Lichenology in Germany: past, present and future

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Abstract: Kärnefelt, I., Scholz, P., Seaward, M.R.D. & Thell, A. 2012: Lichenology in Germany: past, present and future. Schlechtendalia **23**: 1–90.

Short biographies of 104 lichenologists who have played a key role in the development of German lichenology are provided. These date from Hoffmann and the early days of lichen classification in the 18th century, through the 19th century with the discovery of the lichen symbiosis by Schwendener and Stahl, to the dynamic period of enormous scientific development of the 20th century. A significant body of German lichenologists continue to expand this remarkable achievement into the 21th century.

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Kurzbiographien zu 104 Lichenologen werden vorgestellt, beginnend mit der alten Zeit von Hoffmann im 18. Jahrhundert mit dem Schwerpunkt der Klassifizierung der Flechten, über das 19. Jahrhundert mit der Entdeckung der Flechtensymbiose durch Schwendener und Stahl, bis in die dynamische Periode des 20. Jahrhunderts mit ihrer enormen wissenschaftlichen Entwicklung. Eine neue Generation von jungen Lichenologen setzt jetzt erfolgreiche diese Tradition fort.

Key words: German lichenology, lichenologists, historical botany, symbiosis, bibliographies, biographies.

Introduction

Germany has a long history of lichenology covering nearly three centuries. Grummann (1974) lists 839 scientists involved in German lichenology, a considerably longer list than any other country at that time. Our intention is not to repeat Grummann's work but to emphasize trends in lichenology and special interests of 104 lichenologists from the late 18th century through to the present day. The early days of lichen classification by Hoffmann, Meyer and Wallroth progressed to the development of our knowledge of lichen symbiosis, anatomy and chemistry by Schwendener, Stahl and Zopf in the 19th century; these studies were extended in the 20th century using new techniques and methods under the guidance of a number of charismatic scientists, who have laid the foundation for a new generation of enthusiastic lichenologists who are successfully continuing this tradition.

Grummann, V.J. 1974: Biographisch-bibliographisches Handbuch der Lichenologie. Lehre: J. Cramer. 839 pp.

1 Searching for a definition and classification

For the period corresponding with the 18th century, only a few persons are mentioned; this period could be characterized by the search for definitions of lichens and how to arrange them in systematic order. Haller, Hoffmann, Schreber and Sprengel mainly focussed on the systematic arrangement of the lichens, although they also saw great challenges in finding appropriate definitions and explaining lichen reproduction. Gärtner mainly tried to find ways of defining lichens and their reproduction. Other persons listed here, namely Flörke (Fig. 1), Flotow (Fig. 2), Hoffmann (Fig. 4), Link (Fig. 5), Meyer and Wallroth (Fig. 8), were born in the second half of the 18th century, but their published work mainly appeared in the early 19th century.

Heinrich Flörke

Heinrich Gustav Flörke, born in 1764 in Altenkalden in Mecklenburg, first studied theology and mathematics at the University of Bützow in Mecklenburg but later turned to medical studies in Jena. After successful studies, he was made a professor of natural history in Rostock in 1816 where he stayed until his death in 1836. However, he had also become interested in botany, particularly in lichens, specializing on the genus *Cladonia* (Flörke 1807, 1808, 1810a); he is also known for his critical reviews of Acharius's work (Flörke 1810b).

Fig. 1: Heinrich Gustav Flörke, a pioneer in German lichenology.

Literature

Floerke, H.G. 1807: Beurtheilung der bisher angenommenen Arten und Abarten der Becherflechten. Der Gesellschaft Naturforschender Freunde zu Berlin Magazin für die neuesten Entdeckungen in der gesammten Naturkunde **1**: 279–294.

Floerke, H.G. 1808: Beschreibung der rothfrüchtigen deutschen Becherflechten. Der Gesellschaft Naturforschender Freunde zu Berlin Magazin für die neuesten Entdeckungen in der gesammten Naturkunde **2**: 212–226.

Floerke, H.G. 1810a: Die braunfrüchtigen deutschen Becherflechten. Beiträge zur Naturkunde (Weber & Mohr) **2**: 266–339.

Floerke, H.G. 1810b: Kritische Anmerkungen zu den Becherflechten in der Lichenographia universalis des Herrn Doctors und Ritters Erik Acharius. Der Gesellschaft Naturforschender Freunde zu Berlin Magazin für die neuesten Entdeckungen in der gesammten Naturkunde **4**: 248–266.

