Taste strongly bitter. Spores white.

Obs. Eaten in Italy. I think it requires an educated taste to like it, however.—*W. D. H.*

(67.) **AGARICUS ALBELLUS; Tricholoma albella;** The Muscat.

Habitat. On mossy lawns, borders of woods, etc. In groups.

Season. April and May. Not generally common.

Pileus. Three to four inches across, white, mottled with ochry-grey, smooth, perhaps clammy; conical, convex, sub-umbonate, irregularly expanded. Margin thin, even, incurved.

Stem. One to two inches high, white, striate, sericeo-fibrillose, naked. Base enlarged, deeply implanted.

Section. Flesh white, thick, brittle. Stem solid, becoming spongy. Gills white, numerous, crowded, broad before, attenuate behind, sinuate, adnexed. Odour musky. Flavour peculiar, pleasant. Spores white.

Obs. In chapter vii. Not often met with, but an especial dainty.—*W. D. H.*

(68.) **AGARICUS ALBO-BRUNNEUS; Tricholoma albo-brunnea;** The Brownie.

Habitat. Hilly pine-woods. In groups.

Season. August to October. Common.

Pileus. Two to four inches across, at first dirty-white, soon rusty-brown; globose at first, then expanding, rounded, convexo-plane; floccose in youth, afterwards glutinous.

Stem. One to three inches high, whitish above, brown below, sub-squamulose, thick, naked, unequal.

Section. Flesh pallid, thick. Stem solid. Gills pallid, then brownish, crowded, broad, sinuate, adnexed. Odour and taste farinaceous. Spores white.

Obs. A fairly good comestible. Rather tough and juiceless, so should be prepared like Paxils.—*W. D. H.*

(69.) **AGARICUS BREVIPES**; **Tricholoma brevipes**; The Dwarf.

Habitat. Plantations, woodland glades, roadsides. Solitary or scattered.

Season. June to September. Not uncommon.

Pileus. Two to three inches across, grey-brown; at first concave, then plane, perhaps convexo-plane, obtusely sub-umbonate; even, smooth, soft. Margin sleek.

Stem. Very short, brown, thick, bulbous, rigid, smooth, naked.

Section. Flesh pallid, perhaps reddish, fragile. Stem solid. Gills pallid, soon brownish, crowded, unequal, pointed in front, emarginate, adnexed. Odour slight. Taste a little astringent. Spores white.

Obs. Not a bad viand, but infrequent in occurrence.—*W. D. H.*

(70.) **AGARICUS COLUMBETTA**; **Tricholoma columbetta**; The Columbette.

Habitat. In woods, under oaks, on heaths. Solitary.

Season. September and October. Not common.

Pileus. One to three inches across, white, disc greyish; convex, perhaps ovate, then plane, rounded; at first smooth, then silky, fibrilloso-squamulose, moist. Margin sub-involute, split at length.

Stem. One to two inches high, white, stout, unequal, bent, silky-striate, naked.

Section. Flesh white, thickish, firm. Stem solid. Gills white, crowded, thin, sub-serrulate, sinuate, almost free. Odour earthy. Flavourless. Spores white.

Obs. Fairly good. Must be carefully distinguished from the suspicious Tri. spermatica, which resembles it, but has a stuffed or hollow stem, eroded gills, and a pungent, disagreeable scent.—*W. D. H.*

(71.) **AGARICUS GAMBOSUS; Tricholoma gambosa;** The St. George.

Habitat. Pastures and fields, near copses and plantations. Singly, or in groups and rings.

Season. April to June. Common.

Pileus. One to four inches across, white, creamy, perhaps pale buff on disc, moist; convex, expanded, irregular, often lobulate, obtuse. Cuticle adnate, smooth like kid, minutely tomentose, rimulose. Margin at first involute, uneven.

Stem. Two to three inches high, white, stout, firm, subflocculose above, incrassate below, naked.

Section. Flesh white, compact, very thick. Stem solid, or perhaps fistulose below. Gills pallid, creamy, numerous, very narrow, irregular, unequal, emarginate, denticulato-adnexed. Odour strong, musky-fungic. Taste pleasant. Spores white.

Obs. In chapter vii. In all respects a first-class esculent, and most commendable.—*W. D. H.*

(72.) **AGARICUS GRAMMOPODIUS; Tricholoma grammopodia;** The Field Darkie.

Habitat. Damp, poor pastures. In rings.

Season. August to October. Common.

Pileus. Three to five inches across, dusky grey-brown, black in wet weather, smooth, moist; convex, then expanding, plane, depressed, perhaps obtusely umbonate, repand. Margin thin, brittle.

Stem. Two to three inches high, pallid, striate with grey, rigid, thick, sulcate, naked, sub-incrassate and villose below.

Section. Flesh pallid, stained, brittle, not thick. Stem stuffed. Gills pallid, narrow, arcuate, unequal, sinuate, adnate. Odour sickly. Taste nauseous. Spores white.

Obs. It appears to be a good deal eaten on the Continent; but it is very unpleasing, and not at all commendable. It would need preparation like the Stumptuft. It may easily be mistaken for that much better esculent the Brown Pratelle, which grows on the same site.—*W. D. H.*

(73.) **AGARICUS GRAVEOLENS; Tricholoma graveolens;** The False Muscat.

Habitat. Heathy pastures, under firs. Solitary.

Season. April to June. Rare.

Pileus. Two to three inches across, pallid, or ochreish, dry, velvety; at first conical, then expanding, convex, rather repand. Margin thin, sub-involute.

Stem. One to two inches high, white, not thick, rigid, cylindrical, equal, fibrillose, naked, rooting.

Section. Flesh white, not thick, brittle. Stem solid. Gills pallid, then ochreish grey, crowded, thin, arcuate, unequal, scarcely sinuate, adnate. Odour strong, mouldy, rather musky. Taste good. Spores white.

Obs. Accounted edible abroad. I have found and tried it here, though I believe it has not been previously noted among British species. It seems good in quality, but must be very rare.—*W. D. H.*

(74.) **AGARICUS HUMILIS; Tricholoma humilis;** The Little Darkie.

Habitat. Among grass in damp situations. In groups.

Season. August to October. Not common.

Pileus. Two to three inches across, slate-grey, brownish on disc, blackish in wet; convexo-plane, depressed and sub-umbonate; minutely tomentose, smooth, hygrophanous. Margin thin, waved, projecting.

Stem. Two inches high, brownish, fragile, slender above, swollen below, pulverulent above, tomentose and rimose below, naked.

Section. Flesh pallid, not thick, brittle. Stem stuffed, brown. Gills pallid, then brownish, broad, crowded, undulate, unequal, sub-ventricose, denticulato-adnexed. Odour and taste unpleasant, Spores white.

Obs. Gastronomically it is identical with Tri. grammopodia.—*W. D. H.*

(75.) **AGARICUS IMBRICATUS; Tricholoma Imbricata;** The Lapped-cap.

Habitat. On the ground in fir and pine woods. In imbricated tufts.

Season. September and October. Rare.

Pileus. Two to three inches across, rich red-brown; conical, then convex, plane, rounded, sub-umbonate, dry, rimulose, squamulose or sericeo-fibrillose. Margin involute, pale, pubescent.

Stem. Two to four inches high, tint of pileus, pruinose above, thick, firm, swollen below, naked.

Section. Flesh pallid, thick, compact. Stem stuffed, then fistulose. Gills pale rusty-white, browning where bruised, crowded, not broad, serrulate, sinuate, adnexed. Odour agreeable. Taste sweet. Spores white.

Obs. Scarce and little known here, but esteemed a wholesome esculent in France.—*W. D. H.*

(76.) **AGARICUS IONIDES; Tricholoma ionides;** The Purple-cap.

Habitat. Amid grass in damp woods. Solitary, or in groups.

Season. September and October. Uncommon.

Pileus. One to three inches across, dull purple; campanulate, then convex, expanded, umbonate, even, nearly smooth. Margin at first pubescent.

Stem. Two inches high, pale purple, slender, elastic, attenuate, fibrillose, naked.

Section. Flesh pallid, thickish. Stem stuffed. Gills pallid, crowded, thin, narrow, eroded, sinuate, adnexed. Odourless. Flavourless. Spores white.

Obs. Of but slight value. It is wholesome, but insipid.—*W. D. H.*

(77.) **AGARICUS MONSTROSUS; Tricholoma monstrosa;** The Big St. George.

Habitat. In pastures and fields, near trees. In groups.

Season. April to June. Uncommon.

Pileus. Four to twelve inches across, opaque white; convex, umbonate, at length lobulate, repand. Margin thick, inflexed.

Stem. Three to six inches high, opaque white, thick, uneven, striate, pubescent above, bulging below, naked, rooting.

Section. Flesh very thick, white, compact. Stem solid, or fissured. Gills creamy, distant, narrow, scarcely sinuate, adnate. Odour pungent, musky. Taste agreeable. Spores white.

Obs. In chapter vii. It is practically the same as the St. George, but an uncommon form.—*W. D. H.*

(78.) **AGARICUS PESSUNDATUS; Tricholoma pessundata;** The Turnover.

Habitat. In pine woods. Solitary.

Season. September and October. Rare.

Pileus. Three to four inches across, chestnut or reddish, squamose, spotted, viscid; convex, repand, bent. Margin uneven, pale.

Stem. Two to three inches high, white, bulbous at first, then nearly equal, thick, villoso-squamose, naked.

Section. Flesh thick, compact, stained. Stem solid, hard. Gills pallid, at length reddish, narrow, shining, crowded at first, then more distant, very emarginate, adnexed. Odour mealy. Taste good. Spores white.

Obs. Closely allied to A. russula of Schaeffer, which is eaten on the Continent.—*W. D. H.*

(79.) **AGARICUS VACCINUS**; **Tricholoma vaccina**; The Calf-skin.

Habitat. In pine woods. Solitary, or in groups.

Season. September and October. Uncommon.

Pileus.—One to two inches across, rufous brown, dry, floccoso-squamose; campanulate, then expanded, obtusely umbonate. Margin involute, fibrillose.

Stem. Three to four inches high, pallid above, pale brown below, thick, equal, fibrillose, naked.

Section. Flesh pallid, thickish. Stem fistulose. Gills pallid, then brownish, spotted with red, sub-distant, broad, emarginate, adnexed. Odour feeble. Taste rather bitter. Spores white.

Obs. Reported to be a wholesome esculent, but of inferior quality.—*W. D. H.*

Genus AGARICUS. Sub-genus VOLVARIA.

(80.) **AGARICUS BOMBYCINUS**; **Volvaria bombycina**; The Silky Volvar.

Habitat. In open grassy woods, under trees, corners of fields, etc. Singly.

Season. July to October. Not common.

Pileus. Three to six inches across, fawn, becoming brown; at first conical within the volva, then campanulate, convex, expanding, perhaps plane and umbonate; viscid within the volva, then sericeo-fibrillose, bearing evanescent patches of volva, smooth, even, very silky. Margin even, silky.

Stem. Three to seven inches high, pallid, smooth, attenuate,

swollen below, not annulate, soft, firm. Volva fawn or pallid, slimy, large, at length cup-like about base.

Section. Flesh white, firm, elastic, thick. Stem solid. Gills pallid, then pink, unequal, broad, numerous, free. Odour slight. Taste mild. Spores pink.

Obs. I have met with it several times, and, knowing it to be considered esculent abroad, I have eaten it. It is of similar quality to A. vaginatus.—*W. D. H.*

Genus CANTHARELLUS.

(81.) **CANTHARELLUS CIBARIUS**; The Chantarelle.

Habitat. In shady woods, on the bare ground, or amid moss and leaves, on marly soils. Scattered.

Season. July to October. Common.

Pileus. One to five inches across, bright yellow, tint of egg-yoke; at first rounded, convex, depressed, involute, then expanding, repand, lobulate, sinuate, depressed, irregular, uneven, smooth.

Stem. One to two inches high, tint of pileus, thick and continuous above, attenuate below, smooth, naked.

Section. Flesh white, firm, tough. Stem solid, perhaps at length fistulose. Gills tint of pileus, folded, plicate, wrinkled, forked, thick, decurrent. Odour of plums or apricots. Taste peppery. Spores pallid.

Obs. In chapter vii. Supremely excellent when properly dressed.—*W. D. H.*

Genus COPRINUS.

(82.) **COPRINUS ATRAMENTARIUS**; The Inkcap.

Habitat. On the ground in well-manured fields, sites of old dung-heaps, gardens, etc. In groups and tufts.

Season. June to October. Common.

Pileus. Two to four inches high, whitish at first, soon dirty brown; ovate, conical, campanulate, expanding, obtuse, squamose on apex, corrugate. Margin soon uneven, split, waved, striate.

Stem. Three to eight inches high, white, smooth, half an inch thick, attenuate above, cylindrical, nearly equal, fibrillose, imprint of ring remaining.

Section. Flesh thin, fragile. Stem hollow, banded within. Gills whitish, then brown, lastly black and deliquescent, ventricose, rounded behind, free. Odour slight. Taste pleasant. Spores black.

Obs. In chapter vii. It must always be gathered young, and is then good.—*W. D. H.*

(83.) **COPRINUS COMATUS**; The Maned Inkcap.

Habitat. Rank soil in pastures, gardens, woods, railway embankments, etc. In groups.

Season. August to November. Common.

Pileus. Three to four inches high, two or three across, white, squamose with broad, feathery, fibrillose scales; ovate, conical, apex tinted lilac or pinky-brown. Margin thin, splitting, curling outward.

Stem. Four to six inches high, white, perhaps pinky, cylindrical, attenuate upward, bulbous below, rooting, brittle, fibrillosо-squamose. Ring movable.

Section. Flesh white, pinky under cuticle, thick at apex, finely plicate, fragile. Stem hollow, containing fibrils, base solid. Gills pinky-lilac at first, then brown, black, and liquefying, numerous, linear, entire, free. Odour farinaceous. Taste agreeable. Spores black.

Obs. In chapter vii. It is the best edible of the genus.—*W. D. H.*

(84.) **COPRINUS OVATUS**; The Little Maned Inkcap.

Habitat. On rank soils, manure-heaps, etc. Solitary.

Season. August to October. Not common.

Pileus. Two to three inches high, one to two inches across, white; ovate, conical, campaniform, striate, delicate. Cuticle at first woven into densely imbricate, thick, concentric scales, which at length become feathery. Margin thin.

Stem. Two to four inches high, white, floccose, attenuate, bulbous, rooting. Ring evanescent.

Section. Flesh thin, fragile. Stem hollow above, solid below. Gills at first whitish, then pinky, brown, black, and liquefying, lanceolate, narrow, remote. Odour slight. Taste pleasant. Spores black.

Obs. Young specimens are good, very similar to C. comatus.—*W. D. H.*

(85.) **COPRINUS STERQUILINUS**; The Dingy Inkcap.

Habitat. On cow-dung. Singly, or in groups.

Season. June to October. Not common.

Pileus. One to two inches across, dingy grey; conical, then expanded, sericeo-villose or fibrillose, then squarrose. Margin sulcate, uneven.

Stem. Three to five inches high, whitish, attenuate, bulbous, fibrillose. Ring evanescent.

Section. Flesh thickish at apex, white, fragile. Stem hollow above, solid below. Gills whitish, then lilac, brown, black, and liquescent, numerous, ventricose, free. Odour slight. Taste bland. Spores black.

Obs. Of very trifling account. It is wholesome, however.—*W. D. H.*

Genus CORTINARIUS. Sub-genus DERMOCYBE.

(86.) **CORTINARIUS CINNAMOMEUS; Dermocybe cinnamomea**; The Cinnamon-cap. (Pl. II. fig. 5.)

Habitat. In woods. Solitary, or by twos and threes.

Season. August to October. Not uncommon.

Pileus. Two to three inches across, red-bay, silky, at length smooth; convex, then plane, obtusely umbonate. Margin thin, splitting.

Stem. Two to three inches high, slender, yellow-brown, equal, minutely fibrillose. Veil yellowish, arachnoid.

Section. Flesh yellowish, thick centrally. Stem stuffed, at length hollow. Gills reddish-yellow, broad, crowded, lustrous, serrate, adnate. Odour and taste like cinnamon or cassia. Spores rusty-brown.

Obs. It is wholesome, and may be used for the spice it resembles, fresh or dried.—*W. D. H.*

Genus CORTINARIUS. Sub-genus HYGROCYBE.

(87.) **CORTINARIUS CASTANEUS; Hygrocybe castanea**; The Chestnut-cap.

Habitat. Bare ground in woods and shrubberies. In groups.

Season. July to October. Common.

Pileus. One to two inches across, bay-brown, sleek, at first

silvery with veil; convex, sub-umbonate, expanding. Margin pale, rimulose, perhaps elevated.

Stem. One to two inches high, violet-brown, silvery from veil, slender, fibrillose, even, rigid. Veil white, silvery, delicate, arachnoid.

Section. Flesh thin, discoloured. Stem stuffed, at length hollow. Gills violet-umber, then bay-brown, crowded, unequal, broad, fixed, adnate. Odourless. Flavour strong but agreeable. Spores rusty-brown.

Obs. A very good esculent. Resembles the Oread when dressed like it.—*W. D. H.*

Genus CORTINARIUS. Sub-genus INOLOMA.

(88.) **CORTINARIUS VIOLACEUS; Inoloma violacea;** The Imperial.

Habitat. In woods, especially of pine. In groups.

Season. August to October. Not common.

Pileus. Three to six inches across, dark purple, velvety, villose; convex, then expanding, plane, rounded. Margin at first fimbriate with veil.

Stem. Three to four inches high, dark purple, cylindrical, tomentose, swollen below. Veil silvery, arachnoid.

Section. Flesh violet, thick, juicy. Stem stuffed, spongy. Gills purple, soon tawny, brown, thick, fixed, broad, distant, unequal, adnate. Odour and taste appetizing. Spores rusty-brown.

Obs. A singularly handsome species, and a rich and luscious esculent. It has always been highly extolled by those who have tried it, and it is perfectly wholesome.—*W. D. H.*

Genus CORTINARIUS. Sub-genus MYXACIUM.

(89.) **CORTINARIUS COLLINITUS; Myxacium collinitum;** The Glue-cap. (Pl. II. fig. 2.)

Habitat. In woods and on heaths. Singly, or scattered.

Season. August to October. Common.

Pileus. Two to three inches across, ochry-brown, viscid, shining; convex, then expanded, rounded, even. Margin thin.

Stem. Three to four inches high, white, veil forming a silky glutinous coat, which cracks and exposes a red-brown surface

beneath; stout, fibrillose above obsolete ring. Veil slimy, arachnoid, fugacious.

Section. Flesh white, thick at centre. Stem solid, white above, red-brown below. Gills ochry-grey, then tawny, broad, distant, venate, ventricose, rounded behind, denticulato-adnate. Odour feeble. Taste not pronounced. Spores rusty-brown.

Obs. It is eaten on the Continent, but I cannot commend it.—*W. D. H.*

Genus CORTINARIUS. Sub-genus TELAMONIA.

(90.) **CORTINARIUS ARMILLATUS; Telamonia armillata;** The Bracelet-stem.

Habitat. In woods, especially of oak. Solitary.

Season. July to October. Not common.

Pileus. Three to five inches across, tawny or brick-red, dry, smooth, innato-fibrillose or squamulose; campanulate, then convex, plane, expanded. Cuticle separable. Margin thin.

Stem. Three to six inches high, tint of pileus, middle marked with a blood-red zone, half-inch thick, silky, fibrillose, swollen at base. Veil reddish-white, arachnoid.

Section. Flesh thickish, discoloured. Stem solid. Gills pallid, soon rusty, unequal, broad, distant, fixed, rounded behind, adnate. Faint smell of radishes. Taste sharp. Spores rusty-brown.

Obs. A very commendable esculent, sometimes plentiful, and readily recognised by its bracelet.—*W. D. H.*

Genus GOMPHIDIUS.

(91.) **GOMPHIDIUS GLUTINOSUS**; The Peg-top. (Pl. III. fig. 5.)

Habitat. In pine woods. Solitary.

Season. August to October. Not rare.

Pileus. Two to five inches across, purplish-brown, glutinous; obtuse, flattened, continuous, top or peg-shaped. Margin thin, even.

Stem. Two to four inches high, yellowish below, continuous, tapered downward. Base enlarged, perhaps scaly. Veil glutinous. Ring fragmentary.

Section. Flesh thick, tough, stained. Stem solid. Gills pallid, then dusky lilac, furcate, soft, glutinous, narrow, decurrent.

Odour slight. Taste insipid. Spores greenish-grey, becoming purple-black.

Obs. It is used in France. Schummel called it dangerous, apparently without reason. It is not commendable.—*W. D. H.*

(92.) **GOMPHIDIUS VISCIDUS**; The Rhubarb-stem.

Habitat. On the ground, chiefly in fir and pine woods. Solitary,

Season. August to October. Not uncommon.

Pileus. Two to three inches across, tawny or red-brown, viscid, lustrous; at first conical, then convex, flattened but umbonate, perhaps peg-shaped, continuous. Margin dark, thin, at first involute.

Stem. Two to three inches high, colour of rhubarb root, largest above, confluent, striate, fibrillose, viscid. Ring filamentous, obsolete.

Section. Flesh reddish, tough, thick. Stem solid, rhubarb colour. Gills lilac-brown, firm, elastic, thick, entire, branched, distant, decurrent. Odour feeble. Taste insipid. Spores greenish grey, becoming purplish black.

Obs. Better known than the preceding. Wholesome, but not delicate. To be prepared like Paxils.—*W. D. H.*

Genus HYGROPHORUS.

Obs. The white species of this genus have all been well tested, and proved to be good safe esculents. But the majority are brilliant in colouring, like parrots, and only one or two of these are proved edibles. Of the remainder—namely, H. miniatus, H. puniceus, H. obrusseus, H. chlorophanus, H. psittacinus, and H. conicus—nothing is known with regard to their qualities, though the presumption is that they are not deleterious. H. conicus turns black when bruised, and has been suspected because of that circumstance, which is of course no criterion of its qualities at all. H. puniceus is large and blood-red, and so has lain under reproach, without any reason. But amateurs will do well to let them alone until experiment has proved their several characters. Sound esculents are plentiful at the season of their appearance. The following Hygrophores are the approved esculents of the genus.—*W. D. H.*

(93.) **HYGROPHORUS CERACEUS**; The Waxy-Hood.

Habitat. On lawns and wet mossy pastures. Solitary.

Season. September to November. Common.

Pileus. One inch across, yellowish-buff, viscid, hygrophanous, wax-like; convexo-plane, obtuse, sub-umbonate. Margin striate.

Stem. Two to three inches high, yellow, waxy, lustrous, equal, flexuose, not thick, naked.

Section. Flesh thin, brittle, translucent. Stem fistulose. Gills yellowish, broad, distant, ventricose, venate, adnate or sub-decurrent. Odourless. Taste bland. Spores white.

Obs. It is eaten in Germany, and may be pronounced of second-rate quality. —*W. D. H.*

(94.) **HYGROPHORUS COCCINEUS**; The Scarlet-Hood.

Habitat. In grassy places. In scattered groups.

Season. August to November. Common.

Pileus. One to two inches across, scarlet above, shading into orange and yellow below; obtuse, conical, campanulate, expanding, sub-umbonate, perhaps inverted, or splitting from centre; thin, viscid in wet, hygrophanous, smooth, undulate.

Stem. One to two inches high, yellow, streaked with scarlet, thick, smooth, flexuose, tough, easily split, naked.

Section. Flesh thin, fragile, coloured, translucent. Stem hollow. Gills yellow or red, broad, ventricose, wrinkled, venate, thick, denticulato-decurrent. Odourless. Taste agreeable. Spores white.

Obs. It is a commendable esculent. But sundry of the untested species may be mistaken for it.—*W. D. H.*

(95.) **HYGROPHORUS EBURNEUS**; The Ivorine.

Habitat. On the ground under trees, in the shade. Scattered.

Season. September to November. Not very common.

Pileus. Two to three inches across, ivory-white, lustrous, smooth, viscid in wet; hemispherical at first, then plane, sub-umbonate, perhaps concave. Margin at first involute, entire, even.

Stem. One to three inches high, ivory-white, unequal, punctate above with minute brown scales, naked.

Section. Flesh thin, white, elastic. Stem stuffed, at length hollow. Gills ivory white, straight, distant, firm, adnate or sub-decurrent. Odour pleasing. Taste agreeable. Spores white.

Obs. I have placed it in chapter vii., as being highly commendable.—*W. D. H.*

(96.) **HYGROPHORUS NIVEUS**; The Snowdrop.

Habitat. Mossy lawns, pastures, and banks. In groups.

Season. September and October. Common.

Pileus. Half to one inch across, snow-white, smooth, hygrophanous, viscid in wet; campanulate, convex, then umbilicate, striate.

Stem. One to two inches high, slender, even, smooth, straight, naked, snow-white.

Section. Flesh of equal thickness, white, thin, tough, translucent. Stem fistulose. Gills snow-white, thin, entire, arcuate, distant, decurrent. Odourless. Flavour inviting. Spores white.

Obs. In chapter vii. Though small, it is often plentiful, and makes good dishes.—*W. D. H.*

(97.) **HYGROPHORUS OVINUS**; The Sheep-hood.

Habitat. On pasture flats and moorland sheep-walks. Scattered.

Season. August to November. Common.

Pileus. One to two inches across, dingy, brownish, viscid in wet, at length sub-squamulose; conical, convex, then expanding, revolute, undulate, gibbous.

Stem. Two inches high, pallid, dingy, slender, smooth, glossy, unequal, bent, naked.

Section. Flesh pallid, thin, tough. Stem stuffed. Gills pallid, then dingy, broad, arcuate, veined, decurrent. Odour and taste agreeable. Spores white.

Obs. According to Duchesne it is wholesome and good.—*W. D. H.*

(98.) **HYGROPHORUS PRATENSIS**; The Melon-hood.

Habitat. Downs and close-cropped pastures. In groups or tufts.

Season. July to November. Common.

Pileus. One to two inches across, tawny-buff, dusky or whitish, glabrous, moist; convex, then plane but umbonate. Margin thin, rimose, lobulate, undulate.

Stem. One to two inches high, whitish, sleek, even, attenuate below, naked.

Section. Flesh thick centrally, whitish, tough. Stem stuffed. Gills white or dusky, few, distant, thick, arcuate, unequal, deeply decurrent. Scent like that of melon. Taste pleasing. Spores white.

Obs. This is a very commendable species, much liked by some English fungus-eaters.—*W. D. H.*

(99.) **HYGROPHORUS VIRGINEUS**; The Virgin.

Habitat. On lawns, commons, pastures, downs, etc. In groups.

Season. July to October. Very common.

Pileus. One to two inches across, satin-white, glossy, viscid in wet, hygrophanous, at length discoloured; convex, then plane and umbonate, or depressed, wrinkled, lobulate. Margin thin, translucent, inflexed at first.

Stem. One inch high, firm, tapered below, satiny white, smooth, even, cylindrical, naked.

Section. Flesh thin, translucent. Stem stuffed, fibrous. Gills satiny white, few, thick, unequal, distant, broad, veined, decurrent. Odour slight. Taste good. Spores white.

Obs. Included in chapter vii. A very excellent comestible.—*W. D. H.*

Genus LACTARIUS.

Obs. The grand characteristic of this genus is the milky juice which exudes from the gills or flesh when wounded. In most species this juice is white like milk, in some it is coloured, and in some it changes colour on exposure. We have about thirty species in this country, and they are of common occurrence. There are but two which are so entirely wholesome and of such excellent quality as to be really commendable esculents, viz. the Redmilk and the Kidney. English fungus-eaters will do well to regard these two apart from their congeners. But it would be wrong to confound all the rest together under the ban of suspicion. In France, Germany, and Russia a good many kinds are commonly eaten, in the last mentioned country particularly. Yet many of these are acrid, and they ought all to be subjected to a certain preparation before being cooked, for which I have given a receipt. Not otherwise is it agreeable or perhaps safe to partake of them. Moreover, cautious attention must be paid to the differences of species, for it will be found that several undoubtedly very poisonous species of Lactar are included in my list of detrimentals. I here describe several species which are freely eaten abroad, and which are therefore edible, in spite of the great suspicion which their close alliance with poisonous congeners has caused to be aimed at them. But I do not personally recommend any of these edibles—except the Redmilk and the Kidney; and I advise any who wish to try them to be very careful in preparing them according to the process I have elsewhere indicated.—*W. D. H.*

(100.) **LACTARIUS CONTROVERSUS**; The Bloodstain.

Habitat. Under trees on lawns, in woods. In groups.

Season. July to October. Common.

Pileus. Three to six inches across, white, with blood-red spots and streaks, floccose at first, then smooth, soapy to the touch, viscid in wet; convex, then plane, depressed, sub-infundibuliform. Margin at first involute and villose, thin, irregular.

Stem. One to two inches high, white, with blood-red streaks, thick, unequal, excentric, swollen, base attenuate, naked.

Section. Flesh white, compact, fragile. Milk white, plentiful. Stem solid. Gills pink, thin, crowded, serrulate, unequal, attenuate, sub-decurrent. Odour slight, pleasant. Taste very acrid. Spores white.

Obs. Much eaten in France, and dried for storage. Not commendable.—*W. D. H.*

(101.) **LACTARIUS DELICIOSUS**; The Redmilk.

Habitat. In grassy places under firs, in hilly woods. In groups.

Season. July to November. Common.

Pileus. Three to five inches across, salmon, zoned with orange-tawny, smooth, viscid in wet; convex, then plane, depressed, expanding. Margin at first involute and finely tomentose.

Stem. Two to three inches high, salmon-yellow, spotted, firm, thick, bent, scrobiculate, strigose below, naked.

Section. Flesh thick. Juice abundant, orange-red, becoming dull olive-green on exposure. Stem stuffed, becoming fistulose. Gills salmon, stained by juice, broad, distant, forked, decurrent. Odour good. Taste sharp. Spores whitish.

Obs. In chapter vii. Truly delicious. One of the best of all fungus esculents.—*W. D. H.*

(102.) **LACTARIUS MITISSIMUS**; The Bright Lactar.

Habitat. Hedge-banks, woods, wastes. Solitary.

Season. September to November. Not uncommon.

Pileus. One to three inches across, bright orange, smooth, polished, papillate at first, dry; convex, then depressed, even.

Stem. One to three inches high, orange, smooth, even, firm, not stout, naked.

Section. Flesh thin, pallid, fragile. Milk white. Stem stuffed, at length hollow. Gills pale orange, crowded, thin, at first arcuate, then straight, narrow, adnate. Odour feeble. Taste bland. Spores white.

Obs. Letellier and others pronounce it esculent. It has not any acridity.—*W. D. H.*

(103.) **LACTARIUS PIPERATUS**; The Peppery Lactar.

Habitat. On the ground in woods. Scattered.

Season. July to October. Common.

Pileus. Two to six inches across, white, browning or blackening where bruised, sub-farinose, glabrous, umbilicate, then infundibuliform. sub-rugulose. Margin involute, then undulate.

Stem. One to three inches high, white, thick, farinose, cylindrical, naked.

Section. Flesh white, blackening, thick, compact, brittle. Milk white, not copious. Stem solid, spongy, becoming fissured. Gills creamy, or faintly glaucous, browning where bruised, numerous, straight, narrow, close, unequal, furcate, adnate, or sub-decurrent. Odour slight, unpleasant. Taste very peppery. Spores white.

Obs. It is much eaten on the Continent. Badham pronounced it esculent, but Cooke calls it poisonous! I find it difficult to remove the acridity, even of young individuals.—*W. D. H.*

(104.) **LACTARIUS QUIETUS**; The Modest Lactar.

Habitat. In woods. Singly, or in twos and threes.

Season. September to November. Not uncommon.

Pileus. Two to four inches across, liver-brown, at length pale red, slightly zoned, viscid at first, then dry, smooth; rounded, plane, then umbilicate. Margin pale, incurved, pubescent.

Stem. Two inches high, tint of pileus, thick above, firm, cylindrical, naked.

Section. Flesh white, compact. Milk white. Stem stuffed, spongy. Gills at first whitish, soon reddish, unequal, numerous, narrow, forked below, sub-decurrent. Odour faint, like bugs. Taste mild. Spores white.

Obs. Eaten about Bordeaux, and held in some estimation. Its scent has repelled me from trying it.—*W. D. H.*

(105.) **LACTARIUS SUBDULCIS**; The Sweet-milk.

Habitat. In woods. Scattered.

Season. July to November. Common.

Pileus. One to three inches across, tawny or cinnamon, smooth, dry, polished; convex, soon umbilicate, with central papilla. Margin even, at length undulate.

Stem. One to two inches high, tint of pileus, pale, not thick, equal, sub-pruinose, naked.

Section. Flesh thin, reddish. Milk white. Stem stuffed, then hollow. Gills pink, then reddish, unequal, crowded, straight, narrow, fragile, not furcate, adnate. Odour slight, agreeable. Taste sweet, eventually sub-acrid. Spores white.

Obs. Too like the poisonous L. rufus to be safely gathered, and also like L. camphoratus, a species with a bad reputation, smelling of camphor. The Sweet-milk seems to be a tolerably good esculent, however.—*W. D. H.*

(106.) **LACTARIUS THEIOGALUS**; The Primrose-milk.

Habitat. In woods. Solitary.

Season. September to November. Uncommon.

Pileus. One to three inches across, tawny-red, somewhat zoned, glabrous, dry; convex, then depressed, irregular. Margin thin, viscid at first, shining.

Stem. One to two inches high, tint of pileus, smooth, even, thickish, naked.

Section. Flesh yellowish, thick centrally. Milk white, changing to primrose-yellow. Stem stuffed. Gills pink, then reddish, crowded, thin, narrow, fragile, unequal, straight, adnate. Odour slight. Taste bitter. Spores yellowish.

Obs. Paulet and Léveillé have demonstrated by experiment that this species is harmless, and it seems to be eaten abroad. But it is ill-flavoured and not commendable.—*W. D. H.*

(107.) **LACTARIUS TORMINOSUS**; The Fringed Lactar.

Habitat. In woods, shrubberies, and wastes. Scattered.

Season. June to October. Not uncommon.

Pileus. Two to five inches across, strawberry red, zoned, smooth, at first viscid; convex, then umbilicate, even. Margin involute, thickly villose.

Stem. Two to three inches high, tint of pileus, pale, thickish, smooth, sleek, equal, tomentose, naked.

Section. Flesh thickish, white, firm, feeling soapy. Milk white. Stem stuffed, soon hollow. Gills yellowish-pink, straight, unequal, thin, narrow, sub-decurrent. Odour feeble. Taste very acrid. Spores white.

Obs. Letellier and others pronounce it esculent, and it seems to be eaten in France and Russia. The ill-fame of the malignant L. rufus appears to have been unjustly attached to it. But it cannot be commended.—*W. D. H.*

(108.) **LACTARIUS TURPIS**; The Dirty Lactar.

Habitat. In woods of fir and pine. Scattered.

Season. June to October. Common.

Pileus. Three to seven inches across, buff or olive-brown, glabrous, sub-viscid; convex, depressed, rigid. Margin involute, pale, tomentose, at length perhaps sulcate.

Stem. One to three inches high, tint of pileus, pale, thick, attenuate below, viscid or dry, not spotted, naked.

Section. Flesh compact, pallid. Milk white. Stem stuffed. Gills pallid, then reddish, thin, numerous, unequal, straight, adnate. Odour musty. Taste very acrid. Spores white.

Obs. Lenz and others pronounce it esculent, though it has been stigmatised deleterious. It certainly cannot be much commended.—*W. D. H.*

(109.) **LACTARIUS VOLEMUS**; The Kidney.

Habitat. In woods. Singly.

Season. June to September. Not common.

Pileus. Three to four inches across, rich golden-tawny or orange-brown, dry, not zoned, smooth, eventually rimose, sub-pulverulent; convex, then obtuse, depresso-umbonate. Margin inflexed, not involute at first, wrinkled.

Stem. Two to three inches high, tint of pileus, pale, pruinose, stout, hard, unequal, perhaps grooved, naked.

Section. Flesh thick, white, compact. Milk white, browning on exposure. Stem solid, spongy. Gills pallid, then pale buff, browning where bruised, numerous, unequal, straight, adnate and almost decurrent. Odour pleasing. Taste sweet and mild. Spores white.

Obs. In chapter vii. A most delicious and truly first-class esculent.—*W. D. H.*

Genus LENTINUS.

(110.) **LENTINUS TIGRINUS**; The Tiger-tuft. (Pl. IV. fig. 6.)

Habitat. On old willow, poplar, and elm trunks. In tufts.

Season. July to October. Uncommon.

Pileus. Two to three inches across, yellowish, covered with small, tawny, numerous, and silky scales, thickset towards centre;

orbicular, umbilicate, irregular, almost infundibuliform. Margin rounded, pendent, depressed, split.

Stem. One to two inches high, tint of pileus, squamose, slender, unequal, twisted, continuous. Veil fragmentary, fugacious.

Section. Flesh white, thin, fragile at first, then tough. Stem solid. Gills creamy, yellowish, crowded, unequal, sinuate, narrow, finely crenulate, pointed, decurrent. Odour strong, pleasant. Flavour good. Spores white.

Obs. While young a good esculent. Must be cooked at once, as it toughens if kept. Another species, Lent. Dunalii, is probably also esculent.—*W. D. H.*

Genus LEPISTA.

(111.) **LEPISTA NUDA**; The Wood Blewit. (Pl. III. fig. 3.)

Habitat. In woods, especially of fir and pine. In groups.

Season. July to October. Common.

Pileus. Two to three inches across, pale lilac, discoloured, smooth, moist; convex, obtuse, then expanded, depresso-umbonate, plane, or waved and concave. Margin thin, glabrous, involute.

Stem. One or two inches high, lilac, farinose above, tomentose below, thickish, sub-incrassate, elastic, naked.

Section. Flesh thick centrally, lilac, brittle. Stem stuffed. Gills lilac, then tawny, crowded, narrow, unequal, pointed before, rounded behind, venate, adnate or sub-decurrent. Odourless. Taste good. Spores whitish.

Obs. In chapter vii. A good esculent. Somewhat local in growth. A correspondent tells me he has seen it abundant about Killarney, and has largely eaten of it.—*W. D. H.*

(112.) **LEPISTA PERSONATA**; The Blewit.

Habitat. In pastures. In rings or groups.

Season. September to November. Common.

Pileus. Two to six inches across, pallid, grey, or partly lilac, glabrous, sleek, even, moist; convex, expanded. Margin involute, sub-tomentose.

Stem. One to three inches high, tinted with violet or lilac, farinose or tomentose, thick, firm, naked, incrassate.

Section. Flesh pallid, firm. Stem solid, mottled, hollow in age. Gills pallid, perhaps stained with lilac, obscurely pink where

bruised, crowded, broad, narrow before, rounded behind, free. Odour aromatic. Taste good. Spores pallid.

Obs. In chapter vii. When fresh, not at all decayed or rainsoaked, it is a first-class viand. It has always been favourably regarded in England.—*W. D. H.*

Genus MARASMIUS.

(113.) **MARASMIUS ALLIACEUS**; The Little Onion-cap.

Habitat. Among dead leaves in hilly woods. In groups or scattered.

Season. October and November. Rare.

Pileus. One inch across, grey-white, perhaps reddish, smooth, then striate; campanulate, then expanded, plane, sub-umbonate.

Stem. Two inches high, elongate, blackish, slender, rigid, velvety or pruinose, naked. Base curved and rooting.

Section. Flesh membranaceous. Stem hollow, horny. Gills pallid, brownish, unequal, pointed before, rounded behind, distant, free. Odour and flavour of onion. Spores white.

Obs. Small and scarce. It can be used instead of onion, fresh or dried.—*W. D. H.*

(114.) **MARASMIUS OREADES**; The Oread. (Pl. I. fig. 4.)

Habitat. On pastures, downs, commons, meadows. In rings.

Season. July to October. Very common.

Pileus. Half to two inches across, fawn or buff; conical, then convex, plane, sub-umbonate, smooth; inverted, sinuate, crisped, and dark in wet; wrinkled, shrivelled, and pale in dry weather.

Stem. One to three inches high, tint of pileus, pale, equal, twisted, tough, elastic, slender, silky, not villose, naked, rooting.

Section. Flesh thin, white. Stem solid, fibrous. Gills tint of pileus, pale, unequal, not numerous, distant, ventricose, broad, free. Odour aromatic. Flavour decided, aromatic. Spores white.

Obs. In chapter vii. Always very highly esteemed by English fungus-eaters, though not valued much abroad. There has been a disposition to call it the *Champignon*, but that is the generic French title for all mushrooms, and should not be used for one in particular. The Oread is very commendable.—*W. D. H.*

(115.) **MARASMIUS PORREUS**; The Garlic-cap.

Habitat. Among fallen leaves. In groups.

Season. October and November. Uncommon.

Pileus. Half to two inches across, pallid, disc ochry, opaque; convex, then plane, orbicular, depressed. Margin thin, striate.

Stem. Two to three inches high, red-brown, slender, tough, incrassate above and below, tomentose, naked. Base villose.

Section. Flesh membranaceous, tough. Stem stuffed, at length hollow. Gills pale fawn, distant, firm, truncate, remote. Odour and taste of garlic. Spores white.

Obs. This and the other alliaceous mushrooms are a good deal employed on the Continent.—*W. D. H.*

(116.) **MARASMIUS SCORODONIUS**; The Little Shallot-cap.

Habitat. On heaths, commons, hill pastures, stubble-fields, etc. In groups.

Season. July to September. Rather common.

Pileus. Half to one inch across, pale red-buff; convex and smooth, then plane and rugose; tough, even, thin, elastic.

Stem. One inch high, red-brown, slender, glabrous, polished, equal, scarcely rooting.

Section. Flesh thin, tough. Stem hollow. Gills pallid, crisped, distant, adnate. Odour and taste like shallot. Spores white.

Obs. May be used dry or fresh to impart its flavour to soups, gravies, etc. —*W. D. H.*

Genus PANUS.

(117.) **PANUS CONCHATUS**; The Conch.

Habitat. On trees. In tufts.

Season. August to December. Uncommon.

Pileus. Two to five inches across, pinky-buff or pale tan, glabrous, then squamulose, thin, flaccid, tough; excentric, dimidiate, unequal, irregular, conchate or infundibuliform. Sessile. Base unequal, tomentose.

Section. Flesh thick centrally, white, tough. Gills pinkish or buff, attenuate behind, branched, anastomosing, pointed before and behind, deeply decurrent. Odour and flavour farinaceous. Spores white.

Obs. It is a good edible, and should be dressed like the Oyster. Must not be confounded with P. stypticus.—*W. D. H.*

(118.) **PANUS TORULOSUS**; The Bavarian Sprout. (Pl. V. fig. 1.)

Habitat. On stumps, chiefly of birch. In tufts.

Season. August to October. Uncommon.

Pileus. Two to three inches across, red-buff or flesh colour, smooth, sleek, leathery; dimidiate, depressed, concave. Margin incurved, thin, perhaps split. Sessile. Base thick, oblique, greyish, tomentose.

Section. Flesh pallid, thickish, tough. Gills pale tan, or reddish, unequal, not crowded, serrulate, a little crisped, pointed before and behind, decurrent. Odour and taste pleasing. Spores white.

Obs. Resembles the preceding. It seems to be very plentiful in Bavaria, and is much esteemed there. It appears to be exported thence to France under the name of *Chair de Bavière.*—*W. D. H.*

Genus PAXILLUS.

(119.) **PAXILLUS INVOLUTUS**; The Paxil. (Pl. III. fig. 2.)

Habitat. On the ground in and about woods and copses. Scattered and singly.

Season. June to November. Very common.

Pileus. Three to six inches across, clay-colour, dull rusty brown, mottled, moist, viscid in wet; compactly convex, then plane and depressed, irregular, sinuate or repand. Margin involute, tomentose, striate when unrolled.

Stem. One to three inches high, tint of pileus, pale, thick, blunt, continuous, naked, perhaps bent or excentric, tapered to base, firm, sub-tomentose or rough.

Section. Flesh thick, firm, yellowish, becoming rusty where cut. Stem solid. Gills pale ochre, rusty where bruised, numerous, thin, unequal, moniliform below, furcate, anastomosing, broad, attenuate back and front, separable, decurrent. Odour of musty meal. Taste bland. Spores rusty brown.

Obs. In chapter vii. It must not be confounded with any of the Lactars growing side by side with it, but it is easily recognisable. It is of inferior flavour and tough, but wholesome, substantial, and nutritious. I think our peasantry and rural poor might be benefited by knowing of it, as is the case abroad.—*W. D. H.*

Genus RUSSULA.

Obs. We have twenty-eight species, of which eleven are esculent and several

of the remainder poisonous. I should certainly recommend all the esculents for popular use were it not that there is immense difficulty in differentiating some of them from others. They vary in tint, and are extremely similar, so that though nothing is easier than to distinguish Russules from other genera, it is only an expert who can certainly determine the several species. The edible Russules are remarkably nice and dainty, and are extremely common. I have placed two of them—the Bisotte and Verdette—in chapter vii., because those species can be pretty easily recognised. Some others, such as R. alutacea, are not hard to distinguish, when one has grown accustomed to handling mushrooms and observing their characters, and I recommend readers to compare their points and acquire knowledge of them. In France they are largely and indiscriminately eaten, and to guard against accidents, it appears to be usual to steep them in vinegar, which is said to destroy the hurtful principle of the poisonous kinds. But the objection to this plan is that it quite spoils the delicate flavour of the good esculents. I therefore advise readers to learn to distinguish such species as are most dissimilar from the poisonous Russules, and to be content with eating those only.—*W. D. H.*

(120.) **RUSSULA ALUTACEA**; The Buff-gilled Redcap.

