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Review

The role of the amateur in mycology – what would we do without them!*

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The amateur's role in the history of mycology will be traced from its early roots deeply based in the collection of fungi for food to the amateur's present day activities. Attention will be drawn to the most important key amateur figures studying fungi solely or as a wider part of natural history in the eighteenth and nineteenth centuries, and the early part of the present century. How their work influenced the development of mycology will be demonstrated. It is often forgotten that the authorities attached to fungal names, including those we use in mycology on a daily basis, often belong to amateurs. The true professions of these amateurs, the net-work of correspondents they developed, etc. will be revealed and discussed in the context of an overall understanding of fungi as organisms. In addition the formation of mycological societies, and how they have become a focus of amateur activity and a source of accurate and disciplined information valuable to professional scientists will be plotted. The kind of work undertaken by amateurs I refer to will be demonstrated by documenting the activities of the British Mycological Society which celebrated its centenary in 1996. The continuing work of this band of workers and their counterparts throughout the world in the closing years of the millennium will be described. It is argued that they are nationally important and necessary resources, despite many governments or their advisers, especially the most influential ones, being under the delusion that systematics is not cutting edge science. It is also emphasized that amateurs will have an even more important role to play in the future as custodians of knowledge – until hopefully opinions change.

Key Words——biodiversity; fungal taxonomy; history of biology; natural history; organismal inventory.

Mycology in its early days was blessed in Europe by some distinguished amateurs who forged a base-line from which we all work today be it in systematics or in allied subjects. These amateurs came from all walks of life ranging from heads of state to those of more humble background. The first is truly rare but it is particularly applicable to you, my hosts.

As you are all aware His Majesty, the late Emperor Hirohito was an amateur mycologist – amongst other biological disciplines. Indeed the first fruits of the Emperor's researches was a small book on myxomycetes of the Nasu district published a little over 60 yr ago; it appeared under the authorship of Hirotaro Hattori and is fully illustrated with paintings doing credit to these delicate organisms (Corner, 1990). A revised edition became available in 1964 incorporating a small supplement which appeared a few years after the original work. One-hundred and twenty-five species are considered of which two described by Miss G. Lister were new, viz. *Perichaena tesselata* G. Lister and *Physarum rigidum* G. Lister. It was through myxomycetes that the friendship between Corner and the Emperor began, on the latter's visit to Singapore in 1929.

The early stirrings in the interest in fungi in Europe hinged upon man's interest or disinterest in eating them. Thus there are long traditions in the Slavic countries, in Poland, France and North Italy and some parts of Spain (e.g. Catalonia) of eating macromycetes (mycophilic) in contrast to Greece, the major parts of Spain, Portugal, Germany, Scandinavia and Britain where fungi were considered less appetizing (mycophobic); see Wasson and Wasson, 1957. These divisions have changed only a little over the last decades. In Central America there was the added factor of fungi being used in ceremonial activities as documented by the Spanish missionaries of the 16th century (Wasson and Wasson, 1957).

From such humble beginnings came a rapid increase in fungi as a food source which has expanded as a wave extending even into Britain, and in its wake came the serious study of fungi as organisms. Even the study of the biology of the fungi had to overcome a history of connections with the devil, demons and black magic, death by poisoning and destruction of building timbers. The early disciples of our study were well versed in all aspects of

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natural history but as various areas of study became circumscribed mycology was consumed by the botanical lobby and has been a Cinderella subject therein until very recently. An amateur for the sake of this presentation is one who, when not fulfilling another employment, spends the major part of his or her spare time in the pursuit of some aspect of mycology; in the early days this generally meant the study of larger fungi.

E. M. Fries (1794–1878, Fig. 1) consolidated into a single systematic account (Fries, 1821) all the fungi then known and because of this became known as '**The Father of Mycology**,' but it was a whole regiment of amateurs before and after him that allowed the basic taxonomy as we know it today to develop. As will be demonstrated this resource was the basis of a second phase of enlightenment but recently the tide has turned and more and more research funding in the developed and developing countries in the world is becoming channeled into so-called cutting edge science. Undoubtedly the pendulum will swing back but meantime systematic mycology will be entrusted for safe keeping to the amateur.