Julius von Flotow

Julius Christian Gottlieb Ulrich Gustav Georg Adam Ernst Friedrich von Flotow was born of a noble family in Pitzerwitz in the region of Neumark near the boarder with Poland in 1788. As was the custom for young noblemen, he chose a military career, but after a serious wound during a battle in 1813, he never fully recovered, his right arm more or less paralyzed. During a military cam-

Fig. 2: Julius von Flotow became interested in lichens after being severely wounded in a battle.

paign in France in 1819 he found the opportunity to study the rich lichen flora of the Ardennes Mountains (Flotow 1820). This became fortunate for the military officer, finding an alternative career for him after he was forced into an early retirement in 1832. Among his works are floristic papers and flora contributions (Flotow 1836, 1849). In the year of his death he received an honorary doctorate from the University of Breslau in 1856.

Literature

Flotow, J. von 1820: Bemerkungen über einige in Frankreich, besonders um St. Mihiel im Department de la Meuse gesammelten Lichenen. Jahrbücher der Gewächskunde (Sprengel, Schrader & Link) **1**(3): 94–156.

Flotow, J. von 1836: Reisebericht über eine Exkursion nach einem Theile des südöstlichen Riesengebirges. Flora [Regensburg] **19**(1), Beiblätter 1–60.

Flotow, J. von 1850: Lichenes Florae Silesiae. Uebersicht der Arbeiten und Veränderungen der Schlesische Gesellschaft für vaterländische Kultur "**1849**": 98–135; [continued in] Jahresbericht der Schlesische Gesellschaft für vaterländische Kultur **28**: 115–143.

Joseph Gärtner

Joseph Gärtner was born in Calw in Baden-Wüttenberg in 1732 and studied medicine and botany with Haller in Göttingen. In 1760, Gärtner was offered a chair in Tübingen, where he could continue his botanical studies. Among his most well-known works is a book on the reproductive organs in plants *De fructibus et seminibus plantarum* where he also described the reproductive organs in lichens (Gärtner 1788–1791). He came to the conclusion that the soredia might have functioned as lateral branches or buds, and even divided them into the more soredia-like, and the leaf-like, referring to the isidia. Gärtner died shortly after the publication of the second volume of his book in 1791, and should be remembered as one of the earliest to describe the nature of reproduction in lichens.

Fig. 3: Albrecht von Haller, famous botanist contemporary with Linnaeus and lichen systematist.

Literature

Gärtner, J. 1788–1791: De fructibus et seminibus plantarum [three volumes]. Stuttgart & Tübingen.

Albrecht von Haller

Albrecht von Haller, born in Bern, Switzerland in 1708, was a botanist specializing in anatomy and physiology, a medical doctor and a poet. Between 1736 and 1753 he was professor of medicine and botany in a newly established chair in Göttingen; he returned to his hometown where he died in 1777. His life span is almost contemporary with that of Linnaeus (1707–1778), but apart from this

coincidence there are no other resemblances. Haller was instead one of strongest opponents of Linnaeus system of classification, both men competing for fame and glory. He published actively throughout his career, but his influence on lichenology is minor in relation to other aspects of botany and medicine. His two major contributions, *Enumeratio methodica stirpium helveticorum* and *Historia stirpium indigenarum Helvetiae*, mainly concern the floristic and systematic arrangement of plants and other organisms, including lichens listed under the Micheli genus name *Lichen* (Haller 1742, 1768). Haller thus followed the view of Micheli (1729), arranging the lichens systematically according external appearance, the position of the apothecia and the soredia, which were regarded as the male organ.

Literature

Haller, A. von 1742: Enumeratio methodica stirpium helveticorum. Gottingae. 918 pp.
Haller, A. von 1768: Historia stirpium indigenarum Helvetiae. Bernae. 444 pp.
Micheli, P. A. 1729: Nova plantarum genera. Florence. 232 pp.