Habitat. In woods and parks. Singly and in groups.

Season. July to November. Common.

Pileus. Three to four inches across, usually dark lake-red, sometimes pinky, or red lilac, smooth, viscid in wet; rounded, expanded, plane, depressed. Margin thin, even, then irregular, pale, eventually striate or tuberculose. Cuticle separable.

Stem. One to three inches high, white, perhaps stained with red or buff, sub-rugulose, glabrous, thick, blunt, swollen above base.

Section. Flesh white, thickish, brittle, red under cuticle. Stem solid, spongy. Gills creamy buff, broad, equal, thick, sub-distant, straight, venate, free. Odourless. Taste mild, acrid in age. Spores buff.

Obs. Distinguished by the colour of its gills. Very good and quite wholesome, though Badham thought it was unsafe. I have often enjoyed it. When mature and acrid, the unpleasantness is removable by double scalding and rinsing.—*W. D. H.*

(121.) **RUSSULA AURATA**; The Golden-cap.

Habitat. In woods of pine and fir. Solitary.

Season. July to October. Not common.

Pileus. Two to three inches across, bright golden yellow, smooth, polished; convex, plane, rigid. Margin striate. Cuticle inseparable.

Stem. Two to three inches high, lemon, pale, blunt, stout, cylindrical, naked, sub-striate.

Section. Flesh thick, compact, brittle, pale lemon. Stem solid, spongy. Gills white with yellow margins, broad, equal, sub-distant, shining, rounded behind, free. Scentless. Taste mild, slightly acrid in age. Spores yellowish.

Obs. Wholesome and good. When old should be doubly scalded and rinsed. —*W. D. H.*

(122.) **RUSSULA CYANOXANTHA**; The Chameleon.

Habitat. In open glades of woods. Singly or in groups.

Season. August to October. Not uncommon.

Pileus. Two to four inches across, lilac, or dull blue and lilac mixed with yellow, rugose, spotted, disc pale; convex, then plane, depressed, perhaps concave. Margin blue, even, sub-striate. Cuticle adnate, except at margin.

Stem. Two to three inches high, white, stained with pink or buff, cylindrical, perhaps bent, venate, rugose, naked, at length lacunose.

Section. Flesh thick, white, red under cuticle, cheesy. Stem solid, spongy. Gills white, thick, straight, equal, broad, veined, sub-distant, furcate, rounded behind, free but approximate. Odour and taste pleasing. Spores white.

Obs. Of first-rate quality. Akin to R. vesca, but often like the Bisotte.—*W. D. H.*

(123.) **RUSSULA DECOLORANS**; Badham's Redcap.

Habitat. In woods, under beeches. Scattered.

Season. July to November. Common.

Pileus. Two to four inches across, dull crimson, paling at length, smooth, polished; spherical at first, then convex, plane, depressed. Margin thin, even. Cuticle separable.

Stem. One to three inches high, white, then dingy, cylindrical, rugose, thick, blunt, swollen above base, naked.

Section. Flesh thin, firm, white, creamy when dried. Stem solid, spongy, at length dusky within. Gills white, pale creamy in age, fragile, veined, thick, broad, simple, equal, attenuate behind, free. Odour faint. Taste bland. Spores creamy.

Obs. This appears to be the species called "Agaricus ruber" by Dr. Badham, and recommended as an edible by him. It is certainly a good comestible, but must be cautiously distinguished.—*W. D. H.*

(124.) **RUSSULA DEPALLENS**; The Bleached-cap.

Habitat. Borders of woods, heaths, mossy banks. In groups.

Season. June to October. Not uncommon.

Pileus. One to three inches across, pale red, becoming whitish or buffish, opaque, perhaps viscid; convex, then irregular, undulate. Margin even, at length sub-striate. Cuticle thin, adnate.

Stem. One to two inches high, white, at length dingy, firm, stoutish, enlarged above, smooth, naked.

Section. Flesh white, compact, brittle. Stem solid. Gills pallid, fragile, crowded, equal, furcate, broad, adnexed. Odourless. Taste bland. Spores white.

Obs. It is quite devoid of acridity and perfectly wholesome.—*W. D. H.*

(125.) **RUSSULA FURCATA**; The Fork-gilled Green-cap.

Habitat. Dry bare woods. Singly or scattered.

Season. June to September. Uncommon.

Pileus. Three to four inches across, dull olive-green, smooth, sleek, moist in wet; convex, then plane, depressed. Margin thin, even, smooth, at first incurved.

Stem. One to three inches high, white, stout, rigid, tapered below, smooth, naked.

Section. Flesh white, thickish, dry, brittle. Stem stuffed, spongy, hollow in age. Gills white, distant, thick, equal, bifurcate at their middle, adnate. Odour slight. Taste bitterish saline. Spores white.

Obs. The species has lain under suspicion, but Hartig, Paulet, and Cordier have proved it to be innocuous. I find it to be of unpleasant flavour, and recommend it to be left alone. It is readily distinguishable from the Bisotte by its forked gills, its taste, and its smooth, sleek, uniformly tinted cap.—*W. D. H.*

(126.) **RUSSULA HETEROPHYLLA**; The Bisotte.

Habitat. Open woods and wastes. Scattered.

Season. July to October. Common.

Pileus. Two to three inches across, tint varied, dull green, grey, brown, but never red or purplish, smooth, even, minutely reticulate; convex, then plane, depressed. Margin thin, even, finely striate. Cuticle thin, separable.

Stem. Two to three inches high, white, stout, rigid, unequal, sub-rugulose, a little swollen above, blunt, naked.

Section. Flesh white, thick, brittle. Stem stuffed, at length fistulose. Gills watery white, thin, crowded, narrow, dimidiate, attenuate behind, nearly equal, almost free. Odour and taste bland and pleasant. Spores white.

Obs. In chapter vii. I strongly recommend it.—*W. D. H.*

(127.) **RUSSULA LACTEA**; The Milky-cap.

Habitat. Under beeches, and in woods. Scattered.

Season. July to September. Uncommon.

Pileus. Two to three inches across, milk-white, creamy at length, dry, opaque, perhaps rivulose; convex, then plane, perhaps depressed. Margin thin, rounded, even, perhaps split.

Stem. One to two inches high, very stout, white, rigid, cylindrical, blunt, naked.

Section. Flesh white, thick, compact. Stem solid, spongy. Gills white, thick, distant, firm, broad, equal, rather branched, projecting, free or adnexed. Odourless. Taste sweet and good. Spores white.

Obs. It is sometimes plentiful, as I have seen it in Blenheim Park. Its wholesomeness has been well attested, and it is of good flavour.—*W. D. H.*

(128.) **RUSSULA LEPIDA**; The Rosy-cap.

Habitat. Under beeches and oaks. In groups.

Season. August to October. Common.

Pileus. Two to four inches across, rosy, paling where exposed, opaque, farinose or sericeo-squamulose, rimose; convex, then plane, sub-depressed, rounded. Margin even, at first incurved, pale or whitish, perhaps split.

Stem. Two to three inches high, white, flushed with rose, stout, smooth, blunt, perhaps swollen below or bent, naked, lacunose.

Section. Flesh white, thick, brittle, cheesy. Stem solid. Gills white, broad, thick, equal, close, straight, rounded before, adnexed. Odour slight. Taste bland and sweet. Spores white.

Obs. Much commended, but it must be carefully differentiated from the noxious R. emetica, which is very like it. Mrs. Hussey especially commended this species, but she thought every individual should be tasted when gathered, to make sure no acrid species were taken by mistake. The rosy cuticle of R. lepida becomes green in cooking.—*W. D. H.*

(129.) **RUSSULA VESCA**; The Ruby-cap.

Habitat. In open woodlands. Scattered.

Season. July to October. Common.

Pileus. Two to three inches across, ruby red, darkest on disc, rugulose, streaked, viscid; convex, then plane, much depressed. Margin even, tuberculose, or sub-striate, at length elevated. Cuticle thin, separable at margin.

Stem. Two inches high, white, reticulate or rugose, firm, stout, tapered downward, blunt, naked.

Section. Flesh thickish, white, reddish under cuticle, cheesy. Stem solid. Gills white, crowded, equal, furcate, broad in front, attenuate behind, adnexed. Odour slight. Flavour mild and nice. Spores white.

Obs. An excellent viand, but it must be carefully distinguished from the noxious R. rubra.—*W. D. H.*

(130.) **RUSSULA VIRESCENS**; The Verdette.

Habitat. In woods and wastes. Scattered or in groups.

Season. July to October. Common.

Pileus. Three to four inches across, pale livid green, tinted with yellow, chequered and areolate, dry, opaque; at first globose, then expanded, convexo-plane, sub-depressed, irregularly rounded. Margin even, obtuse, often depressed, cuticle warty, adnate.

Stem. One to three inches high, white, stout, sub-rugulose, unequal, bent, blunt, naked.

Section. Flesh white, thickish, cheesy. Stem solid. Gills white, straight, close, nearly equal, anastomosed below, firm, elastic, free. Odour agreeable. Taste mild and sweet. Spores white.

Obs. In chapter vii. It is the best of the Russules, and far more dainty than the Pratelles.—*W. D. H.*

ORDER AURICULARINI.

Genus CRATERELLUS.

(131.) **CRATERELLUS CORNUCOPIOIDES**; The Craterelle. (Pl. IX. fig. 2.)

Habitat. On the ground in woods. In small tufts.

Season. July to November. Uncommon.

Habit. Shaped like a trumpet, funnel, or cornucopeia, wide above, apex thin, hollow, rooting. Sessile.

Pileus. Internal. About three inches across at mouth of funnel, brown-black, shaggy or squamulose, continuous downward within funnel. Margin flanged out, sinuate, lobulate, irregular.

Hymenium. External. Pale grey brown, wrinkled, veined, decurrent.

Section. Flesh thin, membranaceous, tough, elastic. Odourless. Taste insipid.

Obs. It is a wholesome edible, but of inferior quality. Other members of the genus are eaten abroad, but are not found here. The remaining British species have not been tested.—*W. D. H.*

ORDER CLAVARIEI.

Genus CLAVARIA.

Obs. There is no evidence of any Clavaria being actually noxious, though some may be inedible by reason of toughness or bad flavour. I have been in the habit of eating them without much discrimination, and find them very tasty, so have placed them in chapter vii. The species now to be named are most suitable for use. I think them quite worth the trouble there is in picking and cleaning them.—*W. D. H.*

(132.) **CLAVARIA AMETHYSTINA**; The Amethystine.

Habitat. On the ground in woods. In tufts.

Season. August to November. Uncommon.

Habit. A bunch of branches rising from a common trunk, about three inches high, violet. Branchlets numerous, large, fragile, smooth, rounded, even, simple, not undulate. Flesh soft. Odour faint. Taste good. Spores white.

Obs. Excellent. Has a nice flavour peculiar to the species.—*W. D. H.*

(133.) **CLAVARIA AUREA**; The Burning Bush.

Habitat. On the ground in woods. In tufts.

Season. October and November. Uncommon.

Habit. Two to four inches high, golden yellow. Trunk pallid, thick, elastic, often elongate, perhaps obsolete. Branches numerous, stout, straight, unequal, rounded. Branchlets dichotomous, toothed. Scent and flavour good. Spores yellow.

Obs. Of capital quality. Possibly identical with the exotic C. flava.—*W. D. H.*

(134.) **CLAVARIA BOTRYTIS**; The Goat's-beard.

Habitat. On the ground in woods. Singly.

Season. July to October. Uncommon.

Habit. Two to three inches high, pale white. Trunk thick, fleshy, unequal. Branches thick, swollen, short, numerous, unequal, rugulose. Branchlets short, compressed, red-tipped, denticulate. Odourless. Taste good. Spores white.

Obs. Of more substance than sundry of the others, and of excellent flavour. —*W. D. H.*

(135.) **CLAVARIA CINEREA**; The Rat's-paw.

Habitat. On the ground in woods. In tufts.

Season. August to November. Common.

Habit. Two to three inches high, dingy grey. Trunk thick, short, spreading. Branches numerous, fragile, irregular, unequal, swollen, rounded, rugose, deformed. Branchlets of like character. Odourless. Taste mild. Spores pallid.

Obs. Quite good, but a little inferior in quality.—*W. D. H.*

(136.) **CLAVARIA CORALLOIDES**; The White Coral-tuft.

Habitat. In damp woods, under firs and hollies. In tufts.

Season. September to November. Common.

Habit. One to two inches high, snow-white. Trunk short, thick, hollow. Branches irregular, numerous, short, fragile, dilating. Branchlets bundled, unequal, crowded, serrate, pointed. Odour feeble. Taste good. Spores white.

Obs. A good species, though small, and difficult to pick clean.—*W. D. H.*

(137.) **CLAVARIA CRISTATA**; The Feather-tuft.

Habitat. In shady woods. In scattered tufts.

Season. September to November. Common.

Habit. One or two inches high, pallid, white, or dingy. Trunk short, small, even, stuffed. Branches numerous, short, tough. Branchlets crowded, serrate, dilate, fimbriate. Odour feeble. Taste bland. Spores dingy.

Obs. Very small, but often abundant. It is very nice.—*W. D. H.*

(138.) **CLAVARIA FASTIGIATA**; The Yellow-twig.

Habitat. Among moss and grass in pastures, woods, heaths, etc. Scattered.

Season. August to November. Common.

Habit. About one inch high, yellow. Trunk short, small. Branches numerous, short, divaricate, fasciculate, smooth, toughish. Branchlets tapered, pointed, equal, straight, vertical. Odour sweet. Taste good. Spores yellowish.

Obs. Very plentiful and pleasant-flavoured. C. umbrina resembles it, and is probably equally good.—*W. D. H.*

(139.) **CLAVARIA FORMOSA**; The Elegante.

Habitat. On the ground in woods, heaths, pastures, and commons. Singly.

Season. August to November. Rare.

Habit. One to four inches high. Trunk white, thick, fleshy, spreading. Branches orange, thick, elongate, rounded, serrate. Branchlets yellow, numerous, rounded, fasciculate, dentate, blunt. Flesh white. Odourless. Taste good. Spores buff.

Obs. It bears the reputation of being peculiarly well flavoured, but it is scarce.—*W. D. H.*

(140.) **CLAVARIA FUSIFORMIS**; The Golden Spindlespike. (Pl. XI. fig. 3.)

Habitat. Among grass and fern. In bundled tufts.

Season. August to November. Common.

Habit. One to five inches high, egg-yolk yellow. Spikes densely fasciculate, firm, simple, smooth, fusiform, attenuate above and below, tough, elastic, fibrous, slender, elongate, upright, twisted. Odour slight. Taste slightly styptic. Spores yellow.

Obs. In chapter vii. I relish its flavour much, and find it light and easy of digestion, though tough if not properly sweated with butter. It is often found in large bundles. I have gathered one such in Richmond Park weighing over three pounds.—*W. D. H.*

(141.) **CLAVARIA GRISEA**; The Grey-twig.

Habitat. In woods and on moors. Scattered.

Season. September to November. Uncommon.

Habit. One to three inches high, dingy grey. Trunk thick, attenuate below, spreading. Branches not numerous, rugulose,

rounded, tapered. Branchlets many, unequal, blunt, slight, elastic, toothed. Scent sweet. Taste agreeably bitter. Spores brownish.

Obs. Plentiful in some localities. A pretty good edible.—*W. D. H.*

(142.) **CLAVARIA MUSCOIDES**; The Moss-gold.

Habitat. Among thick moss. Scattered.

Season. August to October. Common.

Habit. Two or three inches high, egg-yolk yellow. Trunk slight, slender, tomentose. Branches few, graceful, slender, distant, smooth. Branchlets elongate, tapered, arcuate, unequal, pointed. Odourless. Taste piquant. Spores yellow.

Obs. It is good, though sparing in quantity. May be mingled with other species.—*W. D. H.*

(143.) **CLAVARIA PISTILLARIS**; The Dryad's Club.

Habitat. Amoug grass, fern, and undergrowth. Singly, or by twos and threes.

Season. September to November. Uncommon.

Habit. Four to twelve inches high, dull tawny or red-brown, simple, club-shaped, large, fleshy, stuffed, smooth, obovate above, tapered to base, perhaps bent or not vertical. Odour slight. Taste bitterish. Spores white.

Obs. Though wholesome, it is tough and poor in flavour. Young individuals only should be gathered.—*W. D. H.*

(144.) **CLAVARIA RUGOSA**; The Wrinkle-twig.

Habitat. Damp corners of shady woods. Scattered.

Season. August to November. Common.

Habit. One to three inches high, pallid or dingy. Trunk almost simple, thick, attenuate below, rugose. Branches few, irregular, rounded, rugose, dilate, furcate, blunt. Odour slight. Taste good. Spores white.

Obs. Pretty plentiful, and of excellent quality, though small.—*W. D. H.*

(145.) **CLAVARIA VERMICULATA**; The Little White Fascine.

Habitat. On lawns, meadows, amid short grass. In bundles.

Season. August to November. Common.

Habit. One to three inches high, white, simple, in bunches looking like miniature bundles of tallow candles, fragile, nearly even, smooth, usually vertical, sometimes twisted, bluntly pointed. Odour slight. Taste pleasant. Spores white.

Obs. Often plentiful in garden-grounds, and a very excellent comestible.—*W. D. H.*

Genus SPARASSIS.

(146.) **SPARASSIS CRISPA**; The Sparassis. (Pl. XI. fig. 1.)

Habitat. On moors, and at the foot of trees in young plantations. Singly.

Season. July to October. Rare.

Habit. A mass of crisp, petaloid, or ligulate branches, of creamy fawn tint, forming a tuft six or eight inches high, and perhaps twenty inches across. Trunk short, thick, rooting, spreading above. Branches many, fragile, ligulate or petaloid, interlaced, rugose, the tips laciniate, curled. Odour of mouldy meal. Taste strong. Spores creamy.

Obs. So scarce, I have only met with it once. It is well known to be a good esculent, and possesses a good but peculiar flavour. It may be cut up and cooked like Clavarias. It quickly putrifies.—*W. D. H.*

ORDER HYDNEI.

Genus HYDNUM.

Obs. Of the twenty-nine British species of this genus, eight may be called esculent. The rest are of inedible substance, but none of them are known to be poisonous.—*W. D. H.*

(147.) **HYDNUM AURISCALPIUM**; The Fir-cone Sprout.

Habitat. On half-buried rotting fir-cones. Singly.

Season. October to December. Common locally.

Pileus. Half to one inch across, bright red-brown, then dusky, perhaps zoned; rounded, reniform, lobulate, dimidiate, tomentose.

Stem. One to three inches high, tint of pileus, elongate, slender, straight, lateral, villoso-tomentose, rooting.

Section. Flesh thin, brown, tough. Stem stuffed. Spines pale brown, equal, adnexed. Odour aromatic. Taste resinous.

Obs. Of very inferior quality as an esculent, yet commonly eaten in France and Italy.—*W. D. H.*

(148.) **HYDNUM CAPUT-MEDUSÆ**; The Medusa's Head.

Habitat. On trunks of dead trees. Solitary.

Season. July to September. Rare.

Habit. Large, fleshy, size of a man's head, snow-white, then dingy. Trunk short, thick, enlarging upwards into a pileus which terminates in a mass of spines. The spines are slender, simple, elongate, pointed, at first upright, then bent, contorted, drooping, irregular, unequal. Odour and taste agreeable.

Obs. A singular-looking species, scarce here, but common in Italy, where it is much eaten, and is regarded as an esculent of good quality.—*W. D. H.*

(149.) **HYDNUM CORALLOIDES**; The Faun's Delight.

Habitat. On old oaks, firs, beeches, and ash trees. Singly.

Season. July to November. Rare.

Habit. At first pure white, sprouting like a cauliflower, at length creamy yellow. Trunk fleshy, thick, small at base, spreading and branching. Branches attenuate, intricate, interlaced, flexuose, angular, forked, elongate. Branchlets numerous, short, incurved, imbricate, bearing the spines in long, pendant tassels. Odour and taste agreeable.

Obs. One may say of this singular and beautiful plant, "When found make a note of," and, it may be added—eat! Here it is very rare, but abroad it has been pronounced a first-class viand.—*W. D. H.*

(150.) **HYDNUM ERINACEUS**; The Satyr's Beard.

Habitat. In clefts of old oaks and beeches, often high up and quite hidden. In clumps.

Season. August to November (?) Uncommon.

Pileus. Five to nine inches across, yellowish-fawn, pale tan; lateral, obtuse, immarginate, sessile; upper surface fibrillose, the fibres fasciculate, outer edge bearing spines. Base short, thick, lateral, recurved above.

Spines. Tint of pileus, numerous, one to three inches long, thin, pendulous, imbricate, regular, close set, connected, soft, attenuate.

Section. Flesh soft, tough, elastic, white, thick. Odour fragrant. Taste good.

Obs. Not so rare, but hard to find and get at. It is a first-class esculent, digestible, and eats like the Pratelle.—*W. D. H.*

(151.) **HYDNUM FRAGILE**; The Pine-tree Urchin.

Habitat. At the foot of pine trees. Singly.

Season. August to November. Uncommon.

Pileus. Three to six inches across, whitish, soon dusky red-fawn, at first pubescent, then smooth, perhaps rugulose, waved, irregular, repand. Margin undulate, lobulate, greyish.

Stem. Two to three inches high, tint of pileus, pale, short, unequal, thick, firm, smooth, central.

Section. Flesh greyish, not thick, soft, fragile. Spines dusky, slender, elongate, acute, crowded. Odour and taste aromatic. Spores grey.

Obs. A little-known esculent. It is of poor quality.—*W. D. H.*

(152.) **HYDNUM IMBRICATUM**; The Scaly Urchin.

Habitat. On the ground in fir and pine woods. In groups.

Season. August to November. Common locally.

Pileus. Three to five inches across, umber, perhaps tawny, squamose; convex, rounded, then plane, depressed, of irregular outline. Scales thick, flaky, numerous, erect, imbricate.

Stem. Short, white, stout, irregular, smooth, rigid.

Section. Flesh pale buff, thick, compact, tough. Stem solid. Spines dingy white, numerous, short, equal, smooth, decurrent. Odourless. Taste good. Spores fawn.

Obs. A fairly good esculent, but inferior to the succeeding. It is apt to be tough.—*W. D. H.*

(153.) **HYDNUM REPANDUM**; The Urchin of the Woods. (Pl. VIII. fig. 4.)

Habitat. On bare ground in woods; amid grass and fern in glades and parks; on yellow clay soils. In groups, and confluent.

Season. August to October. Common.

Pileus. One to six inches across, pale creamy buff; compact, irregular, sinuate, arcuate, repand, smooth. Margin irregular, undulate.

Stem. One to three inches high, pale creamy buff, stout, unequal, deformed, excentric, perhaps finely tomentose.

Section. Flesh white, unchanging, thick, firm, compact. Stem solid. Spines creamy buff, looking velvety in the mass, short,

unequal, conical, fragile, separable, decurrent. Odour slight. Taste faintly acrid. Spores cream-colour.

Obs. Included in chapter vii. I esteem it one of the very best edible fungi. Abroad it is much eaten, but considered less *recherché* than the Chantarelle. However, I think I prefer it of the two. I am told it is very abundant in the woods bordering the White Sea. We might profitably import it thence, if the British public could be awaked to a just appreciation of it. It is common enough here.—*W. D. H.*

(154.) **HYDNUM RUFESCENS**; The Red Urchin.

Habitat. On bare ground in woodlands; under pines and oaks. Solitary, confluent, or in groups.

Season. August to October. Not very common.

Pileus. One to four inches across, tawny or red-tan; compact, irregular, undulate, lobulate, repand; smooth or finely tomentose. Margin arcuate, sinuate, acute.

Stem. One to two inches high, white, at length tawny, stout, irregular, compressed, excentric.

Section. Flesh white, turning tawny where exposed, thick, compact, brittle. Stem solid. Spines whitish, then buff, numerous, unequal, conical, short, fragile, decurrent. Odour of horse-radish. Taste pungent and bitterish. Spores whitish.

Obs. In chapter vii. It has been regarded as a mere variety of H. repandum; but I find it differs a good deal in locality as well as in habit, and deserves specific place. It is good, but not quite so excellent as the other.—*W. D. H.*

ORDER POLYPOREI.

Genus BOLETUS.

Obs. I would here refer the reader to the remarks on the Bolets which I have made in chapter vii. I repeat that the blackish-blue stain which affects many species when bruised is not any indication as to whether that species be esculent or noxious. The natural tint of the Pores is a more reliable guide, and should be attentively studied by comparison. There are nineteen species well attested to be wholesome edibles, and their great abundance and large size ought to make them valuable. Yet it is this genus which bears the deepest stigma among our country folk, and to which they most emphatically apply the opprobrious epithet of "toadstools." In the other catalogue I shall describe such Bolets as are really noxious, and shall also indicate the remaining British species whose qualities have not been ascertained as yet. The amount of nutritious food offered by Bolets every year is something prodigious, and this at present goes all to waste in England. I deplore the fact, and would do all I can to remedy it.—*W. D. H.*

(155.) **BOLETUS ÆSTIVALIS**; The Summer Bolet.

Habitat. In pastures and parks near copses; in woodlands. Solitary.

Season. May to August. Tolerably common.

Pileus. Four to eight inches across, grey, grey-brown, umber, soft, silky, becoming rivulose and granulate; convex, then expanding, pulvinate, unequally plane.

Stem. Two to five inches high, dingy white, stout, firm, even, smooth, incrassate below, naked.

Pores. Pallid-white, yellow, lastly greenish.

Section. Flesh white, soft, unchanging. Stem solid. Tubes pallid, then greenish, elongate, cylindrical, minute, even. Odour faint. Taste sweet and nutty. Spores greenish-brown.

Obs. One of the largest and best in quality of the genus. In chapter vii. —*W. D. H.*

(156.) **BOLETUS BADIUS**; The Bay Bolet.

Habitat. On high ground in woods of fir and pine. Solitary.

Season. August to October. Rare.

Pileus. Some two inches across, bay-tawny, soft, polished, viscid in wet, smooth; convex, pulvinate, rounded.

Stem. One to two inches high, pale bay, farinose, nearly even, sub-attenuate, not bulbous, smooth, naked.

Pores. Pale yellow, becoming greenish.

Section. Flesh pallid, slightly blueing on exposure, soft, thick, stem solid. Tubes large, angular, sinuate, depressed, adnate, yellow-green. Odour feeble. Taste good. Spores dingy green.

Obs. Not well known, but it is eaten abroad and is quite wholesome.—*W. D. H.*

(157.) **BOLETUS BOVINUS**; The Ox Bolet.

Habitat. Heathy woods of fir and pine. In groups.

Season. September and October. Not uncommon.

Pileus. One to three inches across, dusky, red-brown, or tawny-buff, smooth, glossy, viscid in wet; rounded, then convex, pulvinate, expanding, undulate. Margin incurved, at first white and tomentose, soon yellow and glutinous.

Stem. Two to three inches high, tint of pileus, striate, not thick, cylindrical, equal, smooth, naked, sub-flexuose.

Pores. Dingy yellow, eventually dusky brown.

Section. Flesh dingy, unchangeable, thick. Stem solid. Tubes very shallow, tint of pores, angular, compound, irregular, sub-decurrent. Odour aromatic. Taste bland. Spores dingy green.

Obs. It has been suspected, but seems quite wholesome. Young specimens only should be eaten.—*W. D. H.*

(158.) **BOLETUS CASTANEUS**; The Chestnut Bolet.

Habitat. On the ground in woods. Solitary.

Season. August to October. Not common.

Pileus. Two to three inches across, chestnut or cinnamon, velvety-tomentose, opaque; convex, expanding, pulvinate, slightly depressed, firm.

Stem. Short, tint of pileus, soft, unequal, swollen, bent, irregular, not stout, naked.

Pores. Whitish, then yellow.

Section. Flesh white, unchanging, soft, floccose. Stem stuffed, soon hollow. Tubes yellow, short, cylindrical, narrow, free. Odour slight. Taste pleasant. Spores yellow.

Obs. An agreeable esculent, but soft, and liable to early decay.—*W. D. H.*

(159.) **BOLETUS CHRYSENTERON**; The Red-crack Bolet.

Habitat. In woods, parks, pastures, etc. Solitary.

Season. July to October. Common.

Pileus. Two to four inches across, dull brown, rimose and stained with bright crimson, finely tomentose; convex, pulvinate, at length almost plane.

Stem. Two to four inches high, yellowish, streaked and splashed with red, not thick, bent, rigid, fibrillose, sub-incrassate below.

Pores. Greenish-yellow.

Section. Flesh thickish, pale yellow, red under cuticle, blueing where cut. Stem stuffed. Tubes greenish-yellow, large, angular, unequal, adnexed. Odour slight. Taste bland. Spores brownish-yellow.

Obs. In chapter vii. The blueing is often hardly perceptible. It seems to depend on the weather. Of good quality.—*W. D. H.*

(160.) **BOLETUS CYANESCENS**; The Blue Bolet.

Habitat. Bare woods and wastes. Solitary.

Season. August to October. Uncommon.

Pileus. Two to four inches across, straw-colour, buff, tomentose; convex, expanding, plane, pulvinate. Margin acute, equal.

Stem. Some two inches high, buff, apex constricted, middle swollen, base even, brittle, not reticulate, villoso-pruinose.

Pores. White, then primrose.

Section. Flesh compact, thick, white, becoming instantly bright blue. Juice blue. Stem stuffed, spongy. Tubes yellow, minut round, equal. Odour slight. Taste good. Spores primrose.

Obs. Quite wholesome, and a very fair comestible while young and tender. —*W. D. H.*

(161.) **BOLETUS EDULIS**; The Dainty Bolet.

Habitat. In pastures, parks, and woodlands. In twos and threes.

Season. July to October. Common.

Pileus. Three to eight inches across, pale tan or buff, smooth or sub-rugulose, moist in wet, sometimes rimose; convex, expanded, pulvinate. Margin infolded at first, whitish.

Stem. Three to six inches high, white or buff-white, reticulate above, stout, unequal, incrassate, naked.

Pores. White at first, soon lemon yellow, finally greenish.

Section. Flesh thick, compact, white, unchanging, stained red under cuticle. Stem solid. Tubes greenish, minute, elongate, nearly free. Odour faint. Taste sweet and nutty. Spores yellow-green.

* * * * *

Var SYLVESTRIS.

Grows more frequently in the shade of woods. Colour of pileus is dull brown or umber. Otherwise identical.

Obs. In chapter vii. A most excellent, plentiful, and commendable delicacy. —*W. D. H.*

(162.) **BOLETUS ELEGANS**; The Elegant Bolet.

Habitat. In and about plantations of fir. In twos and threes.

Season. May to November. Common.

Pileus. Two to four inches across, bright golden yellow, disc at

length rusty, smooth, glossy, viscid in wet; convex, regular, expanding, plane. Margin even, thin.

Stem. Three to four inches high, yellow, firm, equal, perhaps flexuose, sub-incrassate below, punctate above, annulate.

Pores. Pale yellow, minute, alveolate.

Section. Flesh thin, soft, glutinous, yellowish. Stem stuffed. Tubes yellow, numerous, small, angular, decurrent. Odour of mouldy meal. Taste insipid. Spores yellow.

Obs. Wholesome, but of inferior quality. Useful for purée and soup.—*W. D. H.*

(163.) **BOLETUS ELEPHANTINUS**; The Giant Bolet.

Habitat. Corners of meadows and commons; chiefly on calcareous soils. Solitary.

Season. August to October. Uncommon.

Pileus. Six to fourteen inches across, pale tan or buff, opaque, whitish-streaked, smooth or sub-rugulose; convex, pulvinate, then unevenly plane. Margin thick, incurved at first.

Stem. Two to four inches high, whitish, reticulate above, very stout, bulbous, rugose, firm, unequal, naked.

Pores. Whitish, soon primrose, finally greenish, minute.

Section. Flesh thick, white, blueing a little. Stem solid. Tubes long, dense, minute, yellow-green, blueing if bruised. Odour mealy. Taste a little piquant. Spores greenish.

Obs. Perhaps only a variety of B. edulis. Of equally good quality.—*W. D. H.*

(164.) **BOLETUS FLAVUS**; The Yellow Bolet.

Habitat. In and about fir and pine woods. Scattered.

Season. May to November. Common.

Pileus. Two to five inches across, yellow, brownish when dry, shining, viscid; convex, plane, expanded, equal, firm.

Stem. Two to three inches high, yellow, punctate with purple-brown, stout, sub-reticulate above, incrassate, annulate.

Pores. Golden-yellow, becoming somewhat ruddy, angular.

Section. Flesh not thick, soft, glutinous, yellow, unchanging. Stem stuffed. Tubes yellow, long, large, sinuate, unequal, angular, decurrent. Odour mouldy, unpleasant. Taste insipid. Spores brownish yellow.

Obs. Wholesome. Closely akin to B. elegans, and of similar quality.—*W. D. H.*

(165.) **BOLETUS FRAGRANS**; The Scented Bolet.

Habitat. In woods, especially under oaks. Solitary.

Season. August to October. Uncommon.

Pileus. Two to six inches across, bronze-umber, tomentose, scabrous; convex, pulvinate, sub-repand. Margin inflexed.

Stem. Two to three inches high, brown, perhaps splashed with red and yellow, scabrous, even, incrassate.

Pores. Yellow, then greenish, small.

Section. Flesh thickish, white, blueing brightly. Stem stuffed. Tubes greenish, small, close, cylindrical, nearly free. Sweet scented. Taste good. Spores pale greenish yellow.

Obs. A tasty and pleasant edible. I found it in a parcel of dried Bolets which lately reached me from Russia, together with B. edulis, B. granulatus, B. scaber, and other species. I may add that Russians seem to like their mushrooms maggoty, just as we like our Stilton "all alive."—*W. D. H.*

(166.) **BOLETUS GRANULATUS**; The Sprinkled Bolet.

Habitat. Among grass under firs. Scattered.

Season. August to October. Not very common.

Pileus. Two to four inches across, bright bay brown, very slimy; at first hemispherical, then convex, expanded, plane, uneven and undulate. Margin at first incurved and sub-tomentose.

Stem. One to two inches high, yellowish, covered with milky drops which dry into sugary granules, scabrous, finely tomentose, thick, nearly equal, naked, rooting.

Pores. Whitish and milky at first, soon yellow and granulose, compound.

Section. Flesh thick, whitish, unchanging. Stem stuffed. Tubes short, simple, small, yellow, adnate. Odour unpleasant. Taste sour. Spores tawny yellow.

Obs. This is an esculent, though not of first-class quality. It is variable, but well marked.—*W. D. H.*

(167.) **BOLETUS IMPOLITUS**; The Dingy Bolet.

Habitat. Woodsides, under oaks and beeches. In twos and threes.

Season. August to October. Common.

Pileus. Three to six inches across, greyish or brown, flocculose

or granulose, rimulose; convex, pulvinate, expanded, dilate, uneven. Margin thick, rounded.

Stem. Some two inches high, dirty white, stout, rigid, even, rugulose, cylindrical, swollen below, naked.

Pores. Lemon yellow, large, alveolate.

Section. Flesh thick, compact, white, blueing dingily. Stem solid. Tubes greenish, long, large, unequal, adnexed. Odour slight. Taste good. Spores greenish.

Obs. In chapter vii. It is not unlike the brown B. edulis, and is of almost as good quality.—*W. D. H.*

(168.) **BOLETUS LUTEUS**; The Collared Bolet.

Habitat. In woods, generally fir and pine woods. In small groups.

Season. August to October. Common.

Pileus. Three to four inches across, dingy yellow or brown, perhaps tawny and streaked with red, viscid; unequally convex, pulvinate, smooth, soft, sleek.

Stem. Two to four inches high, white, then brownish, not stout, flexuose, punctate and scabrous above, pruinose below. Ring large, patent.

Pores. Dull yellow, small, round.

Section. Flesh firm, thick, white, unchanging, at length yellowish and soft. Stem stuffed. Tubes dull yellow, minute, round, simple, adnate. Odour mouldy. Taste rather tart. Spores brownish yellow.

Obs. An esculent of inferior quality, best adapted for boiling down into soup. —*W. D. H.*

(169.) **BOLETUS PACHYPUS**; The Big-stem Bolet.

Habitat. On high ground in woods. Singly or in groups.

Season. July to October. Common.

Pileus. Four to eight inches across, pale tan or clay-brown, dry, sub-tomentose; pulvinate, bulging, uneven. Margin depressed, blunt.

Stem. Three to four inches high, clay-colour, variegated with red, very thick and bulbous, unequal, firm, reticulate, naked.

Pores. Primrose, soon dull yellow.

Section. Flesh thick, white, compact, blueing slightly. Stem

stuffed or hollow. Tubes greenish, elongate, short behind, round, simple, adnexed. Odour slight. Taste agreeable. Spores yellowish.

Obs. In spite of having been suspected, it seems to be quite wholesome. But it is hard, and only young and tender plants should be gathered. It is of inferior quality.—*W. D. H.*

(170.) **BOLETUS SCABER**; The Rough Bolet.

Habitat. In woods. Solitary.

Season. July to September. Common.

Pileus. Three to six inches across, dusky brown or bistre, smooth, tomentose, viscid in wet; at first narrow and orbicular, then convex, pulvinate.

Stem. Four to eight inches high, white-brown, tuberculose, scabrous and corrugate, thick, attenuate upward, coarse and rough, naked.

Pores. Minute, round, pulvinate, whitish, a little rusty at edges.

Section. Flesh thick, white, soft, unchanging in youth, reddening or blackening when mature. Stem stuffed, fibrous. Tubes small, elongate, free, dirty white. Odourless. Taste somewhat salt. Spores pale brown.

Obs. In chapter vii. A well known and very commendable esculent.—*W. D. H.*

(171.) **BOLETUS SUBTOMENTOSUS**; The Yellow-crack Bolet.

Habitat. In woods. Singly or scattered.

Season. July to October. Common.

Pileus. Two to four inches across, bronze, olive brown, rimose with lemon yellow; pulvinate, expanded, convexo-plane; soft, dry, subtomentose.

Stem. Three to five inches high, yellow, marked with red, slender, bent, striato-sulcate, punctate above, sub-incrassate at base, naked.

Pores. Primrose, becoming greenish, coarse.

Section. Flesh thickish, soft, brittle, yellowish, blueing or not. Stem stuffed, fibrous. Tubes large, irregular, angular, elongate, greenish, short behind, rather remote. Odour slight and pleasant. Taste peculiar, good. Spores brownish yellow.

Obs. In chapter vii. Closely allied to B. chrysenteron, but of somewhat better flavour.—*W. D. H.*

(172.) **BOLETUS VERSIPELLIS**; The Orange Bolet.

Habitat. In woodlands. Solitary.

Season. August to November. Common.

Pileus. Three to five inches across, tawny, or orange, or vermilion, dry, at first tomentose, then smooth, perhaps sub-squamulose; hemispherical, then convex, rounded, pulvinate. Margin thick, obtuse, in youth fimbriate with veil.

Stem. Four to nine inches high, whitish-brown, tuberculose, scabrous and corrugate, thick, rigid, unequal, straight, incrassate downwards.

Pores. Small, pulvinate, dingy white, edges rusty.

Section. Flesh very thick, soft, white, reddening when old. Stem stuffed, fibrous. Tubes minute, elongate, straight, whitish, tinged with rust. Odourless. Taste good. Spores pale brown.

Obs. In chapter vii. Closely allied to B. scaber. Both, if full grown, are best if "sweated" with butter before being stewed. The Swiss prefer the stems to the caps, scraping and slicing them longitudinally.—*W. D. H.*

(173.) **BOLETUS VISCIDUS**; The Gummy Bolet.

Habitat. In woods. Solitary.

Season. August to October. Not common.

Pileus. Three to four inches across, dingy yellow, smooth, very viscid; pulvinate, convex, rounded, soft. Margin fimbriate with veil.

Stem. Two to three inches high, whitish, dingy, not thick, unequal, uneven, scabrous, rimose, reticulate, attenuate upward.

Pores. Large, angular, dingy greenish yellow.

Section. Flesh not thick, whitish, soft, slimy. Stem stuffed. Tubes greenish, large, angular, adnate. Odour sickly. Taste insipid. Spores greenish.

Obs. Wholesome, but of very inferior quality. Useful for soups.—*W. D. H.*

Genus FISTULINA.

(174.) **FISTULINA HEPATICA**; The Oaktongue. (Pl. VII. fig. 2.)

Habitat. On trunks of old living oaks. Solitary.

Season. June to November. Common.

Pileus. Two inches to two or three feet across, flesh-pink to blood-red, in age liver-colour, soft, clammy, viscid; obtuse, unequal,

lateral, spathulate, dimidiate, etc., papillate at first, then smooth, spotted with red. Sessile. Base short, thick, lateral, woody.

Pores. Convex, buffish or salmon-pink, dotted with rosy papillæ, viscid.

Section. Flesh very thick, red, marbled, soft like meat, juicy. Tubes short, reddish, continuous with flesh, minute, unequal. Odour slightly vinous. Taste obscurely acid and vinous. Spores salmon-pink.

Obs. In chapter vii. Most excellent, either for the cottage or the palace of Dives !—*W. D. H.*

Genus POLYPORUS.

(175.) **POLYPORUS CORYLINUS**; The Roman Stump-sprout.

Habitat. On charred stumps of a species of hazel (Corylus avellana), a native of Italy. In tufts.

Season. Autumn and winter. Exotic.

Pileus. One to three inches across, buff-white, smooth, dry; expanded, unequal, plane, uneven. Margin incurved, then undulate, thin.

Stem. One inch high, whitish, thick, continuous, cylindrical, nearly central, unequal, incrassate, reticulate, naked.

Pores. Tint of pileus, small, even.

Section. Flesh white, thick, compact. Stem solid. Tubes whitish, short. Odour slight. Taste bland.

Obs. It may be cultivated anywhere in hothouses, upon its particular matrix. See chapter xi.—*W. D. H.*

(176.) **POLYPORUS CRISTATUS**; The Crested Polypore.

Habitat. On the ground in old beech woods. Singly.

Season. September to November. Rare.

Habit. A clump of fragile, fleshy branches, rising from a common base or trunk. The Pilei are three to four inches across, tawny-green, entire or dimidiate, depressed, irregular, imbricate; sub-pulverulent or tomentose, eventually rimoso-squamose. Margins involute. The Stems are long and short, white, then greenish, irregular, lateral, farinose. Pores white, then yellowish, minute, angular, unequal, torn. Odour slight. Taste rather acrid.

Obs. Very scarce here; I have not seen it. Fries says it is esculent, and so does Curtis.—*W. D. H.*

(177.) **POLYPORUS FOMENTARIUS**; The Amadou Polypore.

Habitat. On old oaks, beeches, etc. Singly.

Season. Perennial. Common.

Pileus. To twenty inches across, or more, dusky, grey-brown, furrowed or zoned concentrically; triangular, crescent-shaped, hoof-shaped, etc.; dilate, thick, smooth, opaque, nodulose. Margin stratified. Cuticle thick, hard, persistent, inner layer dark and shining. Sessile. Lateral.

Section. Flesh brown, at first soft, floccose, soon coriaceous, thick, hard. Pores glaucous, then brownish, concave in the mass, very long, minute, regular, stratified. Odour ligneous. Taste bitter-astringent.

Obs. It is the principal and best of the Polypores used for making German tinder, or Amadou. In extreme infancy the German and French peasants eat it, but even then it is very tough.—*W. D. H.*

(178.) **POLYPORUS GIGANTEUS**; The Giant-tuft. (Pl. VI. fig. 3.)

Habitat. At the foot of old trees. In single clumps.

Season. Autumn and winter. Rare.

Habit. A mass of pileated, fleshy, coriaceous branches rising from a tuberose trunk, the whole from one to three feet across. Pilei broad, bright brown, zoned, becoming black, flocculose or squamoso-fibrillose; sub-lateral, imbricate, dimidiate, flaccid, irregular, unequal, rigid, depressed. Stems short and long, connate, lateral, branched, fibrillose, brownish. Pores pallid, browning, round, minute, torn. Odour slight. Taste not unpleasant.

Obs. Abroad it is eaten when very young, but is even then rather tough.—*W. D. H.*

(179.) **POLYPORUS INTYBACEUS**; The Hen of the Woods.

Habitat. At the foot of old trees. In single clumps.

Season. Autumn and winter. Rare.

Habit. A mass of spathulate, fleshy, fragile branches rising from a common base, up to six inches high and sixteen across. Pilei half to one inch across, dusky, grey-brown, numerous, dimidiate, upright, imbricate; discs dilate, flattened, irregular, smooth. Stems continuous, confluent. Pores white, then dingy, compound, small. Odour of mice. Taste agreeable. Spores white.

Obs. The best edible Polypore. Very good until old and tough. Much esteemed on the Continent.—*W. D. H.*

(180.) **POLYPORUS SQUAMOSUS**; The Dryad's Saddle.

Habitat. On stumps, tree-trunks, branches, roots. Singly, or imbricated.

Season. April to September. Very common.

Pileus. Four inches to three feet across, creamy or pale buff, tawny or brown-squamose; flabelliform, expanded, dimidiate, imbricate, depressed behind, irregular. Margin often incurved. Sessile; or short, continuous, thick, excentric, lateral stem. Base black, enlarged, woody. Pores pallid, at first small, round, then large, angular, torn.

Section. Flesh thick, white, juicy, tough. Odour strong, sickly. Taste acrid, then mild. Spores white.

Obs. It is eaten abroad, but only in extreme youth. It is a very inferior esculent.—*W. D. H.*

(181.) **POLYPORUS SULFUREUS**; The Sulphur-clump. (Pl. VI. fig. 4.)

Habitat. On tree-trunks, chiefly of willow. In imbricate clumps.

Season. May to October. Common.