Britain and other parts of Europe have had a rich heritage of amateur mycologists really starting in the late eighteenth century, e.g. James Bolton (1750s–1799, Fig. 2) who wrote *An History of Fungusses growing about Halifax* (Bolton, 1788–1791), a text regularly quoted today as it was by Fries. Bolton's family was in the woollen industry (Watling and Seaward, 1981). In Japan similar fine fungus illustrations can be found in the historical mycology (1761–1880) of the Edo to early Meiji Era (as exhibited by N. Sugiyama and Y. Okusawa at the 42nd annual meeting of the Mycological Society of Japan, Kyoto, 1998).

It is on such works as Bolton's that the foundation of modern systematics was based and in which the seed of our natural history societies began to germinate. In

Fig. 1. Elias Magnus Fries (1794–1878), professional botanist in Uppsala, Sweden, **Father of Mycology**.
From Stockholm Museum Archives.

Fig. 2. James Bolton (1750s–1799), English industrialist and self-taught artist and naturalist.
From British Museum Archives.

mycology in the early days these young societies were generally manned totally by amateurs; now mature and with more professional input they have a very important function. These societies were paramount to the establishment of mycology as a science; some entirely devoted to the study of fungi were founded at the end of the last century, e.g. French Mycological Society in 1884 (Pour le progress et la diffusion des connaissances relatives aux champignons) and British Mycological Society in 1896 (Recognosce notum, ignotum inspice).

These two societies have developed in parallel except that the British society has expanded in a formal way to take in aspects of genetics, physiology, invertebrate and plant interactions with fungi, ecology and biotechnology. Indeed the society because of this now has in addition to the healthy amateur membership a strong professional element. A series of articles and a book has mapped out the history of the French society (Anonymous spread throughout the celebratory Vol. 100 Bull. (Trim.) Soc. Mycol. (1994)) and that of the British Mycological Society (Sutton, 1996; Webster, 1997).

It is difficult to make an amateur/professional division in the early period of mycology as many people involved easily moved back and forth from philosophy, theology, medicine, natural history etc. to the study of fungi, e.g. John Ray (1627–1705, Fig. 3), '**Father of British Botany**' taught Greek and mathematics at Cambridge before entering theology. In fact many of these early contributors to mycology were polymaths something which modern specialization has destroyed.

In the mycophilic parts of Europe the interest in fungi had often been taken up by pharmacists as part of their profession. Even today identification of wild mushrooms is readily undertaken at the local pharmacy in France – hardly something one could expect in the UK or USA. Of course the common link was edibility and poisoning factors which drew fungi to the attention of

the medically trained. Several fungi in fact were already used in mediaeval times as sources of medicine, many later becoming part of the pharmacopoeia of doctors, e.g. *Laricifomes officinalis* (Vill.: Fr.) Kotlaba & Pouzar, *Fomes fomentarius* Kickx.: Fr., *Phellinus igniarius* (L.: Fr.) Quél. (Coppins and Watling, 1995). Many more species of fungi have been used in Southeast Asia for medicinal purposes, and still are. Similarly in other parts of the world native people have used fungi to relieve pain and maladies and cure of some diseases e.g. North American Indians.

The so-called '**Prince of Mycology**,' C. H. Persoon (1761–1836, Fig. 4), originally trained in medicine and A. K. J. Corda (1809–1849), who was one of the first to critically look at the mould fungi, was also trained in this discipline; it was a sad loss when Corda's visit to the New World ended in tragedy. The Bauhin brothers (Casper, 1560–1624; Jean, 1541–1612) both German were physicians and well versed in a knowledge of fungi, and one of Britain's early influential mycologists was W. Withering (1741–1799) who is probably better known for his introduction of Digitalis for the successful treatment of heart problems. J. H. Léveillé (1796–1870, Fig. 5)* who trained in Paris was a military doctor, even, it is said, carrying his microscope with him on assignments; J. P. F. C. Montagne (1784–1866) who contributed some of the first data on the mycota of Central and South Americas was also a military physician. T. Holmskjold (1732–1794) in addition to being a physician was an administrator and director of the Royal Danish China Factory where he promoted the Flora Danica design illustrating fungi and plants on pottery made for Catherine II of Russia. The great H. Anton de Bary (1831–1888), '**Founder of Modern Mycology**,' commenced his life as a surgeon before becoming interested in fungi and plants, an interest which led him to the professorship of botany in Strasbourg. In France, Lucien Quélet (1832–1899) was practicing medicine and avidly describing fungi; he also realigned Fries' tribes and groupings into more formal taxa many of which are used today. The tradition has continued, e.g. Dutch mycologist H. S. C. Huijsman (1900–1986) being an ophthalmologist.