Georg Hoffmann

Georg Franz Hoffmann was born in 1760 in Marktbreit and studied botany in Erlangen, where he also became interested in lichens. After successful studies, he was offered a professorship in Erlangen in 1787 where he started working on lichens, but was subsequently called to the botany chair in Göttingen in 1792 (Hoffmann 1787). Here he became a very popular professor among the students, known for his excellent lectures, but he left this position to take up the botany chair in Moscow in 1804. He is known foremost for his publications on lichens from his time in Germany, namely *Plantae lichenosae. Descriptio et Adumbratio plantarum e classe cryptogamica ...* (Hoffmann 1789–1801). He believed that soredia could function as male fertilizers, and that the apothecia could include both sexes for reproduction. The true fertilising substance was supposed to be hidden in the thallus, and he concluded that fertilisation took place inside the thallus in an early development. Hoffmann (1796) also published a well-known pocket flora for Germany *Deutschlands Flora oder Botanisches Taschenbuch. Zweyter Theil für das Jahr 1795. Cryptogamie*. He died in Moscow in 1826 without having been able to return to Germany.

Fig. 4: Georg Hoffmann, the most productive 18th century lichenologist and a very popular professor during his tenure in Göttingen, left Germany in 1804 for what was regarded as more prestigious university in Moscow.

Literature

Hoffmann, G.F. 1787: Commentatio de vario Lichenum usu. Mémoires couronnés sur l'utilité des Lichens dans le médicine et dans les arts. Erlangen.

Hoffmann, G.F. [1789–]1790–1801: Plantae lichenosae. Descriptio et Adumbratio plantarum e classe cryptogamica Linnaei, quae Lichenes dicuntur. Cum tab. color. 72. Lipsiae 1790–1801.

Hoffmann, G.F. 1796: Deutschlands Flora oder Botanisches Taschenbuch. Zweyter Theil für das Jahr 1795. Cryptogamie. Erlangen: B.I.I. Palm. 200 pp.

Friedrich Link

Fig. 5: Heinrich Friedrich Link, who succeeded Willdenow as Director of the Botanical Garden in Berlin, had a very broad knowledge of all natural sciences, including lichenology.

Johann Heinrich Friedrich Link, born in Hildesheim in 1767, studied natural sciences and medicine in Göttingen, receiving his doctorate in 1789. In 1792 he was appointed professor of chemistry and natural sciences at the new University of Rostock. In 1811, he was called to a chair in chemistry at the University of Breslau, where he stayed only for a few years, replacing the great Carl Ludwig Willdenow (Fig. 8) as Director of the Botanical Garden and professor of natural sciences at Berlin in 1815, where he stayed until his death in 1851. He possessed a universal knowledge, being one of the few 19th century German botanists who aimed at a complete understanding of plants through a combination of systematic, anatomical and physiological research. His most important work, which also includes lichens, is *Handbuch zur Erkennung der nutzbarsten und am häufigsten vorkommenden Gewächse*, published in three volumes between 1829 and 1833 (Link (1829, 1831, 1833). The name of Link is commemorated with the generic names *Bryopogon* and *Coelocaulon*, today included within *Bryoria* and *Cetraria*. All documents and herbaria from Link were unfortunately destroyed during the bombing of Berlin in 1943.

Literature

Link, H.F. (1829, 1831, 1833): Handbuch zur Erkennung der nutzbarsten und am häufigsten vorkommenden Gewächse. Vols 1–3. Berlin. 864, 533 and 536 pp.

Wilhelm Meyer

Georg Friedrich Wilhelm Meyer, born in Hannover in 1782, studied natural sciences in Göttingen, in the same famous university where he would later become a professor of physiography (i.e. natural sciences). He has not gone down in history as a prolific

lichenologist, but published a well-known book, *Die Entwicklung*, *Metarmophose und Fortpflanzung der Flechten*, also known with the word *Nebenstunden* in the title, referring to his spare time when he could study the lichens (Meyer 1825); he includes a careful discussion on the the structure of the thallus and apothecia, including the role of the algae and spores, and their relation to habitat selection and nutrition in growth. He believed in the more spontaneous generation of the lichen thallus, opposing the similar theoretical discussions by Wallroth (1825, 1827). Meyer was a great intellect of his time having corresponded with among others Johann Wolfgang von Goethe. He criticized Acharius for his system of classification of lichens. Meyer died in 1856.

Literature

Meyer, G.F.W. 1825: Die Entwicklung, Metamorphose und Fortpflanzung der Flechten [Nebenstunden meiner Beschaefftigungen im Gebiete der Pflanzenkunde]. Göttingen: Vandenhoeck & Ruprecht, 372 pp.

Wallroth, C.F.W. 1825: Naturgeschichte der Flechten, Band 1 "Von dem Flechtenlager im Allgemeinen". Frankfurt a. M.: Friedrich Wilmans. 722 pp.