Habit. A mass of confluent, imbricate pilei, two or three feet across, compacted. In age sometimes encrusted with crystals of potassic binoxalate. A single Pileus is six to sixteen inches across, sulphur-yellow, tinged with red, smooth, undulate, irregular, lateral. Sessile. Margin uneven, irregularly indented. Pores sulphur-yellow, plane, minute. Flesh thick, yellow, doughy. Odour pleasant. Taste sour. Spores white, abundant.

Obs. While young it is esculent, and certainly better than the preceding. It requires to be sliced, well scalded and rinsed, before sweating and cooking.—*W. D. H.*

(182.) **POLYPORUS TUBERASTER**; The Italian Stone-tuft.

Habitat. On an argillaceous tufa found in Italy, called Pietra fungaia. In tufts.

Season. At all times in a temperature of 65° to 75° Fahr.

Pileus. Four to eight inches across, white, soon tawny, villoso-squamose; plane, then infundibuliform, undulate, thin.

Stem. Short, tint of pileus, rigid, slender, continuous, uneven, unequal, smooth, tapered downward.

Pores. Straw-tint, large, equal, angular, torn, decurrent. Odour aromatic. Taste sharp.

Obs. May be cultivated anywhere on the Italian "Fungus-stone," under proper conditions. See chapter xi.—*W. D. H.*

ORDER TREMELLINI.

Genus HIRNEOLA.

(183.) **HIRNEOLA AURICULA-JUDÆ**; The Jew's-ear. (Pl. XII. fig. 2.)

Habitat. On elder-trees, etc. In groups.

Season. October to May. Common locally.

Habit. Irregularly cup-shaped, ear-shaped, one to two inches deep, two to four inches across; thin, soft, elastic; exterior dusky, grey-brown, wrinkled, velvety-tomentose. Hymenium on interior surface, dingy flesh-pink, corrugate, convolute, ear-like, interstices smooth. Substance gelatinous, horny when dry. Odourless. Taste insipid.

Obs. According to monkish legend, this is the ear of Judas, which sprouts for ever upon the tree on which he hung himself. In China this and kindred species are accounted great delicacies, and are imported at great expense from New Zealand, Tonga, and Samoa, and in huge quantities. I have tried the Jew's-ear both there and here, but do not find it nice. In Europe it has been regarded as a medicine, but it possesses none of the qualities assigned to it. Rabelais mentions it as eaten in salad (Pantagruel, liv. iv.). It is simply a tasteless, mucilaginous viand.—*W. D. H.*

Genus TREMELLA.

(184.) **TREMELLA FIMBRIATA**; The Dark Jelly-sprout.

Habitat. On stumps, logs, branches, etc., in wet. In tufts.

Season. September to November. Uncommon.

Habit. Purple-black or dusky olive, two or three inches broad, gelatinous, tremulous, soft, elastic, amorphous; erect, undulate, lobulate, corrugate, dilate. Margin fimbriate. Substance jelly-like. Odourless. Tasteless.

Obs. Used abroad to colour and thicken soup. It yields a good colour by infusion. It is nutritious, but almost flavourless. It can be dried, and will revive when soaked in water.—*W. D. H.*

(185.) **TREMELLA LUTESCENS**; The Yellow Jelly-sprout.

Habitat. On stumps, logs, branches, twigs. In tufts.

Season. September to January. Uncommon.

Habit. Amorphous, small, pale yellow; jelly-like, tremulous, soft, elastic, undulate, lobulate, gyrose, entire. Substance gelatinous, not watery. Odourless. Flavourless.

Obs. Used in Germany as a substitute for Morels. Of little value.—*W. D. H.*

(186.) **TREMELLA MESENTERICA**; The Orange Jelly-sprout. (PL. XII. fig. 4.)

Habitat. On stumps, logs, branches, old posts, etc. In tufts.

Season. September to January. Common.

Habit. Amorphous, spreading to two or three inches broad, orange-yellow, smooth; ascending, expanded, gelatinous but toughish, plicate, undulate; several individuals confluent. Odourless. Taste bland.

Obs. It is commoner, and possesses a trifle more flavour than the preceding. —*W. D. H.*

(187.) **TREMELLA MORIFORMIS**; The Mulberry Jelly-sprout.

Habitat. On stumps, logs, branches, and on the ground near them. In tufts.

Season. September to November. Common.

Habit. Amorphous, small, mulberry-purple or blackish, wrinkled, folded, undulate, gyrose; smooth and shining, toughish, elastic, juicy, gelatinous; many confluent. Substance jelly-like, staining the fingers. Odour faint. Taste sub-acid.

Obs. It seems wholesome, and I find it palatable, having a tomato-like taste. But it is difficult to do anything with these Tremelles, except add them to soup. This one also yields a dye.—*W. D. H.*

ORDER HYPOGÆI.

Genus HYMENOGASTER.

(188.) **HYMENOGASTER KLOTSCHII**; Klotsch's Hymenogaster.

Habitat. Subterranean. In sandy soils, in woods and wastes.

Habit. Irregularly globose, tuberous, obovate. Peridium smooth, dirty buff, perhaps wrinkled. Base fibrillose, distinct. Substance firm, whitish, veined with reddish fibres. Odour nauseous.

Obs. It is eaten in Languedoc in spite of its smell, but is of inferior quality. —*W. D. H.*

Genus MELANOGASTER.

(189.) **MELANOGASTER VARIEGATUS**; The Red Truffle of Bath.

Habitat. Underground, or partially exposed. Beneath beeches and poplars. Clustered. Common locally.

Habit. Rounded, oval, tuberous. Peridium bright rusty-brown, minutely tomentose, without base, attached by creeping fibres. Interior black, variegated by whitish or buffish veins, which are the walls of cells inclosing the black pulp. Odour musky. Taste good.

Obs. At one time much found about Bath, and sold in the market there. It is also eaten in France; but it is an esculent vastly inferior to the true Truffles. —*W. D. H.*

ORDER TRICHOGASTRES.

Genus BOVISTA.

(190.) **BOVISTA NIGRESCENS**; The Black Puff-ball.

Habitat. On the ground in meadows and fields. Scattered.

Season. June to October. Common.

Habit. Globose, about one and a half inches in diameter, sessile, attached at base. Peridium double, outer coat whitish, smooth, flaking off; inner coat becoming black, papyraceous, tough. Flesh at first whitish, becoming coloured, eventually purple-brown dust. Odourless. Taste good.

Obs. While young, the flesh unstained and solid, it is good.—*W. D. H.*

(191.) **BOVISTA PLUMBEA**; The Leaden Puff-ball. (Pl. XV. fig. 1.)

Habitat. In fields and meadows. Scattered.

Season. June to October. Common.

Habit. Globose, about one inch in diameter, sessile, base attached by rootlets. Peridium double, outer coat white, flaking off; inner coat becoming lead-grey, smooth, papyraceous, flexible. Flesh at first whitish, becoming discoloured, eventually brown dust. Odourless. Taste good.

Obs. Like the last. Edible whilst the flesh is white and solid.—*W. D. H.*

Genus LYCOPERDON.

Obs. Puff-balls of any species are esculent if, when cut, they exhibit a solid white substance throughout. It is to be noted that even when the capillitium

is just beginning to change, and is slightly soft and discoloured at the centre, scent and flavour are already affected, and the Puff-ball is no longer nice to eat. As maturity advances, the capillitium gradually changes into coloured dust, or in wet weather often becomes a slimy, rotting mass. It has been thought to become poisonous in this stage, but I do not find any evidence of its really being so. Yet the dust of Puff-balls, if inhaled, or if introduced into the eye, will cause distressing inflammation and acute pain in the mucous membrane. This is, however, the result of mechanical irritation only, and is not due to any principle such as we should call a poison. The ripe, or partially ripened, Puff-ball has its use. When dried, it may be burnt like tinder, and the fumes are certainly narcotic. Bee-keepers make use of it in this way, and vivisectionists stupefy the subjects to be experimented on with it. When studying physiology, I have frequently seen Puff-ball so employed, and its effects are complete and lasting, though it is apt to be tedious in acting. Before chloroform was known, patients were sometimes placed under the influence of burning Puff-ball fumes, and formidable operations were conducted with the help of this anæsthetic. In some parts of Northern Europe the dust is mixed with milk, and given as a veterinary medicine to domestic animals. It acts thus as an astringent. The dry Puff-ball is also used as a styptic; but I doubt if it be not dangerous, on account of the irritation the fine dust may cause.—*W. D. H.*

(192.) **LYCOPERDON CÆLATUM**; The Embossed Puff-ball.

Habitat. In meadows and fields. Solitary.

Season. August to October. Common.

Habit. Globose above, tapered to base, rooting. Several inches high, three to six inches widest diameter. White, in age brown. Outer coat of peridium broken into large, angular, persistent warts, giving the plant an embossed appearance. Flesh white, firm, floccose; then yellow; at last brown dust. Odour aromatic. Taste bland and agreeable.

Obs. Of very good quality, of course while white and solid always understood.—*W. D. H.*

(193.) **LYCOPERDON GEMMATUM**; The Pillar Puff-ball.

Habitat. In pastures, parks, grassy woods, commons, etc. Solitary.

Season. June to September. Common.

Habit. Two to five inches high, columnar, white, brown in age. Lower part like a thick stem. Upper part enlarged, rounded, umbonate, farinose, squamose, perhaps rimose. Flesh white at first, with central floccose pith, eventually yellow powder. Odour strong, aromatic. Taste good.

Obs. Of rather inferior quality, as the flesh is woolly.—*W. D. H.*

(194.) **LYCOPERDON GIGANTEUM**; The Giant Puff-ball.

Habitat. In pastures, grass fields, parks, etc. Solitary.

Season. August to October. Common.

Habit. Globose, from four inches to two feet in diameter, white, in age dirty green. Peridium smooth like kid, sometimes flocculose and rimose. Base attached by few fibrils. Flesh firm, white, light, in age yellow-green dust, when the peridium is rent above to discharge it. Odour and taste faintly aromatic.

Obs. The best edible Puff-ball, and also the largest. It may be sliced from the top while growing, and a fresh slice taken off daily.—*W. D. H.*

(195.) **LYCOPERDON PUSILLUM**; The Little Puff-ball.

Habitat. In meadows. Scattered.

Season. June to September. Common.

Habit. Globose, half to two inches in diameter, cream-white, then yellowish and brown. Peridium flaccid, persistent, thickish, rough, slightly plicate below. Base slightly rooting. Flesh white, at length yellow-brown dust. Odourless. Flavour bland.

Obs. A good kind to eat raw, with salt and bread or biscuit, with or without butter. Very delicate.—*W. D. H.*

(196.) **LYCOPERDON PYRIFORME**; The Pear-shaped Puff-ball. (Pl. XV. fig. 2.)

Habitat. On commons, heaths, and about decaying stumps. In tufts.

Season. August to October. Common.

Habit. One to three inches high, dirty-white, soon brown; elongate, ovate, pyriform, umbonate. Peridium membranaceous, squamulose. Base distinct, rooting by long fibrils. Flesh dingy, columella conical, eventually brown dust. Odour slight. Taste good.

Obs. Of inferior quality, the flesh being woolly and the flavour not so good. —*W. D. H.*

(197.) **LYCOPERDON SACCATUM**; The Tall Puff-ball.

Habitat. Glades and borders of woodlands. Solitary.

Season. August to October. Uncommon.

Habit. Tall, erect, ovate, elongate, obtuse, variable, ding-

white, soon brownish. Peridium thin, membranaceous, areolate strongly plicate underneath. Flesh dense, spongy, white, then brown and dusty. Odour slight. Taste good.

Obs. Of fair quality, though somewhat spongy.—*W. D. H.*

Genus SCLERODERMA.

(198.) **SCLERODERMA VULGARE**; The Earth-ball. (Pl. XV. fig. 4.)

Habitat. In or near woodlands. Singly or in groups.

Season. August to October. Common.

Habit. Two to five inches in diameter, globose, irregular, base rooting. Peridium yellowish or brown, hard, corky, thick, squarrose, verrucose, areolate or dehiscent. Flesh whitey-grey, marbled, becoming nearly black. Odour strong, aromatic. Taste mild.

Obs. Edible in youth according to Vittadini. I have found it far from commendable, and it is too closely like S. verrucosa, which is held to be poisonous. S. bovista also seems to be edible, at least—innoxious.—*W. D. H.*

ORDER ELVELLACEI.

Genus BULGARIA.

(199.) **BULGARIA INQUINANS**; The Black Bulgar. (Pl. XLIX. fig. 7.)

Habitat. On logs, stumps, and deadwood, chiefly of oak. In groups or tufts.

Season. April and May, August to October when wet. Uncommon.

Habit. Conical, truncate, turbinate, sessile, brown-black, one to two inches in diameter. Exterior rugulose, furfuraceous, lacunose. Disc at first saucer-shaped, margin upturned as a brim; then plane, perhaps slightly convex, smooth. Flesh brown, thick, tough, elastic, gelatinous. Odourless. Taste unpleasant.

Obs. An inferior esculent, though reported to have been largely eaten abroad at times when it was plentiful and other food scarce. It yields a good dye, like sepia.—*W. D. H.*

Genus GYROMITRA.

(200.) **GYROMITRA ESCULENTA**; The Lorchel. (Pl. XLIX. fig. 1.)

Habitat. In woods of pine and fir. In clusters.

Season. April and May, October and November. Common locally.

Pileus. Two to three inches high or broad, bay-brown, white and tomentose underneath; bullate, inflate, sub-orbicular, lobulate, undulate, gyroso-plicate. Margin adnexed to stem.

Stem. One to two inches high, pinky-white, smooth, even, villose.

Section. Flesh firm, white, hollowed out in irregular cavities. Odour and taste pleasant.

Obs. In the raw state it contains an actually poisonous principle, which is, however, so sparingly diffused that a large quantity of the Lorchels must be eaten for it to prove dangerous. The poison is removable by the simple method of preparation I have elsewhere detailed. Lorchels are very abundant in North and Middle Germany, and are brought to market there in huge quantities. They are extremely nourishing food. The facts in regard to the properties of the species have lately been demonstrated by Ponfick. The genus comes between the Morels and Helvels, differing from the first in its pileus not being pitted, and from the last by greater solidity.—*W. D. H.*

Genus HELVELLA.

(201.) **HELVELLA CRISPA**; The Common Helvel.

Habitat. In woods, among grass and moss. In groups.

Season. October and November. Common.

Pileus. Free, lobed, deflexed, bent all ways, crisped, pallid on upper sides, pale tawny below, pinky when dry.

Stem. Two to five inches high, white, glabrous, stout, deeply lacunose and canaliculate.

Section. Flesh white, elastic. Stem fissured throughout. Odourless. Taste good.

Obs. It gives me the idea of a piece of old kid glove crumpled up and stuck on the top of a worm-eaten cabbage-stalk. The stem is here the principal part in regard to flesh. In chapter vii. This species is perhaps the commonest, and is of first-class quality.—*W. D. H.*

(202.) **HELVELLA ELASTICA**; The Little Dark Helvel. (Pl. XLIX. fig. 3.)

Habitat. In woods. In small groups.

Season. September and October. Common.

Pileus. Bistre, dark grey, mitre-shaped, lobed, free, inflated, uniform on both surfaces, thin, pendulous.

Stem. Tint of pileus, pale, elongate, slender, attenuate, pruinose not lacunose, hollow.

Substance. Thin, greyish, elastic. Odourless. Taste good.

Obs. Slight, but if plentiful it makes a very good viand.—*W. D. H.*

(203.) **HELVELLA GIGAS**; The Big Helvel.

Habitat. On sandy soil under trees. Solitary.

Season. April and May, September and October. Rare.

Pileus. Dusky brown above, whitish on under surface, large, lobed, undulate, plicate, costate with white lines; the lobes down-curved and adpressed to stem. Margins irregularly sinuate and crisped.

Stem. Three to six inches high, thick, smooth, glossy, canaliculate. Substance thick, whitish, elastic. Odour strong. Taste good.

Obs. Seldom met with here. It is of first-class esculent quality.—*W. D. H.*

(204.) **HELVELLA LACUNOSA**; The Mitred Helvel.

Habitat. On sandy soils in woods, among grass and moss. In groups.

Season. April and May, September to November. Common.

Pileus. Bistre or dark grey, inflated, in two or three lobes, these erect from centre, curving, deflexed, adnexed at margins.

Stem. Two to three inches high, whitish, dingy, thick, firm, very costate, lacunose. Substance white, thick, elastic, hollow. Odourless. Taste good.

Obs. With the rest in chapter vii. Of excellent quality.—*W. D. H.*

Genus LEOTIA.

(205.) **LEOTIA LUBRICA**; The Lizard-tuft. (Pl. XLIX. fig. 5.)

Habitat. On the ground in woods. In tufts.

Season. June to October. Not very common.

Pileus. Small, one inch across, greenish yellow, soft, gelatinous, tremulous, broadly wrinkled, smooth, viscid; convex, obtuse, irregularly undulate. Margin revolute on stem.

Stem. One to three inches high, tint of pileus, cylindrical, slender, soft, pulpy or hollow. Flesh slight, gelatinous. Odourless. Taste bland.

Obs. Small and slight, but quite good. It may be eaten with Helvels.—*W. D. H.*

Genus MORCHELLA.

Obs. The Morels are included in chapter vii. They are true luxuries, being the most dainty in flavour and nutritive in substance of all mushrooms. Their

reputation abroad is only equalled by that of Truffles. Here they are very much localized, but reappear annually, often in large quantities. It is matter of indifference which species is found, as they are all of first-class quality.—*W. D. H.*

(206.) **MORCHELLA CRASSIPES**; The Great Morel.

Habitat. Damp sites under hedges, bushes, and trees. Singly.

Season. April and May. Rare.

Pileus. Two to three inches high, brown, large, costate, lacunose; sub-conical, soft, irregular. Pits unequal, large, deep, wrinkled at bottom. Margin incurved, adnate.

Stem. Four to nine inches high, pinky white, stout, bulbous below, smoothly lacunose, hollow. Substance soft, not easily dried, soon decomposing. Odour peculiar. Taste good.

Obs. Practically only a rare and large variety of the following.—*W. D. H.*

(207.) **MORCHELLA ESCULENTA**; The Common Morel. (Pl. XLIX. fig. 3.)

Habitat. In woods, parks, and damp shady corners. In groups.

Season. April to June. Common locally.

Pileus. Two to three inches high, dirty-white, grey, ochreish, or brown, costate, lacunose; ovate, sub-conical, rounded, pyramidal. Ribs pale. Pits irregular, deep sunk, polygonal. Margin infolded, adnate.

Stem. One to three inches high, pallid, stout, smooth, scarcely lacunose, hollow. Substance whitish, soft, compact. Odour faint. Taste good.

Obs. The commonest and best species. Most excellent.—*W. D. H.*

(208.) **MORCHELLA SEMILIBERA**; The Tall Morel.

Habitat. Damp shady places in woods, etc. Singly, or in groups.

Season. April to June. Not uncommon.

Pileus. One and a half inches high, one inch broad, olive-buff, or brown, costate longitudinally, lacunose; conical, pyramidal. Pits oblong, irregular, wrinkled at bottom. Margin incurved, free. Pileus adnate half-way between margin and apex.

Stem. Three to five inches high, pallid or brownish, one inch thick below, smaller above, sub-lacunose, even, granulose, hollow.

Substance thin, white, crisp. Odour peculiar, pleasant. Taste good.

Obs. An amateur might mistake the Stinkhorn for this species. But the Stinkhorn is autumnal, and has a disgusting odour. The Tall Morel is of first-rate quality.—*W. D. H.*

Genus PEZIZA.

Obs. The genus comprehends over a hundred and sixty British species. The series Aleuria is composed of those which are of fleshy substance, comparatively large, and of terrestrial growth. These are said to be all esculent, and certainly none are noxious. But few are really commendable, and even those are insipid to eat alone. But they improve various made dishes, can be stuffed, and so forth. The best will be separately described as follows.—*W. D. H.*

(209.) **PEZIZA ACETABULUM**; The Chalice. (Pl. XLIX. fig. 6.)

Habitat. On the ground in shady woods. In groups.

Season. March to May. Not common.

Cup. Two inches broad, one and a half high, dusky brown within, paler without, thin, mouth contracted, smooth within, externally costate, venate, floccose, furfuraceous. Flesh thickish, firm, tough, waxy.

Stem. Very short, whitish, thick, costate and lacunose, hollow.

Obs. In chapter vii. The largest species, or nearly so. Wholesome, but not possessing much flavour.—*W. D. H.*

(210.) **PEZIZA AURANTIA**; The Orange Elf-cup.

Habitat. On the ground in shady woods. In clusters.

Season. July to October. Common.

Cup. One to four inches across, bright orange, rounded at first by folded margin, then expanded, broadly waved, repand, irregular, almost plane. Exposed surface or interior smooth, bright-coloured. Exterior below paler and farinose. Sessile, attached at one point. Substance tough, elastic, rather wax-like. Scentless. Taste bland.

Obs. Very brilliant and attractive. It is a safe edible, but has little flavour. In chapter vii.—*W. D. H.*

(211.) **PEZIZA BADIA**; The Common Brown Elf-cup.

Habitat. On the ground near ponds, in woods, gardens, etc. In clusters.

Season. June to September. Common.

Cup. One to two inches across, varied brown, entire, flexuose, irregular, margin at first inrolled, then repand, spreading; smooth, perhaps slightly porous. Exterior below, pale, pruinose. Base tomentose. Flesh thin, elastic, fragile. Odourless. Taste bland.

Obs. It is often very plentiful, and makes a good addition to sundry dishes. *W. D. H.*

(212.) **PEZIZA COCHLEATA**; The Snail-shell.

Habitat. On the ground among grass, in woods, gardens, etc. In clusters.

Season. July to September. Not very common.

Cup. One inch high, two and a half broad, buff-brown, whorled spirally, convolute in two lateral lobes, thin, large, fragile, sessile. Exterior farinose. Odour none. Taste agreeable.

Obs. In chapter vii. Sometimes abundant locally. Has been gathered here as a substitute for Morels. Perhaps its quality makes it more commendable than other Elf-cups.—*W. D. H.*

(213.) **PEZIZA HEMISPHERICA**; The Hairy Elf-cup.

Habitat. On the ground in damp woods. In clusters.

Season. Autumn probably. Uncommon.

Cup. A quarter to one inch broad, brown without, greenish white within; hemispherical, erect, regularly cyathiform, very villose. Substance thickish, fragile, waxy. Sessile. Scent and taste agreeably sour.

Obs. I can only say of it that it has been reported among esculent Elf-cups. —*W. D. H.*

(214.) **PEZIZA LEPORINA**; The Bat's-Ear.

Habitat. On the ground in pine woods. In tufts.

Season. June to September. Not uncommon.

Cup. One to two inches high, rusty brown, smooth and dark within, farinose and pale without; one side elongate, folded below, sub-stipitate. Substance thin, elastic. Odour slight. Taste pleasant.

Obs. It has been spoken of as an esculent of fairly good quality.—*W. D. H.*

(215.) **PEZIZA MACROPUS**; The Long Stem Elf-cup.

Habitat. On the ground in woods. In groups.

Season. April and May, September and October. Not uncommon.

Cup. Half to one and a half inches across, dusky grey; at first hemispherical, then open, flat, perhaps unevenly depressed, undulate; exterior tomentose. Substance slight, elastic, waxy.

Stem. Two or three inches long, tapered downwards, flexuose, perhaps lacunose, soft. Odourless. Taste mild.

Obs. It is commonly eaten by French rustics, but is almost flavourless.—*W. D. H.*

(216.) **PEZIZA ONOTICA**; The Hare's-ear.

Habitat. On the ground in woods. Solitary.

Season. April and May, September and October. Rare.

Cup. Two or three inches high, rosy or orange within, fawn without and farinose; dimidiate, one side elongate, irregular, bent, folded below, sub-stipitate, wrinkled in age. Base rugose, flexuose, rooting. Odour feeble. Taste agreeable.

Obs. Very scarce here, but abroad considered almost a dainty.—*W. D. H.*

(217.) **PEZIZA VENOSA**; The Scented Elf-cup.

Habitat. On the ground in woods. In clusters.

Season. March to May. Common.

Cup. One to four inches across, dark velvety brown within, opaque white and farinose without; irregular, twisted, oblique, spirally folded, or repand. Exterior rugose, venose, costate. Substance thin, tough. Scent like nitric acid. Taste mouldy.

Obs. It is of fair quality, as it possesses some flavour of its own.—*W. D. H.*

(218.) **PEZIZA VESICULOSA**; The Bladder Elf-cup.

Habitat. On hot-beds, dunghills, garden plots, etc. In small groups.

Season. March to May, September to November. Common.

Cup. One to three inches across, dingy drab or brownish; at first spherical, mouth contracted, then more turbinate or cyathiform. Margin crenulate, sinuate, convolute. Exterior granulose,

furfuraceous. Base tomentose. Substance thin, fragile, sub-translucent, waxy. Odourless. Taste bland.

Obs. It may be dressed raw for salad, or cooked like the others.—*W. D. H.*

Genus VERPA.

(219.) **VERPA DIGITALIFORMIS**; The Thimble-finger. (Pl. XLIX. fig. 4.)

Habitat. In damp, shady sites. Solitary.

Season. March to May. Rare.

Pileus. Half an inch high and broad, dull brown at apex, greyish below; obtusely conical, irregular, free, but adpressed to stem. Margin smooth or sub-rugulose. Inside whitish and minutely tomentose.

Stem. One to three inches high, white, with tawny floccose patches, stout, nearly equal, perhaps bent, rooting.

Section. Flesh thin, fragile. Stem loosely stuffed, or hollow below. Odourless. Taste bland.

Obs. It seems rare with us, but is a good deal eaten in Italy. It is of inferior quality.—*W. D. H.*

ORDER TUBERACEI.

Genus TUBER.

(220.) **TUBER ÆSTIVUM**; The Summer Truffle. (Pl. L. fig. 1.)

Habitat. Underground, in beech woods. In clusters.

Season. June to October. Supposed to be common.

Habit. Globose, irregular, one to three inches in diameter, dark brown-black, strongly verrucose. Warts large, polygonal, pyramidal, transversely striate.

Section. Solid, flesh whitish at first, soon clay-colour, white-veined. Odour aromatic. Taste peculiar.

Obs. This species may be common enough, but of course there is difficulty in searching for and finding it. It is of good quality, though it has less flavour than T. magnatum or T. cibarium, the most prized French species, which have not been found in Great Britain.—*W. D. H.*

(221.) **TUBER BRUMALE**; The Winter Truffle. (Pl. L. fig. 2.)

Habitat. Underground, in oak woods. In clusters.

Season. October to January. Supposed to be common.

Habit. Globose, irregular, one to three inches diameter, bright brown, blackish, verrucose. Warts dark, polygonal, smooth.

Section. Solid, flesh grey or grey-buff, marbled with very distinct white veins. Odour aromatic. Taste agreeable.

Obs. Of finer flavour than the other. Possibly abundant locally. These two species are the only ones, out of a considerable number indigenous to Great Britain, which are known esculents.—*W. D. H.*

CHAPTER IX.

On the Chemistry and Toxicology of Fungi.

It would seem that English men of science have not been attracted to the study of Fungi, in regard to the chemistry of them, or to the physiological properties their various components possess. At present all our available information of this sort must be drawn from foreign sources. A variety of facts have been gathered up abroad, by one person and another; and though investigation has been very partial, limited, and desultory, the aggregate knowledge thus acquired is not inconsiderable, and is sufficient to prove the importance of the subject, and to serve as a sure basis for further research.

Investigation has proceeded in various ways. First, information has been collected of that kind we may term folk-lore. The practice of the populace in different countries and localities has been noted, in respect of the particular species of Fungi employed as food or otherwise, and the special methods of such employment. Here and there medical men have had opportunities of watching the effects of a fungus diet, or have had to study and contend with cases of fungus poisoning. Again, chemists have undertaken the minute analysis of sundry species of Fungi; and lastly, physiologists have experimented and practically tested some of the effects produced by different Fungi on the economy of men and animals. Information so acquired is fragmentary, and must be gathered piecemeal from the various countries of civilization during an extended period. Putting together and comparing all results obtained, we shall find a fair accumulation of ascertained facts, some abstract of which is here set forth.

The first thing we learn is to appreciate the distinctions and differences which make one species unlike another, in constituent character as in external habit. This separation of genus from genus and species from species has been emphatically urged frequently in this work. And, indeed, it cannot be too strongly forced

upon attention; for persons new to the subject appear to find a difficulty in receiving the idea of discrimination. They are dominated by the erroneous notion that species of Fungi differ little from one another, and that a few broad generalized distinctions are enough to know. But though all Fungi have much in common, there are not only external features but also elements of their composition which divide the most closely allied species from one another, and which give to each a distinctive identity which is fixed and invariable, wherever and whenever that species may grow.

Various analyses concur in showing that there are certain constituents which are held in common by all of the larger Fungi yet examined. But there is entire difference among the species as to the proportions in which these common constituents are severally blended in them. They are as follows:—

Water; sometimes in certain species nine-tenths of the gross weight.

Cellulose or Lignose, constituting the fibrous structure of the plant ($C_{12}H_{29}O_{19}$).

Proteids; namely, a nitrogenized substance insoluble in water; a second nitrogenized substance soluble in water and coagulable by heat (albumen); and a third nitrogenized substance soluble in alcohol (osmazome).

A fatty matter analogous to wax (adipocere).

A fatty matter like tallow, resolvable into a fluid (olein), and a body solid and crystallizable at ordinary temperatures (stearin).

Sugar, of the kind called specifically mannite.

A resinoid matter, which becomes brown on exposure to the air.

Traces of salts of potash and silica, and of sulphur.

Over and above the foregoing constituents, Fungi possess others which are not common to all species, but one or other of which may be found in particular species. These peculiar and especial constituents are gelatine, gum, mucilage, bassorine, inuline, dextrine, glucose, essential oils, colouring matter; also citric, malic, oxalic, phosphoric, and fumaric acids; also salts of potassium, sodium, and calcium; and other matters unnamed or not yet isolated, on certain of which may depend the scent and taste of the species. For the odours and flavours of Fungi are exceedingly various, and differ very greatly in one species and another, often affording great assistance in the determination of species. Many being peculiar, without common analogues, are almost impossible

to describe in set terms. But it will be seen from the two catalogues that scent and taste afford no indication of the relative wholesomeness or noxiousness of species generally. They do not depend upon the same essences which exert an injurious influence on our bodies.

Lastly, we find that sundry species of Fungi are infiltrated by extractive essences, some of which set up a peculiar morbid action when taken into the bodies of men or animals. These essences may be alkaloids, but none of them have yet been isolated, or, at least, have not been found to act as bases in the presence of acids and to form salts with them. Until further examination of them has been carried out, we must be content to call them active principles, extractives, or essences. Some of these principles have been to some extent examined, and have been named, such as Agaricine, Amanitine, Bulbosine, Ergotine, Geine, Muscarine, Mycetine, etc. But some of the names are indistinctive. It must be borne in mind that these fungus essences vary exceedingly in action and power of action. There is little community between them. True, there is usually a similitude of action in the principles found in different species of the same genus or sub-genus; but there is diametric difference between these and others. Nor are we justified in supposing, for instance, that the Bulbosine of *Amanita phalloides* is identical with the Muscarine of *Amanita muscaria*, though both act similarly; or that it is right to consider these principles, together with those of other Amanites, under the one title of Amanitine. Belladonna, Stramonium, and Henbane are not considered identical, though their action is very similar; and neither ought the essences of the sundry Amanites to be considered only one. The cases are strictly parallel.

Passing back to the common constituents, it is easy to understand that every chemist who has analysed Fungi has been forcibly struck by the amount of nutritive matter contained in them. In this particular they absolutely surpass every other class of vegetable. And observation of the effects produced by a prolonged diet mainly composed of Fungi has established beyond doubt that they afford an unusual amount of nourishment. There is, then, scientific evidence to support the popular instinct which—in most countries but our own—causes people to eat Fungi, to regard them not merely as tasty adjuncts to a meal, but as the meal itself, and to bestow on them such grateful names as "manna of the poor." And this, too, despite risks of poisoning, despite the spectacle of

occasional accidents! In the analysis of a mushroom is made clear the reason why of fungus eating. The wisest investigators of Fungi have studied, not to deter people from eating material so remarkably well adapted by Nature to the needs of the human body, but to increase a knowledge of species, so as to lessen the risk of mistakes and accidents, and to verify means of rendering noxious kinds harmless and wholesome.

The name of *Fungine* has been applied to the solid matter of Fungi, as apart from the water and soluble extractives contained in them. This is the nutritive part, but it owes its alimentary excellence chiefly to the proteids. These belong to the same class of matters as the gluten of wheat, the legumin of beans and lentils, and the caseine of milk. Their composition is identical with that of the constituents of blood, and hence they are flesh-and-blood-making material. They exist in all species, but not in the same proportions; consequently some kinds are more nourishing than others. An analysis of the dry Fungine of certain well-known esculents showed nitrogen to be present in the following proportions:—The Pratelle (*Agaricus campestris*), 7·26 per cent. The Black Bolet (*Boletus æreus*), 4·70 per cent. The Redmilk (*Lactarius deliciosus*), 4·68 per cent. The Bisotte (*Russula heterophylla*), 4·25 per cent. The Chantarelle (*Cantharellus cibarius*), 3·22 per cent.[1]

Another chemist[2] found a less percentage in the Pratelle, but the circumstance is attributable to his having employed the cultivated variety (*A. hortensis*), for analysis. And other researches indicate that the Pratelle loses protein the wider the circumstances of its growth depart from the natural condition. As might be safely supposed, too, it has been proved that the young mushroom or "button" is far less nutritious than the mature plant. The proportion of nitrogen in the dried Fungine of the various parts of the Pratelle is given by the same analyst as follows:—Cap, 3·51 per cent. Gills and Spores, 2·10 per cent. Stem, ·34 per cent.

From the most recent analyses it would seem that the commonest species of Truffle and Morel are the richest in proteinaceous matter. The relative values are thus set forth, the percentage being that of the proteids found in the dry Fungine: The Truffle (*Tuber cibarium*), 35 per cent. The Morel (*Morchella esculenta*), 36·25 per cent. The Lorchel (*Gyromitra esculenta*), 26·31 per cent.[3]

[1] Dopping and Schlossberger. [2] Lefort.
[3] *Die Breslauer ärztliche Zeitschrift;* pro. 1882, Nr. 16, u. 17.

By way of comparison, let some familiar examples of vegetable food be similarly examined. We shall find the proteids in their dry substance to be as follows:—Lentils, 29·31 per cent. Peas, 28·02 per cent. Barley, 17 per cent. Wheat, 16 per cent. Rye, 12 per cent. Potatoes, 1·66 per cent. Turnips, 1·5 per cent.

These are among the most valuable vegetable foods we possess, their value depending on the amount of nourishment they afford, and that being estimated by their richness in proteids. As mushrooms are shown to possess proteids in greater quantity, it is evident they must be of higher nutritive value. But besides the proteinaceous components of Fungi, there are others to be considered. Foremost is the Cellulose, which constitutes on the average 40 to 50 per cent. of the dry Fungine. This may be held equivalent to the starch of the other vegetables just mentioned, as an amyloid, or heat-producer. In the Morel, mannite and glucose exist to the amount of 9·58 per cent.; in the Lorchel to that of 5·59 per cent.; and in other species in varying proportions. They are important in an estimate of nutritive constituents. Starch is not found in Fungi, but the fatty matters, which average 10 or 15 per cent. of the Fungine, are certainly of alimentary value.

Consideration of these facts shows that Fungi have a very high economic value. They afford food which is readily adaptable, agreeable, and especially sustaining. The knowledge that there exist species permeated by poisonous juices has not been sufficient to deter men from eating innocent ones. It is instinct which tempts the poor forester or peasant to resort to the use of Fungi —a true instinct, because a natural craving for suitable food. Even in our own country, where the knowledge of Fungi has always been popularly most limited, where dread and prejudice have ever been exaggerated, there has always been a great liking for, and large consumption of, the familiar Pratelles. In these days of light, of increased and widespread knowledge, of waning prejudice and advanced utility, there is hope that the economic importance of Fungi may cease to be disregarded. Here are annual tons of food, now wasted; and here, too, are poverty and hunger! Is it, then, absurd to advocate the use of this food, to relieve, as far as it may, this distress? If the more delicate species could be brought into general favour, then they would assume marketable value, as is the case abroad; and the humble gatherers would gain thereby, while also learning to make use themselves of less choice kinds. In Ireland, a few years ago, there was failure

of the harvest and consequent famine. But the same unusual moisture which accelerated the potato-disease, also favoured the growth of Fungi. People starved—even to death—ignorant that all around, in every wood, field, pasture, waste, and even bog, the earth was offering a store of food, nutriment of a far richer sort than the potato. One autumn the author saw, in Yorkshire, immense quantities of certain Fungi, which are best adapted for drying, salting down, and otherwise being stored up, neglected as usual, and rotting where they grew. In the same neighbourhood there was great distress in the ensuing winter. Had those crops of Fungi been utilized, surely they would have been of *some* avail, even if not of much! These are high grounds, but they are true grounds, on which to base advocacy of fungus-eating, a subject which English people are prone to consider a ridiculous one!

Those Fungi which contain poisonous elements are in other respects similarly constituted to their innocuous congeners. Hence they are equally nourishing food, if they could be deprived of their venom. In some cases this can be done. Some process of washing or maceration removes or neutralizes the poisonous principle, and the fungus becomes fit for food. In this way some species which are undoubtedly poisonous are actually treated and eaten by the peasantry of Russia, France, and elsewhere. But it is advisable to remember that a method sufficient in the case of one species or a series of species may be quite ineffective in the case of other species. Yet it is quite possible that a process might be found that would eliminate the poison of any species, and render the mushroom harmless and esculent. Let not the reader be surprised at this. There is analogy in the case of the common article of food known as tapioca. That substance is prepared from a root whose juices are poisonous in a high degree; yet no one hesitates to eat it, therefore. Why may not the richer material of Fungi be freed from deleterious essences likewise? Nor has the fact that poisonous species of Fungi may be rendered harmless and edible, been gathered solely from rural traditions and usages. It has been tested and experimented on by many men of science, and various noted names[1] can be cited in support of it, to a greater or less extent.

Such English authors of medical and scientific works as make any allusion to the poison of Fungi, or to its effects, appear to

[1] Boudier, Bulliard, Chansarel, Cordier, Gerard, Germann, Gobley, Krapf, Lenz, Letellier, Paulet, Ponfick, Pouchet, Schrader, etc., etc.

have been under the impression that the poisonous element in all kinds of Fungi must necessarily be identical, both as to its character and as to its effects. Nothing could be farther from the truth. The poisonous essences of different Fungi are radically diverse. In species of the same genus or sub-genus, where there is close alliance, the poisonous essences preserve a certain family resemblance as to their action, generally, though not invariably. But those of different genera often manifest entirely various characters. There are fungus poisons belonging to each of the three grand classes: narcotic, narcotico-acrid, and irritant or caustic. Some of these have specific action, influencing some particular organ or organs of the body. A prominent example of these is Ergotine, which is a principle found in *Claviceps purpurea*, a kind of bunt parasitic in the ear of rye and some other cereals. Its peculiar action is well known, and has caused it to be largely employed in medicine. Among the larger Fungi, the objects of our present inquiry, one or two specific principles have also been found. But researches into these particulars have been so limited that a vast field still lies open to the explorer. It is the more to be regretted that inquiry is practically forbidden here, by that singular enactment of ignorant philanthropy, which makes it an offence to conduct experiments on animals. For that is, of course, the only way in which satisfactory knowledge of the actions of these principles could be obtained. We Britons must look to foreign sources for more light.

The great genus Agaricus contains a number of poisonous species. The principles of these have severally a widely diverse action. But where more than one species in a sub-genus are permeated by a noxious constituent, then these essences are found to be of similar character, though not perhaps actually identical. Those of which most is known are the poisonous species of the sub-genus Amanita. This sub-genus contains some entirely wholesome and esculent species, and six which have been demonstrated to be poisonous; besides some others whose qualities have not yet been determined. The order of their relative noxiousness may be stated as follows:—The worst is *Am. phalloides;* then come *Am. mappa* and *Am. verna;* then *Am. muscaria;* and lastly, *Am. excelsa* and *Am. pantherina.* Whether the poisons of these Amanites are identical or not, when they are extracted, is yet uncertain. But there is no doubt that the plants are not equally virulent. To eat but a portion of one mature specimen of *Am. phalloides* is almost certain

death, and the two next are but little less dangerous. *Am. muscaria*, whose scarlet cap with white warts is so often seen, enjoys a worse reputation in England than it deserves. It has rarely proved fatal, though eaten in large quantity. The remaining two are even less deleterious. *Am. muscaria* is the poisonous mushroom best known in England. This is partly because it is conspicuous and common, and partly because a decoction of it is an old-fashioned means of exterminating flies. Great capital has also been made of the story that it is used as an intoxicant by the natives of Kamstchatka. This tale, so often repeated, decidedly wants sifting. No doubt there is some substratum of truth in it. But the effects produced by this species of fungus, or by its active principle Muscarine, differ altogether from the kind of intoxication the Kamstchatdales are said to derive from it. But these circumstances have drawn much attention to the species. Muscarine, or an extract so called, has been introduced into medicine as a sialogogue, which it is in small doses, and as a remedy for epilepsy, which it certainly is not. The plant is eaten both in North Russia and in Southern France, but of course after being boiled and washed to carry off the Muscarine.

The Amanitines, as we may term the various extractive essences of these Amanites, are narcotico-acrid. If the mushrooms are eaten, they are wholly digested before symptoms appear, so that evacuation is impossible or useless. Often twenty-four hours elapse between ingestion and the commencement of morbid symptoms. These are principally of a nervous character, though there is some irritation of the digestive canal as well. Progress is speedy; delirium, narcotism, coma, death; or in fortunate cases, very slow and painful recovery. *Am. phalloides* kills in a few hours after the first symptoms appear. The poison, in this species, resides most largely in the bulb of the stem. If any of these plants are brought in contact with scratches or abrasions on the hand or elsewhere, the poison will be absorbed and produce its ordinary effects; but no local inflammation is set up.

In 1854, Frédéric Gérard proved, in a somewhat dramatic manner, that the Amanitines could be easily separated, and the plants rendered fit for food. He demonstrated this before a commission appointed by the Conseil de Salubrité of Paris. The method adopted was this. Gérard put three spoonfuls of vinegar, or two of grey salt, in a litre of water. He took 500 grm. of *Am. phalloides*, *Am. muscaria*, and other Amanites, cut them in

pieces, and steeped them in the solution two hours, then draining them and rinsing in fresh water. He then put them into cold, pure water, and brought this to boil, keeping it boiling for half an hour. Then again the mushrooms were drained, rinsed in fresh water, and lastly dried in a cloth. They were then dressed in some simple fashion and eaten by Gérard and his family, proving to be quite harmless.[1] It was thus shown that any of the Amanites, however deadly in their natural state, could be rendered eatable. But we must be careful not to assume, without further proof, that this method is efficient in the case of noxious mushrooms belonging to other subgenera or genera.

Entoloma clypeata, and probably other Entolomes, contains an essence which differs from those of the Amanites. It begins to act not until hours have elapsed after ingestion. The symptoms are dizziness, vertigo, confusion of mind, partial paralysis, and eventually coma, ending in slow recovery or speedy death. There is no irritant effect, or only slight and indirect, so the poison may be classed as narcotic simply. The poisons of certain Hebelomes seem to be similar, but slightly irritant as well; whereas those of Hypholomes are terribly irritant, and only slightly narcotic.

Poisonous species of the genus Russula act with extreme rapidity. No sooner is the mushroom swallowed, or even taken into the mouth if raw, than the poison attacks the mucous membrane of the throat and æsophagus. Russuline, so to call it, is frightfully irritant. The whole tract of the alimentary canal becomes rapidly inflamed; there is vomiting, dysentery, and severe ulceration of the bowels. Nervous derangement accompanies the latter stage. But the very nature of the poison minimizes its effects. The system is relieved by the vomiting and purging, and moreover, some amount must be eaten to produce a fatal ending. It is to be noted, too, as will be seen in the catalogue, that there are differences in the nature of the poisonous species of Russula. Krapf could not separate the poison from *R. emetica* by boiling or maceration, whereas *R. fragilis* appears to be so rendered harmless, and is then eaten about Nice. In the North of France, people seem to eat all sorts of Russules promiscuously, but they soak them in vinegar and water before dressing them. Probably this destroys the poison. *R. rubra* is more narcotic in its effects than *R. emetica*, though both are equally irritant. All the noxious Russules sting the tongue if

[1] *Revue Scientifique et Industrielle*, 1854.

tasted raw, while innocuous species are bland. This hint may be a safeguard to those who gather them.

Lactarine, if the poisons found in the genus Lactarius may so be termed, produces much the same train of symptoms as Russuline. But it is more to be dreaded. It acts much more slowly, hence there is little or no vomiting, the mushroom is retained in the stomach, the poison more fully imbibed, and the resulting ulceration and agony more frightful. Convulsions and paralysis often appear before the end. *Lact. rufus*, the Slayer, is decidedly the worst, and has caused many fatalities. A mere touch of its milk on the tongue inflames the mouth and fauces, as the author knows to his cost. But acridity in this genus is not an invariable sign of poison, as it is in Russula. The Lactarine is blended with some acrid resinous matter. On account of the resinous constituent, the poison cannot be separated by boiling, washing, or maceration in plain water. But the usage of Russians and Poles appears to show that salt and vinegar neutralize Lactarine. In various parts of Europe the poisonous Lactars are safely eaten, after having lain in pickle or brine for some time. There is much difference, too, in the relative virulence of species.