(**It is often mistakenly stated that J. H. Léveillé's herbarium is housed at the Royal Botanic Garden, Edinburgh (**E**); the herbarium there is that of A. A. Hector Léville, a French clergyman and botanist (1863–1918). J. H. Léveillé's material collections are in the University of Caen*).

Whereas Charles Tulasne (1816–1884) practiced medicine his brother E. Louis-René (1815–1885) worked as a notary (legal profession) but they collaborated in their mycological studies and together introduced the important concept of pleomorphism. The legal profession was to be echoed a generation later when Carleton Rea

Fig. 3. John Ray (1627–1705), English botanist and naturalist, **Father of British Botany**.
From Acta Horti Bergiani **3**, 1897.

Fig. 4. Christiaan H. Persoon (1761–1836), Dutch medic, **Prince of Mycology**.
From Acta Horti Bergiani **3**, 1897.

Fig. 5. J. H. Léveillé (1796–1870), French military surgeon who described many tropical fungi.
From Acta Horti Bergiani **3**, 1897.

(1861–1946), a barrister by training, wrote *The British Basidiomycetae* (Rea, 1922), a text used in Britain by amateurs and professionals alike until the second half of this century. A correspondent of Rea's was the French medic R. C. J. E. Maire (1878–1949) who amongst other things explored the relationships between different groups of fungi.

The amateur element did not end there as fungi were an integral part of the '*natural order of life*' so who better to dedicate time to them than theologians, priests and clergy. Thus J. J. Dillenius in Oxford (1684–1747) was a theologian, Frans van Sterbeeck (1630–1693) a Flemish priest, G. A. Battara (1714–1789) a clergyman and physician and J. Schaeffer (1718–1790) an evangelist clergyman in Regensburg. Torrub, whose name is encapsulated in the Latin generic name of the 'vegetable fly' (*Torrubiella*) was a Spanish Franciscan friar working in 1756 in the Caribbean. Much later Torrub's fungus was beautifully illustrated by the amateur Japanese mycologist Shimizu. Over 100 yr later, also working in the New World and adding considerably to our knowledge of the fungi there, was J. Rick (1869–1946), an Austrian Jesuit missionary in Rio Grande, Brazil who later became a professor of theology.

In Britain the Very Rev. M. J. Berkeley (1803–1889), although world famous for his contributions to mycology, had time to join fungi with an ecclesiastical vocation. He was '**The Father of British Mycology**,' although as has been pointed out by Watling (1986) it was Robert Kaye Greville (1794–1866), a Scottish amateur cryptogamic botanist who really coaxed him away from his first interest, viz. bryophytes, to fungi. A. Ricken (1851–1921, Fig. 6) followed his illustrious German countrymen and offered some of the best descriptions of European agarics then available; he was a Roman Catholic priest in various localities in what was then Prussia.

In pharmacy L. Rabenhorst (1806–1881) practised in Brandenburg, finding time also to produce a descriptive flora of the cryptogams whilst T. F. L. Nees von Essenbeck (1787–1837) practised in Leiden as an assistant pharmacologist. In Britain S. F. Gray (1766–1828) is known to have lectured on pharmacy and botany and authored the book *A Natural Arrangement of British Plants*. In this work he introduced a new series of generic names for fungi which came into conflict with the customs of his time so blurring the application of the Rules of Botanical Nomenclature generations later. But perhaps the three mycologists which immediately come to mind within this profession, all French, are N. Patouillard

Fig. 7. Narcisse T. Patouillard (1854–1926), French pharmacist who introduced microscopic characters to our understanding of basidiomycete relationships.
From Lilloa **22**, 1949.

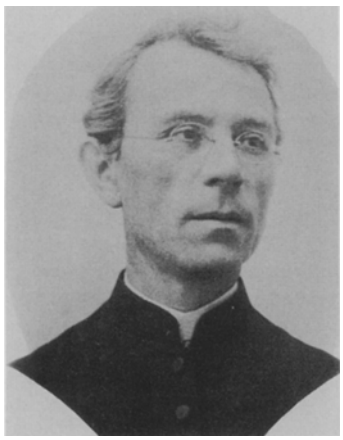

Fig. 6. Albert Ricken (1851–1921), German priest who's accurate descriptions of European agarics are used as examples even today.
From cover of Zeitshrift für Mykologie.