Wallroth, C.F.W. 1827: Naturgeschichte der Flechten, Band 2 "Physiologie und Pathologie des Flechtenlagers". Frankfurt a. M.: Friedrich Wilmans. 518 pp.

Daniel von Schreber

Johann Christian Daniel von Schreber was born in Weissensee in Thuringia in 1739. He first studied at Uppsala, being one of the many and well known foreign students of Linnaeus. In 1769 be was appointed professor of natural history and medicine in Erlangen, where he stayed until his death in 1810. Schreber is mainly known for his many publications on insects and other animals and not for his contribution to lichenology, also editing several editions of *Genera plantarum* (Schreber 1791). One of Schreber's most distinguished pupils at Erlangen was Hoffmann. As a lichenologist, Schreber's contribution is mainly through his floristic work and *Genera plantarum*, where he also described the well-known genera *Cornicularia*, *Lobaria*, *Physcia*, *Stereocaulon* and *Sticta* (Schreber 1771, 1791).

Fig. 6: Johann Christian Daniel von Schreber, professor in Erlangen, one of the best known foreign students of Linnaeus.

Literature

Schreber, J.C.D. von 1771: Spicilegium florae lipsiensis. Leipzig.

Schreber, J.C.D. von 1791: Linné's Genera Plantarum, edit. octav. Frankfurt a. M.

Kurt von Sprengel

Fig. 7: Kurt von Sprengel, director of the botanical garden in Halle, classified the lichens according to their apothecial structures.

Kurt Polycarp Joachim von Sprengel was born in Boldekow in Pommern in 1766. He studied theology and medicine in Halle, where he earned his doctorate in medicine in 1787. After his studies he worked as a practical physician until 1795 when he became professor and director of the botanical garden in Halle. Here he devoted much of his time to medical work and the history of medicine, as well as to botany, editing, for instance, one issue each of Linnaeus's *Systema vegetabilium* in 1824 and *Genera plantarum* in 1830. Material on lichens was published in his work *Einleitung in das Studium der cryptogamischen Gewächse* (Sprengel 1804, 1817), where he tried to classify them according to the structure of the apothecia, which he showed to be rather unclear. He died in Halle in 1833.

Literature

Sprengel, K. von 1804, 1817: Einleitung in das Studium der cryptogamischen Gewächse. Halle.

Wilhelm Wallroth

Fig. 8: Carl Friedrich Wilhelm Wallroth, a medical doctor, became a lichenologist in his spare time and introduced such terminology as *homoiomerous* and *heteromerous* for describing lichen thalli.

Carl Friedrich Wilhelm Wallroth was born in Breitenstein in the Harz region in 1792. He studied medicine and botany at the universities of Halle and Göttingen, earning his doctorate in medicine from Göttingen in 1815. After a few years of searching for an opportunity and a place to settle, he became a *Kreisphysikus* (public health officer) and practising doctor in the town of Nordhausen in 1822 where he stayed until his retirement in 1855. His life did not entirely consist of hard work caring for the sick; as with Acharius, also a medical doctor, his earlier studies in botany had made a deep impression on him. In his spare time, being a bachelor all his life, Wallroth seems to have spent on botanical studies, especially the cryptogams. His major works were the *Flora Cryptogamica Germaniae* (Wallroth 1831–1833) and his

comprehensive study of the biology of the lichens, *Naturgeschichte der Flechten*, which appeared in two volumes (Wallroth 1825, 1827) in which his theoretical discussion of the development of lichens is much more complicated to understand than that of Meyer presented during the same year. Wallroth also tried to introduce new terminology, of which at least two terms remain, i.e. *homoiomerous* and *heteromerous* lichen thalli. He especially tried to understand the importance of gonidia and spores, which he believed were the only reproductive organs in lichens, and became one of the strongest critics of the Acharian system of classification. He died in Nordhausen in 1857.

Literature

Wallroth, C.F.W. 1825: Naturgeschichte der Flechten, Band 1 "Von dem Flechtenlager im Allgemeinen". Frankfurt a. M.: Friedrich Wilmans. 722 pp.

Wallroth, C.F.W. 1827: Naturgeschichte der Flechten, Band 2 "Physiologie und Pathologie des Flechtenlagers". Frankfurt a. M.: Friedrich Wilmans. 518 pp.