Boletine, a poisonous essence found in a few species of Boletus, is a simple irritant, giving rise to no nervous derangement at all. It appears to be slightly emetic and powerfully purgative. It acts within an hour or two of ingestion, and the effects are speedy and transitory, leaving no ill consequences. Very rarely has even *B. satanas*, the most virulent species, caused more than a passing colic. *B. luridus* does not develop the Boletine until full grown, and in all species containing it the essence is sparingly diffused. Debility caused by the purging is the worst symptom to be feared. Boletine is volatile, and disappears altogether when the Bolets are dried.

Gyromitra esculenta is the only species of all the Elvellacei ascertained to be poisonous. It has a unique history. As will be seen from its name, it has always been considered edible. In great part of Germany it is a very common mushroom, appearing in spring, and being brought to market in large quantities. But now and then accidents were traced to it, and a belief arose that it must be unsafe sometimes, under unknown conditions. Here, where the species is uncommon, and where there are few who would eat it, it was sufficient for Berkeley to note the circumstance. And no doubt this helped to create or perpetuate the belief that any

mushroom might be unsafe "sometimes," no one knowing why or how. But in Germany, where this species is largely eaten, and greatly esteemed, both for its flavour and nutritiousness, the uncertainty regarding it attracted much attention. Prof. Ponfick, of Breslau, undertook a protracted series of experiments, and succeeded in establishing the character of the species, at the same time demolishing the theory of uncertainty and variableness. He found in the species an essential principle which may for the present be termed Lorcheline. This, however, is but sparingly diffused in the plant, and is removable by boiling water. (See Culinary Receipts, No. 112.) If eaten unboiled to the extent of a quarter or half a pound, sickness would result, and death might follow the consumption of a pound or two. But it is customary on the Continent to scald mushrooms before cooking, and no doubt that practice had some effect in minimizing accidents, as they had occurred in small proportion to the quantity of Lorchels annually consumed. When dried, too, the Lorchel slowly loses the poisonous essence. It begins to disappear a month after drying, and in six months the mushrooms are quite innocuous. Lorcheline, according to Ponfick, is not narcotic, nor does it attack the mucous membrane of the alimentary canal. It has specific action on the kidneys, causing elimination of the red corpuscles of the blood, and setting up acute nephritis and congestion of the spleen and liver.

From these examples it will be seen that the poisonous essences of different Fungi are of very varied kind. It is evident they must be discriminated, one from another. Little has yet been done to ascertain their precise and varying qualities, and no more can be added to what has just been said on this subject. But there are sundry reasons why the examination of fungus principles should be recommended to the notice of physicians, chemists, and toxicologists. In the first place, some of these essences have specific action. The example of Ergot should encourage further research. For there may lurk in certain Fungi as yet undreamt of agencies of a kind invaluable in medicine. Some of these essences may have actions as unique and valuable as that of Ergot, though of a different kind, and might prove to be weapons of power in the struggle with disease.

In certain instances it has been shown that the poisonous essences are easily removable from the bulk of the plant, or that they can be destroyed, neutralized, or rendered inert, or that they

are volatile and disappear. Extended inquiry into these characteristics might enable us to render available a larger number of Fungi for food; and it has been shown of what valuable quality that food is. If Fungine were never to be taken into favour as human food, is it not possible that it could be prepared as a food for domestic animals?

So little is known, generally speaking, about fungus-poisons, that if a physician were called to a case of fungus-poisoning, he would be quite at sea. Without knowing anything about Fungi, or about the action of their essences, how would it be possible for him to act? His diagnosis would not tell him what to do; and if he knew nothing of the special *corpus delicti*, nothing of the train of symptoms it would set up, how could he make a prognosis at all? He could only meet such symptoms as he saw, without knowing what might be expected to follow. He would take refuge in the stomach-pump, or emetics, perhaps. In some cases this would be useless, if Amanites or Entolomes had caused the poisoning; in others, if, for instance, Lactars were the agents, such means would but accelerate and increase the disorder—the inflammation of the membranes.

Acute attacks of indigestion, occurring after some meal of which mushrooms have formed a part, have often been set down to fungus-poison. The doctor warns the patient, sapiently! the patient never again dares to touch a mushroom, and perhaps the local newspaper fulminates on the subject. It might have been the cream, the cucumber, the lobster, or the wine; but no, the mushroom explains everything to prejudiced opinion! Again, idiosyncracy of temperament occasionally causes what may be wrongly deemed a case of poisoning. The stomachs of some of us have an antipathy to certain things, which other people eat with impunity. The author well remembers a case of "fungus-poisoning" *apropos* to this. He had gathered a basket of Chantarelles and invited a friend to sup with him upon them. The friend was timorous and ate sparingly; the author devoured the greater part of the dainty dish. A few hours later the friend finds himself "poisoned," vomiting, purging, etc., though the author never felt better. Curious! People look askance at the author, and for some days blame him severely. At length comes the explanation. The friend was the victim of serious organic mischief. His economy was in fault, not the Chantarelles. Many wholesome and familiar viands acted similarly upon him. Yet, seriously, mush-

rooms have often been set down as poisonous on no better grounds.[1]

In a real case of poisoning by a fungus, no physician is in a position to cope with the disorder unless he knows more than most physicians do. Unless he knows the radical differences of fungus-poisons, knows the actions peculiar to each, or to each series, and can recognise the one which he has to deal with, upon what is he to base his line of treatment? It has been stated that the more narcotic poisons do not begin to act until digestion has far advanced. The stomach-pump, or evacuatory remedies are useless in such cases. When symptoms appear shortly after ingestion, one of the caustic poisons is to be feared, and then evacuatory means would probably only aggravate the mischief. In the latter case the author would be inclined to trust to the exhibition of oil and demulcents in large quantities, perhaps with subcutaneous injection of morphia, to be followed by strengthening and stimulating remedies in due course. To meet the narcotic poisons, astringents might be useful with, in some cases, stimulants, in others, such sedatives as bromide of potassium. But these are no more than suggestions. More investigation is needed; more knowledge required, more certainty essential.

There is yet another startling and formidable reason why the examination of fungus-poisons should be pressed upon the attention of those most fitted to undertake such a task. Suppose that a modern Locusta, or, say, another Pritchard, were to arise, and to find a weapon, secret and sure, drawn from this department of the vegetable kingdom. Let us suppose that the poisoner used Lorcheline, for instance. We have no physician who could diagnose the case, because all knowledge of fungus-poisons is a dead letter here. The poison in question acts in so peculiar a manner, disturbing neither the brain nor the alimentary canal, that the mischief would probably be relegated to organic or functional disorder—to the visitation of God, as the juries say. Suppose Bulbosine were used. Physicians could only *assume* that a poison had been administered; they could not swear to it, because they could not recognise the symptoms. And of any

[1] The author has seen esculent mushrooms selected from a heterogeneous basketful, and upon them has found spores deposited by some poisonous species which had lain on top of them. Now the spores are often the most virulent part, and hence these esculent mushrooms might have been thereby rendered hurtful. This shows that the gatherer should be able to discriminate properly the species he gathers.

fungus-poison, there lives not yet the chemist who could find a trace in the body of one done to death thereby, supposing that the material of the fungus itself had not been used!

For these reasons and more, the author earnestly urges upon men of science in this country, men who have the means, the opportunity, and the ability for the undertaking, to disregard Fungi no longer, but to make them the subjects of analysis and experiment. There is a wide field for new discovery here offered. The matter is one of high importance. It is unwise to continue in ignorance of this province of vegetation; it is foolish to ridicule the mycologist, as many do; it is not prudent to disregard this chapter in the Book of Nature!

CHAPTER X.

A Catalogue of British Poisonous Fungi.

*** In this list are described all of our larger Fungi which have been demonstrated to contain some essential principle which induces morbid effects if taken into the body. Subjoined are notes stating what is known of each species in particular, without recapitulating what has already been said in the preceding chapter, to which the reader is referred. Mention is also made of some species which there is reason to suspect of being poisonous, but whose qualities have not been ascertained as yet, and which cannot therefore be certainly stated to contain noxious essences until further light shall have been thrown upon them. For sundry "suspects" have turned out, upon careful examination, to be really quite harmless. This catalogue is imperfect, and affords very limited information. Still, in conjunction with the last chapter, the author believes he has collected all precise details on the subject yet known to the world. The paucity of this knowledge of fungus toxicology should evidence how desirable it is that further investigation should be undertaken by the scientific world, especially here, where the subject has hitherto been almost wholly overlooked in the right quarters.

ORDER AGARICINI.

Genus AGARICUS. Sub-genus AMANITA.

(I.) **AGARICUS EXCELSUS**; **Amanita excelsa**; The Tall Amanite.

Habitat. On the ground in hilly woods. Solitary.

Season. July to October. Not common.

Pileus. Three to six inches across, grey, grey-buff, moist, verrucose; spherical, then convex, plane. Warts large, conical, scattered, irregular, fugacious. Cuticle tough, separable. Margin smooth, even, or striate in age.

Stem. Four to seven inches high, white, thick, firm, striate at apex, squamulose above, squarrose below. Base bulbous. Ring white, large, medial, tomentose. Volva dingy, fugacious, half-buried.

Section. Flesh white, unchanging, thick, firm. Stem stuffed. Gills white, broad, unequal, thick, ventricose, crenulate, rounded behind, free. Odour and taste agreeable. Spores white.

Obs. Principle narcotico-acrid. Much less virulent than other Amanites. Its nature was determined by Tulasne. It must not be mistaken for a Parasol. —*W. D. H.*

(II.) **AGARICUS MAPPA**; **Amanita mappa**; The Sorceress.

Habitat. In woodlands and parks. Scattered or in groups.

Season. July to November. Common.

Pileus. Two to three inches across, usually sulphur-yellow, sometimes white, greenish, or pale fawn, dry, smooth, glossy, subverrucose; convex, then plane, even. Warts white, few, flocculose, fugacious. Cuticle adnate. Margin striate.

Stem. Three to five inches high, white, thick, smooth, attenuate above, bulbous below. Ring membranaceous. Volva slight.

Section. Flesh thickish, white, brittle. Stem stuffed, at length fistulose. Gills white, numerous, straight, unequal, broad, adnexed. Odour faintly disagreeable. Taste scarcely unpleasant. Spores white.

Obs. An exceedingly beautiful species. Its principle is narcotico-acrid, and the plant is extremely virulent, scarcely less so than Am. phalloides. It is mentioned in chapter ix.—*W. D. H.*

(III.) **AGARICUS MUSCARIUS**; **Amanita muscaria**; The Scarlet Fly-cap. (Tab. 1. fig. 1.)

Habitat. In woods, parks, hedge-sides, etc. Solitary, or in groups.

Season. August to November. Common.

Pileus. Three to seven inches across, scarlet, verrucose, viscid in wet; at first spherical on bulb, then convex, expanded, nearly plane. Warts white, large, angular, conical, numerous. Margin often orange, thin, striate.

Stem. Two to nine inches high, white, thick, bulbous below. Ring large, white, deflexed. Volva fragmentary at length.

Section. Flesh white, yellow under cuticle, thick. Stem stuffed.

Gills white, broad, ventricose, unequal, adnexed. Odour faint. Taste bitterish. Spores white.

Obs. Referred to in chapter ix. Narcotico-acrid, but much less virulent than other Amanites. It is a species which, under favourable conditions, will attain extraordinary size. In a bramble-covered pit I found two specimens, the largest of which was nearly three feet high and some twenty inches across the pileus. The differences between it and the Blusher are so obvious that a child would not mistake one for another. But abroad it has been often mistaken for the Oronge, which is nearer to it in colour.—*W. D. H.*

(IV.) AGARICUS PANTHERINUS; Amanita pantherina; The Panther-cap.

Habitat. On high grounds in and about woodlands. Solitary, or scattered.

Season. August to November. Uncommon.

Pileus. Two to four inches across, livid buff or brownish, concentrically verrucose, viscid in wet, soft and smooth in dry weather; convex, then expanded, plane. Margin thin, striate. Warts white, mealy, flat, scale-like, persistent.

Stem. Three to five inches high, white, even, thick, silky-smooth. Base bulbous. Ring deflexed. Volva close-sheathing, smooth, edge free.

Section. Flesh not thick, white, unchanging. Stem stuffed, at length hollow. Gills white, unequal, broad in front, the shorter ending abruptly, the longer adnexed. Odour slight. Taste salt and bitter. Spores white.

Obs. Narcotico-acrid, but not virulent. Cordier proved its quality. I once ate two specimens, before I knew better. In eight or ten hours I experienced giddiness, vertigo, nervous trembling, and some time after painful colic. These symptoms passed off, but next day urticaria showed itself, and lasted a week. The species must not be mistaken for the Blusher.—*W. D. H.*

(V.) AGARICUS PHALLOIDES; Amanita phalloides; The Arch Bane.

Habitat. On the ground in and about woods. Singly, or scattered.

Season. August to November. Common.

Pileus. Two to five inches across, pallid, or white, or livid, yellowish, greenish; smooth, glossy in dry weather, viscid in wet, scarcely or not verrucose; campanulate, then convex, expanded,

plane, obtuse. Warts floccose, scattered, patchy, fragmentary, white, fugacious. Margin even, regular, not striate.

Stem. Three to five inches high, white, stout, attenuate above, sub-fibrillose, bulbous below. Ring large, membranaceous, deflexed. Volva ample, loose, expanded, free.

Section. Flesh thick, white, unchanging. Stem stuffed, at length hollow above. Gills white, numerous, unequal, rather broad, straight, free. Odour peculiar. Taste scarcely acrid. Spores white.

Obs. Mentioned in chapter ix. It is an elegant species, and probably as virulent as any known. In youth it is enticing in appearance, and neither scent nor taste are then against it. The principle, Bulbosine, is a narcotico-acrid, and is always present. The green variety occurs late. This variety *has* been mistaken for the Bisotte by a person who knew nothing of Fungi, and who took an illustration for his guide, paying no attention to the verbal description. I probably saved him from death by explaining the mistake, luckily before any were eaten. There is really no resemblance, if the characters are known. Yet this shows that plates are deceptive, if not used in conjunction with a description of structure. I think that inferior illustrations are a snare.—*W. D. H.*

(VI.) **AGARICUS VERNUS**; **Amanita verna**; The Destroying Angel.

Habitat. In and about woods. Solitary, or in small groups.

Season. May to August. Common locally.

Pileus. Two to four inches across, snow-white, satin-sleek in dry weather, viscid in wet, patchy-verrucose; at first ovate in volva, then campanulate, convex, expanded, plane. Warts floccose, irregular, few. Margin even, regular, smooth, perhaps fimbriate at first from veil.

Stem. Three to six inches high, snow-white, elongate, equal above, bulbous at base. Ring large, high, membranaceous, deflexed. Volva large, loose, close-sheathing, persistent, free.

Section. Flesh thickish, white, unchanging. Stem stuffed. Gills white, numerous, unequal, free. Odour faintly aromatic. Taste at first mild, in age acrid. Spores white.

Obs. Angelically beautiful and demoniacally poisonous. Narcotico-acrid. See chapter ix. It reminds me of a bride in white satin and lace. A perfect specimen I once lit upon in the shade of a dark shrubbery, illuminated by a straggling ray of sunshine, through which a red admiral butterfly fluttered down upon it, afforded me an artistic feast. It must not be mistaken for any of the white spring esculents. Before leaving this sub-genus, I may note that Am. spissa, Am. lenticularis, and Am. adnata are suspicious species, though nothing certain seems to be known about them.—*W. D. H.*

Genus AGARICUS. Sub-genus CLITOCYBE.

(VII.) AGARICUS INVERSUS; Clitocybe inversa; The Infamous Clitocybe.

Habitat. In woods and under trees. Scattered, or in tufts.

Season. September to November. Not common.

Pileus. Some two inches across, red-brown, then tan, smooth, sleek; convex, then plane, at length infundibuliform. Margin thin, even, involute.

Stem. One to two inches high, tint of pileus, slender, rigid, equal, smooth, often bent, naked.

Section. Flesh pallid, thin, fragile. Stem stuffed, at length fistulose. Gills pallid, then tan, simple, narrow, sub-serrulate, very decurrent. Odour sour. Taste repelling. Spores white.

Obs. Paulet, L'Ecluse, and Kickx state it to be poisonous, but do not assign character to the noxious principle it contains. Clit. flaccida is also said to be poisonous. It differs from the above species by flabby habit, arcuate gills, and yellowish gills and stem, otherwise resembling it.—*W. D. H.*

Genus AGARICUS. Sub-genus COLLYBIA.

(VIII.) AGARICUS DRYOPHILUS; Collybia dryophila; The Leaf-bane.

Habitat. Among dead leaves under trees. Singly or in tufts.

Season. May to November. Common.

Pileus. One to two inches across, pallid, livid, dusky buff, or pale pinky tan, smooth, perhaps polished, soft; hemispherical, then plane, slightly depressed, obtuse, even.

Stem. Two to three inches high, tint of pileus, pale below, slender, smooth, sleek, fragile, perhaps split, naked, sub-incrassate, at base, attached to leaves by villose filaments.

Section. Flesh pallid, watery, thin, soft. Stem hollow. Gills pallid or discoloured, numerous, soft, narrow, serrulate, sinuate, free at first, then denticulato-adnexed. Odour mouldy. Taste bitter and nauseous. Spores white.

Obs. Its essential principle is irritant, but is not very virulent. The species is repelling, but inexperienced gatherers might mistake it for the Oread.—*W. D. H.*

Genus AGARICUS. Sub-genus ENTOLOMA.

(IX.) **AGARICUS CLYPEATUS; Entoloma clypeata;** The Buckler.

Habitat. In woods, shrubberies, and gardens. By twos and threes.

Season. April to June. Not uncommon.

Pileus. Three to six inches across, grey-tawny, streaked and spotted, dry, smooth, sleek, silky, sub-farinose, hygrophanous; campanulate, then expanding, depresso-umbonate. Margin sinuate, undulate.

Stem. Two to four inches high, dingy or grey, streaked with tawny, attenuate and farinose above, fibrillose below, firm, naked.

Section. Flesh not thick, white, brittle. Stem stuffed, then fistulose. Gills dingy pink, then dull red, large, serrulate, rounded behind, adnexed, or denticulato-adnate. Odourless. Taste mild. Spores pink.

Obs. This species is intensely poisonous, even in small quantities. Its principle seems to be wholly narcotic. See chapter ix. The sub-genus is a dangerous one, for the esculent Entolomes are closely resembled by congeners of unknown quality, some of which, such as Ent. repanda, are reputed to be noxious.—*W. D. H.*

Genus AGARICUS. Sub-genus HEBELOMA.

(X.) **AGARICUS CRUSTULINIFORMIS; Hebeloma crustuliniformis;** The Snake in the Grass.

Habitat. In woods, parks, commons, grass-fields. In wide rings.

Season. July to November. Common.

Pileus. Two to three inches across, whitey-buff, yellowish, tan, tawny on disc, smooth, shining and viscid in wet; convex, then plane, repand. Margin somewhat sinuate and depressed.

Stem. Two to four inches high, pallid, discoloured, firm, thick, naked, squamulose above, glabrous and swollen below.

Section. Flesh thin, pallid. Stem stuffed. Gills fawn, then red-brown, crowded, thin, narrow, unequal, crenulate, holding dew-drops, free. Odour of radish. Taste nasty. Spores brown.

Obs. Narcotico-acrid, but not a powerful poison. This, as well as other Hebelomes, is very hardy. Though the seasons assigned seem the normal ones, yet in mild and wet winters and springs I have noticed Hebelomes appearing in some abundance.—*W. D. H.*

(XI.) AGARICUS FASTIBILIS; Hebeloma fastibilis; The Repellant. (Tab. III. fig. 20.)

Habitat. In woods and fields. In groups and clusters.

Season. July to November. Common.

Pileus. Two to three inches across, pallid, buff, perhaps tawny, smooth, viscid in wet; campanulate or convex, then plane, repand, sinuate. Margin pale, involute, sub-tomentose.

Stem. Two to four inches high, pallid, thick, bent, fibrillosо-squamose, sub-incrassate, rooting, retaining fragments of veil.

Section. Flesh white, thickish, compact. Stem solid, fissured at length. Gills pallid, then tan, broad, ventricose, irregular, unequal, numerous, emarginate, adnexed. Odour strong, nauseous, like cherry-laurel flowers. Taste bitter, nauseous. Spores brown.

Obs. It is of similar quality to the preceding, but possibly more virulent.—*W. D. H.*

(XII.) AGARICUS RIMOSUS; Hebeloma rimosa; The Slit-Cap.

Habitat. In woodlands and wastes. In groups and clusters.

Season. June to October. Common.

Pileus. One to three inches across, brown-yellow, tawny, satin-smooth, polished, but fibrillose; conical, campanulate, then expanded and sharply umbonate; rimose, the chinks radiating from centre and yellow.

Stem. One to three inches high, whitish, slender, farinose above, naked, fibrillose and enlarged below.

Section. Flesh thin, white, stained yellow, firm. Stem stuffed. Gills pallid, soon brown, numerous, unequal, crenulate, narrow, sinuate, adnexed or free. Odour earthy. Taste nauseous. Spores brown.

Obs. The exact character of the poisonous principle has not been ascertained, but may be regarded as narcotico-acrid, probably mostly acrid. No Hebelomes are eatable, and others than these are suspected to be noxious.—*W. D. H.*

Genus AGARICUS. Sub-genus HYPHOLOMA.

(XIII.) AGARICUS FASCICULARIS; Hypholoma fascicularis; The Sulphur-Tuft.

Habitat. On old stumps, tree roots, and buried deadwood, in damp places. In dense tufts.

Season. June to November. Common.

Pileus. Two to three inches across, sulphur-yellow and greenish, with tawny disc, smooth, glabrous, moist; conical or convex, then plane and sub-umbonate. Margin thin, involute, fimbriate with veil-fragments.

Stem. Two to nine inches high, green-yellow, slender, unequal, bent, floccoso-fibrillose, sometimes attenuate and tomentose at base. Ring yellow, fibrous, high, patent, upper side sprinkled with the dark spores.

Section. Flesh sulphur yellow, thickish, firm. Stem hollow, Gills yellow, then greenish, overlaid by purple-black spores, crowded, unequal, linear, serrulate, moist, denticulato-adnate. Odour and taste repelling. Spores purple-black.

Obs. A most dangerous species. The poisonous principle is intensely virulent, and is a drastic irritant. Site and habit are those of the Spindleshank and Stumptuft, but the colouring of the Hypholomes is distinctive.—*W. D. H.*

(XIV.) AGARICUS LACRYMABUNDUS; Hypholoma lacrymabunda; The Crocodile. (Tab. IV. fig. 29.)

Habitat. On tree-trunks, stumps, and the ground. In tufts.

Season. June to November. Uncommon.

Pileus. Two to four inches across, pale red-brown, disc dark, spotted, fibrilloso-squamulose; campanulate, then convex, expanding. Margin thin, firm, even, incurved, fringed with veil-fragments.

Stem. Two to three inches high, whitish above, dingy below, slender, flexuose, firm, elastic, fibrilloso-squamulose, enlarged at base. Ring dusky, floccose.

Section. Flesh thickish, dingy, firm. Stem hollow. Gills pallid, then red-brown, clouded with dark spores, numerous, ventricose, adnate. Odour repulsive. Taste nauseous. Spores purple-black.

Obs. Like the preceding in quality. Intensely irritant. It is bowed with the weight of its guilt!—*W. D. H.*

(XV.) AGARICUS SUBLATERITIUS; Hypholoma sublateritia; The Red-Tuft.

Habitat. On stumps, tree-roots, and the ground. In dense tufts.

Season. September to November. Common.

Pileus. Two to three inches across, brick-red, disc dark, sericeo-tomentose at first, then smooth, glabrous, dry; convex, obtuse, plane, flattened. Margin involute, fimbriate with veil-fragments.

Stem. Two to five inches high, yellow above, reddish below, slender, attenuate downwards, firm, flexuose, silky at first, then fibrillose. Ring high, distinct, filamentous, fugacious.

Section. Flesh thickish, white, compact. Stem stuffed. Gills whitish olive, then olive brown, blackened with spores, crowded, unequal, rounded behind, denticulato-adnate. Odour feebly disagreeable. Taste bitter. Spores purple-black.

Obs. As the two last, permeated by an intensely irritant principle. Hyph. epixantha and Hyph. velutina are strongly suspected of the same qualities. Nothing is known of other members of the sub-genus, but no good can be said of them. The one edible is of doubtful quality, and rare here.—*W. D. H.*

Genus AGARICUS. Sub-genus LEPIOTA.

(XVI.) AGARICUS VITTADINI; Lepiota Vittadini; The Great White Parasol.

Habitat. On the ground in woods, parks, and shady pastures Solitary, or in twos and threes.

Season. June to October. Rare.

Pileus. Three to six inches across, snow-white, cuticle broken into warty, serrated scales; convex, expanded, broadly umbonate, robust, regular. Margin fimbriate and shaggy.

Stem. Five to seven inches high, white, stout, cylindrical, squamose below, scales reflected, rough. Ring high, large, deflexed.

Section. Flesh thick, white, compact. Stem solid. Gills white, few, distant, thick, ventricose, free. Odour slight, not unpleasant. Taste mild, afterwards pungent. Spores white.

Obs. Rare here. A large and handsome species. Distinguished from its esculent congeners by entire whiteness. It is not virulent, but contains a principle which is narcotic, and perhaps slightly acrid.—*W. D. H.*

Genus AGARICUS. Sub-genus PANÆOLUS.

(XVII.) AGARICUS PAPILIONACEUS; Panæolus papilionaceus; The Butterfly-Cap.

Habitat. On dung and rich soil, anywhere. In groups.

Season. June to October. Common.

Pileus. Half to one inch across, fawn, sub-rufescent, smooth, sleek, never viscid, sometimes rimose or sub-squamulose; hemispherical, then conico-convex, even. Margin projecting.

Stem. Two to three inches high, rufescent, slender, even, equal, pulverulent above. Veil fugacious.

Section. Flesh pallid, thickish. Stem stuffed or hollow. Gills fawn, clouded with black spores, crowded, broad, entire, at first ascending, then plane, equal, adnate. Odour feeble. Taste nauseous. Spores black.

Obs. It is certainly poisonous, but the action of its essence is undetermined. Others of its congeners are suspected, but they are all insignificant in size, and not likely to be mistaken for any esculent.—*W. D. H.*

Genus AGARICUS. Sub-genus PHOLIOTA.

(XVIII.) **AGARICUS AURIVELLUS; Pholiota aurivella;** The Guilty-sprout.

Habitat. On trunks of willows and pollards. Singly.

Season. September and October. Rare.

Pileus. Some three inches across, golden-yellow and tawny-squamose, viscid in wet; hemispherical, then campanulate, convex, expanded, gibbous. Scales thick-set on disc, scattered at margin, tawny, adpressed.

Stem. Three or four inches high, yellow, tawny-squamose, curved, hard, unequal, sub-bulbous. Ring high, torn.

Section. Flesh pallid, thickish, tough. Stem stuffed, brown within base. Gills pallid, then yellow, at length brown, fixed, broad, straight, sinuate, adnate. Odour disagreeable. Taste bitterish. Spores brown.

Obs. Sundry authorities affirm this species to be poisonous, but the character of its essence is unknown. It might easily be mistaken for one of the esculent Pholiotes. Pho. radicosa is also suspected, but apparently only because it has the scent of bitter almonds.—*W. D. H.*

Genus AGARICUS. Sub-genus PSALLIOTA.

(XIX.) **AGARICUS SYLVATICUS; Psalliota sylvatica;** The Wood Pratelle.

Habitat. In woods, under trees and hedges. Scattered.

Season. August to October. Not common.

Pileus. Two to three inches across, white, at length dusky-squamose and flocculose; campanulate, then expanded, nearly plane or uneven and sub-umbonate. Margin at last rimose.

Stem. Three to four inches high, white, or dingy, slender, unequal. Base incrassate. Ring distant, simple.

Section. Flesh thin, white, yellowing where cut. Stem stuffed, at length fistulose. Gills pallid, then grey-pink, at last brown, thin, crowded, dry, unequal, attenuate before and behind, free. Odour strong, not unpleasant. Taste mild. Spores purplish.

Obs. There is much uncertainty regarding this species, owing to the very variable way in which the Pratelles have been hitherto described. I have eaten it, I believe, in a dish of other Pratelles. But Cordier asserts he has known a single specimen induce symptoms. It is narcotico-acrid, but evidently not in a powerful degree. Its site and slender habit distinguish it from other Pratelles. —*W. D. H.*

Genus AGARICUS. Sub-genus PSILOCYBE.

(XX.) AGARICUS SEMILANCEATUS; Psilocybe semilanceata; The Liberty-cap.

Habitat. In rich pastures, grassy roadsides, etc. In groups and clusters.

Season. April and May, September and October. Common.

Pileus. About three-quarters of an inch broad and high, pale buff or drab, smooth, glabrous, sleek in dry weather, viscid in wet; conical, campanulate, obtusely cuspidate. Margin sub-striate, thin, dark, translucent.

Stem. Two to four inches high, pallid, drab, very slender, flexuose, tough, equal, smooth, naked. Base enlarged, perhaps blue-tomentose.

Section. Flesh membranaceous. Stem fistulose. Gills brown, then purple-black, ascending, ventricose, serrate, adnate. Odourless. Taste nauseous. Spores purple.

Obs. Berkeley says it is certainly poisonous. The principle seems to e irritant.—*W. D. H.*

Genus AGARICUS. Sub-genus STROPHARIA.

(XXI.) AGARICUS SEMIGLOBATUS; Stropharia semiglobata; The Skull-cap.

Habitat. On dung, and in meadows. In tufts, and scattered.

Season. May to December. Common.

Pileus. Half to one inch across, pallid, dingy, or buff-drab, smooth, sleek, viscid in wet; hemispherical, even, obtuse.

Stem. Two to four inches high, tint of pileus, slender, upright, silky-smooth, viscid in wet, even, equal. Base slightly enlarged. Ring slight, complete, membranaceous, often blackened.

Section. Flesh thin, white, soft. Stem fistulose. Gills pallid, clouded with black, very broad, horizontal, serrulate, denticulate, broadly adnate. Odourless. Taste insipidly disagreeable. Spores purplish.

Obs. Its principle is irritant, but not strongly developed. The species grows among Oreads, and has sometimes been carelessly mingled with them. Stro. æruginosa is also suspected.—*W. D. H.*

Genus AGARICUS. Sub-genus TRICHOLOMA.

(XXII.) AGARICUS SPERMATICUS; Tricholoma spermatica; The Stinker.

Habitat. In woods of fir and pine. Scattered.

Season. September to November. Uncommon.

Pileus. Three to five inches across, white, smooth, glabrous, viscid in wet; obtusely convex, then irregularly expanded, repand or lobulate. Margin thin, membranaceous, sinuate.

Stem. Two to three inches high, white, stout, even, smooth, perhaps bent, naked.

Section. Flesh white, thick, compact. Stem stuffed, at length hollow. Gills white, broad, thick, distant, eroded, sub-emarginate, adnexed. Odour strong and nasty. Taste repelling. Spores white.

Obs. Generally regarded as poisonous. Nature of principle unknown.—*W. D. H.*

(XXIII.) AGARICUS SULFUREUS; Tricholoma sulfurea; The Yellow Reptile.

Habitat. In or near woodlands, among grass and fern. Singly.

Season. September to November. Common.

Pileus. One to three inches across, sulphur-yellow, dingy, disc dark, dry, silky-pulverulent; obtusely conical, then convex, ex-

panded, depresso-umbonate, unequal, sinuate. Margin involute at first, tomentose. Cuticle adnate.

Stem. Two to three inches high, yellow, not thick, nearly equal, smooth, glabrous, striate, naked, rooting.

Section. Flesh yellow, thickish, compact. Stem stuffed, perhaps hollow. Gills yellow, broad, distant, arcuate, pointed behind, sinuate, adnate. Odour of rotten hemp-seed. Taste nauseous. Spores faintly yellow.

Obs. It is provided with a principle that is strongly irritant. Some authorities also suspect Tri. murinacea, Tri. saponacea, Tri. bufonia, and Tri. rutilans, but none of them have actually been proved poisonous.—*W. D. H.*

Genus AGARICUS. Sub-genus VOLVARIA.

(XXIV.) AGARICUS PARVULUS; Volvaria parvula; The Little Volvar.

Habitat. In meadows. Scattered.

Season. August to October. Not common.

Pileus. One inch across, white, dry, silky-tomentose; conical in volva, then expanded, convex, umbonate, even.

Stem. One inch high, white, slender, equal, silky-tomentose, naked. Volva small, pallid, lobed, persistent.

Section. Flesh white, thickish. Stem stuffed. Gills rosy, unequal, broad, thick, free. Odourless. Taste bland. Spores pink.

Obs. Sometimes plentiful after thunderstorms. Its poison seems to be narcotico-acrid. Probably this species has often been mistaken for "button" Pratelles by careless or inexperienced people. It is therefore dangerous.—*W. D. H.*

(XXV.) AGARICUS SPECIOSUS; Volvaria speciosa; The Specious Volvar.

Habitat. In fields and shrubberies, on dunghills, etc. Solitary.

Season. September and October. Uncommon.

Pileus. Two to four inches across, grey, darkest on disc, smooth, glossy, viscid in wet; campanulate in volva, then convex, rounded, plane, even. Margin finely striate.

Stem. Three to four inches high, white, pinky above, attenuate upwards, thick, glabrous. Base swollen, villose. Volva white, loose, thin, villose, torn.

Section. Flesh not thick, white, soft. Stem solid, fibrous. Gills

pallid, soon rosy, numerous, unequal, broad behind, free. Odour strong, not pleasant. Taste rather nauseous. Spores pink.

Obs. Its principle is probably narcotico-acrid, but is not very virulent. Vol. gloiocephala is like this, but larger, taller, and umbonate. It is said to contain the same principle. Either might be mistaken for the Grisette, if the pink gills and spores were not noted.—*W. D. H.*

(XXVI.) **AGARICUS VOLVACEUS**; **Volvaria volvacea**; The Striped Volvar. (Tab. II. fig. 10.)

Habitat. On tan, dung, compost, etc., anywhere. In twos and threes.

Season. June to October. Not common.

Pileus. Two or three inches across, grey, with black radiating stripes, floccoso-fibrillose, not viscid; campanulate in volva, then convex, expanded, rounded, even.

Stem. Two to five inches high, white or dingy, thick, glabrous, nearly equal. Volva grey, large, loose, unequally torn, persistent.

Section. Flesh white, thickish, soft. Stem solid, fibrous. Gills rosy, broad, pulverulent, unequal, free. Odour slight. Taste acrid. Spores pink.

Obs. Characterized by its site and large volva. It is rather strongly poisonous, acrid, and perhaps narcotic.—*W. D. H.*

Genus COPRINUS.

(XXVII.) **COPRINUS FUSCESCENS**; The Brown Ink-cap. (Pl. I. fig. 5.)

Habitat. On dead stumps and tree-roots. In tufts.

Season. August to October. Rare.

Pileus. Two to three inches across, brownish-grey, disc tawny, at first opaque and pulverulent; ovate, campanulate, then expanded. Margin thin, uneven, split.

Stem. Three inches high, brownish, slender, fragile, curved, sub-fibrillose. Ring fragmentary, fugacious.

Section. Flesh membranaceous, fragile. Stem hollow. Gills umber, black, numerous, linear, entire, free, deliquescent. Odour slight. Taste insipid. Spores black.

Obs. Paulet has demonstrated this species to be poisonous in a slight degree. Its effects are irritant. It is the only Coprinus certainly known to be noxious, though the common Cop. micaceus and others are suspected.—*W. D. H.*

Genus HYGROPHORUS.

(XXVIII.) HYGROPHORUS MURINACEUS; The Mouse Hood.

Habitat. In grassy woods, parks, lawns, and pastures. In small groups.

Season. September and October. Rare.

Pileus. Two to three inches across, mouse-grey, silky-smooth, viscid in wet, squamulose at length; campanulate, then expanded, irregular, peaked and umbonate, thin. Margin rimose.

Stem. Two to three inches high, grey, slender, twisted, unequal, squamulose, viscid, bent, naked.

Section. Flesh white, thin, waxy. Stem fistulose. Gills whitish, then glaucous, waxy, broad, distant, venate, emarginate, adnate. Odour nitrous. Taste unpleasant. Spores white.

Obs. Poisonous according to Duchesne, Morel, and Barla. The principle is probably narcotico-acrid. No other Hygrophore is certainly known to be poisonous, though sundry are suspected.—*W. D. H.*

Genus LACTARIUS.

Obs. There is some uncertainty as to which Lactars are actually impregnated with a poisonous essence, and which are merely unpleasant to the palate. The following are proved to be decidedly poisonous. The character of their poisons appears to be nearly identical, differing only as to the degree in which it is contained in them. Both the acridity and the poison are removable by salt and vinegar, and the esculents, saving only the Redmilk and Kidney, should not be eaten without such preparation as I have elsewhere prescribed for them. These known poisonous Lactars are even eaten in some countries, after salting, etc. See chapter ix.—*W. D. H.*

(XXIX.) LACTARIUS FULIGINOSUS; The Smoky Lactar.

Habitat. In woods. Solitary.

Season. August to November. Not common.

Pileus. One to three inches across, dusky brown and grey-pruinose, dry, not zoned, soft, hardly smooth; convex, then plane, depressed, round. Margin not involute, undulate.

Stem. One to three inches high, dingy, then dusky, pruinose, stout, equal, smooth, naked.

Section. Flesh, thick, soft, white, yellowing. Stem solid, spongy. Milk white, becoming saffron-yellow on exposure. Gills pale buff, numerous, unequal, sub-furcate, pulverulent, sub-decurrent. Odour slight. Taste mild, then acrid. Spores yellowish.

Obs. Very poisonous. The principle is exceedingly caustic.—*W. D. H.*

(XXX.) **LACTARIUS PLUMBEUS**; The Leaden Lactar.

Habitat. In woods and wastes. Solitary.

Season. August to November. Uncommon.

Pileus. Two to four inches across, lead-grey or blackish, smooth, opaque, dry, not zoned; convex, round, then plane, depressed, sub-infundibuliform. Margin sub-involute.

Stem. Two to three inches high, dingy, brownish, stout, firm, equal, naked, blunt.

Section. Flesh thickish, compact, brittle, granulose, white and unchanging. Stem solid. Milk white, unchanging. Gills yellowish, crowded, unequal, narrow, sub-decurrent. Odour faintly disagreeable. Taste acrid. Spores yellowish.

Obs. It is dangerously poisonous, in quality like the preceding.—*W. D. H.*

(XXXI.) **LACTARIUS PYROGALUS**; The Burning Lactar.

Habitat. In woodlands and wastes. Solitary.

Season. August to November. Not uncommon.

Pileus. Two to three inches across, livid grey or ochrey, slightly zoned, smooth, moist, glabrous; convex, then plane, at length depressed, even.

Stem. One to two inches high, tint of pileus, pale, slight, attenuate downwards, smooth or sub-scrobiculate, naked.

Section. Flesh thickish, firm, white. Milk white, unchanging. Stem stuffed, then hollow. Gills salmonoid, thin, distant, waved, narrow, sub-decurrent. Odour feebly fruity. Taste mild in youth, then burning. Spores yellowish-white.

Obs. A species that is probably harmless while young. At any rate, it is not acrid then. When mature it is intensely acrid, and contains a decidedly dangerous caustic poison.—*W. D. H.*

(XXXII.) **LACTARIUS RUFUS**; The Slayer.

Habitat. In woods, especially fir and pine woods. Solitary.

Season. August to November. Common locally.

Pileus. Three or four inches across, chestnut-red, tawny, copper-colour, dry, not zoned, polished; convex, then expanded, umbonate, then depressed, rigid. Margin at first incurved, sub-striate and sub-villose, at length smooth.

Stem. Two or three inches high, tint of pileus, pale, opaque, pruinose, browning where bruised, thick, equal, blunt, firm, naked. Base tomentose.

Section. Flesh pale reddish buff, firm, slight. Stem stuffed, then hollow below. Milk white, unchanging. Gills salmon-buff, crowded, unequal, sub-furcate, adnato-decurrent. Odour slight. Taste intensely caustic. Spores buff.

Obs. It is incontestably the most dangerous species of the genus, and has been the cause of many fatalities. See chapter ix. Its poison is a terrible caustic irritant, and a very small portion of one individual is enough to induce symptoms. No doubt the likeness of several other species to this one has caused them to be regarded as equally bad; Lact. torminosus, in particular, has shared the ill-fame and name of the Slayer. I would recommend fungus-eaters to carefully avoid this evil mushroom.—*W. D. H.*

(XXXIII.) **LACTARIUS VELLEREUS**; The Woolly White Lactar.

Habitat. In woods. In twos and threes.

Season. August to November. Common.

Pileus. Four to seven inches across, white, thickly and finely flocculose or tomentose; convex, then plane, at length infundibuliform, firm. Margin incurved.

Stem. One to three inches high, white, very stout, firm, blunt, tomentose, larger above, naked.

Section. Flesh white, thick, compact. Stem solid. Milk scanty, white, yellowing. Gills pallid, ochrey at length, reddening where bruised, narrow, distant, venate, furcate, arcuate, decurrent. Odour slight, repelling. Taste acrid. Spores white.

Obs. There is no doubt this species is poisonous, though in what degree cannot be stated. Yet Léveillé and Barla both report it edible; but that means after due preparation. It is irritant.—*W. D. H.*

Genus MARASMIUS.

(XXXIV.) **MARASMIUS PERONATUS**; The Hairy-foot. (Pl. IV. fig. 5.)

Habitat. Among leaves in woods and odd corners. In clusters.

Season. August to October. Pretty common.

Pileus. One to two inches across, clay-yellow, or reddish-tan, pale and shrivelled in drought or age, minutely silky; campanulate, then convex, expanded, broadly umbonate, even.

Stem. Two to three inches high, tint of pileus, slender, cylindrical, silky above, naked. Base enlarged, villose, strigose.

Section. Flesh white, membranaceous. Stem fibrous, hollow

below. Gills dull pinky-buff, thin, narrow, numerous, distant, rounded behind, free. Odour faint. Taste peppery. Spores white.

Obs. Contains an irritant principle, but in slight degree. It must not be mistaken for the Oread.—*W. D. H.*

(XXXV.) **MARASMIUS URENS**; The Stinger.

Habitat. Among fallen leaves. In clusters.

Season. August to October. Pretty common.

Pileus. One to three inches across, clay-yellow, or reddish tan, shrivelled and pale in drought or age, smooth; convex, then expanded, plane, even. Margin thin, sub-involute.

Stem. Two to three inches high, tint of pileus, pale, slender, white-flocculose, cylindrical, naked. Base slightly thickened, sub-villose.

Section. Flesh white, membranaceous. Stem solid, fibrous. Gills pale brown, numerous, narrow, firm, distant, remote. Odour faint. Taste stinging. Spores white.

Obs. A species very like the preceding, both in appearance and deleterious quality.—*W. D. H.*

Genus PANUS.

(XXXVI.) **PANUS STYPTICUS**; The Pill-sprout.

Habitat. On dead tree trunks and stumps. More or less imbricated.

Season. October to January. Not common.

Pileus. About one inch across, cinnamon or pale tan, dry, pruinose, paling in age, perhaps zoned, at length furfuraceous; semi-orbicular or reniform, perhaps lobulate. Margin incurved.

Stem. Half to one inch high, tint of pileus, pale, continuous, lateral, ascending, dilate above, pruinose or furfuraceous.

Section. Flesh yellowish, tough, not thick. Stem solid. Gills pale cinnamon, narrow, crowded, serrulate, thin, unequal, venate, branched, decurrent. Odourless. Taste insipid at first, soon hot and acrid. Spores white.

Obs. The principle it contains seems to be merely a strong cathartic, without other effect. The consequences of eating it are unpleasant rather than harmful so it had better be avoided.—*W. D. H.*

Genus RUSSULA.

Obs. The general facts regarding the poisons of this genus will be found in chapter ix.—*W. D. H.*

(XXXVII.) **RUSSULA EMETICA**; The Sickener.

Habitat. In woods, and under trees on lawns, etc. Scattered.

Season. July to November. Common.

Pileus. Two to five inches across, rosy, then blood-red, perhaps becoming tawny, ochraceous, or pale; polished, viscid in wet, smooth; convex, then plane, depressed. Cuticle separable. Margin thin, patent, at length striate.

Stem. Two to three inches high, white, flushed with rose, thickish, elastic, smooth or sub-rugulose, naked, blunt.

Section. Flesh fragile, not thick, white, rosy where snail-eaten. Stem solid, spongy. Gills white, equal, broad, distant, brittle, thickish, simple, veined beneath, free. Odour slight. Taste pungent. Spores white.

Obs. The poison is very irritant and rapid in action; it has some after-tendency to induce nervous disorder as well. Krapf found that it was not separable either by boiling or drying the mushroom. Yet I have heard of this species having been eaten, probably after treatment with vinegar.—*W. D. H.*

(XXXVIII.) **RUSSULA FRAGILIS**; The Sickener's Sister.

Habitat. In woods and under trees. Singly.

Season. September to November. Common.

Pileus. One to two inches across, rose-red, perhaps becoming ochraceous or pallid, opaque, sleek, viscid in wet; convex, then plane, depressed, unequal, thin, lax. Cuticle not separable. Margin striate, tuberculose.

Stem. One to two inches high, white, glossy, not stout, finely striate, nearly equal, naked, blunt.

Section. Flesh thin, fragile, white. Stem stuffed, then fistulose. Gills white, crowded, thin, equal, ventricose, sub-serrulate, adnate. Odour faint. Taste pungent. Spores white.