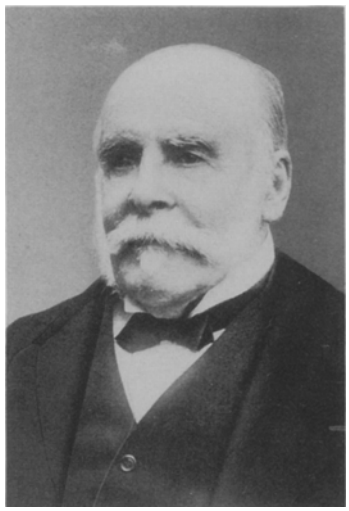

Fig. 8. J. L. Emile Boudier (1828–1920), French pharmacist who produced amongst other mycological publications an analytical account of the discomycetes.
From Lloyd's Mycological Writings.

(1854–1926, Fig. 7), who made us all aware of the great limitations of a classification based purely on macromorphology (Watling, 1996); J. L. E. Boudier (1828–1920, Fig. 8), who introduced a synthesis of the discomycetes then known, and a little later, in the field of *Amanita* and the boletes, E. J. Gilbert (1888–1954). Across the Atlantic C. G. Lloyd (1859–1926), from a pharmaceutical background and with a private means, is known for his work particularly on polypores, gasteroid fungi and *Xylaria*. He published in his own *Mycological Writings* and stimulated much mycological discussion which was often quite heated, and still does even after his death; his correspondents stretched as far as Japan.

In Germany P. Kummer (1834–1911), a private teacher and clergyman and F. Staude (d. 1861), a town physician, were at the forefront of early agaric systematics, both refining the generic concepts then accepted, something which was overlooked for a long time (Donk, 1949). Later in France, F. Bataille (1850–1946) and still later G. Métrod (1883–1961) joined the teaching vocation keeping their hobby in mycology; the latter's expertise even allowed him to describe some of the new agarics then arriving from the French colonies (e.g. *Mycena* from Madagascar; Métrod, 1949). On the other hand Bataille introduced the systematic use of chemical reagents into agaricology, many of which are still used on a regular basis today (Bataille, 1948). More recently A. F. M. Reijnders (1908–), a teacher in a secondary school, has spent what appears to be all his waking time, especially since his retirement, exploring the development of the basidiome; his work has laid the foundation to a fundamental approach to this area of study (Reijnders, 1963). A fellow Dutchman, Kits van Waveren (1906–1995), an insurance broker, made valuable contributions in classical taxonomy of *Geastrum*, *Conocybe* and in the latter part of his life until his death *Psathyrella*.

Finally in this summary of professions J. L. Lucand (1821–1896) and H. Essette (1895–1972), amongst others were both professional soldiers, Captain and Commandant respectively; L. Örstadius presently working in Sweden is a policeman.

Nevertheless our greatest admiration must be kept for Pier Antonio Micheli (1679–1737, Fig. 9), who although of scanty education and from humble beginnings, through his drive and determination became self taught and proficient in mycology and was one of the first to observe and illustrate basidia, asci, etc. In fact the introduction of the microscope punctuated the development of mycology. By 1674 Antony van Leeuwenhoek (1632–1723), a draper and haberdasher who became Chamberlain of the Council Chamber of the Worshipful Sheriffs of Delft in The Netherlands was observing micro-fungi under the lenses he had made. This was in parallel to Robert Hooke (1635–1703), a British physicist who became secretary of the Royal Society of London; one of the first objects the latter illustrated was *Phragmidium mucronatum* (Pers.) Schlecht.

Similar parallels were taking place in Scandinavia but generally many of the important developments in mycology were perhaps overshadowed by the professional botanists there, e.g. with C. Linnaeus in Uppsala (1701–1778) and later E. M. Fries, although P. A. Karsten (1834–1917, Fig. 10), a teacher in Southern Finland stands out head and shoulders above others. He introduced many of the now widely accepted generic splits of the then unwieldy Friesian genera. Eckblad (1996) has summarised the situation in Norway. There were not only political upheavals and crown betrothals in the 17th and 18th centuries between Sweden, Denmark and Norway but more importantly interchange of scientific information. This strong link between these countries and Finland remains today with the regular meeting of the Nordic Mycological Congress which links amateurs and professionals from all the Scandinavian countries in their common goal of mycology. Mention has already

Fig. 9. Pier Antonio Micheli (1679–1737), self-taught Italian amateur who contributed some of the first microscopic observations of fungi.
From Ainsworth's Introduction to the History of Mycology.