Wallroth, C.F.W. 1831–1833: Flora cryptogamica Germaniae. Nürnberg. 654 pp.

Ludwig Willdenow

Carl Ludwig Willdenow was born in Berlin in 1765, where he first studied to become a pharmacist. However, in 1785, he wished to broaden his knowledge, starting on medical studies in Halle, where he became a medical doctor in 1789. A few years after he worked as a pharmacist in Berlin until 1798 when he became a professor of natural history at a medical college and a member of the academy in Berlin. Finally he was also appointed the director of the botanical garden of the academy, dying only a few years after in 1812. He is known above all for his definition of plant geography for European conditions and for his attempts to understand the adaptations of plants to climatic conditions. As a lichenologist, he published *Florae Berolinensis prodromus* (Willdenow 1787), its treatment of the lichens being updated by Sipman et al. (2004).

Fig. 9: Carl Ludwig Willdenow, Director of the Botanical Garden in Berlin-Dahlem and author of *Florae Berolinensis prodromus.*

Literature

Sipman, H., Leuckert, C., Otte, V., Knoph, J.-G. & Rux, K.-D. 2004: Die Flechten in Willdenows "Florae Berolinensis Prodromus" und ihr Vorkommen im heutigen Berlin. Feddes Repertorium **115**: 121–133.

Willdenow, C.L. 1787: Florae Berolinensis Prodromus. Berlin. 439 pp.

2 Towards a better knowledge

During the period corresponding with the 19th century we would see new theories of the definition of lichens mainly through the work of Simon Schwendener and Ernst Stahl (Figs 18–19). Generally speaking this period must be seen as a period of progressive work in the history of lichenology and particularly for Germany where many people with well-known names made great contributions, such as Ferdinand Arnold (Fig. 10), Georg Bitter (Fig. 11), Max Britzelmayr, Philipp Hepp (Fig. 12), Oswald Hesse, Gustav Krabbe, Wilhelm Körber (Fig. 13), August von Krempelhuber (Fig. 14), Gustav Lindau (Fig. 15), Ludwig Rabenhorst (Fig. 16), Johannes Reinke (Fig. 17), Ernst Stizenberger (Fig. 20) and Wilhelm Zopf (Fig. 21). Hepp, Krabbe and Schwendener contributed towards a better understanding of anatomical structures through microscopy, and Hesse and Zopf were forerunners in the study of secondary metabolic prducts in lichens.

Ferdinand Arnold

Fig. 10: Ferdinand Arnold, earned his living as a lawyer, but found his life's interest in lichens, amassing a large herbarium and publishing *Lichenologische Ausflüge in Tirol*.

Ferdinand Christian Gustav Arnold was born in Ansbach in Bavaria in 1828, where he became interested in botany at school, but nevertheless chose to study something which would give him a secure income by studying law at the universities in Munich and Heidelberg. He became a judicial officer in Eichstätt for 20 years and a further 20 years in Munich. These were Arnold's working days, but most of his spare time was spent in the field collecting and studying plants, mostly lichens. Arnold built an enormous personal herbarium for his time comprising c. 120 000 specimens of lichens in addition to 30 000 of other groups of plants and lichenenicolous fungi, from which material he contributed some 140 scientific publications. His legacy rests on his herbarium, his contributions published as *Lichenologische Ausflüge in Tirol* appearing in 30 issues from 1868 to 1898 (Arnold 1868), his *Lichenologische Fragmente* published in 32 issues from 1867 to 1893 (Arnold 1893) and his distribution of several large and important exsiccates. He died in Munich in 1901.

Literature

Arnold, F. 1868: Lichenologische Ausflüge in Tirol. 1. Kufstein. Verhandlungen der kaiserlich-königlichen zoologisch-botanischen Gesellschaft Wien **18**: 703–710.

Arnold, F. 1893: Lichenologische Fragmente 32. Österreichische Botanische Zeitschrift **43**: 95–99, 137–138.

Georg Bitter

Friedrich August Georg Bitter, born in Bremen in 1873, studied in Jena, Munich and Kiel finishing his studies with a doctorate at Kiel in 1896. After his studies Bitter had short assignments in Berlin before being appointed as director of a new botanical garden in Bremen in 1905. In his studies he had been fortunate to be inspired by great academic teachers such as Wilhelm Zopf, Johannes Reinke and Simon Schwendener. His interest in anatomy and development of the lichen thallus is obvious in his publications (BITTER 1889, 1899, 1901a, 1904), but he seems to have been particularly interested in the group of species within *Parmelia*, which were later to be included in the genus *Hypogymnia* (BITTER 1901b); this interest has been commemorated with the epithets *bitteri* and *bitteriana*. He died in 1927 after having worked the last five years of his life as professor and director of the Botanical Garden in Göttingen.