Obs. It appears to be equally as poisonous as R. emetica, and is very like it. The principle exerts the same action. But Barla says the poison of this species can be extracted by boiling.—*W. D. H.*

(XXXIX.) **RUSSULA OCHROLEUCA**; The Brazen-face.

Habitat. In damp parts of woods, especially under pine and fir. Scattered.

Season. August to November. Common.

Pileus. Two to five inches across, yellow or yellow-buff, pallid, smooth, polished; expanded, plane, depressed. Cuticle adnate. Margin thin, patent, even at length.

Stem. Two to three inches high, white or pallid, stoutish, firm, sub-rugulose or reticulate, equal, naked, blunt.

Section. Flesh white, thickish, brittle. Stem solid, spongy. Gills pallid, broad, equal, connate, rounded behind, free. Odourless. Taste acrid. Spores white.

Obs. It is poisonous, according to Quetelet, Roussel, and others; its principle being probably narcotico-acrid. A species very like it, and commoner, is R. fœtens, which smells repulsively and is also acrid. Its qualities are not known.—*W. D. H.*

(XL.) **RUSSULA RUBRA**; The Destroyer.

Habitat. In shrubberies and thickets of woods. Solitary.

Season. August to November. Not uncommon.

Pileus. Three or four inches across, dark vermilion, dry polished, smooth; convex, then plane, expanding, depressed, even. Margin patent, blunt, even. Cuticle inseparable on disc.

Stem. Two to three inches high, white, flushed with red below, enlarged above, stout, hard, rugulose, naked, blunt.

Section. Flesh white, red under cuticle, compact, thick, of cellular substance. Stem solid. Gills white, crowded, equal, fragile, the ends furcate, obtusely adnate. Odour slight. Taste bitter. Spores white.

Obs. This appears to be the most malignant species of the genus. Its principle is irritant like the others, but also seems to have a stronger influence on the nervous system. One or two specimens have been sufficient to kill. Mentioned in chap. ix.—*W. D. H.*

(XLI.) **RUSSULA SANGUINEA**; The Sanguine-cap.

Habitat. Damp sites in woods. Solitary.

Season. July to November. Common.

Pileus. Two to three inches across, blood-red, dark on disc, smooth, moist, glistening; rounded, convex, then much depressed irregularly. Cuticle inseparable. Margin thin, sharp, sub-striate.

Stem. Some two inches high, white, or stained with red, stout, striate, not smooth, nearly equal, naked, blunt.

Section. Flesh thick, white, cheesy. Stem solid, spongy. Gills

white, numerous, thin, narrow, sub-serrulate, furcate, equal, pointed at both ends, sub-decurrent. Odour feeble. Taste bitter and pungent. Spores white.

Obs. It seems to contain an irritant principle, but in slight degree, and which is separable by boiling, etc. It is reported to be commonly eaten in the south of France, and I think I have eaten it myself. Yet in maturity it would be hurtful, if eaten unprepared and to any appreciable extent.—*W. D. H.*

(XLII.) **RUSSULA SARDONIA**; The Malignant.

Habitat. On bare ground in woods. Singly.

Season. August to November. Not uncommon.

Pileus. Two to three inches across, buff, or buff and red, or yellowish, tint changing as it develops, smooth, opaque, viscid; convex, then plane, depressed. Cuticle thin, adnate. Margin even, smooth.

Stem. One to two inches high, white, perhaps touched with red, stout, enlarged above, smooth, naked, blunt.

Section. Flesh white, thick, compact. Stem solid, spongy. Gills white, yellowish at length, numerous, narrow, equal, furcate, adnate. Odour slight. Taste sparingly acrid. Spores pallid.

Obs. It is said to be poisonous in high degree, probably narcotico-acrid. I once found a specimen growing conjoined to a Chantarelle—a curious instance, which shows that care is always needful. There are other Russules to which poisonous properties have been ascribed, but the above are all I can find that have been circumstantially proved to be so.—*W. D. H.*

ORDER POLYPOREI.

Genus BOLETUS.

(XLIII.) **BOLETUS CALOPUS**; The Red-shank Bolet.

Habitat. In and about woodlands. Solitary.

Season. August to October. Rare.

Pileus. Two to four inches across, dull olive-brown, opaque, at first sub-tomentose, then finely rimulose; at first globular, then pulvinate, convex, expanded, obtuse.

Stem. Two to three inches high, uniformly scarlet, thick, at first conical, then sub-equal, reticulate, firm, naked.

Pores. Pale yellow or greenish, minute, angular.

Section. Flesh thick, spongy, yellowish, blueing when exposed.

Stem solid. Tubes small, yellow, adnate. Odourless. Taste insipid. Spores yellow-brown.

Obs. A species easily distinguished from other yellow-pored Bolets by the thick scarlet stem. Réveil reports it poisonous. It contains an irritant principle in slight degree.—*W. D. H.*

(XLIV.) **BOLETUS ERYTHROPUS**; The Spotty-leg Bolet.

Habitat. In woodlands. Solitary.

Season. August to October. Uncommon.

Pileus. Two or three inches across, reddish-tan or tawny-brown, velvety-tomentose, slightly viscid in wet; convex, then plane, scarcely pulvinate.

Stem. Two to six inches high, drab, punctate with red, not stout or reticulate, sub-granulose above, nearly equal, naked.

Pores. Dark red, round, rather small.

Section. Flesh compact, thick, yellowish, blueing and partly reddening on exposure. Tubes reddish-yellow, short, free. Stem solid, red within below. Odour slight. Taste insipid. Spores brownish.

Obs. Doubtfully poisonous. If really so, but in slight degree. It is, however, generally reckoned to be a poisonous species, by most authorities. It would probably be irritant.—*W. D. H.*

(XLV.) **BOLETUS LURIDUS**; The Lurid Bolet.

Habitat. In woodlands, parks, and pastures. Solitary, or scattered.

Season. July to November. Common.

Pileus. Two to six inches across, or more, olive-brown, brick-red, or tawny, tint brightest in youth, at first sub-tomentose, then smooth, clammy or viscid; orbicular, soon pulvinate, convex, expanded.

Stem. Two to four inches high, yellow or rusty, blotched with red, stout, unequal, smooth or tomentose, reticulate above. Base bulbous.

Pores. Red-brown, orange, or vermilion, small, round.

Section. Flesh thick, compact, pallid or yellowish, quickly blueing. Stem solid, tough. Tubes yellow-green, long, round, simple, small, free. Odour faintly unpleasant. Taste insipid in youth, at length nauseous. Spores brownish-green.

Obs. This species is most frequently alluded to as *the* poisonous Bolet, others being probably confounded with it. In maturity it undoubtedly contains the irritant principle I have termed Boletine, though possibly not strongly. In youth this poison is apparently undeveloped. The Lurid Bolet is certainly eaten commonly in some countries, and has been eaten here without ill result. It seems evident, then, that the poison is easily dissipated, perhaps by simple boiling. It is certain that all Bolets are innocuous after having been dried. But fatalities have been traced to this species. It may be possible that the poison is more strongly developed under circumstances and conditions yet unknown, or it may be that it acts more powerfully on some constitutions than on others. Till more facts are gathered together regarding the species, it must be considered a dangerous one.—*W. D. H.*

(XLVI.) **BOLETUS SATANAS**; Beelzebub's Cushion.

Habitat. In woodlands, parks, and commons. Solitary.

Season. August to October. Uncommon.

Pileus. Four to eight inches across, pale buff, whitish, shaded and marbled with pale pink or green, perhaps quite white; soft, smooth, glabrous, dry, slightly viscid in wet; convex, rounded, pulvinate, thick.

Stem. Two to four inches high, crimson, or purplish, stout, swollen, reticulate above, bulbous at base, naked.

Pores. Blood-red or crimson, minute, round.

Section. Flesh thick, compact but soft, juicy, white, on exposure first reddening, then purpling. Stem solid. Tubes greenish-yellow, elongate, small, free. Odour agreeable. Taste mild. Spores red-brown.

Obs. It is apparently the most noxious of the genus. Possibly it has been sometimes mistaken for B. luridus, which may have caused that species to have acquired a worse reputation than is really due to it. The principle in B. satanas is irritant and violent. Yet, despite its name and its glaring hues, it is scarcely so much to be dreaded as species of other genera already described. See the mention of Boletine in chapter ix.

∴ I here append a list of the remaining British species of Boletus, such as have not been mentioned in the catalogue of esculents, or, as yet, in this. It will be sufficient to record only some distinguishing characteristics of each, instead of giving full descriptions. Since the genus affords a considerable number of capital esculents, and many of these are very abundant, I consider it desirable to bring them well into notice. It seemed right, then, to make mention of species not actually known to be poisonous, as well as the four just described. These species, which now follow, are suspected by some authorities, though they have not been examined. Some of them may be noxious, or they may not. At any rate, they are to be distrusted, and not meddled with by amateur fungus-eaters.

Boletus felleus. Pileus umber. Pores pinkish. Flesh becoming pink on exposure. Taste bitter. Spores pink. Common locally.

Boletus laricinus. Small. Weedy habit. Drab tints. Drab pores. Stem slender and scrobiculate. Under larches. Rare.

Boletus parasiticus. Entirely golden-yellow. Very small. Parasitic on Scleroderms.

Boletus piperatus. Small. Cinnamon pileus. Reddish-brown pores. Yellow flesh. Slender stem. Peppery taste. Common locally.

Boletus purpureus. Pileus, stem, and pores purple-crimson. Rare. (Pl. VI. fig. 1.)

Boletus radicans. Pileus, stem, and pores drab, or stone-colour. Pileus large. Stem slender and rooting. Uncommon.

Boletus rubinus. Tubes entirely carmine. Flesh vivid yellow, unchanging. Rare.

Boletus sanguineus. Very small. Pileus and stem crimson. Tubes orange, Rare.

Boletus (Strobilomyces) strobilaceus. Pileus blackish-brown, scaly as a fir-cone. Rare. (Pl. VI. fig. 2.)

Boletus variegatus. Pileus tawny-yellow, scaly. Margin flocculose. Stem and flesh yellow, becoming greenish where wounded. Tubes brown-yellow. In pine woods. Rare.—*W. D. H.*

Genus POLYPORUS.

(XLVII.) **POLYPORUS OFFICINALIS**; The Larch-clump.

Habitat. On old larches. Solitary.

Season. September until April.

Pileus. Up to twelve or sixteen inches diameter, white, zoned with yellow and brown, smooth, glabrous, dry, polished; reniform, flabelliform, or like a horse-shoe, very thick; lateral, sessile, rimose at base.

Pores. Minute, indistinct, yellowish.

Section. Flesh very thick, soft, tough, white, friable when dry. Tubes short, minute. Odour mealy. Taste bitter.

Obs. Not stated to have occurred in Britain. It is found in the Alps and Dauphiné, and I believe also in North America. It is an old-fashioned, popular medicine, and was once an official drug with us. It is an active purgative, and somewhat emetic. It seems to have lately reappeared in American pharmacy as a remedy for phthisis. The powder of it is still kept by herbalists, under the title of "Larch Boletus," or "Boletus laricinus." I therefore include it in this list as a species having some interest attached to it.—*W. D. H.*

(XLVIII.) **POLYPORUS PERENNIS**; The Brown Stump-flap.

Habitat. On stumps, sterile ground, and charcoal heaps. Singly, or in tufts; perhaps confluent.

Season. Autumn, and then perennial. Uncommon.

Pileus. Two or three inches across, varying shades of bright

brown, zoned, striate, soft, velvety; plane, cyathiform, or infundibuliform, thin, leathery. Margin fimbriate or laciniate. Base brown, thick, firm, velvety, tomentose.

Pores. Veiled at first, brown, minute, torn, angular, decurrent.

Section. Flesh brown, thin, coriaceous. Odour faint. Taste bitter.

Obs. I have seen it a good deal in the Lake District. Elsewhere it seems rare. Quetelet states that it is poisonous; but the character of the poison is undetermined.—*W. D. H.*

(XLIX.) **POLYPORUS VERSICOLOR**; The Striped Stump-flap.

Habitat. On stumps, trunks, and branches of trees. In single clumps.

Season. Spring and autumn. Common.

Pileus. Two to twelve inches across, white, buff, or grey, zoned with various colours, villose, velvety; thin, rigid, plane, depressed behind, or resupinate, reflexed, imbricate, dimidiate, etc. Sessile.

Pores. White or pallid, minute, torn.

Section. Flesh thin, coriaceous, whitish, rigid. Tubes short, small, round, acute. Odour disagreeable. Taste nauseous.

Obs. It has been stated to contain an irritant principle, probably purgative. Little is known about it.—*W. D. H.*

ORDER PHALLOIDEI.

Genus CLATHRUS.

(L.) **CLATHRUS CANCELLATUS**; The Cage Fungus. (Pl. XIV. fig. 3.)

Habitat. In woods and wastes. Solitary.

Season. August to October. Rare.

Habit. Uniqne. At first inclosed in volva, white, globular, ovate, rooting. Volva breaks at the top, disclosing an oval cage or lattice of fleshy branches anastomosed together, and of a scarlet or orange colour. The interstices of the cage-work are rectangular or lozenge-shaped. The substance is cellular. The cage excretes a deliquescing, viscid juice, which falls into the open volva and collects there. Odour most abominable.

Obs. The hateful stench of this curious plant has always caused it to be thought noxious, and there is a French vulgar belief that the touch of it will produce cancer. Paulet examined it, and proved it to contain a virulently poisonous principle, of a narcotic kind.—*W. D. H.*

Genus PHALLUS

(LI.) PHALLUS IMPUDICUS; The Stinkhorn. (Pl. XIV. fig. 2.)

Habitat. In woods, among grass, weeds, fern. In dry ditches. Singly.

Season. August to October. Uncommon.

Pileus. About two inches high, green-grey, conical, hood-shaped, apex perforate, surrounding top of stem, adherent at margin, reticulate with polygonal cells which contain a viscid, greenish exudation.

Stem. Four to eight inches high, whitish, thick, closely and finely scrobiculate. Volva cup-like and adnexed at base; investing the whole plant in youth.

Section. Substance of pileus gelatinous, inclosed in membranaceous coats. Stem hollow, its substance thin, white, and firm. Odour abominably fœtid.

Obs. Flies are attracted by the stench of this plant, and cats are said to be also drawn to it. The stink in a room has caused illness. Krombholz asserts that it contains a poison; but Cooke states that a friend of his eats the stem, and says it makes a relishing dish! The form of the plant has in all ages led to the belief that it possessed aphrodisiac properties, which is not likely to be the case, however. There is a kindred species (Cynophallus caninus; Pl. XIV. fig. 1), though of a different genus, very like the Stinkhorn in shape and smell, but much smaller, with imperforate red hood. It is as common, according to my experience, and probably of like quality.—*W. D. H.*

ORDER TRICHOGASTRES.

Genus SCLERODERMA.

(LII.) SCLERODERMA VERRUCOSUM; The Warty Earth-ball.

Habitat. On sandy and gravelly soils, in undisturbed places. In groups.

Season. September to November. Not common.

Habit. Globose, sub-stipitate, rooting, one to three inches diameter, drab, or brownish. Peridium thick, hard, strong, persistent, covered with numerous prominent warts, thinnest at top. Stem, when present, thick and lacunose.

Section. Flesh whitey-grey, soon purple-brown or black, eventually a brown powder. Odour earthy.

Obs. The powder of the ripe plant is intensely irritating to the eyes or mucous membrane. It is asserted that the species contains a poisonous principle in all stages, probably narcotico-acrid, and virulent enough to have sometimes proved fatal. But little can be gleaned about it.—*W. D. H.*

ORDER TUBERACEI.

Genus ELAPHOMYCES.

(LIII.) ELAPHOMYCES GRANULATUS; The Lycoperdon Nut. (Pl. LI. fig. 6.)

Habitat. Underground, in pine woods and heaths. In clusters.

Season. February to June. Uncommon.

Habit. Ovate, one to two inches' diameter, globular, rootless. Peridium tawny, or earth-colour, becoming whitish when dry, hard, rigid, covered with small angular papillæ.

Section. Flesh reddish-white at first, soon brown, becoming purple-brown powder mingled with white filaments. Odour slightly aromatic. Taste unpleasant.

Obs. Sold by herbalists under the above English name as an aphrodisiac. It is questionable whether it possesses that quality, and though it has also been deemed poisonous, there seems reason to suppose it is actually inert. At any rate, it should not be mistaken for an edible Truffle.—*W. D. H.*

CHAPTER XI.

On the Cultivation of Certain Fungi.

Of the many kinds of esculent Fungi, only one species has been artificially raised to the extent of proving a distinct commercial success. Others have been cultivated as well, but hardly more than experimentally or locally. Still, there is no reason to doubt that means may be found for raising crops of various choice kinds, were attention duly bestowed upon them.

The familiar Pratelle, vaguely known in England as "the common mushroom," is now largely cultivated in various countries besides our own. Produced under artificial and altered conditions, the features of the original White Pratelle (*A. campestris*) are in some measure modified, and a new variety appears which it may be expedient to regard as a distinct species under the name of the Garden Pratelle (*A. hortensis*). The cultivation of this species is easy and inexpensive. In and near Paris it is carried out in subterranean excavations, where there are many miles of mushroom beds in the aggregate. Here, in recent years, the demand has greatly increased, and the Garden Pratelle is raised in large and steadily augmenting quantities. It proves exceedingly lucrative to the growers, who state they can rely on a return of one hundred to one hundred and fifty per cent. per annum, at least, on capital invested in mushroom-culture. But this production is far from having attained its fullest development as yet. Cultivated mushrooms ought to be retailed at a much lower price than they are at present. Moreover, English people still regard mushrooms as but a mere relish and adjunct to other dishes, and have yet to learn that they might take the place of a staple article of food, which their wholesomeness and nutritiousness fit them to be.

The author does not propose to enter into details respecting the cultivation of the Garden Pratelle on a large scale. The subject will be found treated of in most modern manuals of gardening, and numerous treatises have been published which give the fullest

particulars.[1] It is enough to say here that, for domestic use, there is no crop that can be raised more simply, easily, and inexpensively. Any cellar, shed, or outhouse can be utilized for the purpose. Cottagers, particularly in the neighbourhood of towns, would find it very advantageous to grow this Pratelle for home use. At the expense solely of a little time and trouble, they could secure a sensible amount of palatable and nourishing food. An outhouse, ten or twelve feet square, provided with two or three tiers of shelves, would afford room enough in which to raise crops worth several shillings a week, the greater part of the year, or which would save more if allowed to take the place of other articles of food. Townsfolk can easily provide themselves with a few dishes weekly by making mushroom-beds in boxes and so forth, bestowed in cellars or any out-of-the-way corner. This domestic cultivation may be carried out according to either of the following sets of instructions. The first is from Paxton's *Botanical Dictionary*, as quoted by Dr. Badham :—

"Collect a sufficient quantity of fresh horse-dung, as free from straw as possible : lay it in an open shed in a heap or ridge ; here it will heat violently, and in consequence should be now and then turned for sweetening ; after this has subsided to moderation, it will be in a fit state for forming into a bed. In the process of making the bed, the dung should be put on in small quantities and beaten firmly and equally together, until it is the required size. In this state let it remain until the highest degree of heat to which it is capable of coming is ascertained, which may be readily done by inserting a stick, occasionally withdrawing it, and feeling the heat of it with the hand. When the heat is not much greater than that of the hand, a spawn-brick (obtainable from any nurseryman for 6*d*. or 9*d*.) may be broken up into pieces of two or three inches square, and put into holes about three inches in depth and six inches asunder, over its surface ; after this throw a very small quantity of well-broken dung over the whole. In this state let it remain for two or three weeks, when a loamy soil may be put on, about an inch or an inch and a half thick, and gently patted with the spade. If the temperature of the house be kept about 60° or 65° Fahr., mushrooms may be expected in six weeks. It is not well to water the beds much, particularly when bearing ; it is much better to throw a little water over the paths and flues, etc."

As regards the spawn, should gardener's spawn-bricks not be obtainable, it may be got by taking the soil about the roots of Pratelles growing naturally in the fields. The *débris* of old beds is afterwards generally sufficient wherewith to fertilize new ones. Mushrooms may also be obtained without artificial fertilization of

[1] The following can be recommended : J. Cuthill, *On the Cultivation of the Mushroom*. W. Robinson, *On Mushroom Culture*. W. Earley, *How to Grow Mushrooms*.

the beds, by so regulating the heat that the spores present in the horse-dung shall not be destroyed. This is described in the following instructions, which are taken from Mr. Cuthill's book:—

"Addressing myself to the working classes, I advise them, in the first place, to employ their children or others collecting horse-droppings along the highway, and if mixed with a little road-sand, so much the better. They must be deposited in a heap during summer and trodden firmly. They will heat a little, but the harder they are pressed, the less they will heat. Overheating must be guarded against; if the watch or trial stick inserted into them gets too hot for the hand to bear, the heat is too great, and will destroy the spawn. In that case artificial spawn must be used when the bed is made up. The easiest way for a cottager to save his own spawn would be to do so when he destroys his old bed. He will find all round the edges or driest parts of the dung one mass of superior spawn; let him keep this carefully in a very dry place, and when he makes up his next bed, it can then be mixed with his summer droppings, and will insure a continuous and excellent crop.

These little collections of horse-droppings and road-sand, if kept dry in shed, hole, or corner, under cover, will in a short time generate plenty of spawn, and will be ready to spread on the surface of the bed in early autumn, say by the middle of September, or sooner. The droppings during the winter must be put into a heap, and allowed to heat gently, say up to 80° or 90°; then they must be turned over twice daily to let off the heat and steam; if this is neglected, the natural spawn in the dung is destroyed. The cottager should provide himself with a few barrowfuls of strawy dung to form the foundation of his bed, so that the depth, when all is finished, be not less than a foot. Let the temperature be up to milk heat. He will then, when quite sure that the bed will not overheat, put on his summer droppings. By this time these will be one mass of natural spawn, having a grey, mouldy, and thready appearance, and a smell like that of mushrooms. Let all be pressed very hard; then let mould, unsifted, be put on to the thickness of four inches, and trodden down hard with the feet, and watered all over; and the back of a spade may now be used to make it still harder, as well as to plaster the surface all over."

These directions should suffice for home cultivation of the Garden Pratelle, and further information may be had, as already indicated. Crops are obtainable all through the winter, if the temperature of the house can be kept above 50° Fahr. During summer, Pratelles are easily grown in the open air, by placing the collected droppings, after heating is over, on asparagus beds or the like, or under thin turf. So far as size and substance is concerned, the Garden Pratelle develops well even in dark cellars or caves. But the plant then loses something of digestibility, is less nutritious, and poor in flavour. It requires light and air to attain perfection in these respects. For the natural habitat, it must not be forgotten, is the open pasture. The author feels bound to add that the wild Pratelles gathered at the proper stage, are certainly

better flavoured, and probably more nutritious, than the Garden Pratelle is at its best.

Some attempts have been made here to introduce the cultivation of Truffles, but they do not appear to have been successful. We have two esculent species, which have been described in the catalogue, and these may be of abundant occurrence, and might be found plentifully if properly looked for. But the most esteemed kinds, *Tuber cibarium* and *Tuber melanosporum*, the latter being the famous Perigord Truffle, have not been found in Britain. If they could be introduced, there is no doubt they might become a source of large profit. The extent of the trade in Truffles, in some parts of France and Italy, is very considerable indeed. Immense quantities are annually consumed or exported. Perhaps the aggregate amount is as much as that of Pratelles consumed here. In one small market, that of Apt, there are from 3,000 lbs. to 4,000 lbs. of Truffles sold weekly during the season. The annual yield of the Department of Vaucluse alone is stated to exceed 60,000 lbs. of Truffles.

In districts where Truffles are naturally prevalent, a certain amount of cultivation is resorted to, and has proved successful. But whether they can be induced to grow in a new country is as yet uncertain, and no purely artificial mode of raising crops has been devised. The choice Perigord Truffle is of course the kind it would be most desirable to cultivate. It prefers a marly, argillaceous soil, resting upon chalk and flints. It has a preference for certain trees, notably oaks of three species—*quercus robur*, *ilex*, and *coccifera;* and some observers think that, in their early stages of growth, Truffles draw nutriment from the rootlets of these trees. That there is some connection appears almost certain. Our Winter Truffle is found beneath oaks, and our Summer Truffle beneath beeches. Although subterranean, Truffles require light and air. The shade of the trees must not be too dense, and the ground must be free from brushwood. Borders of woods and open glades are the likeliest sites.

Truffle grounds are prepared by choosing suitable localities, where the soil and timber answer the requirements just mentioned. The ground is cleared, the trees are thinned, and trenches are dug. Truffles are now brought from their native site, inclosed in the earth in which they grew, and are planted in the trenches. In time they propagate, and it is said that grounds have been successfully fertilized in this way. Another mode employed has

been to sow barren soil of the right sort with acorns. In the course of years Truffles are found among the roots of the young trees. But this plan has only been proved to be successful in places where the Truffles had once, at some previous period, been indigenous. Other similar experiments have been tried, with more or less success. Whether or not Truffles have really been induced to grow where none ever grew before is doubtful, but it is certain that judicious treatment has done much to augment the crops yielded by natural Truffle-grounds. Much investigation and patient experiment are yet needed to make Truffle culture practicable and satisfactory, in spite of the attention that has been already devoted to the subject.[1]

It would be very advantageous if a means could be found for cultivating the Morel (*Morchella esculenta*). It is solely a spring mushroom, and affects certain localities, in which it reappears most years during May and early June, often in profusion. Both in flavour and nutritiousness it is superior to the Pratelle. As it was noticed that Morels were most abundant in forest clearings, particularly where the brushwood had been fired, such places have been made merely to promote the growth of Morels, and with success. In Germany, the sale of Morels is so profitable that special enactments are enforced, to prevent the peasantry from burning the woods down right and left, in order to insure crops. A French gentleman, M. Géflin, is said to have been successful in raising Morels. He prepares a bed exactly as if for Pratelles, and he sows this with Morels chopped up into pieces. Darkness and moisture are essential to the plant, and must be secured to it. Plentiful watering is necessary, but the bottom of the bed must be so arranged as to provide free drainage. By this means continuous crops are secured from April to the middle of July, and M. Géflin is stated to have succeeded in reaping rich harvests. If this expedient is reliable, it should be widely carried out. The Morel is a most desirable mushroom, and ranks only second to the Truffle in the opinion of epicures. It may be added that Helvels grow under much the same condition as Morels, and might most likely be raised in a similar way. They are of excellent quality, though less esteemed than the other.

[1] See, on this head, Broome, *On Truffle Culture*, in "Jl. Hort. Soc.," i., p. 15, 1866; Cordier, *Les Champignons*, chap. xiii., 1876; Ravel, *Culture de la Truffe*, 1857; De Borch, *Sur les Truffes du Piémont*, 1780; Vittadini, *Monographia Tuberacearum*, 1831.

The Dainty Bolet (*Boletus edulis*) is so desirable a species that it is not surprising to find that various people have endeavoured to cultivate it. The method adopted has been to choose a suitable site, similar to the natural habitat, and to water it freely with an infusion of the Bolets. But the plan has been very partially successful. A suggestion is offered that affords more likelihood of success. Let the earth and mycelium about the base of the Bolets be dug up and transported to the desired site, and then let this transplanted spawn be watered with infusions of the plant. There will be then more probability of a crop being reaped next year. Similar experiments have been tried in France with regard to that delicious species, the Verdette (*Russula virescens*), and apparently with more success than in the case of the Bolet. The author's present opinion is that the fecundity of spores depends on the presence also of the mycelium, and *vice-versâ*, at least in some species, though possibly not in all. He has always failed in trying to raise Bolets, using an infusion—that is to say the spores—alone.

It has often been suggested that the Oread (*Marasmius oreades*) would be a good species to cultivate. Certainly it possesses a very strong and agreeable flavour, but on the other hand it can yield little nutriment. The author has seen it accidentally transferred from place to place, when soil was carried, and turf taken from one field to another. Transplantation, indeed, appears practicable in the case of many species. It is necessary that the whole plant should be taken, with a quantity of the earth through which the mycelium ramifies, and the new site must afford every suitability. It would be well worth trying to propagate the St. George (*A. gambosus*) in this or other ways. It is a mushroom only appearing in mild springs, and consequently is uncommon, though very abundant where it does occur. It is, moreover, both substantial and richly flavoured.

The Giant Puffball (*Lycoperdon giganteum*) may be in so far cultivated that, if its site be kept carefully undisturbed, it will recur there annually. Moreover, it may sometimes be induced to appear in a new spot, by depositing there a ripe Puffball, and leaving it to decay undisturbed till next year. The author has found that sundry species may be grown in this way on selected sites, but unfortunately, except in regard to the Puffball—and that is uncertain—none of those it is most desirable to cultivate. Several of the Pezizas can readily be raised in gardens or conservatories, simply by depositing or burying the whole plant, and

leaving it undisturbed, but well watered, till its season recurs, when a crop generally appears. But they are hardly worth the trouble as esculents. Some success, but unhappily not very well assured, has attended endeavours made by the author to multiply the Oak-tongue (*Fistulina hepatica*). By grafting pieces of it in decaying clefts of other oak-trees, he hoped to insure a new growth. In one case this really seemed successful, but in others it has failed. Various experiments made with the Chantarelle, the Urchin, and the Orange Bolet, have not, up to the present, given any results.

Some species of Fungi have migrated from afar, and become naturalized in new countries. An instance of this is the Onion-stem (*A. cepœstipes*). This is a Brazilian fungus, accidentally imported into this country in some package of plants. It has now become quite at home here, and has even passed over to the Continent. The fact gives ground to hope that certain useful exotic species may some day be naturalized here. The Perigord Truffle is one such, and another is the famous Oronge (*A. cœsareus*), which indeed is reported, though not on sure authority, to have already appeared here. It is a mushroom highly prized by Continental *gourmets* to-day, just as it was by Roman epicures twenty centuries ago.

Then there is the Ægerita, which was one of several species cultivated for the table in the time of Dioscorides. It is thought to be identical with one of the Pholiotes (*A. cylindraceus*), which is now grown in the south of France. In spring-time transverse sections are taken from stumps of black poplar. These are rubbed all over with the flesh of the mushroom, and are then loosely buried in some damp, dark place. During the succeeding summer and autumn they produce plentiful crops. The ancients used to drench the standing stumps with hot wine and water to induce the growth of the mushroom; or they strewed a prepared bed with the bark.

In the vicinity of Naples is found a substance called Pietra fungaja, or Fungus-stone. It consists of volcanic tufa, concreted together by mycelium. On being placed in a warm place, and well watered, this "stone" produces crops of a dainty esculent mushroom, the Italian Stone-tuft (*Polyporus tuberaster*). Fungus-stone has been brought to England, and is productive in hot-houses. But to induce the spread of the mycelium, and consequently the real cultivation of this species, is evidently impossible without the

special nidus. Probably it would not be found in Great Britain. But in connection with this a whimsical idea one day struck the author, that possibly some good useful fungus of a similar kind may exist, which could be induced to fertilize those immense mounds of slag and cinder seen near collieries, ironworks, and so forth; and which in some places cover many acres of ground with black and sterile oppression! Comical as the notion may seem at first sight, it is not altogether ridiculous. For this Italian Stone-tuft shows us that Nature has provided plants which can feed upon igneous mineral matter, and so transform it into fertile soil.

The Neapolitans cultivate a small fungus (*A. catinus*), which grows upon coffee-grounds. The coffee-grounds are simply bestowed in a warm corner, and kept undisturbed and constantly damp for six or eight months, when they begin to afford crops. The mushroom is said to be extremely dainty. Dr. Badham mentions another species which appears on tea-leaves similarly treated, but there is no evidence as to whether it is edible or not.

In the Campagna of Rome, a small Polypore (*P. corylinus*) appears on charred stumps and logs of hazel and cob-nut. These stumps are brought to market. They are well singed, and then put into a warm place, left undisturbed, and watered freely. In a few weeks they become covered with mushrooms, and these are said to be of first-class quality. There is little doubt that if some of these stumps were brought to England, and so treated, that they would bear. And it is not improbable that the spores would disseminate themselves, and in course of time render our own hazels and cob-nut trees similarly fruitful.

If any readers have become interested in these subjects, and if they happen to be persons blessed with the inestimable treasure of much leisure-time—not filled up and occupied, every minute of it, by the unceasing drudgery of working and scheming to provide for themselves and families—then they may be here reminded that it is they who are privileged, they who have the opportunity, to carry out protracted experiment and prolonged research, so as to decipher pages in the book of nature as yet unread, and render the gifts of nature more available to man. Here is an occupation offered, one that may yield results which will benefit the many—to experiment on the culture of sundry eatable Fungi; not to mention those other studies and investigations previously adverted to in this work! It has been said that he is the truest benefactor of his race who can make two grains of wheat grow where only

one grew before. Surely, then, he is not to be despised who can render available a new food of the highest nutritive quality, or increase the crops of it, even if that food be found in "fruits of the earth," which blasphemers of nature, ignorant and prejudiced, have hitherto only neglected, ridiculed, and aspersed!

CHAPTER XII.

A Calendar of the Common Esculent Fungi.

In both catalogues the season of each species is noted. These seasons have been assigned after a careful comparison of many notes, and they seem to be the normal periods of the year during which the several species appear. But the author wishes it to be understood that the seasons he has tabulated are scarcely more than approximate, for sufficient attention has not been generally bestowed by mycological observers to this point. Some species—such as the Morel, for example—are never found out of certain months. Others again are very variable, and isolated specimens may show at almost any period, depending on the weather, the local climate, or on some peculiarity of site, although the times at which they are generally prevalent are the seasons indicated. The calendar that follows simply refers to those of the esculent Fungi which have been placed in chapter vii., as kinds which may be safely recommended for popular use. It is merely intended as a rough guide to the fungus-hunter, to advise him as to what eatable species he may look for in each month. Reference must be made to the catalogues for more extended information.

MARCH. Some Elfcups; Morels; The Oyster.

APRIL. Some Elfcups; Helvels; Morels; The Mousseron; The Muscat; The Oyster.

MAY. Elfcups; Helvels; Morels; The Mousseron; The Muscat; The Oyster; Parasols; The St. George; The Summer Bolet.

JUNE. The Blusher; The Grisette; Elfcups; Inkcaps; The Kidney; Morels; The Mousseron; The Oaktongue; Parasols; Puffballs; The St. George; The Spindleshank; The Summer Bolet; The Paxil; The White Pratelle.

JULY. The Bisotte; The Blusher; Bolets; The Chantarelle; Clavarias; Elfcups; The Grisette; Inkcaps; The Kidney; The Oaktongue; The Orcelle; The Oread; Parasols; The Paxil; Pra-

telles; Puffballs; The Redmilk; The Spindleshank; The Stumptuft; The Verdette; The Virgin; The Wood Blewit.

AUGUST. The Bisotte; The Blusher; Bolets; The Chantarelle; Clavarias; Elfcups; The Grisette; Inkcaps; The Kidney; The Oak-tongue; The Orcelle; The Oread; Parasols; Pratelles; Puffballs; The Paxil; The Redmilk; The Spindleshank; The Stumptuft; Urchins; The Verdette; The Virgin; The Wood Blewit.

SEPTEMBER. The Bisotte; The Blewit; The Blusher; Bolets; The Chantarelle; Clavarias; Elfcups; The Grisette; Inkcaps; The Ivorine; Helvels; The Kidney; The Oaktongue; The Orcelle; The Oread; The Oyster; Parasols; The Paxil; Pratelles; Puffballs; The Snowdrop; The Spindleshank; The Stumptuft; The Redmilk; Urchins; The Verdette; The Wood Blewit; The Virgin.

OCTOBER. The Bisotte; The Blewit; The Blusher; Bolets; The Chantarelle; Clavarias; Elfcups; The Grisette; Helvels; Inkcaps; The Ivorine; The Oaktongue; The Orcelle; The Oread; Parasols; The Paxil; Pratelles; Puffballs; The Redmilk; The Snowdrop; The Spindleshank; The Stumptuft; Urchins; The Verdette; The Virgin; The Wood Blewit.

NOVEMBER. The Blewit; Bolets; Clavarias; Elfcups; The Grisette; Helvels; Inkcaps; The Ivorine; The Oaktongue; The Oyster; The Paxil; The Redmilk; The Stumptuft; Urchins.

DECEMBER. The Oyster; Elfcups.

∴ In the above list the plural is used to denote the occurrence of more than one species having the same generic name, as the various Bolets, Elfcups, etc.

In January and February the Oyster may still sometimes be found, together with its kindred, and some of the edible Polypores, Tremelles, or Elfcups. They are very sparingly seen, however.

APPENDIX.

APPENDIX A.

On the Preparation of Fungi for the Table.

The importance of discrimination has been strongly insisted on; and it must be applied in the kitchen as well as in the field. We must get rid of the notion that esculent mushrooms are all one kind of thing, and must look upon each species, or each little group of kindred species, as entirely distinct one from another, and probably needing quite different treatment to prepare for the table. Certain species, such as the various kinds of Pratelle, or the various kinds of Parasol, or of Clavarias, may be lumped together without disadvantage perhaps. But as a general thing it is better to gather one species at a time, to prepare and cook one at a time, and to eat one at a time.

There are several rules which it is advisable not to forget. First, no new species should be ventured on unless it has been surely and satisfactorily identified, and unless it be one of those which are here recommended. And all the individuals in a basket should be looked over before they are put into the cook's hands, to make sure that there is no "suspect" among them. Second, no kind of fungus is good when putrescence or decay has commenced in it. It is true that some appear to be harmless even when far gone. One often sees the common Pratelles exposed for sale when they are half-rotten, and some people appear to think these black-gilled, putrifying specimens the most tasty. But some other kinds become quite noxious as soon as the chemical changes of decomposition begin, and of these the Blewit is a striking example. Therefore it should be regarded as a rule that any mushroom, of whatever kind, is to be rejected if at all "gone," or decomposed in the slightest degree.

It may be advanced as a pretty sure fact that the greater number of the "poisonings by mushrooms" we hear of every autumn, are due simply to the consumption of half-rotten individuals, which were very likely quite wholesome when fresh. If people

eat of rotten fruit or tainted meat they are not surprised if they are taken ill in consequence. Yet they will eat putrifying mushrooms, and, when the same consequence ensues, both they and their doctors (in England) will assume that a poisonous principle inherent in the mushroom was to blame; and henceforth they will nurture the strongest prejudice against all Fungi, fresh or rotten. Surely this is not very sensible.

It is further to be noted that no kind of mushroom is good when it is full of the larvæ of insects—maggoty, in point of fact, Natural repugnance would generally suffice to prevent such individuals being eaten; but some people are not particular. Mushrooms full of maggots are usually in the first stages of decay, and hence are more or less unwholesome. Unsound specimens are always to be rejected. Relative age, too, must be taken into account. Species of firm flesh are often too tough when old, and only young individuals may be selected. This is especially the case with tree-Fungi.

On the Continent many of the edible Fungi are eaten raw, either simply with bread and salt, or dressed as salad. Probably our palates will only be satisfied with a few species this way; the Puffballs and the Oaktongue, for example. A French author has gone so far as to assert that eating mushrooms raw is the only way to avoid accidents, and that cooking is responsible for poisonings. He founds his advice upon the assumption that poisonous plants taste unpleasantly, and would hence be rejected in the raw state, while cookery might disguise their unpalatableness. But the theory is wholly adverse to facts, and is therefore inadmissible. Several very poisonous kinds are quite bland and pleasant to the taste; numerous thoroughly wholesome sorts are forbidding in flavour until properly dressed. And lastly, in many kinds actually possessing deleterious essences, these are more or less dissipated by culinary processes. The author is an advocate for careful and suitable cookery, and there are only a few species that he recommends for consumption *au naturel.*

It is a certain fact, that various kinds of Fungi in whose tissues there exists some essence deleterious to the human economy are yet commonly eaten by the people in foreign localities. Probably it is this fact which has given rise to a popular but erroneous notion that the identical species of fungus might be poisonous when it grew in one place, but not so when it grew in another. Upon careful investigation, however, it turns out that the mush-

rooms possess the same qualities wherever they grow, as is the case with other plants. The reason why poisonous kinds can be eaten with impunity is simply because they are submitted to some simple process which destroys or removes the noxious essence, leaving the nutritious tissues perfectly harmless and good to eat. This is undoubtedly a very valuable discovery, since it increases the supply of available food. It has been elsewhere discussed in connection with the chemistry and toxicology of Fungi. But even the application of such processes will not allow Discrimination to be altogether set aside. The methods employed to render one set of poisonous species innocuous prove abortive when applied to another series of noxious individuals. Boiling is sufficient in one case, but not so in another. Salt is required for one, vinegar for a second, desiccation for a third. Even in this respect we see how entirely wrong it is to regard Fungi from a general point of view. The only sure system is to appreciate each several species as something quite apart from its congeners.

Having selected our Mushrooms, of one kind or another, and in accordance with the advice already given, the first thing to be done is obviously to remove all adherent dirt, with the fingers and a brush. If they be in a fair and clean condition it may not be necessary to wash them, though it is better always to do so. Fragile and watery sorts, like Inkcaps, are best not washed, if they can be gathered clean enough. Washing consists in merely rinsing the Mushrooms in cold water, and then lightly pressing each one dry in a soft cloth.

Modes of preparation will now differ, according to the kind of mushroom and to the way it is to be dressed. In the succeeding chapter of recipes will be found directions in each case, both for preliminary preparation and dressing. In the majority of cases mushrooms should be scalded. When they are taken out of the cold water in which they have been rinsed, they are at once to be plunged into boiling water, but not left in it more than two or three seconds, then to be immediately dried with a soft cloth. A few need a second rinsing in cold water, after having been scalded. These processes are for the purpose of ensuring a thorough cleansing of the mushrooms, and the removal of any extraneous flavour. Scalding has a curious result, in making the cooking which is to follow more effective. It is essential for some kinds, but is better dispensed with for others, as will be indicated in the proper places.

Where the stems of mushrooms are of the same substance as the caps, or where they are of a light and fleshy texture, only the butt end need be pared away. But when at all tough, or different in substance to the cap, then the whole stem must be rejected. In many cases it is well to scoop out the gills of Agarics and to reject them. The tubes of Bolets must always be cleanly removed with a spoon, as they spoil the flavour, except in very young specimens. As a rule, it is better not to peel the cap, this especially with regard to Pratelles. But where the peel is tough or thick, then it is obvious it should be taken off. It will depend on the mode of dressing whether the mushroom is sliced, minced, or cooked whole; but when there are big and small together, the larger should be cut into pieces the size of the smallest. The time required for cooking will be long or short, depending not only on the kind of mushroom, but also on the particular receipt employed. The ordinary rules as to this will be specified, but much must be left to the cook's own judgment.

Since we have, in most large towns, Schools of Cookery educating the kitchen mind, amateur and professional, the assertion ought to be comprehended that there are as many ways of cooking mushrooms as of dressing eggs or potatoes—that is to say, legion! The one hundred and more receipts given here may be made the basis for many others. It should be well understood that, although many species may be cooked in a similar fashion, others again require a wholly different treatment. One cannot cook the Chantarelle like the Pratelle, for example. Again, there are special dishes which can only be properly prepared from some one particular species. Distinction must never be forgotten if we wish to really know mushrooms in their best aspects. People have often made trial of esculents new to them, and have been disappointed simply because they did not practise proper culinary method.

Nicety in cooking does not invariably imply expense. Most of the annexed receipts should be within the means of the humblest cottage. A few, more luxurious, are suited for well-to-do people, who will find that the daintier sorts of mushrooms are well worthy of the most elaborate *cuisine*. It may be added, too, that the two or three ways in which common Pratelles are usually cooked in England are simply barbarous. They are apparently designed to rob the mushrooms of all flavour, and render them as indigestible as possible. It is not expensive materials that are wanted, but only a little care, and the employment of suitable methods.

Most kinds of mushrooms can be very readily preserved for use at a future time, and several receipts are given with that intention. Some make excellent pickles. Dry-fleshed species can usually be dried. These preserve their aroma well, can be used in powder for flavouring, or can be revived and made into dishes; the more juicy and succulent sorts can be preserved in brine or dry salt, like meat. Preserved in these several ways, many sorts are regular articles of commerce on the Continent. Some kinds are suitable for preserving in oil, or in brandy, etc. The best species for ketchup are all the Pratelles, all the Parasols, Blewits, and Blushers. Oreads improve the flavour of ketchup, though they cannot yield it themselves. The juice of the Oaktongue makes a splendid substitute for beef gravy, and will keep well, like ketchup.

In a culinary sense, as well as in regard to their nutritive quality, mushrooms should be considered equivalent to *flesh-meat*, rather than as vegetables.

APPENDIX B.

Culinary Receipts.

In the last chapter it was shown that the proper handling of mushrooms in the kitchen involved, first, a preliminary process, and then the actual dressing. The preliminary process varies a little in different cases. In order to avoid unnecessary repetition, the sundry methods of preparing mushrooms in the first place will be set down once and for all; and each receipt will commence by referring to whichever of them is proper to be adopted, prior to following out the mode of dressing set forth in it. In *every* case the mushrooms must first of all be picked as clean as possible by hand, adherent dirt or twigs, etc., brushed off, and the stems, or the butts of them, removed, together with such other parts as it is necessary to reject. Then comes the washing or preliminary process, as directed in each case, and then the rest of the operation indicated in the receipt which is being employed.[1]

No. 1.—To Prepare Mushrooms.

(A.) After cleansing and paring off what is to be rejected, rinse the mushrooms well in cold water, take them out and wipe them carefully dry with a soft cloth.

(B.) After cleansing, etc., rinse in cold water, then scald by throwing the mushrooms into a pan of boiling water. Do not let them remain in the hot water more than a few seconds, but immediately take them out and carefully dry them with a soft cloth.