Fig. 10. P. A. Karsten (1834–1917), Finnish teacher who revolutionized the way we define basidiomycete genera.

been made of Holmskjold but Danish mycology is also noted for Jakob E. Lange (1864–1941), father of Morten Lange himself a mycologist, who produced *Flora Agaricina Danica*, whilst teaching first at the Agricultural Folk High School, then at the Smallholder's Agricultural School at Odense. Italy honours a great mycologist also in this same period, viz. Rev. G. Bresadola (1847–1929, Fig. 11) whose *Iconographia Mycologica* is a great source of information for amateurs far further afield than Italy. His name is embodied in the dominantly amateur *Bolletino del Gruppo Micologico Giacomo Bresadola*.

In Europe and North America as in other parts of the world the illustration had been paramount in documenting fungi, both those from the field and under the microscope, especially when the latter technique developed in complexity. In the British Isles James Bolton, mentioned earlier, was until very recently the only British mycologist to have his book translated into a non-English speaking language. Two-hundred years later Roger Phillips was the other; he too is an amateur mycologist but professional photographer. Bolton made his own copper engravings, as many did in his period, or alternatively were in a position to commission such work. Beatrix Potter (1866–1943), the author of many children's books, is a good example of an independent woman neither linked to an institute nor profession. She produced some classic illustrations, and documented the germination of basidiospores, the dual formation of lichens, etc. (Noble, 1981). She was tutored at first by a local (Scottish) postman, Charles McIntosh (1839–1922), himself an excellent example of a true mycologist/naturalist of the period (Coates, 1923). Later in her life Beatrix Potter used a camera. Indeed with the advent of the camera accurate documentation of fungi was possible by all; especially pleased were the non-artists! Photography blossomed in Japan where the camera is particularly close to the heart of the culture, and economy. The photographs by M. Izawa, an amateur mycologist offer stunning examples as do the books by S. Yoshimi. More recently fungi have been used more and more in the production of dyes and of fungus paper, in ceramics and wood-carvings and in abstract art. In Japan a recent example is the work of Ryuji Watanabe. The use of pigments from fungi has a long history in some parts of the world, e.g. Indian paint Conk, *Echinodontium tinctorium* Ellis & Everh., used in North America, and *Pisolithus arhizus* (Pers.) Rauschert (=*tinctorius* (Micheli: Pers.) Coker & Couch) in the Canary Is. but now the activity has taken a greater dimension. Minoru Aoki of Japan is also a fine draftsman and he kindly sent me illustrations and descriptions of his finds during my early research days; alas other duties did not allow me to make as full use of them as I would have liked; they are clear and very informative.

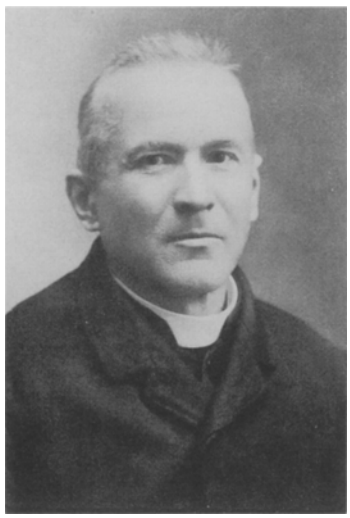

Fig. 11. Giacomo Bresadola (1847–1929), Italian priest who familiarized mycologist with an enormous number of larger fungi through his illustrations and accompanying descriptions.
From Lloyd's Mycological Writings.

At the time of Berkeley and his amateur British collaborator C. E. Broome and of Patouillard etc., the world was opening up to travellers and explorers, and dispatched in their vanguard were clergyman and missionaries many of whom were also naturalists. The fungi collected and documented were dispatched to Europe from China, India, Australasia, as well as Africa and South and Central Americas. Names such as G. Zenker in West Africa, and the Rev. R. P. R. Duss in the Caribbean spring immediately to mind.

These were exciting times and Berkeley etc. were documenting a whole spectrum of taxa which would ultimately change the face of systematics during the 20th century. The classification which was then in place was biased towards European taxa and could not cope with the new discoveries, although probably on the whole it did better than those classifications then available for the flowering plants and animals. Many of the colourful and often bizarre fungi encountered for the first time in these distant lands were illustrated by the wives of plantation owners or of professional men in colonial service, e.g. Mme. Goosens-Fontana in Central Africa, Edith Burkill in Malaysia.

Europeans visited North America from a relatively early time and in the 18th century students were sent from European institutes to collect '*objects naturelles*.' Indeed in Fries' Systema 45 species are noted as being from North America. The **Father of American Mycology** was undoubtedly Lewis David von Schweinitz (1780–1834, Fig. 12) who was administrative head of the Moravian church in North Carolina finally moving to Bethlehem, Pennsylvania. Similarly M. A. Curtis (1808–1872), who collaborated with Berkeley in documenting North American fungi, was in the church; his nearest mycological neighbour was Ravenel in Texas also a correspondent of Berkeley. It was Schweinitz's early work that laid the foundations of the North American mycota, so admirably discussed in '*A Brief History of Mycology in North America*' by Rogers (1977). Estey (1994) has more recently plotted the development of mycology in Canada, although this country, despite having some out-

Fig. 12. Lewis David von Schweinitz (1780–1834), German priest who emigrated to North America there becoming a leading authority on the fungi of the Atlantic States. From Acta Horti Bergiani **3**, 1897.

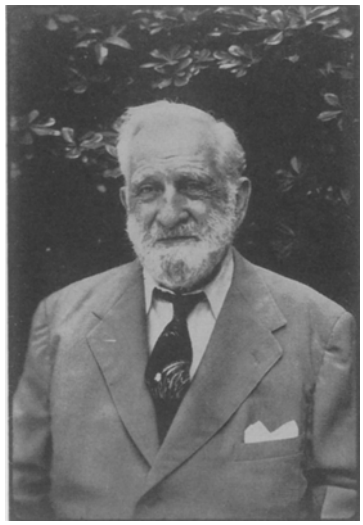

Fig. 13. William A. Murrill (1869–1957), prolific writer on North American and Caribbean macromycetes describing many scores of new species. From Lloyd's Mycological Writings.

standing professionals, had few noteworthy amateur contributors.

Apart from these early collectors the mycota of the colonies of the European powers were poorly known, especially those countries of the mycophobic motherlands; the areas were mainly exploited for goods for the European market. Only now are there stirrings in these territories to address the problem as undoubtedly many of the questions in the evolution of fungi will be solved by critical examination of selected species from these countries. The fungi of the rain forests of the world are exceedingly poorly known and in some cases the little we do know of vast areas are from amateurs working often single handed, e.g. André de Meijer in the Atlantic rain forests of Brazil. With the more practical interest of the European colonists natural history studies in their colonies were slow to develop in contrast to those in forestry and agriculture.

Berkeley, as indicated earlier, had a net-work of amateur correspondents to back him up in his studies as indeed did others, for instance, the professional, C. H. Peck (1833–1917) in the United States. From the latter's headquarters in the museum in Albany, New York State he examined material sent by C. C. Frost, a shoemaker by trade, A. P. Morgan, an Ohio teacher, H. W. Harkness, a doctor, etc., all names which appear on specimen labels and sometimes in species epithets. Rogers (1981) notes that there was a dearth of activity in the United States immediately after Schweinitz's death (1834) until C. H. Peck, although about this time J. B. Ellis (1829–1905), a teacher from New York State, collaborated with B. M. Everhart (1818–1904), a merchant in Pennsylvania to very good effect; together they made many significant contributions. The famous W. A. Murrill (1869–1957, Fig. 13), who is instinctively associated with the New York Botanic Garden, was also a high school teacher by profession, although later moving to the Botanic Garden; after his retirement in 1924 he disappeared only later to be found working as a taxi driver but he was encouraged to take up mycology again. This he did describing many species and proposing many genera as he had done in the early phase of his life. H. A. Kelly (1858–1943) was in medical research but although not publishing a great deal on mycology nevertheless made a substantial contribution to the subject by employing L. C. C. Krieger (1873–1940) for 10 yr to illustrate fungi and by amassing himself papers and letters on mycological topics; he presented his holdings to the University of Michigan (Kanouse, 1943) where it proves of extremely great value to the researchers there. W. G. Farlow also trained as a doctor but had little or no interest in medicine and ultimately was able to make a career in fungi. Finally, Captain C. McIlvaine (1840–1909), a natural history author, whose name is enshrined in the title of the journal for amateurs, *McIlvainea*. His conclusions about the edibility of mushrooms, which he reached by eating them himself, were not accepted by the professionals of the time. Nevertheless, he joined R. K. Macadam to produce in 1902 the North American amateurs' "mushroom bible" – *One Thousand American Fungi* (McIlvaine and Macadam, 1902).