(C.) As the last, but after scalding, rinse the mushrooms again in cold water, and then dry them with a soft cloth.

No. 2.—To Grill Mushrooms. Take large ones. Remove the stems, but not the peel or gills. As in No. 1 B. Then powder slightly with flour. Put a little butter, pepper, and salt on the

[1] The receipts here given are headed only with the names of mushrooms included in chapter vii. But in the Index will be found a reference number assigned to every esculent species, which will suffice to indicate according to what system that species should be prepared and dressed.

gills. Lay top downwards on a gridiron over a moderate fire. Five or six minutes at the most.

No. 3.—Pratelles with Herbs. Remove butts of stems and peel. As in No. 1 B. Then slice into a pie-dish. Mingle with them butter or oil, also chopped parsley and scallion, pepper and salt, and some bread crumbs. Cover the dish with a plate. Put into a warm oven for about fifteen minutes. Serve in the dish.

No. 4.—Pratelles à la Bourgeoise. Take half a pound. Remove butts and peel. As in No. 1 B. Then cut into equal-sized pieces. Put into a pie-dish with two ounces of butter, two table-spoonfuls of olive oil, salt and pepper. Set before the fire for two minutes. Then cover with a plate, and put into a hot oven for ten to fifteen minutes. Serve at once, sprinkling chopped parsley over the mushrooms, and garnishing with slices of lemon.

No. 5.—Pratelles à Soyer. Remove the butts. As in No. 1 B. Then divide large ones. Line a pie-dish with toast. Place the mushrooms on it, sprinkling with pepper and salt, and one clove. Pour over them some spoonfuls of thick cream. Cover with a plate, and with a wet cloth. Put in a warm oven for fifteen minutes. Serve without removing the cover to let the rich odour escape.

No. 6.—Mushroom Fricassée. Take "buttons" only. Pare the butts slightly. As in No. 1 A. Melt butter in a stewpan. When it is hot, put the buttons into it, stirring well for some minutes. Then add a little broth, pepper and salt, a bunch of parsley, and a suspicion of allspice. Stew for twenty minutes, adding a little more broth when requisite. Beat up the yolks of two eggs with a wine-glassful of cream, and a spoonful of lemon juice. Take the pan off the fire, remove the parsley, add the eggs and cream, pour out over toast, and serve at once.

No. 7.—Pratelle Fricassée. Take full-grown mushrooms, but not too old. Remove the stems, peel, and gills. As in No. 1 B. Then slice into small square pieces, and proceed as in No. 6, adding curry-powder or not. Serve with boiled rice round the dish.

No. 8.—Pratelles aux Croûtes. Remove the stems. As in No. 1. B. Cut into large dice. Put into a stewpan, in which butter and flour are already heated. Season with pepper, salt, and nutmeg. Add a bunch of sweet herbs and scallions, and a little broth. Simmer for half an hour. Take off and remove the herbs. Add egg-yolks beaten up with cream and lemon-juice. Pour over slices of bread that have been buttered and fried. Serve.

No. 9.—Mushroom Fritters. Take large ones. Remove the stems and peel. As in No. 1 B. Then powder all over with salt. In five minutes wipe off the salt and dust with flour. Throw the floured mushrooms into boiling batter. When they have taken a good crust, take them out, drain them, and serve on a napkin, garnishing with fried parsley.

No. 10.—Mushroom Croquettes. Take eight large ones. Remove stems and peel. As in No. 1 B. Then cut into dice. Fry in melted butter for three minutes. Then add two or three wine-glassfuls of cream sauce (*béchamel*). Add the yolks of three hard-boiled eggs, minced, also salt and nutmeg. Add two table-spoonfuls of grated cheese (Parmesan). Stew for eight minutes, stirring assiduously. Then take off the pan, add egg-yolk to bind, and turn out on a dish. When set, divide into rolls, and cover with paste, etc., as for ordinary croquettes.

No. 11.—Pratelles à la Provençale. Remove butts only. As in No. 1 B. Then steep in olive-oil for two hours. Heat plenty of oil in a frying-pan. Take the mushrooms out of the cold oil, drain, and throw into the hot pan. Sprinkle them with salt, pepper, nutmeg, minced parsley and onion. Eight minutes over a brisk fire, then serve on fried bread.

No. 12.—Ragoût of Pratelles. Remove butts only. As in No. 1 B. Then put into a stewpan, with salt and pepper, butter and flour, minced parsley and onion, and a little broth. There *may* be added some rich gravy, and white wine. Stew very gently for an hour. Add some good brown sauce, and serve.

No. 13.—Purée aux Pratelles. Remove the butts only. As in No. 1 A. Then boil the mushrooms in water until they begin to break up. Take out and drain. Mash up, pressing out the water in a napkin. Put the mash into a stewpan, with a little butter and lemon-juice. Heat. Next add a few spoonfuls of broth, and the same quantity of white-meat jelly (*coulis*), also salt and pepper, and other seasoning to taste. Stew down to a proper consistence, and serve.

No. 14.—Mushroom Pie. Remove stems and peel. As in No. 1 B. Take a pie-dish, and cover the bottom with butter. Lay on this half an inch of bread-crumb, and on that a layer of mushrooms, sprinkled with salt, pepper, minced parsley and onion. Then put another layer of butter, next an inch depth of bread-crumb, and mushrooms again. Preserve this order until the dish is full. Finish with a thick top of bread-crumb, or of potato, or

of pie-crust. Cover with a plate, and bake for an hour. Serve in the dish.

No. 15.—**Mushroom Egg.** Take large juicy mushrooms. Remove butts only. As in No. 1 A. Then mince, and heat very gently with a spoonful of gravy or milk, pepper and salt, parsley and onion, until the juice has run out of the mushrooms. Then strain off all the liquor, and to every pint of it add the yolks of five eggs and the whites of three. Beat well together, and heat quickly, stirring. Pour out over toast and serve.

No. 16.—**Pratelle Dumplings.** Take young ones. Remove only the butts. As in No. 1 B. Then cut into dice, with an equal quantity of bacon fat. Add salt, pepper, and onion, or garlic. Inclose in paste, as dumplings, wrap in cloths, and boil half an hour. Serve.

*** Garlic is a great improvement, in spite of the prejudice against it in English kitchens. But it must be used with great delicacy, and in homœopathic quantities. It brings out mushroom flavours wonderfully.

No. 17.—**To Fry Pratelles.** Remove the stems, but not the peel. As in No. 1 B. Then cut large ones into two or three pieces, and flour them. Heat butter, oil, lard, or dripping in a frying-pan. When boiling, put the mushrooms in, sprinkling them with salt, pepper, and with minced sweet-herbs and onion if desired. Fry for five or six minutes, and serve hot. Should not be overdone.

No. 18.—**Mushrooms in Made Dishes.** Remove the stems. As in No. 1 B. Then grill plainly to add to the dish on serving, or cook along with the meat. Various kinds of mushrooms, besides Pratelles, are admirable additions to sundry meat hashes, stews, pies, puddings, salmis, vols-au-vent, ragoûts, fricassées, and soups.

No. 19.—**Pratelles à la Mâtelote.** Remove the stems only. As in No. 1 B. Then divide large ones. Heat butter in a pan. When it boils, put in the mushrooms. Fry for four minutes. Take out and put into another pan, in which mâtelote sauce is simmering. Stew ten minutes, and serve. Or, a little anchovy sauce may be added to Pratelles fried as in No. 17, and the dish called by this title.

No. 20.—**Pratelles à la Crême.** Remove stems and peel from ten large mushrooms. As in No. 1 B. Put entire into a stewpan, with salt, pepper, minced parsley and scallions, and two large wineglassfuls of fresh cream. Stew gently half an hour. Take out the mushrooms and drain them. Set them on a hot plate.

Beat up the yolks of three eggs with one ounce of butter, a little nutmeg, and chopped sweet herbs. Add this to the liquor in the pan, heating gently and stirring. As soon as it begins to thicken, pour it over the mushrooms on the plate, and serve whilst hot.

No. 21.—Pratelles à la Languedocienne. Remove butts and peel from large mushrooms. As in No. 1 B. Then put into a stewpan, gills uppermost. Sprinkle with salt and pepper, minced parsley and scallion. Pour two or three spoonfuls of oil on them, and stew gently, adding more oil if requisite. Do not turn or stir them. In fifteen minutes take out and serve.

No. 22.—Pratelles à la Marquise. Take "buttons," or young White Pratelles. Remove the butts only. As in No. 1 B. Then divide each down the middle, and rub with a piece of garlic. Put into a stewpan with plenty of butter, and heat briskly. In three minutes add pepper, salt, nutmeg, and a spoonful of lemon-juice. Then add a wineglassful of the richest brown gravy. After two minutes add two glasses of Sauterne. Simmer for ten minutes. Pour out on fried buttered bread, and serve.

No. 23.—Pratelles à la Lombarde. Remove stems and gills from six large mushrooms. As in No. 1 B. Then cut across into thin slices. Dip in egg and flour. Melt three ounces of butter in a frying-pan. Put in the slices. Set over a moderate fire, and turn the slices as they brown. In three or four minutes sprinkle with salt, and with parsley that has been rubbed with garlic and minced. When nicely browned, take off and serve hot, garnishing with pieces of lemon.

No. 24.—Pratelles à la Maintenon. Take large, firm, dry mushrooms. Remove only the butts of the stems, and the gills. As in No. 1 B. Then make forcemeat with bacon fat, bread crumb, parsley and onion, salt, pepper, and allspice. Pack this where the gills were round the stem. Wrap each in oiled paper, and broil, basting with oil as necessary. In ten minutes serve in the papers.

No. 25.—Pratelles à l'Italienne. Remove stems and peel from three pounds of large mushrooms. As in No. 1 B. Then cut in slices. Put into a stewpan a quarter pound of butter, two tablespoonfuls of olive oil, two anchovies rubbed into paste with garlic, and heat. When hot, put in the mushrooms, adding salt, pepper, the juice of one lemon, and a wineglassful of good brown gravy. Stew gently for fifteen minutes, stirring with a wooden spoon. Then add a pinch of minced parsley, and a leaf of mint bruised; and serve, garnishing with sippets of toast.

No. 26.—Pratelles à l'Anglaise. Remove stems and peel from six large ones. As in No. 1 A. Then puncture each all over with a fork, and put them in a bowl, sprinkling salt, pepper, lemon-juice, and minced sweet herbs over them. Cover all with olive-oil and allow to remain for an hour. Then take out and cover with bread-crumb. Grill over a slow fire twenty minutes. Serve them immersed in sauce *à la maître d'hotel.*

No. 27.—To Dry Pratelles. Take those neither very young nor very old. Remove the butts only. As in No. 1 B. Then slice. String or skewer the slices lightly, and expose to a current of warm dry air. A warm oven, with the door open, is a good place. When quite dry and shrivelled, pack in tins, with spice at top and bottom. When wanted for use, soak the slices in tepid water for some hours. Then cook.

No. 28.—To Pickle Pratelles. Take "buttons," and remove butts only. As in No. 1 B. Put into jars, and cover with cold spiced pickling vinegar. Add a few peppercorns and mustard seeds, and seal hermetically.

No. 29.—Soused Mushrooms. Remove the butts, or all the stems, from large, not juicy, mushrooms. As in No. 1 A. Then boil with some salt in water for ten or twelve minutes. Take out and drain before the fire. Then put in a dish, and pour over them hot vinegar, in which has been boiled peppercorns, mustard seed, cloves, mace, a bunch of sweet herbs and scallions, *and a clove of garlic.* Serve cold, for a side dish. Spindleshanks, Stumptufts, or Paxils go well this way.

No. 30.—Potted Mushrooms. Let mushrooms be prepared and dressed according to any receipt preferred. They may then be drained and pressed into jars. When cold, melted butter is to be poured over the top. They are as good as potted meats. The liquor may be preserved with them, if isinglass or something similar be added to make it "jelly."

No. 31.—To Keep Mushrooms Temporarily. Cleanse and remove parts to be rejected. As in No. 1 A. Then boil for five or ten minutes with salt and water. Drain, and wipe dry. A good plan for saving nice fresh mushrooms for a few days.

No. 32.—To Prepare Russules. The Bisotte and Verdette, with the other edible Russules, can be cooked in any of the foregoing methods. But they lack moisture, and are not very good to grill or fry. Their stems and gills are to be rejected, not the peel, and they are to be prepared as in No. 1 B.

No. 33.—Omelette aux Verdettes. Remove the stems only. As in No. 1 A. Then throw into boiling water, and boil for three minutes. Take out, and drain before the fire. Mince fine, and mix with pepper, salt, and a little chopped lemon-peel. Mingle with eggs, and cook as an omelette. Verdettes make the best omelette of any mushrooms, but others may be tried in the same way.

No. 34.—St. Georges à la Paysanne. Remove the butts only. As in No. 1 B. Then put them entire into a stewpan, with plenty of butter or oil, or both, and season with pepper, salt, and lemon-juice. Stew gently for half an hour to three-quarters. Then serve, garnishing with lemon.

No. 35.—St. George Ragoût. Remove the butts only. As in No. 1 B. Then divide each St. George into two or three pieces. Melt lard in a stewpan. Boil it with minced parsley and scallions, a morsel of garlic, crushed peppercorns, and salt. In a few minutes put in the St. Georges. After ten minutes, add broth, and simmer, skimming off the lard as it rises. In half an hour add some meat jelly, and then serve.

No. 36.—St. Georges aux Croûtes. Dress as in the preceding receipt, for a ragoût. Take bread crumb, and cut crusts into it. Soak in milk, and brown in a frying-pan. Drain, and put on the dish with the ragoût.

No. 37.—To Dry St. Georges. Remove the butts only. As in. No. 1 A. Then cut into slices down through cap and stem. Lightly thread or skewer these, and suspend them in a warm, dry room for four days. When quite dry, pack into tins, with spice at top and bottom. Two or three of these slices, either entire or powdered, will add a marvellous flavour to meat hashes, stews, pies, or soups.

No. 38.—Sterbeck's Condiment. Take blanched almonds, peppercorns, salt, a clove of garlic, lemon-juice, and a little oil. Pound in a mortar, mixing together into a fine paste. Used as a table condiment, like mustard, with all mushrooms, but especially with St. Georges.

No. 39.—To Prepare Lactars. Remove the stems. As in No. 1 B. Then take tepid water, adding a wineglassful of strong vinegar, and a tablespoonful of salt to each pint. Steep the Lactars in this for six hours, remove into fresh salt and water, and boil ten minutes. Then rinse in fresh cold water, and dry. They may now be dressed according to any receipt from No. 3 to No. 30. Redmilks and Kidneys must not be so prepared.

No. 40.—To Prepare Redmilks and Kidneys. Remove the butts of the stems only. As in No. 1 A. Then proceed to dress in any way from No. 2 to No. 20.

No. 41.—Redmilks à l'Impératrice. Prepare as just directed. Then slice and fry in butter, constantly stirring. In five minutes add pepper, salt, minced sweet herbs and scallions, and thicken the gravy with flour. In five minutes more put in lemon-juice, cayenne pepper, and a glass of champagne or sauterne. Then serve at once. An especially excellent dish.

No. 42.—To Pickle Redmilks. Prepare as in No. 40. Lay them whole in jars. Pour on them boiling hot, strong, white-wine vinegar, well spiced. Fill the jars, and seal hermetically.

No. 43.—To Salt Redmilks. Remove the butts, and simply cleanse with a brush. Put them in layers in a keg, covering each layer with salt. Pack tightly, fill the keg, and close hermetically. Brine may be used, but dry salt is best. When to be used, throw the mushrooms into boiling water for three minutes, then rinse in cold, and dry in a cloth. Then cook as from No. 3 to No. 30.

*** The receipt answers for any firm-fleshed and juicy kinds of mushroom.

No. 44.—To Prepare Amanites. The esculent Amanites can be dressed any way from No. 2 to No. 30. The stems and peel are to be rejected, and they require short cooking. The two following receipts are applied in France to the famous Oronge. They will be found here very appropriate for sound, well-selected Blushers. Exquisite ketchup is yielded by Blushers, and spoiling ones may go into the tub.

No. 45.—Blushers à la Barigoule. Remove peel and stems, but reserve upper half of stems. As in No. 1 A. Make forcemeat with the upper part of the stems minced, bread crumb, sweet herbs, garlic, pepper, salt, and a little oil. Pack this upon the gills of the Blushers. Put them on a plate in a Dutch oven before a hot fire, and continue to baste them with oil. Give them fifteen minutes, and serve.

No. 46.—Blushers à la Chapsal.—Take six large ones. Remove peel and lower half of stems. Do not wash, but wipe carefully with a damp cloth. Put olive-oil in the bottom of a pie-dish, and lay the Blushers in it. Bone and clean two anchovies, and rub them into paste in a mortar, together with pepper, salt, garlic, and parsley. Put this on the Blushers, and pour over all a pint of white wine. Cover the dish with oiled paper, lay a plate over it,

and put it into a hot oven for twenty minutes. Then take out the Blushers and set them on a dish. Skim the oil off the liquor, add the juice of half a lemon to it, and pour it over the Blushers. Serve at once.

No. 47.—To Prepare Chantarelles. Pare off the base of the stem. Wipe clean. Rinse in cold water, and dry in a cloth. Immerse in warm milk, and let them soak in it for six hours. They require lengthy stewing, with plenty of butter or oil and broth, They are excellent to add to meat hashes and stews. The following special methods are the best in which to dress them alone:—

No. 48.—Chantarelles à la Beurre. Instead of soaking in milk, slice the washed Chantarelles, and put them into a stewpan in which butter is melted. Keep them warm, and stir them for ten minutes. Then add more butter, with pepper, salt, and minced parsley, also some sippets of bread. Fry briskly for ten minutes. and then serve.

No. 49.—Omelette aux Chantarelles. Prepare as in No. 47. Then mince fine with sweet herbs and seasoning. Mingle with eggs, and cook as usual for an omelette.

No. 50.—Chantarelles à la Duchesse. As in No. 47. Then put them into a stewpan with a little butter, a spoonful of oil, crushed peppercorns, salt, a spoonful of lemon-juice, a shred of lemon-peel, and a leaf of fresh tarragon. Heat briskly to boiling point, then allow to simmer. Add a few spoonfuls of rich gravy, and of cream. Stew gently for twenty minutes. Finally add egg-yolk to bind, and serve at once.

No. 51.—Purée of Chantarelles.—Prepare as in No. 47. Then stew gently in water, not allowing it to boil, until the Chantarelles are soft and pulpy. Take out, mash, and strain in a cloth. Put the mash into a stewpan with butter, lemon-juice, minced parsley and onion, and a leaf of fresh tarragon. Heat gently, adding a little broth and meat jelly. Simmer and stir to a proper consistence. Serve alone, or with veal.

No. 52.—To Prepare Oreads. Remove the stems. As in No. 1 A. Then dress, according to such receipts from No. 3 to No. 30, as seem suitable for small, dry-fleshed mushrooms. They want short cooking and plenty of butter and broth.

No. 53.—Oreads à la Reine. Remove the stems. As in No. 1 B. Then flour slightly and dip into egg. Have butter or oil boiling in a pan, seasoned with salt, pepper, parsley, and shallot. Throw

the Oreads into this, and fry till nicely brown. Then take out, drain, serve on a napkin, garnishing with lemon.

No. 54.—To Dry Oreads. Remove the stems. As in No. 1 B. String through the centre. Expose in a warm room for three days, till quite dry. Pack in tins with spice. They may be used powdered to impart their rich flavour to gravies and soups. Or they may be refreshed by soaking them in warm water, and then be cooked whole, as if fresh.

No. 55.—Oread Wine. Prepare as in No. 1 A. Then put in a bowl, and just cover them with white wine, and let them remain twenty-four hours. Then press out all the liquor. Add to it crushed peppercorns, mustard seed, allspice, ginger, mace, and salt. Heat gradually to boiling point. Then strain and bottle. An excellent flavouring for meat-dishes, soups, and sauces.

No. 56.—To Prepare Blewits. Gather only when dry, not rain-soaked. Remove the butts, or the whole stems, according to age. As in No. 1 B. Then dress any way from No. 2 to No. 30. The Blewit has a taste of veal, and the following is a dainty way of cooking it. Blewits also make good ketchup.

No. 57.—Blewits aux Papillotes. As in No. 1 A. Then dip in oil, and sprinkle with pepper, salt, minced sweet herbs and scallions. Enfold in oiled paper. Broil for ten to fifteen minutes, constantly basting with oil. Serve in the papers, garnishing with lemon.

No. 58.—To Prepare Parasols. Remove the stem and peel. As in No. 1 A. Then dress in any manner from No. 2 to No. 30. They yield first-rate ketchup. The following is the author's favourite way of dressing them:—

No. 59.—Parasols à la Tourtière. As in No. 58. Then put into a well-buttered pie-dish, with a little butter on them, or cream, and with toast below. Sprinkle with pepper, salt, and parsley that has been rubbed with garlic and minced. Cover with oiled paper and a plate. Bake in a hot oven fifteen minutes. Serve in the dish, without removing the cover.

No. 60.—To Prepare Paxils.—A coarse species, but so plenteous that it might be of considerable benefit to poor families. Remove the butts. As in No. 1 A. Then divide down the middle, throw into boiling water, and boil for three minutes. Take out, and press dry in a cloth. Dress as in Nos. 3, 4, 11, 12, 13, etc. Cook a little longer than Pratelles, and season more highly.

No. 61.—Paxils à la Milanaise. As in No. 60. Then mince the

Paxils finely. Heat butter and brown sauce in a stewpan, adding salt, pepper, minced sweet herbs, and a shred of garlic. When hot, put in the Paxils and stew five minutes. Then add half the quantity of grated cheese (Parmesan) as of Paxils. Stew fifteen minutes, adding more butter and gravy as required. Then turn out, garnish with maccaroni, sprinkle with grated cheese and bread crumb, and brown the top. Serve.

*** Of course lard or dripping can always be used as a substitute for butter, oil, and gravy, but the dish cannot be expected to be so dainty. In the same way, perry, or even good-class cider, can fill the place of wine, when that is ordered.

No. 62.—To Salt Paxils. Remove butts and wipe clean. Pack in layers in a keg, with salt or brine on each layer. Close the keg hermetically. When wanted, rinse in cold water, then boil for fifteen minutes, drain, dry in a cloth, and proceed as above.

No. 63.—To Prepare Stumptufts. Remove stems, and as much of the peel as can be stripped off. As in No. 1 B. Then put to soak in tepid water, adding two tablespoonfuls of vinegar to the pint. After two hours take out, rinse in cold water, dry in cloth, and proceed as in Nos. 3, 4, 11, 12, 13, or 29.

No. 64.—Stumptufts à la Cabaret. As in No. 63. Then melt butter in a stewpan, with sweet herbs, onion or garlic, pepper and salt. Put in the mushrooms. Simmer five minutes. Add two or three glassfuls of table ale. Stew twenty minutes, and then serve.

No. 65.—To Prepare Spindleshanks. Remove the stems. As in No. 1 A. Then dress in any way from No. 2 to No. 30. Stew the stems in a little water, with seasoning, strain, and use the gravy for cooking and serving with the caps.

No. 66.—To Pickle Spindleshanks. Gather young, and in dry weather. As in No. 1 B., removing butts only. Divide in halves through cap and stem. Lay in jars and cover with cold, spiced, white-wine vinegar. Cork tightly.

No. 67.—To Prepare Inkcaps. Gather only when young, before the gills have begun to liquefy, and in dry weather. Remove the base of the stems. Wipe clean with a damp cloth. Dress as in No. 17, taking off as soon as they break or "sink." Serve on toast. Ketchup made from Inkcaps will not keep, and is poor.

No. 68.—Ketchup (1). Remove the butts. Sprinkle all with salt. Pile in a bowl. Let them remain so for three days, stirring occasionally. Then squeeze out all the liquor. To each gallon of

it add cloves and mustard seed, crushed, of each half an ounce; allspice, peppercorns, and ginger, crushed, of each one ounce. Heat slowly up to boiling point in a covered vessel. Set aside in a warm place for a fortnight. Then strain and bottle. If the ketchup shows signs of not keeping, add more salt and spice, heat and proceed as before.

No. 69.—Ketchup (2). Remove the butts. Put the mushrooms in a press, and drive out all the juice. Of this, to each two gallons add allspice, crushed, two ounces; peppercorns, mustard seed, and ginger, crushed, of each one ounce; salt a pound or more; shallots minced, three ounces; garlic one clove. Simmer for one hour in a closed vessel. Let cool for twelve hours. Then strain and bottle. The best ketchup mushrooms are the various Pratelles and Parasols, Blewits, Blushers, and Grisettes. Oreads may be added, as they greatly improve the flavour; but they have no juice to yield themselves.

No. 70.—To Prepare Bolets. Remove the stems, and scoop out the tubes with a spoon. As in No 1 B. Then proceed as in Nos. 2 to 30. The following are special methods :—

No. 71.—Bolets à la Bordelaise. As in No. 70. Put them on a plate, pouring oil upon them. Sprinkle with salt, pepper, minced parsley, and onion. Put the plate in a Dutch oven before a bright fire for ten or fifteen minutes. Serve on toast.

No. 72.—Bolets à la Citoyenne. As in No. 70. Then lay them in oil for two hours. Take out, drain, put into a pie-dish, with fresh butter, salt, crushed peppercorns, minced parsley, scallions, and a leaf or two of fresh tarragon. Cover with fried bread grated. Cover the dish with oiled paper and a plate. Bake in a hot oven fifteen minutes. Serve at once, in the dish.

No. 73.—Bolets à la Vivandière. As in No. 70. Then cut into thick slices. Heat oil, lard, or dripping in a frying-pan, with pepper and salt. Throw in the Bolets, and fry seven minutes, Serve on fried bread.

No. 74.—To Dry Bolets. Gather in dry weather. Remove stems and tubes. Wipe clean with a damp cloth. Slice. String the slices. Hang up in a warm place for two days. Then give them a minute in a moderately warm oven. Pack in tins with spice. When wanted, steep the slices in tepid water for some hours, till they swell. Then proceed to dress as for fresh Bolets. The Russians retain the stems and dry their Bolets whole, stringing them up the stem and through the centre of the cap.

No. 75.—Fresh Bolet Soup. Remove only the butts of the stems. Rinse in cold water, and dry. Chop up all small. Put into a stewpan with salt, crushed peppercorns, grated nutmeg, half a pound of breadcrust, a quarter pound of butter, and some stock (a pound of lean ham, or a cupful of lentils, if stock is not available). Stew for an hour, adding warm water or broth if necessary. Then rub all through a fine sieve. Put back on the fire, thin with broth if requisite, simmer twenty minutes, and serve, with sippets of fried bread in the tureen. The Yellow Bolets can be used this way.

No. 76.—Dried Bolet Soup. Take two handfuls of dried Bolet slices. Put them in a pan of broth, and set it by the fire for some hours, till the slices are fully swelled. Then set it on the fire to simmer, and add bread crust till the whole is pasty. Now take some Bolet slices separately, which have been swelled in warm water. Put butter, with pepper and salt, into a frying-pan, and when hot, fry these slices in it for ten minutes. Now take off the purée, and rub it through a sieve. Return it to the fire, adding salt, pepper, parsley rubbed with garlic and minced, and thin with broth as needful. Lastly, add the fried slices to the soup, boil up a moment, and serve at once.

No. 77.—Bolets à la Normande. As in No. 70. Then set before the fire a minute to steam, and again press dry in a cloth. Then put in a pie-dish, cover with oil, and sprinkle with pepper and salt, minced parsley and onion. Cover the dish with oiled paper and a plate. Bake ten or twelve minutes, and serve with halves of lemon to be used at table.

No. 78.—Bolets à la Marseillaise. As in No. 70. Reserve the upper halves of sound stems. Mince these portions up with salt, pepper, sweet herbs, and onion, and mix into a paste with oil, or with cream, or butter. Stew this very gently for twenty minutes. Meanwhile smear the caps with oil or butter, and grill them for five minutes. Then add them to the stew, with gravy as requisite. Simmer a few minutes, and serve.

No. 79.—Bolets à la Potence. As in No. 70. Then put before the fire for a minute to steam, and again wipe dry. Cut large ones into two or three pieces. Put on skewers alternately with slices of fat bacon. Dip all in oil. Sprinkle with salt, pepper, and minced sweet herbs. Flour or bread the skewers. Then grill for ten or fifteen minutes, basting with oil. Arrange the skewers on a dish, garnish with sliced lemon and fried parsley, and serve.

No. 80.—To Prepare Oaktongues. Gather whilst of a light red or flesh-tint, no matter how large. Remove the hard butt or base only. As in No. 1 B. Then as follows. Oaktongues may also be cooked in various ways, as if they were beef. Such good old English dishes as Toad-in-the-Hole and Bubble-and-Squeak can be made with them.

No. 81.—Oaktongue à la Druidesse. As in No. 80. Then cut into thick steaks. Smear each liberally with oil or butter. Sprinkle with pepper and salt, and dust them with flour. Put on a hot grill over a bright fire, and give them about ten minutes' grilling. Serve hot, garnishing with fried onions.

No. 82.—Oaktongue Salad. As in No. 80. Then cut in thin slices, and rub them with garlic. Mingle with lettuce or other green salad. Dress with oil, vinegar, pepper, mustard, and salt. Serve.

No. 83.—Oaktongue à la Pompadour. As in No. 80. Then mince fine, and put into a stewpan with all the juice that has run out. Add butter, three ounces to the pound. Add salt, pepper, minced parsley and onion. Minced veal or chicken may also be added, but is not necessary. Stew gently for twenty minutes. Then add lemon-juice and cayenne pepper. Simmer a moment, then add egg-yolk beaten up with cream, to bind; and serve at once, garnishing with toast.

No. 84.—Oaktongue à l'Americaine. As in No. 80. Then mince fine and stew gently for twenty minutes in its own juice, adding butter, plenty of salt and chopped onion, a little minced parsley, and pepper. Then take potatoes, boiled and mashed, and amalgamate the stew with them, mixing well. Put the mixed mash into a pie-dish, and set it in the oven till the top is well browned. Serve.

No. 85.—Consommé of Oaktongue. Take any sound Oaktongues, even when old and brown. Pare off the hard parts, rinse, and dry. Mince fine, and stew in their own juice very gently for twenty minutes. Then press out all the juice and strain it. This may be seasoned and used as stock, soup, or gravy. It is just like beef gravy. It may be boiled with spice and salt, bottled, an kept as a ready substitute for beef broth.

No. 86.—To Prepare Urchins. Remove the butts of the stems, and scrape off the spines. As in No. 1 B. Cut large ones into several pieces. Place all in a stewpan, laying plain butter on top of them. Put near the fire, exposing the pan to just enough heat to liquefy the butter, and no more. Cover the stewpan, but keep

turning it about. In ten minutes take out the Urchins, and drain them thoroughly. Now dress them as in Nos. 48 to 51, or as follows:—

No. 87.—Urchins à la Russe. As in No. 86. Then put into a stewpan, with a spoonful of oil, a glassful of milk, cayenne and black peppers, salt, a piece of mace, and sprigs of parsley. Stew forty minutes, then take out the parsley and mace, and add a little gravy or meat jelly. Lastly, bind with the yolks of eggs beaten up with cream and lemon-juice, heat up a moment, stirring, and serve.

No. 88.—Urchins à la Chasseur. As in No. 86. But select large Urchins, and do not divide them. Then sprinkle with pepper, salt, and minced parsley. Flour them, and put them on a grill over a bright fire for fifteen minutes. Baste with oil or butter. Serve hot.

No. 89.—Urchin Ragoût. As in No. 86. Then slice into a saucepan, with dripping, broth, pepper, and salt, parsley and onion. At pleasure add beans, peas, or turnip and carrot, diced. Stew half an hour, and serve.

No. 90.—Urchins à la Princesse. As in No. 86. Then put into a stewpan with good gravy, with salt, cayenne pepper, sweet herbs and chervil, minced, and a piece of mace. Stew half an hour. Then add a glassful of good cream. Heat up quickly, and pour out on to fried bread. Serve.

No. 91.—Urchins à la Forestière. As in No. 86. Then boil Consommé of Oaktongue in a stewpan, and put the Urchins into it. Add salt, crushed peppercorns, cayenne pepper, mace, minced parsley, and onion, also a little butter or cream. Simmer half an hour. Add flour to thicken, and a glass of white wine. Bind with egg-yolk, heating and stirring cautiously, and serve.

No. 92.—Urchins à la Varsovienne. As in No. 86. Then cut up into dice, with an equal quantity of fat bacon. Mingle with minced parsley and onion, black and red peppers, and salt. Inclose in thin paste, wrap in cloths, and boil half an hour. Serve hot, with tomato sauce.

No. 93.—To Prepare Clavarias.—The Clavarias, together with Sparassis and the branched Hydna, are to be picked clean, then prepared as in No. 1, B, and then buttered or "sweated" as was directed for Urchins in No. 86. Large ones should be divided, and the small ones can be tied into bundles. They may be dressed in the ways just indicated for Urchins, or as follows:—

No. 94.—Clavarias à la Sabine. As in No. 93. Then drain, flour, and put them into a stewpan with butter, gravy, pepper and salt, and minced sweet herbs. Stew gently for half an hour, and then thicken with flour and a little grated cheese. Heat up, stirring. At pleasure bind with egg. Serve.

No. 95.—Clavarias à la Fascine. As in No. 93. Then mingle with a little minced ham, parsley, and crushed peppercorns. Tie up in parcels inclosed in strips of bacon and skewered. Flour the parcels, and stew them in broth for an hour, putting white paper under the lid of the pan. Then serve on toast, with brown sauce, like meat rissoles.

No. 96.—Clavarias à la Romaine. As in No. 93. Then stew them in milk for an hour, adding sweet herbs and shallots, pepper, salt, and nutmeg. Lastly, serve in sauce *à la maître d'hôtel.*

No. 97.—To Pickle Clavarias. As in No. 1 C. Then put into jars with peppercorns, mustard seed, and nasturtium seed. Pour on them cold, spiced, white wine vinegar. Fill up, and cork hermetically.

No. 98.—To Prepare Morels. Gather only in dry weather. Pick clean. Rinse with agitation in several successive pans of cold water. Dry thoroughly. Remove only the butt of the stem. Then proceed as in the following receipts :—

No. 99.—Morels à la Fermière. As in No. 98. Then split them, and stew them with butter, a little gravy, minced sweet herbs, pepper and salt, for half an hour to an hour. Bind with whipped egg-yolk and cream. Serve on fried bread.

No. 100.—Morels à la Hollandaise. As in No. 98. Then split them. Butter both sides. Sprinkle with salt and pepper. Flour them, and put them in a dish in a Dutch oven before a bright fire. About twenty minutes.

No. 101.—Morels à la Vienne. As in No. 98. Do not split, but fill the Morels with a forcemeat composed of bread, suet, sweet herbs, and lemon. Wrap bacon round them and tie it. Stew gently in broth for about an hour. Serve on toast, with good brown sauce. This may be varied by making any of the following a chief ingredient of the stuffing : veal, chicken, sardines, anchovies, lobster, crab, chestnuts, etc.

No. 102.—Morels à la Française. As in No. 98. Then cut across into several pieces. Put them in a stewpan with olive oil, pepper, and salt. Heat up briskly. Then add minced sweet herbs and scallions, and a morsel of garlic. Add some gravy, and

stew gently. In three-quarters of an hour add lemon-juice and a glass of white wine. Then serve, on fried bread.

No. 103.—Noix de veau à la Morille. Put a piece of veal in a pie-dish. Take Morels, prepared as in No. 98, split, butter, and set them round the meat. Season all with black and red peppers, salt, lemon, and minced sweet herbs. Bake in an oven for an hour. Then serve in the dish.

No. 104.—Morels à la Guillotine. As in No. 98. Split them, and put before the fire to steam. Then put them in a pan with oil, butter, pepper, salt, minced parsley and onion. Warm slightly, and let them soak two hours. Then spit the Morels on skewers, season them, bread them, and grill or fry them in their own gravy for fifteen minutes. Serve.

No. 105.—Morels à la Madeleine. As in No. 98. Then split and put them in a stewpan with butter, salt, minced sweet herbs, and a lump of sugar. Moisten with white gravy. Stew gently for an hour. Thicken with flour. Lastly add a glass or two of good cream. Serve on fried bread.

No. 106.—Morels à la Bretonne. As in No. 98. Then split and put into a stewpan with butter; let the butter melt slowly over them, then add lemon-juice and increase the heat, stirring. Next add some good gravy, pepper, salt, and nutmeg. Stew gently for an hour. Lastly, bind with egg-yolk and serve on fried bread.

No. 107.—Morels à la Polonaise. As in No. 98. Then split and put into a stewpan with butter, peppercorns, salt, and a bunch of sweet herbs. Heat briskly for ten minutes. Then add some flour, moisten with chicken-broth, and simmer gently for three-quarters of an hour. Then take out the herbs. Add the yolks of eggs beaten up with cream and sugar. Heat up, and serve on fried bread.

No. 108.—To Dry Morels. As in No. 1 B, after having split them. Let them steam before the fire. Then arrange them on a sieve, and put them in a warm, airy place for a day or two, till dry. Lastly give them a minute in a moderate oven, and pack in tins with spice. When wanted, they are to be steeped in warm milk for some hours, and afterwards dressed as if fresh.

No. 109.—To Prepare Helvels. Gather only in dry weather, and do not keep them long. Pick clean by hand, and serve as in No. 1 B. Remove the butts, split them, and lay them before the fire to steam. Then dress in any way like Morels, or as follows:—

No. 110.—Helvels à la Louise. As in No. 109. Then put them

in milk, with minced parsley and salt, and stew for half an hour. Finally, bind with egg-yolk, and serve on toast.

No. 111.—Helvels à la Gourmande. As in No. 109. Then pack them with stuffing composed of minced veal or chicken, bread-crumb, salt, cayenne pepper, and lemon. Wrap in slices of bacon, and tie round. Then stew for half an hour in rich brown gravy. Flavour the gravy with wine, and bind with egg if desired. Serve the rissoles in it.

No. 112.—To prepare Lorchels. This species must always be subjected carefully to the following preparation, as, without it, it is deleterious :—Pick clean. Cut into slices, and boil these in water for fifteen minutes. Then wash in two successive pans of fresh boiling water, with agitation. Then dry in cloths. Now proceed to dress as Morels and Helvels. Carefully throw away the waters used.

No. 113.—To Prepare Elf-cups, Craterelles, Bulgars, Verpas, Tremelles, etc. Pare off the butts or rooting parts. Treat them as in No. 1 B. Then proceed to dress in any of the ways indicated for Morels and Helvels.

No. 114.—To Prepare Oysters. All the tree-Agarics which are edible may be gathered only in the young state, when fresh and tender. They are to be treated as in No. 1 B, then sliced, and buttered or "sweated" as in No. 86. They can then be dressed like Urchins.

No. 115.—To Prepare Polypores. Select the youngest specimens. Pare off hard parts. Treat as in No. 1 C. Slice thinly. Then sweat as in No. 86. Proceed as for Urchins.

No. 116.—To Prepare Puffballs. Brush them clean. Peel entirely, and pare the bottom part. Slice through the middle, and reject all not perfectly white right through. Dress as follows :—

No. 117.—Puffball à la Lyonnaise. Take small Puffballs. As in No. 116. Cut in thin slices. Mingle with minced bacon, parsley, and shredded onion, with pepper and salt. Fry in lard five or six minutes, and serve on toast.

No. 118.—Puffball à la Dauphine. Take a Giant Puffball. As in No. 116. Cut across into slices half an inch thick. Dip in yolk of egg, and sprinkle with minced sweet herbs, pepper, and salt. Throw into boiling oil, or butter, and fry six minutes, turning once. Serve hot.

No. 119.—Puffball à la Jardinière. As in No. 116. Mince

with carrots, turnips, cabbage, onion, etc. Stew in Consommé of Oaktongue, or in broth. Season and thicken to taste. Serve.

No. 120.—Puffball à la Toscane. As in No. 116. Cut in thick slices. Lay them in a bowl, rubbing each with garlic, and sprinkling with salt and pepper. Cover all with oil, and set in a warm place for an hour. Then take out, flour, and throw into boiling batter. As soon as the slices have taken a good crust, remove them from the batter, drain, and serve on a napkin, with fried parsley.

No. 121.—Puffball à la Grande Duchesse. As in No. 116. Cut into dice. Make sauce with butter, cream, and meat jelly, seasoning it with minced onion, a bunch of sweet herbs, peppercorns, allspice, and Chili pods. Heat it briskly, and then put in the Puffball, and stew gently for ten minutes. Then add a glass of white wine, and the juice of a lemon, and remove the herbs. Bind with egg-yolk beaten with cream, heat up, and serve on fried bread.

No. 122.—Puffball Salads. As in No. 116. Cut into strips. Mingle with mustard and cress; or with blanched dandelion, scallions, and hard-boiled egg, and dress as ordinarily for a salad. Or amalgamate with potato salad *à l'Allemande.*

No. 123.—To Prepare Truffles. All species, English and foreign, together with the other subterranean edibles, are prepared simply by rinsing in cold water, scrubbing with a brush, and drying in a cloth. There are hundreds of ways of dressing Truffles, but there is only room here for a few exceptionally excellent ones, as follows:—

No. 124.—Truffles à la Perigord. As in No. 123. Then put into a stewpan some slices of bacon, and lay the Truffles on them. Sprinkle with salt and a leaf or two of bay. Cover all with champagne. Close the pan tightly, and boil half an hour. Serve the Truffles alone, on a napkin.

No. 125.—Truffles à la Cognac. As in No. 123. Then put into a stewpan two glasses of white wine and one of good brandy, adding spices. Put the Truffles in a steamer above this. Heat and as soon as it boils, put a damp cloth over the lid, and stew for half an hour. Serve the Truffles on a napkin.

No. 126.—Truffles à la Maréchale. As in No. 123. Put salt and pepper on each, and wrap them in oiled paper. Place them in a covered iron pot, which set among hot embers for an hour. Serve in the papers.

No. 127.—Truffles à la Piémontaise. As in No. 123. Steep them in oil for an hour. Cut them in thin slices. Lay these on a silver plate, with oil, salt, pepper, and grated Parmesan cheese. Make fresh layers on top. Bake in a Dutch oven fifteen minutes, and serve on the plate.

No. 128.—Truffle Patties. As in No. 123. Then lard them with a proper larding-pin. Sprinkle with salt and pepper, and inclose each in short paste. Bake an hour. Serve hot or cold.

No. 129.—Truffles à la Rossini. As in No. 123. Then slice thinly. In a salad-bowl mix oil, vinegar, mustard, pepper, salt, and lemon-juice. Put in the sliced Truffles. Black Truffles require also egg-yolk and garlic.

No. 130.—Truffles à l'Italienne. As in No. 123. Then slice thinly. Put the slices in a pan with oil, salt, pepper, parsley, onion, garlic, and a clove. Heat gently for six minutes. Take out and drain the slices. Put them into good gravy or white wine, with butter and flour. Stew an hour. Add lemon-juice, and serve.

No. 131.—Truffles au Court-bouillon. As in No. 123. Put into a saucepan a quart of white wine or champagne, with butter, three scallions, a small carrot, a bunch of thyme and basil, three cloves, a leaf of bay, a sprig of parsley, and salt. Boil for an hour. Wrap the Truffles in buttered paper, and put them in another pan. Strain the boiled wine and pour it on them. Stew half an hour. Take out the Truffles, drain them, and serve dry on a napkin.

No. 132.—Truffles à la Lombarde. As in No. 123. Cut one pound of Truffles in slices on a plate. In a pie-dish mix half a pound of butter, eight table-spoonfuls of olive-oil, two pounded anchovies, parsley rubbed with garlic and minced, and onion. Heat gently, and then put in the Truffles, with a little salt. Bake moderately for twenty minutes. Take out the Truffles, and serve them in rich brown sauce.

No. 133.—Truffles à l'Espagnole. As in No. 123. Divide them into two or three pieces. Stew them fifteen minutes with oil, minced parsley and onion, pepper, salt, allspice, and a leaf of bay. Then add a glass of Madeira or brown sherry. Next put in egg-yolk beaten up with flour, to bind. Heat up a moment, and serve.

A FUNGUS FEAST.

⁂ As should appear evident from the list of Culinary Receipts given, it is quite possible to make up a regular set dinner—nay, more, a positive banquet! —out of nothing but Fungi of various kinds, cooked in appropriate ways. Experience will soon teach the "toadstool-eater" that the flavours of sundry Fungi, the different consistency of their flesh, and the methods of culinary preparation to which they lend themselves, will allow of his selecting kinds suitable for dishes of each course. Here is one of the Author's *Menus*, as a specimen of what may be done during autumn. It is necessary, however, to the gathering of a good variety of kinds, that several instructed persons should each simultaneously search a different locality; one mixed woods, another pine-woods, a third meadows, and so on. By such means a sufficiency of different esculents may readily be collected in any ordinarily prolific season.

MENU.

Soups.

Consommé of Oaktongue. Purée of Golden Bolets.
Consommé of Tremelles. Purée of Chantarelles.

Hors d'Œuvres.

Spindleshanks au Diable. Clavarias vinaigrette.
Oreads à la vin d'Espagne. Soused Stumptufts.
Potted Pratelles. Potted Lactars.
Sterbeck's Condiment.

Fish.

Elm-Sprouts à la Chasseur. Urchins à la Russe.

Entrées.

Blushers à la Chapsal. Redmilks à Soyer.
Oreads à la Reine. Dainty Bolets à la Potence.
White Pratelles à la Crême. Helvels à la Gourmande.
Parasols à la Tourtière.

Roti.

Oaktongue à la Druidesse. Blewits aux Papillotes.

Game.

Truffles au Court-bouillon. Grisettes on Toast.

Entremets.