In Australia Sir 'Baron' Ferdinand von Mueller (1825–1896), Government Botanist in Victoria also relied heavily on amateurs and even paid collectors to provide Australian material much of which was sent to Europe for identification; the fungi were sent to M. C. Cooke (1825–1914) at the Royal Botanic Garden, Kew and also to K. Kalchbrenner (1807–1886, Fig. 14), an Austro-Hungarian priest. Also working at the end of the nineteenth century was F. M. Bailey (1827–1915), who

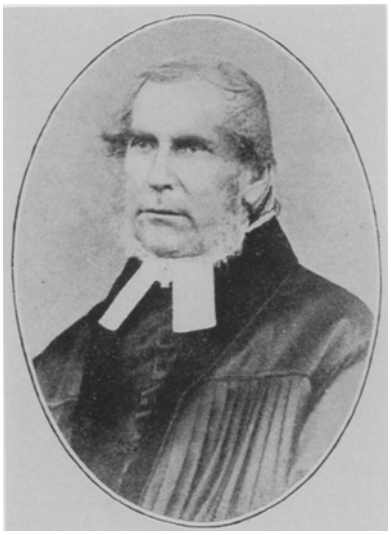

Fig. 14. Karl Kalchbrenner (1807–1886), Austro-Hungarian priest best known for his contributions on Australian and African larger fungi.
From Acta Horti Bergiani **3**, 1897.

as Colonial Botanist in Queensland encouraged amateur fungus collectors. In Tasmania R. Gunn (1808–1881), a public servant and politician, started collecting fungi for dispatch to Europe for identification towards the end of the nineteenth century but it was not until the first half of this century that Australia saw its first outstanding amateur mycologist. He was not simply a collector but one who would critically examine and describe his finds. This was J. Burton Cleland (1878–1971), surgeon by training and author of *Toadstools and Mushrooms and Other Larger Fungi of South Australia* (Cleland, 1934–1935) which appeared in two parts (Parbery and Sheather, 1990; May and Pascoe, 1997). Across the Tasman Sea in New Zealand there was W. Colenso (1811–1899), a British born printer, missionary, ethnologist and botanist. His collections gave an early insight into the New Zealand mycota and Greta B. Stevenson (Mrs. Cone; d. 1990) added to this in a series of illustrated articles which appeared in the *Kew Bulletin*.

All these early mycologists therefore had the equivalent of the present day internet in mycology but this was to change. In the UK three societies viz. Yorkshire Naturalists' Union, Scottish Cryptogamic Society and the Woolhope Naturalists strove to bring mycological links together and formed the British Mycological Society (Watling, 1996). It was dominated in those early days by amateurs who generally paid attention to the macromycetes. Possibly because of the traditional mycophobia operating in Britain their energies were directed into fungi as organisms as opposed to food. To their forays came professionals both national e.g. M. C. Cooke and G. Massee (1850–1917) and international e.g. G. F. Atkinson (1854–1918) from Cornell, USA, Profs. J. de Seynes (1833–1912) and M. M. Cornu (1843–1901) from France, etc. The founding fathers of the Society encapsulated the occupations described above; C. B. Plowright (1848–1910) was a doctor, whilst W. L. W. Eyre (1841–1914), D. Paul (1845–1929) and J. Stevenson (1836–1903) were clergymen; C. Rea was a barrister, W. G. Smith (1837–1917), an illustrator, A. Lister (1830–1908), a wine merchant (and father of Gulielma Lister (1860–1949) – see earlier), W. N. Cheesman (1847–1925), a draper, C. Crossland (1844–1916, Fig. 15), a butcher, A. C. Clarke, a chemist (1848–1925) and Miss A. L. Smith (1854–1937), originally a school's governess who later worked as an unpaid lichenologist at the British Museum. What of the more recent times? A. A. Pearson (1874–1954), author of many small monographic treatments on agarics and later an account of South African agarics and boletes (Pearson, 1950), a textile manufacturer; W. G. Bramley (1897–1992), author of *The Fungus Flora of Yorkshire* (Bramley, 1985), a farmer; M. C. Clark (1911–1991), author of *The Fungus Flora of Warwickshire* (Clark, 1980), an engineer; and W. D. Graddon (1896–1989), President of the British Mycological Society in 1956, a chemist. To these can be added P. D. Orton (1916–), a teacher, an expert in British agarics and who described 120 new species to science less than 40 yr ago (Orton, 1960) and R. Evans (1912), a pharmacist and one of the many noted above to receive the British Mycological Society's Benefactor's award for services to mycology.

In North America a fungus group formed in 1960 as part of the People to People organization was the forerunner of the North American Mycological Association (NAMA) which formed 7 yr later. Although it has links with the American Mycological Society NAMA primarily brought together a whole range of people and helped to spawn the plethora of amateur societies and organizations which have fairly recently formed focused on a particular State of the Union, and predominantly concentrated on collecting larger fungi. The annual meeting of NAMA is held in rotation around the States and commands much local media attention being attended by many many hundred amateur mycologists. The history of NAMA has appeared as a separate publication edited by one of its founding fathers Harry Knighton (1985) on

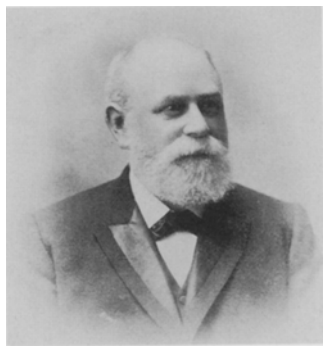

Fig. 15. Charles Crossland (1844–1916), English butcher who was a founder member of the British Mycological Society and its first treasurer.
From Lloyd's Mycological Writings.

the occasion of its 25th anniversary.

Within the American scene those in the north west, who strove to be more critical about their identifications and records formed what is known as The Key Council. With my own connection with this group I introduced the concept to Britain during my own Presidency of the British Mycological Society. Now, we have an active group communicating through a regular newsletter called *Keys*; Jack Marriott, a chemist by training, has guided the Society's associates and developed the idea further and now has encouraged the setting up of ***Fungus Groups*** throughout the British Isles. At the moment there are twenty six such groups. Today's amateurs worldwide are now fully equipped with the all-important computer equipment, superb microscopes and libraries, in contrast to the few manuals available to the amateur in the 1950s when I commenced my studies.

As there have been so many societies formed in the last fifty or so yr, or if they were already in existence they have consolidated their direction and organization, e.g. Finnish Society in 1948, Dutch Society in 1933, it is impossible to detail all their activities. I have every reason to believe that amateur mycology is very strong in the areas of Europe I have had the opportunity to visit in my duties as a professional mycologist viz, all four Scandinavian countries, the the Netherlands, Belgium, Switzerland, and from correspondence. In France and Germany a long tradition is still maintained but in the Mediterranean region progress has been made in leaps and bounds over the last quarter of a century.

Instructive, well-illustrated monographs produced under the eye of M. Candusso, printer and amateur mycologist, are now essential works for everyone and he has made it possible for the amateur in Italy and abroad to own beautiful reproductions of some of the master works. The coloured journals *Rivista di Micologia* and *Bolets de Catalunya* emanating from Spain are not only a delight to view but are highly informative. These are just a few examples of the new enlightenment in the Mediterranean basin which is gradually moving east to Greece and Turkey, areas of the world from where it was difficult to find anyone 40 yr ago to help with the European Mapping Scheme (Lange, 1974).

Finally I would like to conclude by using as an example the present work of the amateurs within the British Mycological Society. Although their names rarely if ever appear in the *Citation Index* the amateur membership has played and still is playing an important role in the Society's post-centenary period.

In addition to the regular biannual fungus forays, one held in the spring and one in the autumn, British amateurs have more recently spread their wings and joined their European counterparts on forays in other parts of Europe and even as far as the Canary Islands. They have also been or are at the present time, involved in a Wax Cap (*Hygrocybe*) survey of the UK, a gasteromycete mapping scheme, the recording of fifty selected larger fungi throughout UK, a mycodiversity study for the UK Government's Forestry Commission, the curating of material in National Herbaria and the preparation of identification keys. Others have organized and taken part in field trips to Ecuador and in 1997 to Khao Yai, Thailand, where they also joined up with Japanese scientists. They are therefore making important contributions in a very expert way whilst enjoying their hobby.

With an estimated 5% of the number of the world's fungi thought to exist known (Hawksworth, 1991) and with funds in most countries directed away from classic systematic studies the role of the amateur will become even more important. In biodiversity studies organismal inventories are called for by the international community (Rio De Janeiro protocol) so an amateur studying an obscure group of organism is worth his or her weight in gold! There are many amateurs I have not mentioned in this widesweeping account who have made contributions; to them I must apologise but I include them all when I indicate the professional mycologist is and will always be grateful for their efforts.

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