Puffball Fritters, with Jam. Omelette aux Verdettes.
Elfcups aux Sucrées.

Salads.

Oaktongue. Pratelle. Puffball.

Fromage.

Golden Spindlespikes à la Sabine. Paxils à la Milanaise.

Dessert.

NOTES.

MUSHROOMS DEDICATED TO SAINTS.

Some species of fungi have been dedicated to certain saints in place of flowers. It is unnecessary to say that such ascription must have originated in other countries than in fungus-despising Britain. Probably France and Italy are chiefly responsible for the fact. This appears the more evident since English compilers of floral saints' calendars have apparently found some difficulty in identifying the consecrated species. These have become known to them, in the first place, under some foreign vulgar designation, which they have simply translated and found a Latin equivalent for in a catalogue of scientific names. Confusion has hence arisen, because the original title has often nothing in common with the modern systematised technical name. Hence the wrong species have been undoubtedly indicated in most cases. I consider this matter of the very last importance! For, if we have such things as mushrooms assigned peculiarly to holy saints, by all means let us know precisely which they are! Here is the list, so far as I have been able to work it out.

St. Gudula's Mushroom. Saint's Day, Jan. 8th. This is **The Yellow Tremelle,** *Tremella mesenterica* and *T. lutescens*, which are the chosen plants, beyond doubt. St. Gudula used to go about with a lantern, which an angel was kind enough to ignite for her whenever it went out. The mushroom is emblematic of the fact —I don't know why. At any rate, it might be found in January.

St. Raymond's Mushroom. Saint's Day, Jan. 23rd. The floral calendarists call this "the Fairy-bath," and have, I believe correctly established its identity with **The Chalice,** *Peziza acetabulum.* I have not the slightest idea who St. Raymond was, or why he has this fungus dedicated to him. It does not appear here until late in March, but might be a January plant in Southern Europe.

St. George's Mushroom. Saint's Day, April 23rd. This plant

appears first about the above date, and hence is named after the saint and consecrated to him. It is that most excellent of edibles **The St. George,** *Agaricus (Tri.) gambosus.*

St. Judas Iscariot's Mushroom. Saint's Day, April 31st (?). Appearing about this date is **The Jew's Ear,** *Hirneola auricula-judæ*, which I take upon myself the responsibility of inserting in this list.

St. Cæsarius' Mushroom. Saint's Day, Aug. 27th. It is not at all surprising that Cæsar's mushroom should become the property of his sainted namesake. **The Oronge,** *Agaricus (Am.) Cæsareus*, is famous in history. It was a dainty beloved by Roman epicures, and the Emperor Claudius was assassinated by poison administered in a dish of Oronges. It is not a British species.

St. Lawrence Justinian's Mushroom. Saint's Day, Sept. 5th. The floral calendarists are only able to designate this as "mushroom" simply, and consequently suppose it to be Agaricus campestris. A more careful examination of the evidence proves it to be, however, **The Giant Pratelle,** or Horse Mushroom, *Agaricus (Psa.) arvensis.*

St. Maurice's Mushroom. Saint's Day, Sept. 22nd. Here the floral calendarists have got into considerable trouble, I think. The name they got hold of was "the Tree Boletus," and they accordingly searched botanical catalogues for a scientific equivalent. They found Boletus arborens, an obsolete name by which Sowerby designated what we now call Merulius tremellosus. This rare and obscure species certainly could not have been the saint's mushroom. All the Polyporei were once called Boleti, though the name is restricted under our present system to a terrestrial genus. Hence "Tree Boletus" might mean any one of a hundred species or more. How then shall we discover which especially belongs to St. Maurice? Let inspiration guide us! I find that St. Maurice was in the habit of shaving, that he kept his razors in order upon a strop of the period, and that the said strop was made from a slice cut from the heart of a great fungus parasitic on trees. Now the razor-strop fungus in particular is **The Scaly Polypore,** *Polyporus squamosus*, which, until better information reaches me, I shall hold to be St. Maurice's Mushroom.

St. Gerard's Mushroom. Saint's Day, Sept. 24th. Here again a similar mistake has occurred. The original designation of the species was translated "dung fungus," which the floral calendarists have found an equivalent for in Agaricus (Pan.) fimiputris. This

is a slight and insignificant species, though common enough. One may well ask what poor St. Gerard has done that, of all the dung-inhabiting fungi, this least attractive species should have been allotted to him! The fact is, it never was. *The* dung-fungus *par excellence* is undoubtedly to be found in the Pratelle family, the "common or garden mushrooms" of these happy islands. The typical form is **The White Pratelle,** *Agaricus* (*Psa.*) *campestris*, and this it is which best merits dedication to the saint.

St. Ceolfrid's Mushroom. Saint's Day, Sept. 25th. This has been translated as "the Great Boletus," which the floral calendarists endeavour to identify as B. bovinus. But that species, though one of the big Boleti, does not deserve to be called *the* Great Boletus. Rather the title should be applied to B. elephantinus. However, the latter is very seldom met with, and I think it more reasonable to conclude that the most remarkable in appearance of the larger Bolets is the true dedicated plant. **The Orange Bolet,** *Boletus versipellis*, is at once indicated. By the way, can any one tell me who St. Ceolfrid was, and why he has a mushroom at all?

St. Denis' Mushroom. Saint's Day, Oct. 9th. This was designated "Milky Agaric," and the sapient floral calendarists triumphantly point to Agaricus (My.) lacteus as fully answering to the description. But that species is small, though common enough, and has nothing to do with milkiness save in hue. It is evident that a Lactar is meant, since Lactarius used to be confounded with Agaricus. Let us therefore look among the Lactars most prevalent about October 9th; and, since St. Denis is the patron saint of France, let us seek for that species most highly esteemed among them in France. **The Kidney,** *Lactarius volemus*, answers to both particulars, and I make no doubt it is the true consecrated plant.

St. Luke's Mushroom.—Saint's Day, Oct. 18th. In spite of the fact that the floral calendarists assert this to be the obscure and unattractive Agaricus (Heb.) flocculosus, because it is named "the Floccose Agaric" in their lists, I have no doubt or difficulty in relegating it to the subgenus Lepiota. Of that family we must take the common typical form as representing all, and The **Parasol,** *Agaricus* (*Lep.*) *procerus*, becomes St. Luke's Mushroom for us. This is far more worthy, and is certainly *the* floccose agaric above all others.

St. Marcellus' Mushroom. Saint's Day, Oct. 30th. Called the "Fringed Agaric." The floral calendarists, pursuing their usual method of identification, state this to be Agaricus (Pleur.) fimbri-

atus. They probably were unaware they had hit upon a species uncommon, small, and altogether unlikely to be the one intended. It is also probable they did not know that the word "agaric" is still familiarly used in France and Italy with about equal looseness and latitude of meaning to the English employment of the words "mushroom" and "toadstool." It may, in fact, mean almost anything fungoid. Some true Agarics possess more or less fringe upon their margins, as do some Cortinars and Lactars. But this is a minute detail scarcely likely to be made a strong point of by persons wishing to indicate a main feature of the plant. I think it almost certain that the hanging spines of some Hydnum have originated the idea of a fringe. Some of the tree-Hydna, such as the Medusa's Head, are practically all fringe; and one of them, I am sure, is the "agaric" intended. But we so seldom see the curious tree-Hydna in this country that I think it will answer the purpose if we assume my old friend and favourite **The Urchin of the Woods**, *Hydnum repandum*, to be St. Marcellus' Mushroom.

St. Cecilia's Mushroom. Saint's Day, Nov. 22nd. It will strike every one that this must evidently be **The Cecilia**, *Agaricus* (*Am.*) *Ceciliæ*. However, it is only within comparatively recent times that this species has been differentiated and named apart from its close ally **The Grisette**, *Agaricus* (*Am.*) *vaginatus*. The two were formerly confounded together, and have equal right to the dedication. In fact, the latter has perhaps the better right, for, of the two, it alone will be found so late as the saint's day. It is also a dainty and wholesome esculent, while the former is thought unsafe by some "toadstool-eaters."—*W. D. H.*

STUDY-INSPIRING MUSHROOMS.

A similar incident raised up the two greatest mycologists of past and present times. **Christian Henry Persoon**, styled "The Creator of Mycology," was led to take an interest in fungi at an early age through accidentally finding a fine specimen of the Orange Elfcup, *Peziza aurantia*. Its beauty and singularity induced him to take up the study of fungi from that moment, and he afterwards introduced a system of classification and nomenclature.

Elias Fries, the great Swedish mycologist, was similarly drawn to the study, when a boy, by finding a superb example of one of the strangest and most beautiful of fungi, The Coralline Hydnum, *H. coralloides*. The system formed by him has superseded that of Persoon (except to French mycologists, who still cling to their own countryman's measure of the science); and he has greatly advanced mycological knowledge.

The author of this work ventures to add his own humble experience to these illustrious examples. In boyhood, while gathering Pratelles in the meadows, he was struck by their varieties and by the conflicting information he was alone able to obtain respecting the relative excellence, or the contrary, imputed to them by those whom he questioned. Interest being thus aroused, he began to study fungi where and how he could; the result being, so far, the present work.

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Scaly-top	Agaricus (Lep.) acutesquamosus	33		58			
Scaly Urchin. . .	Hydnum imbricatum	152		86			
Scarlet Flycap . .	Agaricus (Am.) muscarius . .					iii.	154
Scarlet-hood . . .	Hygrophorus coccineus . . .	94		52			
Scented Bolet . .	Boletus fragrans	165		70			
Scented Elfcup . .	Peziza venosa	217		113			
Scented Parasol. .	Agaricus (Lep.) clypeolarius. .	36	48	58			
Shaggy Pratelle . .	Agaricus (Psa.) villaticus . .	65	45	2, 31			
Sheep-hood . . .	Hygrophorus ovinus	97		2, 31			
Short Parasol . .	Agaricus (Lep.) naucinus . .	42	48	58			
Sickener	Russula emetica.					xxxvii.	155
Sickener's Sister .	Russula fragilis					xxxviii.	155
Silky Parasol . .	Agaricus (Lep.) holosericeus .	40	48	58			
Silky Volvar . . .	Agaricus (Vol.) bombycinus . .	80		44			
Skull-cap	Agaricus (Stro.) semiglobatus .					xxi.	
Slayer	Lactarius rufus					xxxii.	156
Slender Parasol . .	Agaricus (Lep.) gracilentus . .	38	48	58			
Slit-cap	Agaricus (Heb.) rimosus . . .					xii.	
Smoke-cap . . .	Agaricus (Cl.) fumosus . . .	14		2, 31			
Smoky Lactar . .	Lactarius fuliginosus					xxix.	
Snailshell. . . .	Peziza cochleata	212	55	113			
Snake in the Grass .	Agaricus (Heb.) crustuliniformis					x.	
Snowdrop. . . .	Hygrophorus niveus	96	51	52			
Sorceress	Agaricus (Am.) mappa . . .					ii.	153
Sparassis	Sparassis crispa	146		93			
Specious Volvar. .	Agaricus (Vol.) speciosus . .					xxv.	
Spindleshank . .	Agaricus (Col.) fusipes . . .	26	47	65			
Spotty-leg Bolet. .	Boletus erythropus.					xliv.	
Spotty-sprout . .	Agaricus (Pleu.) dryinus . . .	54		114			
Sprinkled Bolet . .	Boletus granulatus	166		70			
Stinger	Marasmius urens					xxxv.	
Stinker	Agaricus (Tri.) spermaticus . .					xxii.	
Stinkhorn. . . .	Phallus impudicus					li.	
Striped Stump-flap	Polyporus versicolor					xlix.	
Striped Volvar . .	Agaricus (Vol.) volvaceus. . .					xxvi.	
Stumptuft . . .	Agaricus (Arm.) melleus . . .	7	50	63			
Sulphur-clump . .	Polyporus sulfureus	181		115			
Sulphur-tuft . . .	Agaricus (Hyph.) fascicularis .					xiii.	
Summer Bolet . .	Boletus æstivalis	155	54	70			
Summer Truffle. .	Tuber æstivum	220	55	123	191		
Sweet-cap. . . .	Agaricus (Cl.) odorus	21		52			
Sweet-Milk . . .	Lactarius subdulcis	105		39			
Tall Amanite. . .	Agaricus (Am.) excelsus . . .					i.	153
Tall Morel . . .	Morchella semilibera	208	48	98			
Tall Puffball . . .	Lycoperdon saccatum	197	45	116			
Tan-cap	Agaricus (Cl.) infundibuliformi	17		2, 31			
Tawny-tuft . . .	Agaricus (Pho.) spectabilis . .	52		114			
Thimblefinger . .	Verpa digitaliformis	219		113			
Tiger-tuft. . . .	Lentinus tigrinus	110		34			
Turnover	Agaricus (Tri.) pessundatus . .	78		2, 31			

Vulgar Name.	Scientific Name.	No. in Cat. of Esculents.	Page in Chap. VII.	No. of Cul. Receipt.	Page in Chap. XI.	No. in Cat. of Poisons.	Page in Chap. IX.
Urchin of the Woods	Hydnum repandum	153	48	86			
Verdette	Russula virescens	130	52	32	193		
Virgin	Hygrophorus virgineus . . .	99	51	2, 31			
Water-skin . . .	Agaricus (Ent.) rhodopolius. .	30		2, 31			
Warty Earthball .	Scleroderma verrucosum . . .					lii.	
Waxy-hood . . .	Hygrophorus ceraecus	93		58			
Wheat-cap . . .	Agaricus (Ent.) frumentaceus .	29		2, 31			
White-cap . . .	Agaricus (Cl.) cerussatus . . .	10		2, 31			
White Coral-tuft .	Clavaria coralloides	136	52	93			
White Giant . . .	Agaricus (Cl.) giganteus . . .	16		34			
White Giant . . .	Agaricus (Cl.) maximus . . .	19		34			
White Pratelle . .	Agaricus (Psa.) campestris . .	60	45	2, 31	188		150
Willow-sprout . .	Agaricus (Pleu.) salignus . . .	57		114			
Winter Truffle . .	Tuber brumale	221	55	123	191		
Wood Blewit . .	Lepista nuda	111	46	56			
Wood Pratelle . .	Agaricus (Psa.) sylvaticus . .					xix.	
Woolly White Lactar	Lactarius vellereus.					xxxiii.	
Wrinkle-twig . .	Calvaria rugosa	144	52	93			
Yellow Bolet . . .	Boletus flavus	164		70			
Yellow-crack Bolet.	Boletus subtomentosus . . .	171	54	70			
Yellow Jelly-sprout	Tremella lutescens	185		113			
Yellow Reptile . .	Agaricus (Tri.) sulfureus. . .					xxiii.	
Yellow-twig . . .	Clavaria fastigiata	138	52	93			

THE ILLUSTRATIONS.

It is hoped that the Figures given will help to elucidate the text, and will assist beginners in mastering the details of structure and classification.

It has been found practicable to advance somewhat beyond the limits laid down in the body of this work, and to illustrate, by means of typical species, the vast majority of the Genera of Fungi found in the British Isles. Unavoidable omissions there are, but they are neither numerous nor important.

Appended is a set of tables illustrating the essential structural points on which the Subgenera of Agaricus have been founded.

PLATE I.

AGARICINI.

FIG.

1. Agaricus (Lepiota) procerus,
   (*reduced.*)
2. Agaricus (Pleurotus) applicatus,
   (*on a twig, natural size.*)
3. Agaricus (Armillaria) melleus,
   (*reduced.*)
4. Marasmius oreades,
   (*natural size, in dry weather.*)
5. Coprinus fuscescens,
   (*reduced; spores magnified.*)
6. Coprinus micaceus,
   (*reduced.*)

PLATE I.

Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

Fig 6.

PLATE II.

AGARICINI.

FIG.

1. Cortinarius (Phlegmacium) fulgens,
   (*reduced; spores magnified.*)
2. Cortinarius (Myxacium) collinitus,
   (*reduced; spores magnified.*)
3. Cortinarius (Inoloma) callisteus,
   (*reduced; spores magnified.*)
4. Cortinarius (Telamonia) hinnuleus,
   (*reduced; spores magnified.*)
5. Cortinarius (Dermocybe) cinnamomeus,
   (*reduced; spores magnified.*)
6. Cortinarius (Hygrocybe) leucopus,
   (*reduced; spores magnified.*)

PLATE II.

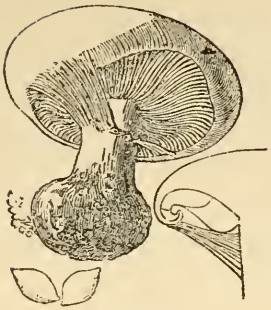


Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.

PLATE III.

AGARICINI.

FIG.

1. Bolbitius fragilis,
   (*reduced; spores magnified.*)
2. Paxillus involutus,
   (*reduced; spores magnified.*)
3. Lepista nuda,
   (*reduced; spores magnified.*)
4. Hygrophorus conicus,
   (*reduced; spores magnified.*)
5. Gomphidius glutinosus,
   (*reduced; spores magnified.*)

PLATE III.

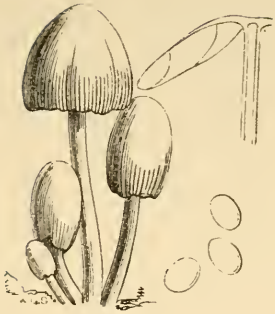


Fig. 1.

Fig. 2.

Fig. 3.

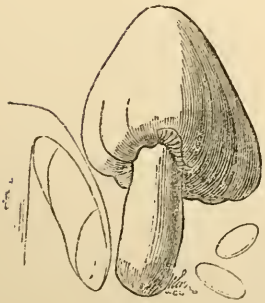


Fig. 4.

Fig. 5.

PLATE IV.

AGARICINI.

FIG.

1. Lactarius zonarius,
   (*reduced; section and magnified spores.*
2. Russula rosacea,
   (*reduced; with magnified spores.*)
3. Cantharellus cinereus,
   (*reduced; with magnified spores.*)
4. Nyctalis asterophora,
   (*natural size; on dead Russula reduced; 1, enlarged; 2, 3, spores magnified.*)
5. Marasmius peronatus,
   (*reduced; with magnified spores.*)
6. Lentinus tigrinus,
   (*reduced; with magnified spores.*)

PLATE IV.

Fig. 1.

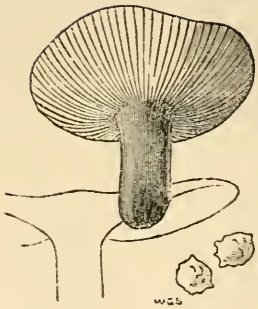


Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

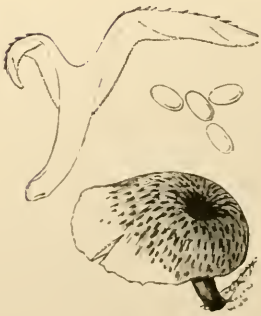


Fig. 6.

PLATE V.

AGARICINI.

FIG.

1. Panus torulosus,
   (*reduced; section and magnified spores.*)
2. Xerotus degener,
   (*natural size.*)
3. Lenzites betulina,
   (*reduced; spores magnified.*
4. Trogia crispa,
   (*natural size; spores magnified.*
5. Schizophyllum commune,
   (*natural size; spores and gills enlarged.*)

PLATE V.

Fig. 1.

Fig. 2.

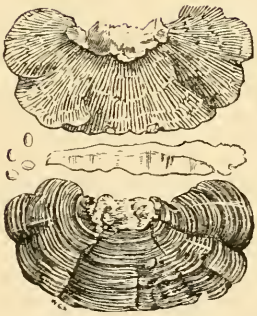


Fig. 3.

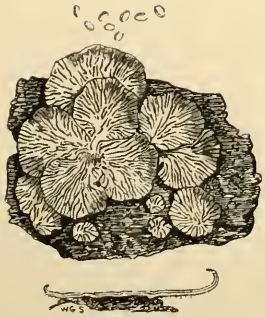


Fig. 4.

Fig. 5.

PLATE VI.

POLYPOREI.

FIG.

1. Boletus purpureus,
   (*reduced; spores magnified.*)
2. Strobilomyces strobilaceus,
   (*reduced; spore magnified.*)
3. Polyporus giganteus,
   (*reduced; spores magnified.*)
4. Polyporus sulfureus,
   (*reduced.*)
5. Trametes gibbosa,
   (*reduced.*)
6. Trametes gibbosa,
   (*reduced section; spores magnified.*)

PLATE VI.

Fig. 1.

Fig. 2.

Fig. 3.

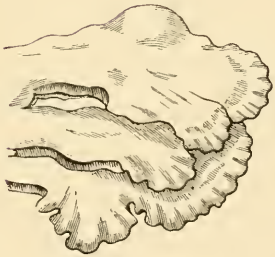


Fig. 4.

Fig. 5.

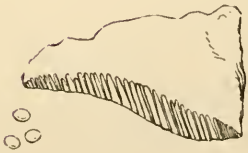


Fig. 6.

PLATE VII.

POLYPOREI.

FIG.

1. Merulius lacrymans,
   (*reduced; spores magnified.*)
2. Fistulina hepatica,
   (*reduced; tubes and spores magnified.*)
3. Porothelium Friesii,
   (*reduced; spores magnified.*)
4. Dædalea quercina,
   (*reduced; with section and magnified spores.*)

PLATE VII.

Fig. 1.

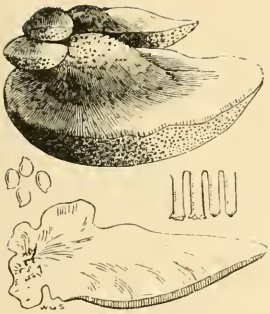


Fig. 2.

Fig. 3.

Fig. 4.

PLATE VIII.

HYDNEI.

FIG.

1. Sistotrema confluens,
   (*reduced; spores magnified.*)
2. Irpex obliquus,
   (*teeth and spores magnified.*)
3. Radulum quercinum,
   (*spores magnified.*)
4. Hydnum repandum,
   (*reduced; spores magnified.*)
5. Phlebia merismoides,
   (*reduced; spores magnified.*)
6. Grandinia granulosa,
   (*spores magnified.*)
7. Odontia fimbriata,
   (*spores magnified.*)

PLATE VIII.

Fig. 1.

Fig. 2.

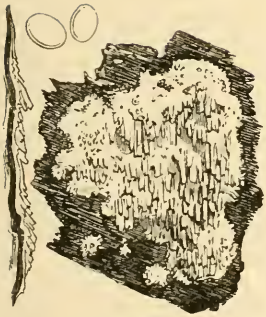


Fig. 3.

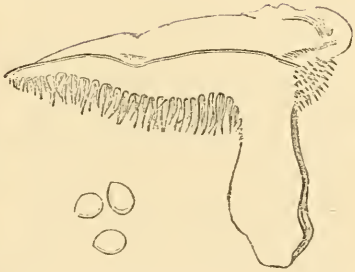


Fig. 4.

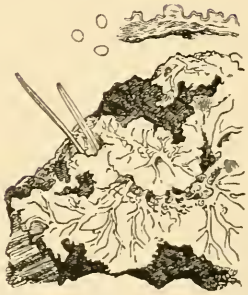


Fig. 5.

Fig. 6.

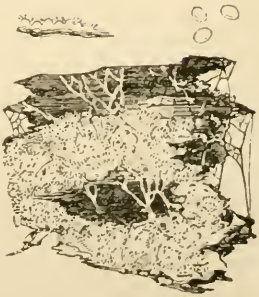


Fig. 7.

PLATE IX.

AURICULARINI.

FIG.

1. Kneiffia setigera,
   (*spores magnified.*)
2. Craterellus cornucopioides,
   (*reduced; with magnified spore.*)
3. Stereum hirsutum,
   (*reduced; spores magnified.*)
4. Thelephora laciniata,
   (*reduced; spore magnified.*)
5. Hymenochæte rubiginosa,
   (*spores magnified.*)

PLATE IX.

Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

PLATE X.

AURICULARINI.

FIG.

1. Auricularia mesenterica,
   (*reduced; spores magnified.*)
2. Corticium nudum,
   (*spores magnified.*)
3. Cyphella muscigena,
   (*natural size;* A, *cups enlarged; spores magnified.*)
4. Solenia candida,
   (*natural size, and magnified.*)

PLATE X.

Fig. 1.

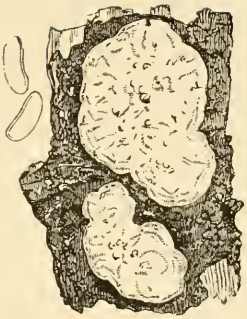


Fig. 2.

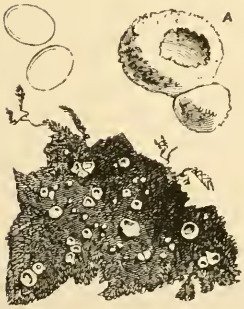


Fig. 3.

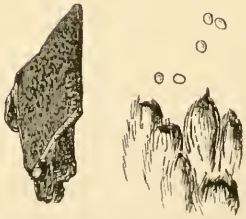


Fig. 4.

PLATE XI.

CLAVARIEI.

FIG.

1. Sparassis crispa,
   (*reduced; with section and magnified spores.*)
2. Clavaria abietina,
   (*natural size.*)
3. Clavaria fusiformis,
   (*small specimen.*)
4. Clavaria tenuipes,
   (*natural size.*)
5. Calocera viscosa,
   (*natural size; spores magnified.*)
6. Typhula erythropus,
   (*natural size; spores magnified.*)
7. Pistillaria quisquilaris,
   (*natural size, and enlarged.*)

PLATE XI.

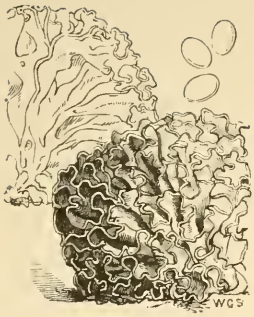


Fig. 1.

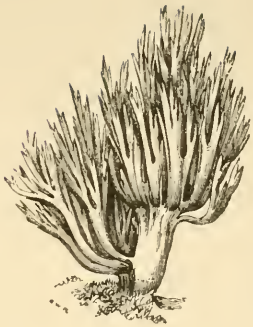


Fig. 2.

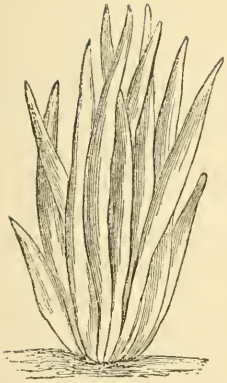


Fig.

Fig. 4.

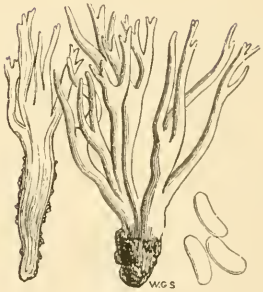


Fig. 5.

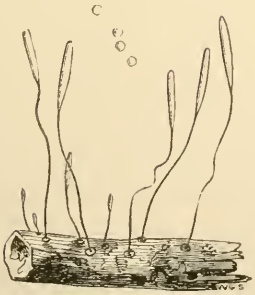


Fig. 6.

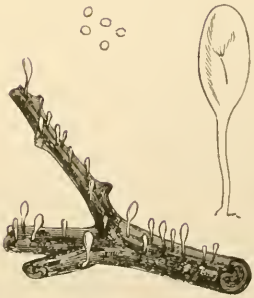


Fig. 7.

PLATE XII.

TREMELLINI.

FIG.

1. Exidia glandulosa,
   (*spores magnified.*)
2. Hirneola auricula-judæ,
   (*spore magnified.*)
3. Dacrymyces sebaceus,
   (*natural size;* A *and* B *magnified.*)
4. Tremella mesenterica,
   (*filament and spores magnified.*)
5. Exidia recisa,
   (*natural size.*)
6. Apyrenium lignatile,
   (*natural size, and magnified.*)
7. Nœmatelia encephala,
   (*natural size; spores magnified.*)
8. Ditiola radicata,
   (*natural size.*)

PLATE XII.

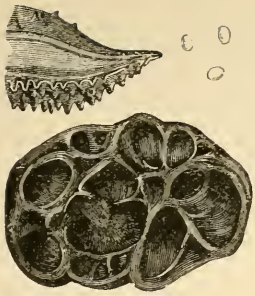


Fig. 1.

Fig. 2.

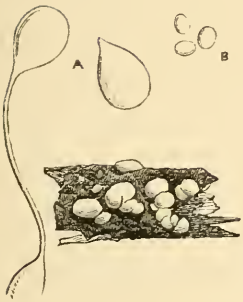


Fig. 3.

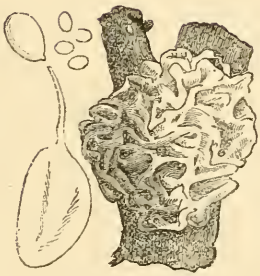


Fig. 4.

Fig. 5.

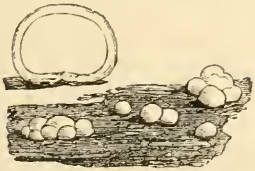


Fig. 6.

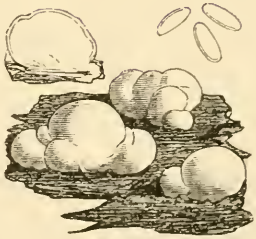


Fig. 7.

Fig 8.

PLATE XIII.

HYPOGÆI.

FIG.

1. Octaviana asterosperma,
   (*spores magnified.*)
2. Hydnangium carotæcolor,
   (*spores magnified.*)
3. Rhizopogon rubescens,
   (*natural size.*)
4. Melanogaster ambiguus,
   (*section enlarged.*)
5. Hymenogaster tener,
   (*natural size; with section.*)
6. Hymenogaster vulgaris,
   (*spores magnified.*)

PLATE XIII.

Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.

PLATE XIV.

PHALLOIDEI.

FIG.

1. Cynophallus caninus, (*reduced.*)
2. Phallus impudicus, (*reduced.*)
3. Clathrus cancellatus, (*reduced.*)

TRICHOGASTRES.

4. Batarrea phalloides, (*reduced.*)
5. Geaster lageniformis, (*reduced.*)
6. Tulostoma mammosum, (*natural size.*)

PLATE XIV.

Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.

PLATE XV.

TRICHOGASTRES.

FIG.

1. Bovista plumbea,
   (*natural size; section and magnified spores.*)
2. Lycoperdon pyriforme,
   (*reduced; with section.*)
3. Cenococcum geophilum,
   (*natural size, and section.*)
4. Scleroderma vulgare,
   (*with section and magnified spore.*)
5. Polysaccum olivaceum.

PLATE XV.

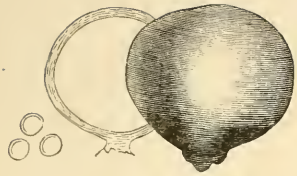


Fig. 1.

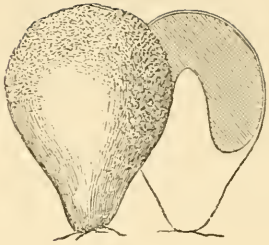


Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

PLATE XVI.

MYXOGASTRES.

FIG.

1. Lycogala epidendrum.
2. Reticularia umbrina,
   (*with magnified spores.*)
3. Æthalium septicum.
4. Ptychogaster albus,
   (*with magnified spores.*)
5. Diderma vernicosum,
   (*cluster natural size, peridium magnified.*)

PLATE XVI.

Fig. 1.

Fig. 2.

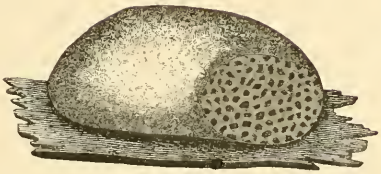


Fig. 3.

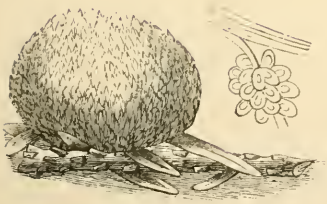


Fig. 4.

Fig. 5.

PLATE XVII.

MYXOGASTRES.

FIG.

1. Didymium farinaceum.
2. Didymium xanthopus.
3. Physarum nutans,
   (*natural size, and enlarged.*)
4. Angioridium sinuosum.
5. Badhamia pallida,
   (*natural size; spores and laminæ.*)
6. Craterium pedunculatum,
   (*natural size, and magnified.*)

PLATE XVII.

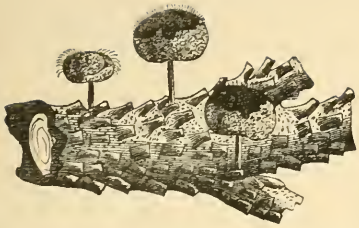


Fig. 1.

Fig. 2.

Fig. 3.

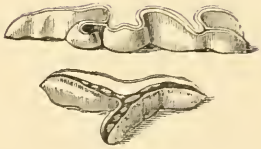


Fig. 4.

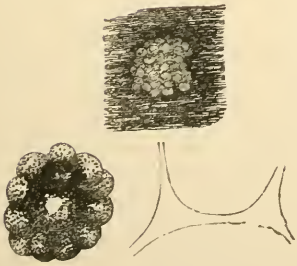


Fig. 5.

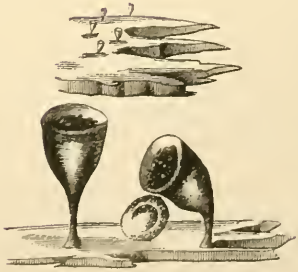


Fig. 6.

PLATE XVIII.

MYXOGASTRES.

FIG.

1. Diachæa elegans.
   (*enlarged.*)
2. Ophiotheca chrysosperma,
   (*with filaments magnified.*)
3. Dictydium umbilicatum,
   (*natural size, and enlarged.*)
4. Enerthenema elegans,
   (*thread and spores magnified.*)
5. Cribraria intricata.

PLATE XVIII.

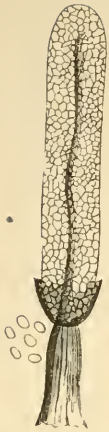


Fig. 1.

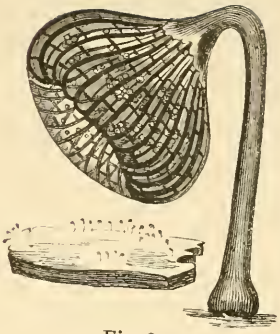


Fig. 3.

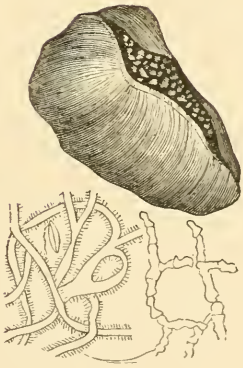


Fig. 2.

Fig. 4.

Fig. 5.

PLATE XIX.

MYXOGASTRES.

FIG.

1. Arcyria incarnata,
   (*with thread and spore magnified.*)
2. Trichia chrysosperma.
3. Trichia chrysosperma,
   (*threads and spores magnified.*)
4. Phelonitis strobilina.
5. Perichæna populina,
   (*natural size, and magnified.*)
6. Licea fragiformis.

PLATE XIX.

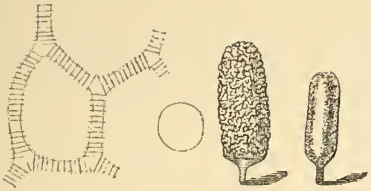


Fig. 1.

Fig. 2.

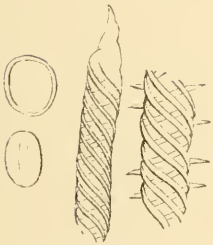


Fig. 3.

Fig. 4.

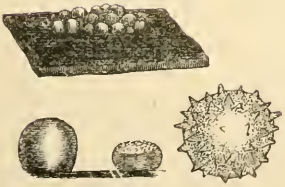


Fig. 5.

Fig. 6.

PLATE XX.

NIDULARIACEI.

FIG.

1. Nidularia pisiformis.
2. Sphærobolus stellatus.
3. Polyangium vitellinum, (*natural size, and magnified.*)
4. Thelebolus terrestris.

PLATE XX.

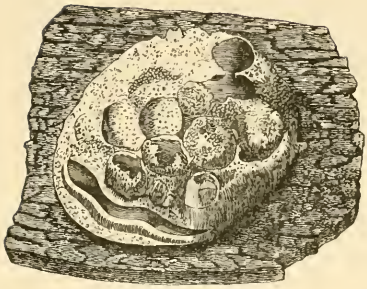


Fig. 1.

Fig. 2.

Fig. 3.

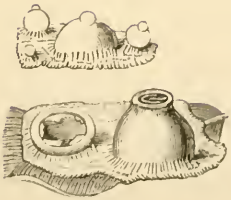


Fig. 4.

PLATE XXI.

SPHÆRONEMEI.

FIG.

1. Coniothyrium glomeratum.
2. Leptostroma caricinum.
3. Phoma samarorum, *(magnified.)*
4. Actinothyrium graminis.
5. Cryptosporium caricis.
6. Sphæronema subulatum.

PLATE XXI.

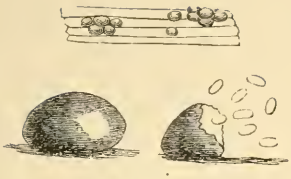


Fig. 1.

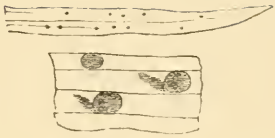


Fig. 2.

Fig. 3.

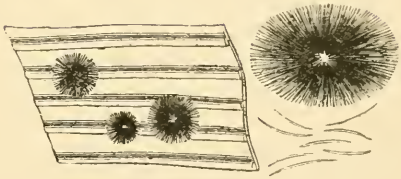


Fig. 4.

Fig. 5.

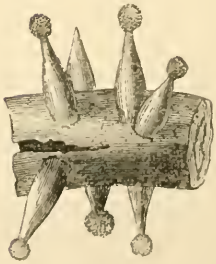


Fig. 6.

PLATE XXII.

SPHÆRONEMEI.

FIG.

1. Sphæropsis atrovirens.
2. Diplodia vulgaris.
3. Hendersonia corni.
4. Dilophospora graminis, (*spores magnified.*)
5. Darluca filum.
6. Vermicularia trichella.

PLATE XXII.

Fig. 1.

Fig. 2.

Fig. 3.

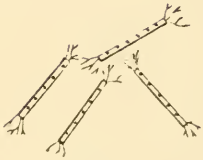


Fig. 4.

Fig. 5.

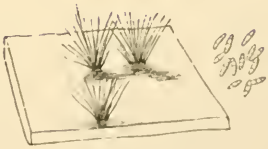


Fig. 6.

PLATE XXIII.

SPHÆRONEMEI.

FIG.

1. Discosia alnea.
2. Pilidium acerinum.
3. Melasmia alnea.
4. Piggotia astroidea.
5. Septoria ulmi.
6. Ascochyta pisi.

PLATE XXIII.

Fig. 1.

Fig. 2.

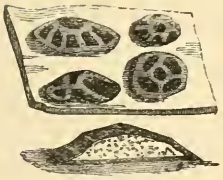


Fig. 3.

Fig. 4.

Fig. 5.

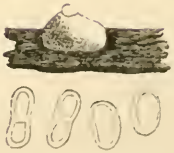


Fig. 6.

PLATE XXIV.

SPHÆRONEMEI.

FIG.

1. Cystotricha striola.
2. Neottiospora caricum.
3. Excipula strigosa.
4. Dinemasporium graminum.
5. Myxormia atro-viridis.
6. Prosthemium stellare.

PLATE XXIV.

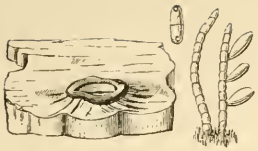


Fig. 1.

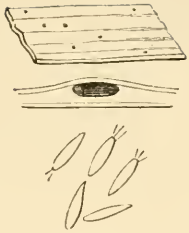


Fig. 2.

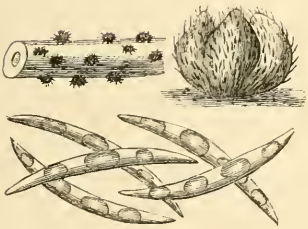


Fig. 3.

Fig. 4.

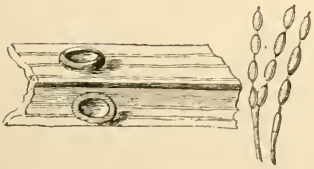


Fig. 5.

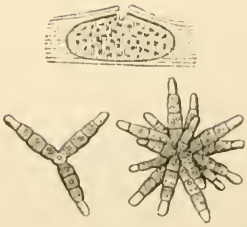


Fig. 6.

PLATE XXV.

SPHÆRONEMEI.

FIG.

1. *a*, Asteroma rosæ.
   b, Asteroma padi.
2. Ceuthospora lauri.
3. Eriospora leucostoma.
4. Discella desmazierii.

MELANCONIEI.

5. Melanconium bicolor.
6. Stegonosporium cellulosum.
7. Stilbospora angustata.

PLATE XXV.

Fig. 1.

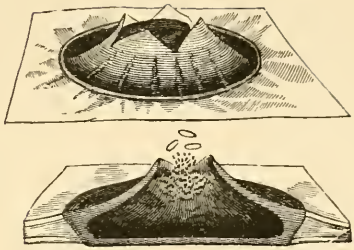


Fig. 2.

Fig. 3.

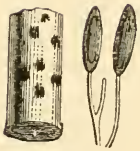


Fig. 4.

Fig. 5.

Fig. 6.

Fig. 7.

PLATE XXVI.

MELANCONIEI.

FIG.

1. Asterosporium Hoffmanni.
2. Coryneum umbonatum.
3. Pestalozzia guepini.
4. Glæosporium fructigenum.
5. Cheirospora botryospora.

PLATE XXVI.

Fig. 1.

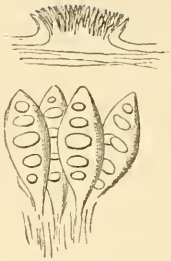


Fig. 2.

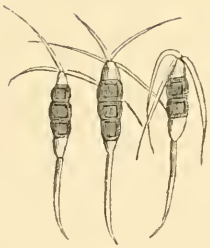


Fig. 3.

Fig. 4.

Fig. 5.

PLATE XXVII.

TORULACEI.

FIG.

1. Speira toruloides.
2. Bactridium flavum.
3. Helicosporium vegetum.
4. Bispora monilioides.
5. Septonema spilomeum.
6. Sporidesmium polymorphum.

PLATE XXVII.

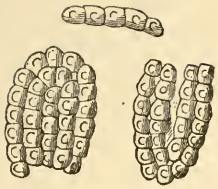


Fig. 1.

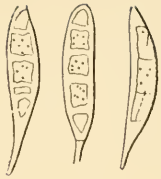


Fig. 2.

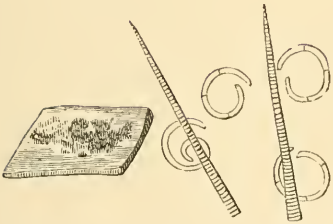


Fig. 3.

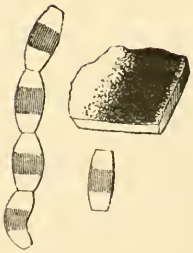


Fig. 4.

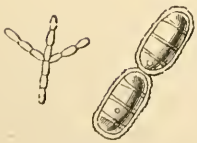


Fig. 5.

Fig. 6.

PLATE XXVIII.

TORULACEI.

FIG.

1. Dictyosporium elegans.
2. Sporochisma mirabile.
3. Tetraploa aristata.
4. Acalyptospora nervisequia.
5. Gymnosporium arundinis.
6. Echinobotryum atrum.

PLATE XXVIII.

Fig. 1.

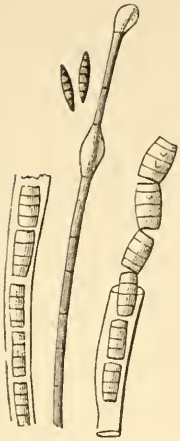


Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.

PLATE XXIX.

PUCCINIÆI.

FIG.

1. Xenodochus carbonarius, (*spore magnified.*)
2. Triphragmium ulmariæ, (*spores magnified.*)
3. Phragmidium bulbosum.
4. Gymnosporangium juniperi.
5. Podisoma juniperi.

PLATE XXIX.

Fig. 1.

Fig. 2.

Fig. 3.

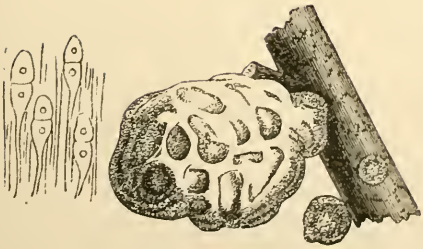


Fig. 4.

Fig. 5.

PLATE XXX.

USTILAGINEI.

FIG.

1. Tilletia caries.
2. Ustilago maydis,
   (*spores magnified.*)
3. Thecaphora hyalina.
4. Tuburcinia scabies,
   (*spores magnified.*)
5. Urocystis occulta.

CÆOMACEI.

6. Melampsora betulina,
   (*winter spores, magnified.*)
7. Melampsora salicina,
   (*winter spores, magnified.*)
8. Coleosporium tussilaginis.

PLATE XXX.

Fig. 1.

Fig. 2.

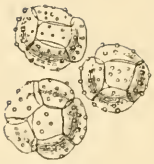


Fig. 3.

Fig. 4.

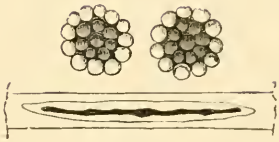


Fig. 5.

Fig. 6.

Fig. 7.

Fig. 8.

PLATE XXXI.

CÆOMACEI.

FIG.

1. Cystopus cubicus.
2. Cystopus candidus,
   (*conidia and oospore.*)

ÆCIDIACEI.

3. Rœstelia cornuta,
   (*enlarged.*)
4. Peridermium pini,
   (*natural size, and magnified.*)

PLATE XXXI.

Fig. 1.

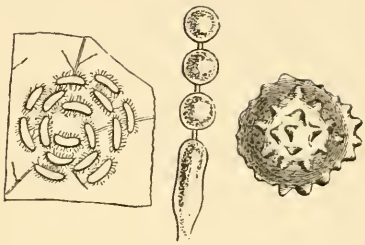


Fig. 2.

Fig. 3.

Fig. 4.

PLATE XXXII.

ÆCIDIACEI.

FIG

1. Graphiola phœnicis.

ISARIACEI.

2. Anthina flammea.
3. Pachnocybe subulata.
4. Ceratium hydnoides.

PLATE XXXII.

Fig. 1.

Fig. 2.

Fig. 3.

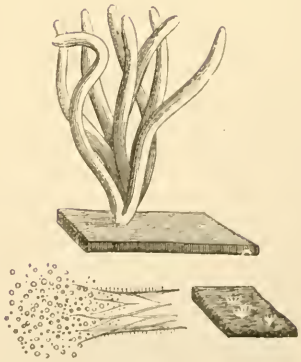


Fig. 4.

PLATE XXXIII.

STILBACEI.

FIG.

1. Stilbum vulgare.
2. Atractium flammeum.
3. Microcera coccophila.
4. Volutella setosa.
5. Tubercularia granulata,
   (*natural size, and section magnified.*)
6. Fusarium heteronema.

PLATE XXXIII.

Fig. 1.

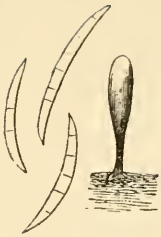


Fig. 2.

Fig. 3.

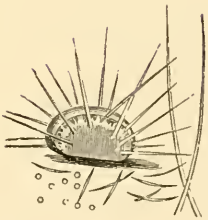


Fig. 4.

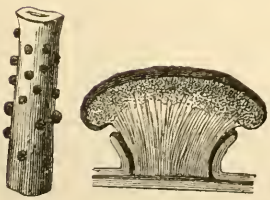


Fig. 5.

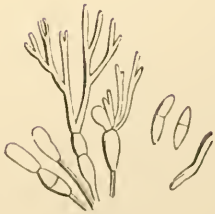


Fig. 6.

PLATE XXXIV.

STILBACEI.

FIG.

1. Myrothecium roridum.
2. Epicoccum neglectum.
3. Illosporium roseum.
4. Ægerita candida.

DEMATIEI.

5. Arthrobotryum atrum.
6. Dendryphium curtum.

PLATE XXXIV.

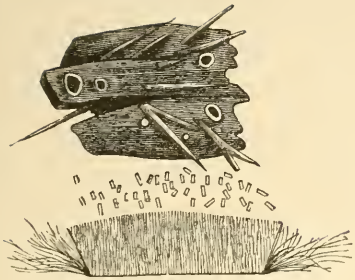


Fig. 1.

Fig. 2.

Fig. 3.

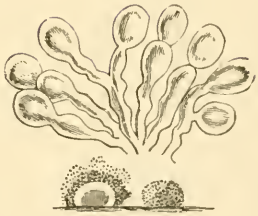


Fig 4.

Fig. 5.

Fig. 6.

PLATE XXXV.

DEMATIEI.

FIG.

1. Periconia glaucocephala.
2. Œdocephalum læticolor.
3. Sporocybe nigrella.
4. Stachybotrys atra.
5. Haplographium delicatum.
6. Monotospora megalospora.

PLATE XXXV.

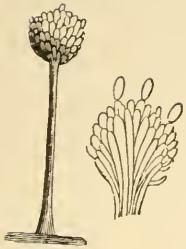


Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.

PLATE XXXVI.

DEMATIEI.

FIG.

1. Cephalotrichum eurtum.
2. Œdemium atrum.
3. Helminthosporium oosporum.
4. Macrosporium concinnum.
5. Mystrosporium stemphylium.
6. Acrothecium simplex.

PLATE XXXVI.

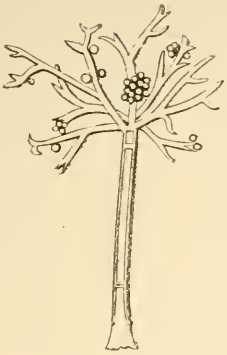


Fig. 1.

Fig. 2.

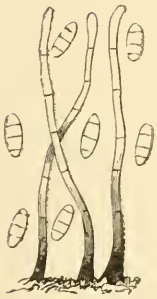


Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.

PLATE XXXVII.

DEMATIEI.

FIG.

1. Septosporium bulbotrichum, (*magnified.*)
2. Triposporium elegans, (*flocci and spores, magnified.*)
3. Helicoma mulleri.
4. Helicocoryne viridis.
5. Cladotrichum triseptatum.
6. Polythrincium trifolii.

PLATE XXXVII.

Fig. 1.

Fig. 2.

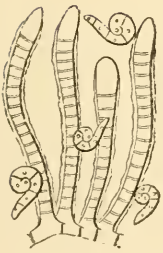


Fig. 3.

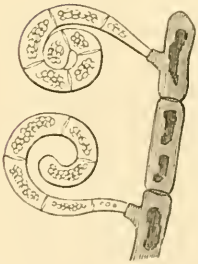


Fig. 4.

Fig. 5.

Fig. 6.

PLATE XXXVIII.

DEMATIEI.

FIG.

1. Cladosporium herbarum.
2. Arthrinium sporophlæum.
3. Gonatosporium puccinioides.
4. Camptoum curvatum.
5. Sporodum conopleoides.

PLATE XXXVIII.

Fig. 1.

Fig. 2.

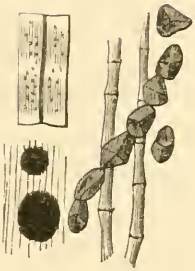


Fig. 3.

Fig. 4.

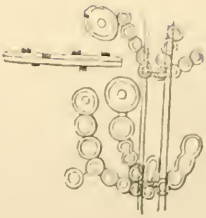


Fig. 5.

PLATE XXXIX.

MUCEDINES.

FIG.

1. Nematogonum aurantiacum.
2. Rhinotrichum lanosum.
3. Botrytis citrina.
4. Peronospora infestans.
5. Verticillium apicale.
6. Haplaria grisea.
7. Acrospeira mirabilis.

PLATE XXXIX.

Fig. 1.

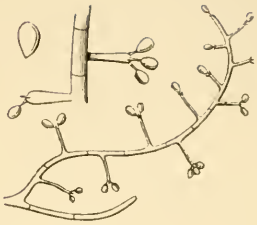


Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.

Fig. 7.

PLATE XL.

MUCEDINES.

FIG.

1. Polyactis vulgaris.
2. Oidium fulvum.
3. Monilia fasciculata.
4. Penicillium chartarum.
5. Stysanus stemonitis.

PLATE XL.

Fig. 1.

Fig. 2.

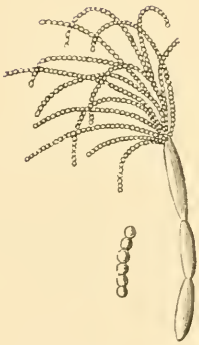


Fig. 3.

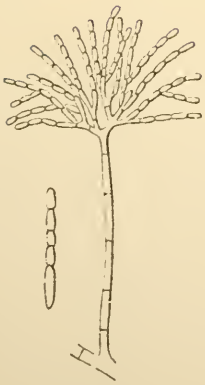


Fig. 4.

Fig. 5.

PLATE XLI.

MUCEDINES.

FIG.

1. Dactylium sphærocephalum.
2. Fusidium griseum.
3. Cylindrium septatum.
4. Sporotrichum sulfureum.
5. Zygodesmus fuscus.
6. Virgaria nigra.

PLATE XLI.

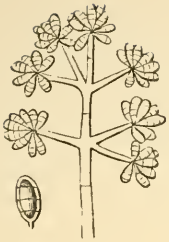


Fig 1.

Fig. 2.

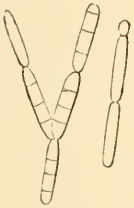


Fig. 3.

Fig. 4.

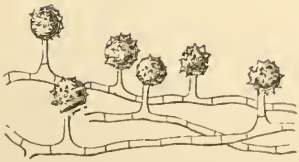


Fig. 5.

Fig. 6.

PLATE XLII.

MUCEDINES.

FIG.

1. Bolacotricha grisea.
2. Gonytrichum fuscum.
3. Myxotrichum chartarum.
4. Menispora lucida.
5. Chætopsis wauchii.
6. *a*. Acremonium alternatum.
   b. Acremonium verticillatum.

PLATE XLII.

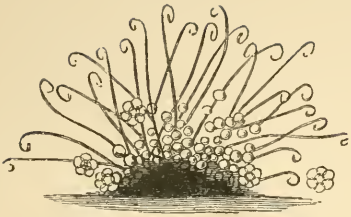


Fig. 1.

Fig. 2.

Fig. 3.

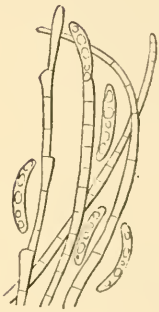


Fig. 4.

Fig. 5.

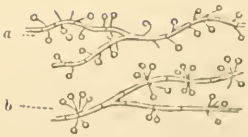


Fig. 6.

PLATE XLIII.

MUCEDINES.

FIG.

1. Gonatobotrys simplex.
2. Clonostachys araucaria.
3. Botryosporium pulchrum.
4. Rhopalomyces candidus.
5. Papulaspora sepedonioides.

PLATE XLIII.

Fig. 1.

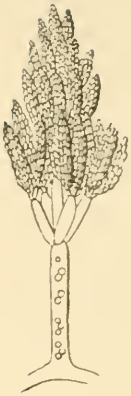


Fig. 2.

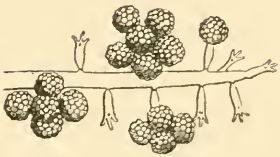


Fig. 3.

Fig. 4.

Fig. 5.

PLATE XLII.

MUCEDINES.

FIG.

1. Bolacotricha grisea.
2. Gonytrichum fuscum.
3. Myxotrichum chartarum.
4. Menispora lucida.
5. Chætopsis wauchii.
6. *a*. Acremonium alternatum.
   b. Acremonium verticillatum.

PLATE XLII.

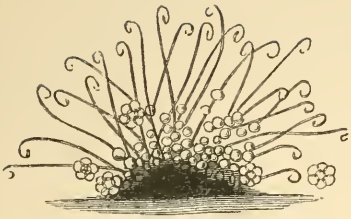


Fig. 1.

Fig. 2.

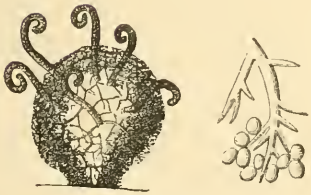


Fig. 3.

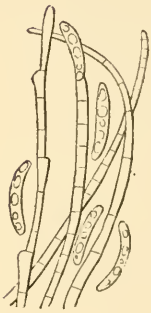


Fig. 4.

Fig. 5.

Fig. 6.

PLATE XLIII.

MUCEDINES.

FIG.

1. Gonatobotrys simplex.
2. Clonostachys araucaria.
3. Botryosporium pulchrum.
4. Rhopalomyces candidus.
5. Papulaspora sepedonioides.

PLATE XLIII.

Fig. 1.

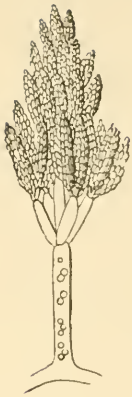


Fig. 2.

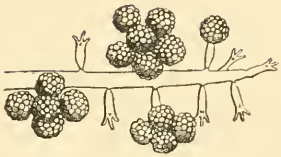


Fig. 3.

Fig. 4.

Fig. 5.

PLATE XLIV.

SEPEDONIEI.

FIG.

1. Sepedonium chrysospermum.
2. Fusisporium insidiosum, (*tuft magnified.*)
3. Epochnium macrosporoideum.
4. Psilonia gilva.

TRICHODERMACEI.

5. Pilacre faginea.
6. Arthroderma Curreyi.

PLATE XLIV.

Fig. 1.

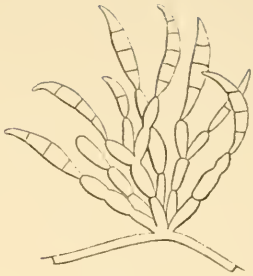


Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.

PLATE XLV.

ANTENNARIEI.

FIG.

1. Antennaria semiovata.

MUCORINI.

2. Ascophora mucedo.
3. Pilobolus roridus, (*magnified.*)
4. Hydrophora stercorea.
5. Mucor caninus.

PLATE XLV.

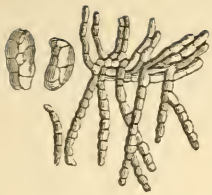


Fig. 1.

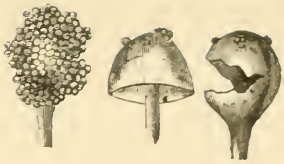


Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

PLATE XLVI.

MUCORINI.

FIG.

1. Endodromia vitrea.
2. Sporodinia dichotoma.
3. Syzygites megalocarpus.
4. Acrostalagmus cinnabarinus, (*magnified.*)
5. Endogone pisiformis.
6. Helicostylum elegans.

PLATE XLVI.

Fig. 1.

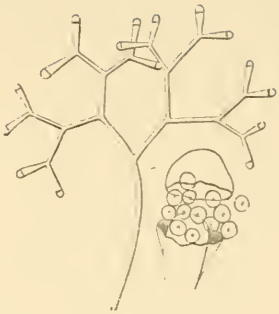


Fig. 2.

Fig. 3.

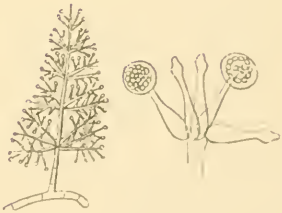


Fig. 4.

Fig. 5.

Fig. 6.

PLATE XLVII.

ONYGENEI.

1. Onygena equina.

PERISPORIACEI.

2. Perisporium vulgare.
3. Lasiobotrys loniceræ,
   (*a, natural size; b, tuft enlarged; c, perithecia magnified.*)
4. Sphærotheca castagnei,
   (*conceptacle magnified.*)
5. Phyllactinia guttata,
   (*conceptacle magnified 300 diam.*)
6. Uncinula adunca,
   (*conceptacle magnified.*)

PLATE XLVII.

Fig. 1.

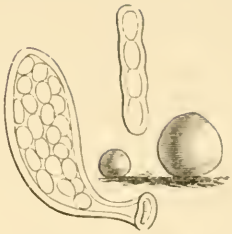


Fig. 2.

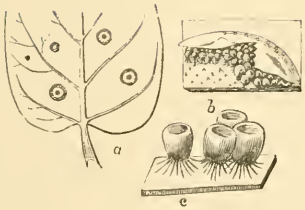


Fig. 3.

Fig. 4.

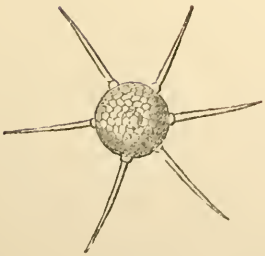


Fig. 5.

Fig. 6.

PLATE XLVIII.

PERISPORIACEI.

FIG.

1. Microsphæria Hedwigii,
   (*conceptacle magnified.*)
2. Erysiphe lamprocarpa,
   (*conceptacle and sporangium magnified.*)
3. Chætomium chartarum,
   (*perithecium and free spore magnified.*)
4. Ascotricha chartarum.
5. Podosphæra Kunzei.

PLATE XLVIII.

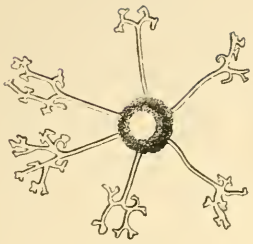


Fig. 1.

Fig. 2.

Fig. 3.

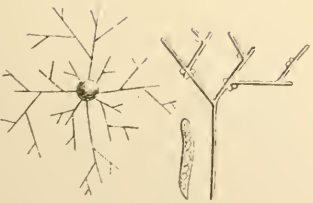


Fig. 4.

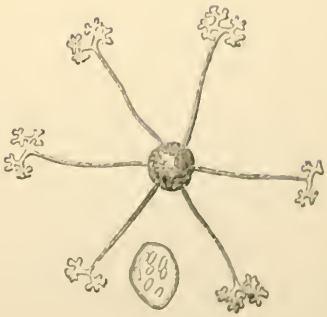


Fig. 5.

PLATE XLIX.

ELVELLACEI.

FIG.

1. Gyromitra esculenta,
   (*reduced, with section; ascus and sporidia magnified.*)
2. Helvella elastica,
   (*reduced, with section; ascus and sporidia magnified.*)
3. Morchella esculenta,
   (*reduced, with section; ascus and sporidia magnified.*)
4. Verpa digitaliformis,
   (*reduced, with section; ascus and sporidia magnified.*)
5. Leotia lubrica.
6. Peziza acetabulum.
7. Bulgaria inquinans.

PLATE XLIX.

Fig. 1.

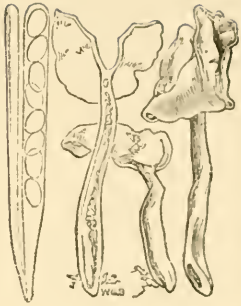
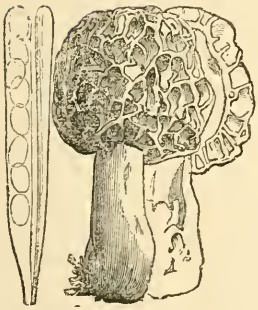


Fig. 2.



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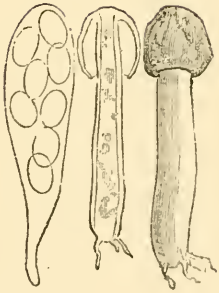


Fig. 4.

Fig. 5.

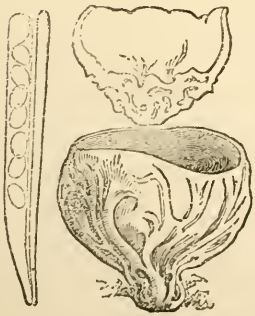


Fig. 6.

Fig. 7.

PLATE L.

TUBERACEI.

FIG.

1. Tuber æstivum,
   (*sporidium.*)
2. Tuber brumale,
   (*sporidium.*)
3. Choiromyces meandriformis,
   (*sporidium.*)
4. Amylocarpus encephaloides,
   (*ascus and sporidia.*)
5. Pachyphlœus melanoxanthus,
   (*section and sporidium.*)
6. Stephensia bombycina,
   (*section.*)
7. Stephensia bombycina,
   (*sporidium.*)

PLATE L.

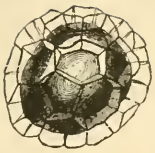


Fig. 1.

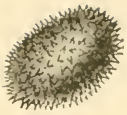


Fig. 2.

Fig. 3.

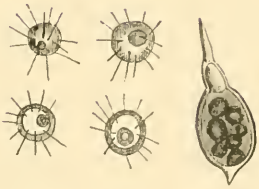


Fig. 4.

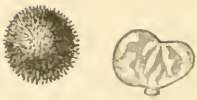


Fig. 5.

Fig. 6.

Fig. 7.

PLATE LI.

TUBERACEI.

FIG.

1. Hydnotrya Tu'asnii,
   (*section and sporidium.*)
2. Hydnobolites cerebriformis,
   (*section and sporidium.*)
3. Sphærosoma ostiolatum.
4. Balsamia platispora.
5. Genea verrucosa.
6. Elaphomyces granulatus.
7. *Ditto, sporidium.*

PLATE LI.

Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

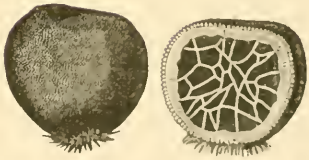


Fig. 6.

Fig. 7.

PLATE LII.

PHACIDIACEI.

FIG.

1. Rhytisma salicinum.
2. Triblidium caliciiforme.
3. Hysterium fraxini.
4. Sporomega cladophila.

PLATE LII.

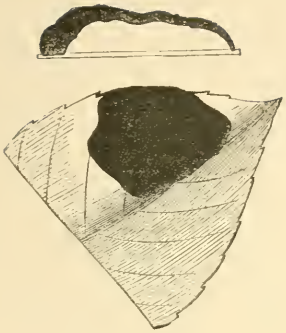


Fig. 1.

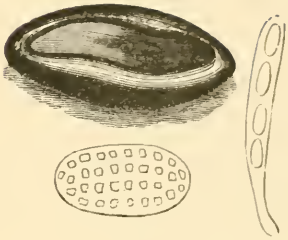


Fig. 2.

Fig. 3.

Fig. 4.

PLATE LIII.

PHACIDIACEI.

FIG.

1. Colpoma quercinum.
2. Ailographum maculare.
3. Actidium hysterioides.
4. Lophium mytilinum.

PLATE LIII.

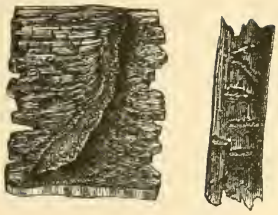


Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

PLATE LIV.

SPHÆRIACEI.

FIG.

1. Epichloe typhina.
2. Hypocrea rufa.
3. Hypomyces ochraceus.
4. Oomyces carneo-albus.

PLATE LIV.

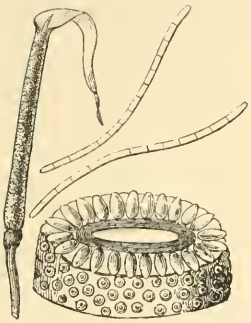


Fig. 1.

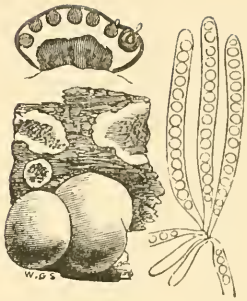


Fig. 2.

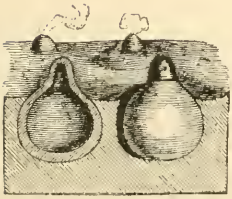


Fig. 3.

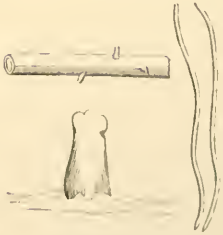


Fig. 4.

PLATE LV.

SPHÆRIACEI.

FIG.

1. Nectria cinnabarina.
2. Poronia punctata.
3. Xylaria polymorpha.
4. Thamnomyces hippotrichioides.
5. Ustulina vulgaris.
6. Hypoxylon coccineum.
7. Nummularia Bulliardi.

PLATE LV.

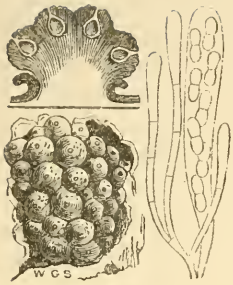


Fig. 1.

Fig. 2.

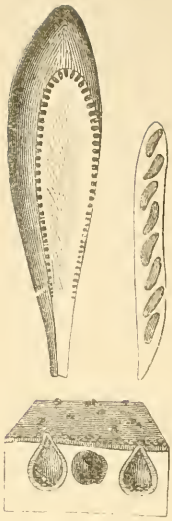


Fig. 3.

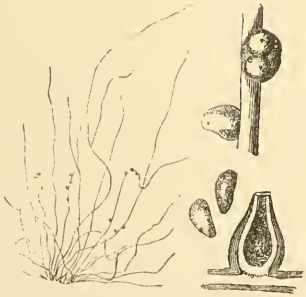


Fig. 4.

Fig. 5.

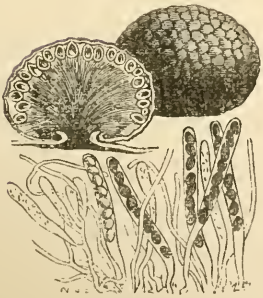


Fig. 6.

Fig. 7.

PLATE LVI.

SPHÆRIACEI.

FIG.

1. Eutypa Acharii.
2. Melogramma Bulliardi.
3. Polystigma rubrum.
4. Dothidea ribesia.
5. Diatrype quercina.
6. Melanconis stilbostoma.

PLATE LVI.

Fig. 1.

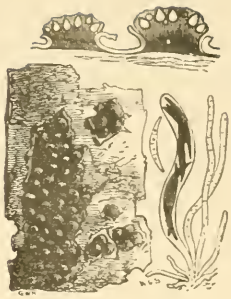


Fig. 2.

Fig. 3.

Fig. 4.

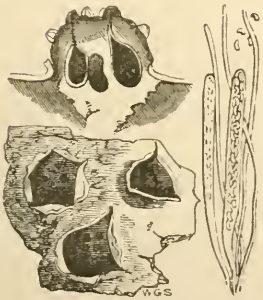


Fig. 5.

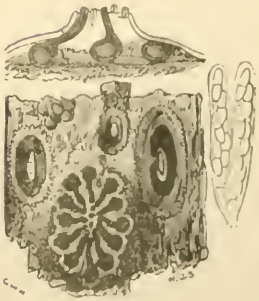


Fig. 6.

PLATE LVII.

SPHÆRIACEI.

FIG.

1. Valsa ceratophora.
2. Cucurbitaria laburni.
3. Gibbera vaccinii.
4. Massaria eburnea.
5. Lophiostoma sex-nucleata.
6. Sphæria aquila.

PLATE LVII.

Fig. 1.

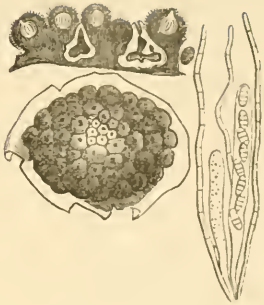


Fig. 2.

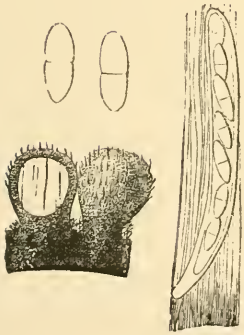


Fig. 3.

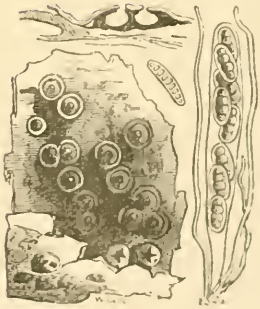


Fig. 4.

Fig. 5.

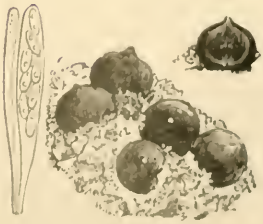


Fig. 6.

PLATE LVIII.

SPHÆRIACEI.

FIG.

1. Sphæria bovilla.
2. Sphæria ampullasca.
3. Sphæria ulnaspora.
4. Sphærella maculæformis.
5. Venturia ilicifolia.
6. Pyrenophora phæocomes.
7. Ceratostoma caprinum.

PLATE LVIII.

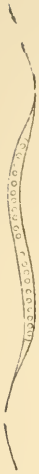


Fig. 1.

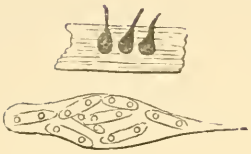


Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

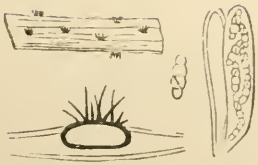


Fig. 6.

Fig. 7.

PLATE LIX.

SPHÆRIACEI.

FIG.

1. Orbicula cyclospora.
2. Microthyrium microscopicum.
3. Stigmatea Robertiani.
4. Hypospila quercina.
5. Isothea rhytismoides.
6. Capnodium elongatum.
7. Dichæna strobilina.

PLATE LIX

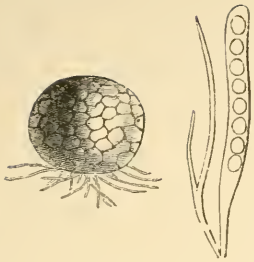


Fig. 1.

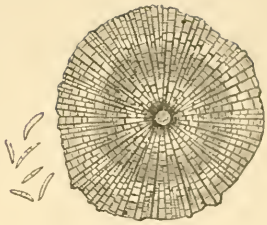


Fig. 2.

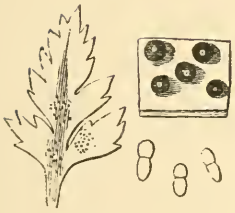


Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.

Fig. 7.

TABLES OF AGARICUS.

Explanatory Key.

The thirty-four Subgenera of Agaricus are divided into five series, to each of which a table is here assigned. These series are arranged according to the colour of the Spores. Table I. presents types of the Subgenera in which the spores are white; Table II. shows those in which the spores are pink, salmon, or rosy; Table III. shows those in which the spores are buff, clay-coloured, dull or bright brown; Table IV. shows those in which the spores are purple, brown or black with a purple tinge; Table V. shows those in which the spores are dead black.

Each series is further arranged in three groups, founded on the following distinctions:—

In Group 1, the Hymenophore is distinct from the fleshy stem.

In Group 2, the Hymenophore is confluent and homogeneous with the fleshy stem.

In Group 3, the Hymenophore is confluent with, but heterogeneous from, the cartilaginous stem.

The three groups are spaced out with blanks, and are similarly arranged in each of the five tables, so as to show the corresponding subgenera in the several series. Thus Amanita will be seen to correspond with Volvaria, but analogues to these subgenera are not found in the remaining series.

The figures are drawn from sections of the fungi, in most cases reduced below the natural size. The spores shown are from highly magnified specimens.

Lettering has been introduced to aid students in understanding certain structural points.

The tables are arranged according to the construction of Mr. Worthington G. Smith, and the drawings are after his original designs, as adopted by Mr. M. C. Cooke.

N.B.—Beginners are warned to differentiate first between the genus Agaricus and the other genera of the order Agaricini.

TABLE I.

SUBGENERA OF AGARICUS; SERIES I.

Leucospori.

SPORES WHITE.

GROUP 1. Hymenophore distinct from the fleshy stem.

1. **Amanita.** Section of *A. muscarius.* B. Warts on pileus. D. Annulus, or ring. C. Volva.
2. **Lepiota.** Section of *A. procerus.* A. Remote gills. E. Point of junction between distinct stem and pileus. F. Scales on cuticle. L. Flesh of pileus.

GROUP 2. Hymenophore confluent and homogeneous with the fleshy stem.

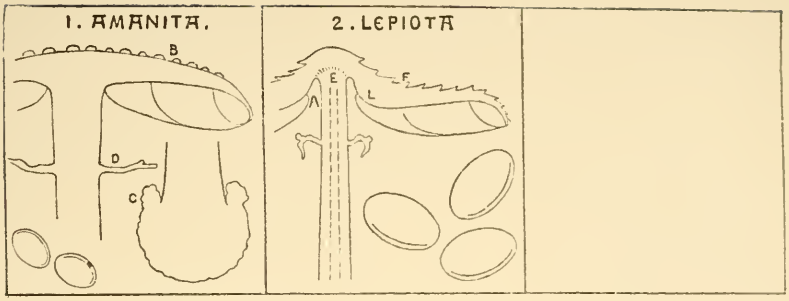
3. **Armillaria.** Section of *A. melleus.* G. Flocci on pileus.
4. **Tricholoma.** Section of *A. terreus.* H. Sinuate or emarginate gills. O. Umbonate expanded pileus.
5. **Clitocybe.** Section of *A. geotropus.* P. Infundibuliform and umbonate pileus. J. Spore of variety *subinvolutus.*
6. **Pleurotus.** Section of *A. spongiosus.*

GROUP 3. Hymenophore confluent with, but heterogeneous from, the cartilaginous stem.

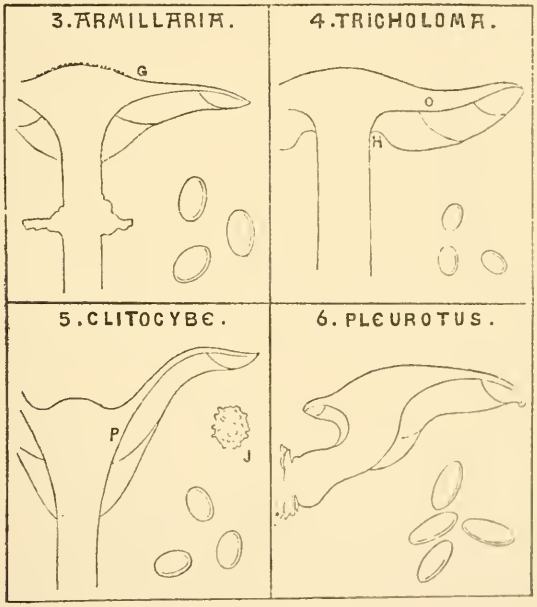
7. **Collybia.** Q. Section of *A. fusipes, var. œdematopus.* Small fig. *A. maculatus.*
8. **Mycena.** Section of *A. polygrammus.*
9. **Omphalia.** Section of *A. fibula.*

TABLE I.

Group 1.



Group 2.



Group 3.

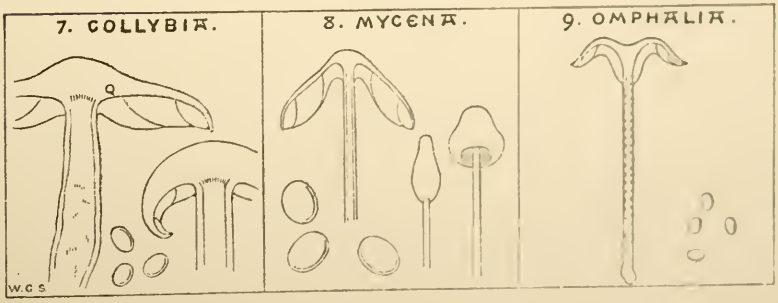


TABLE II.

SUBGENERA OF AGARICUS; SERIES II.

Hyporhodii.

SPORES PINK.

GROUP 1. Hymenophore distinct from the fleshy stem.

10. **Volvaria.** Section of *A. volvaceus.* A. Young plant inclosed in volva. C. Volva after expansion.
11. **Chamæota.** Section of *A. xanthogrammus*, an Italian species.
12. **Pluteus.** Section of *A. cervinus.*

GROUP 2. Hymenophore confluent and homogeneous with the fleshy stem.

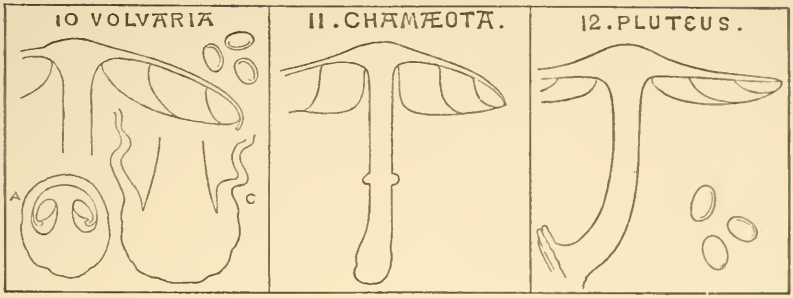
13. **Entoloma.** Section of *A. sinuatus.*
14. **Clitopilus.** Section of *A. prunulus.*
15. **Claudopus.** Section of *A. euosmus.*

GROUP 3. Hymenophore confluent with, but heterogeneous from, the cartilaginous stem.

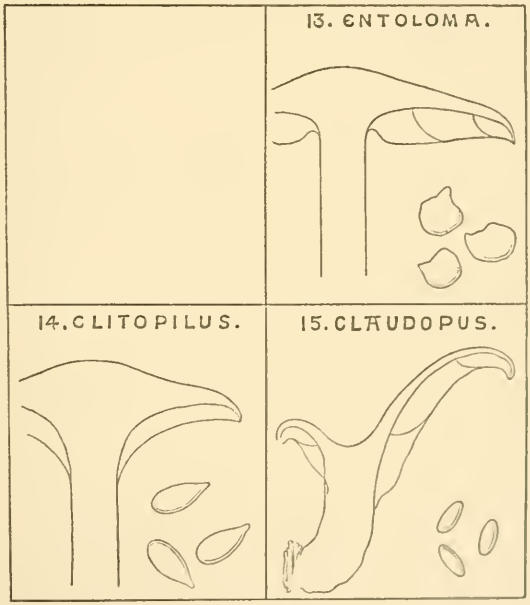
16. **Leptonia.** Large fig. *A. incanus.* Small fig. *A. chalybæus.*
17. **Nolanea.** Section of *A. pascuus.*
18. **Eccilia.** Section of *A. Parkensis.*

TABLE II.

Group 1.



Group 2.



Group 3.

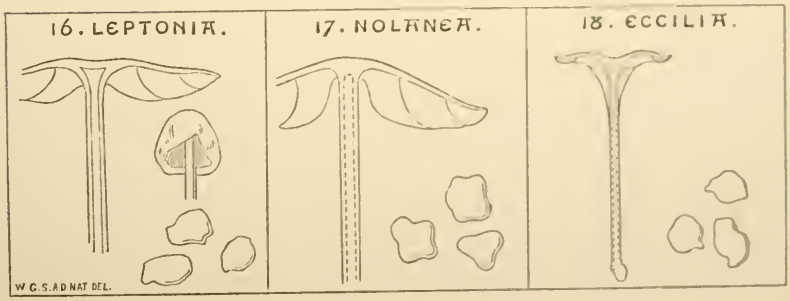


TABLE III.

SUBGENERA OF AGARICUS; SERIES III.

Dermini.

SPORES BROWN.

GROUP 1. Absent.

GROUP 2. Hymenophore confluent and homogeneous with the fleshy stem.

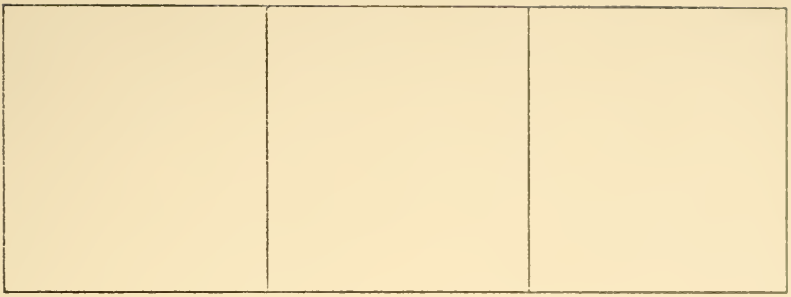
19. **Pholiota.** Section of *A. squarrosus.*
20. **Hebeloma.** Section of *A. fastibilis.*
21. **Flammula.** Section of *A. sapineus.*
22. **Crepidotus.** Section of *A. mollis.*

GROUP 3. Hymenophore confluent with, but heterogeneous from, the cartilaginous stem.

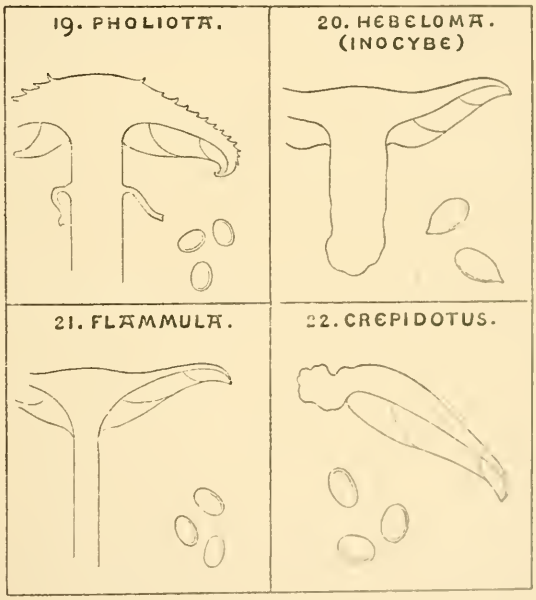
23. **Naucoria.** Section of *A. semiorbicularis.*
24. **Galera.** Section of *A. tener.*
25. **Tubaria.** Section of *A. inquilinus.*

TABLE III.

Group 1.



Group 2.



Group 3.

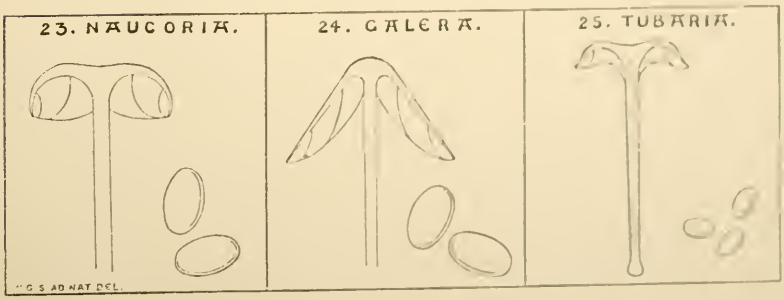


TABLE IV.

SUBGENERA OF AGARICUS; SERIES IV.

Pratellæ.

SPORES PURPLE.

GROUP 1. Hymenophore distinct from the fleshy stem.

26. **Psalliota.** Section of *A. campestris.*
27. **Pilosace.** Not British.

GROUP 2. Hymenophore confluent and homogeneous with the fleshy stem.

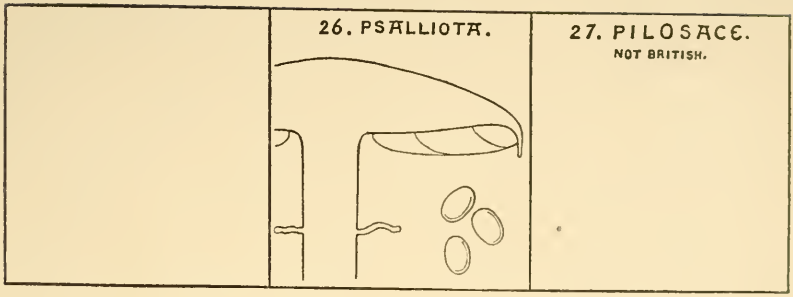
28. **Stropharia.** Section of *A. æruginosus.* A. Rounded adnate gills.
29. **Hypholoma.** Section of *A. lacrymabundus.* B. Veil fringing the margin.

GROUP 3. Hymenophore confluent with, but heterogeneous from, the cartilaginous stem.

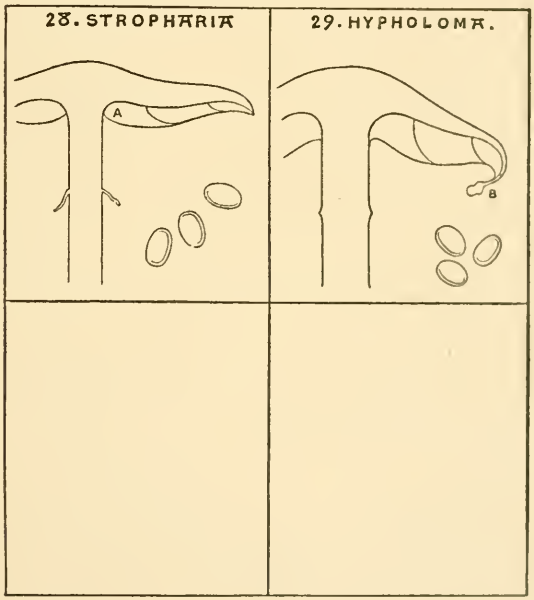
30. **Psilocybe.** Section of *A. spadiceus.*
31. **Psathyra.** Section of *A. corrugis.*
32. **Deconica.** Section of *A. physaloides.*

TABLE IV.

Group 1.



Group 2.



Group 3.

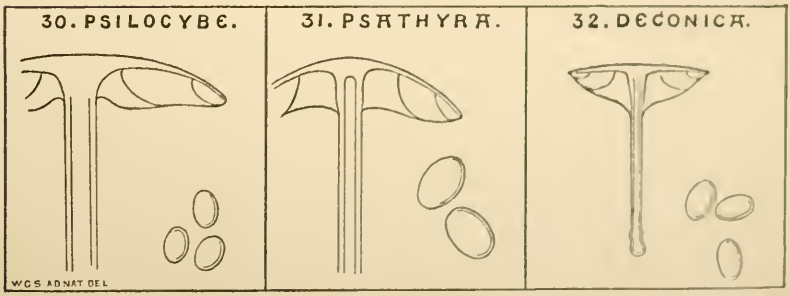


TABLE V.

SUBGENERA OF AGARICUS; SERIES V.

Coprinarii.

SPORES BLACK.

GROUP 1. Absent.

GROUP 2. Hymenophore confluent and homogeneous with the fleshy stem.

33. **Panæolus.** Section of *A. separatus.*

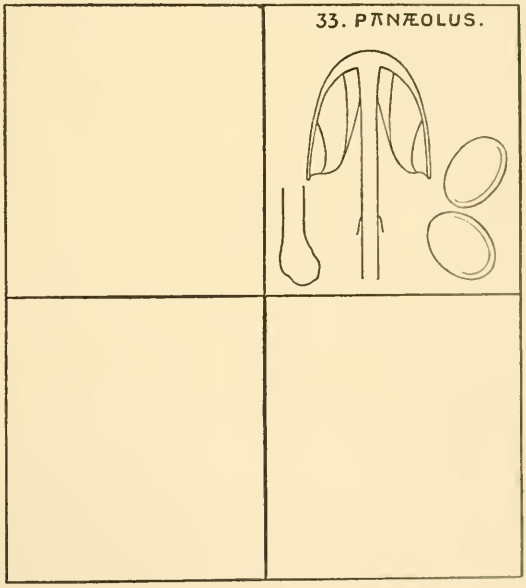
GROUP 3. Hymenophore confluent with, but heterogeneous from, the cartilaginous stem.

34. **Psathyrella.** Section of *A. disseminatus.*

TABLE V.

Group 1.

Group 2.



Group 3.