Fig. 11: Georg Bitter, who ended his career as professor and Director of the Botanical Garden in Göttingen, was mainly interested in the concerned developmental morphology of lichens.

Literature

BITTER, G. 1889: Über das Verhalten der Krustenflechten beim Zusammentreffen ihrer Ränder. Zugleich ein Beitrag zur Ernährungsphysiologie der Lichenen auf anatomischer Grundlage. Jahrbuch für wissenschaftliche Botanik **33**: 97–127.

BITTER, G. 1899: Über maschenförmige Durchbrechungen der unteren Gewebeschicht oder des gesamten Thallus bei verschiedenen Laub- und Strauchflechten. In: Botanische Untersuchungen, Festschrift für Schwendener. Berlin. pp. 120–149.

BITTER, G. 1901a: Über die Variabilität einiger Laubflechten und über den Einfluß äusserer Bedingungen auf ihr Wachstum. Jahrbuch für wissenschaftliche Botanik **36**: 421–492.

BITTER, G. 1901b: Zur Mophologie und Systematik von *Parmelia*, Untergattung *Hypogymnia*. Hedwigia **40**: 171–274.

BITTER, G. 1904: Zur Soredienbildung. Hedwigia **43**: 247–250.

Max Britzelmayr

Max Britzelmayr, born in Augsburg in Bavaria in 1839, chose to study to become a teacher, as his father. He worked as a teacher for 40 years near to Augsburg, but most of his spare time was spent investigating the lichen and fungal flora in southern Bavaria. His c. 30 publications are mainly concerned with the lichen flora in the Augsburg region and Allgäuer Alpen (BRITZELMAYR 1900), and he also distributed exsiccates. He contributed considerably to the exploration of the lichen flora of southern Bavaria and part of the Alps during the second half of the 19th century, and died in Augsburg in 1909.

Literature

Britzelmayr, M. 1900: Die Lichenen der Allgäuer Alpen. Bericht der Naturwissenschaftlichen Vereins für Schwaben und Neuburg (A. V.) in Augsburg **34**: 73–139.

Philipp Hepp

Fig. 12: Philipp Hepp became a political refugee in Switzerland where he developed a great interest in lichens.

Johann Adam Philipp Hepp was born in Kaiserslautern in 1797, and studied medicine to become a practising doctor. However, he took part in the revolutionary 1832 Hambacher Fest and became actively involved in the revolution in 1848. In 1849 he was a member of the short-lived revolutionary government and was hence sentenced to death, but escaped to Switzerland. Here he had lots of spare time, which he devoted to the study of lichens, his most well-known publication being *Die Flechten Europas in getrockneten mikroskopisch untersuchten Exemplaren mit Beschreibung und Abbildung ihrer Sporen,* which was richly illustrated and based on detailed microscopical studies (Hepp 1857, 1867). Some time after the turbulent years, he was given amnesty but remained in Switzerland. He died during a visit to his daughter at Frankfurt in 1867.

Internet

http://www.strasse-der-demokratie.eu/staedte/neustadt-ad-weinstrasse/schauplaetze-museen/wohnung-von-dr-philipp-hepp.html

Literature

Hepp, P. 1857: Die Flechten Europas in getrockneten mikroskopisch untersuchten Exemplaren mit Beschreibung und Abbildung ihrer Sporen V (No. 234–289), VI (No. 290–353), VII (354–412), VIII (413–478). Zürich.

Hepp, P. 1867: Die Flechten Europas in getrockneten mikroskopisch untersuchten Exemplaren mit Beschreibung und Abbildung ihrer Sporen XIII (No. 717–776), XIV (No. 777–837), XV (838–898), XVI (899–962). Zürich.

Oswald Hesse

Julius Oswald Hesse, born in Obereula in Saxony in 1835, studied chemistry at Leipzig. He received his doctorate in Göttingen in 1860 and then embarked on a non-academic profession working in the chemical industry. However, he became interested in chemical substances in plants, particularly lichens, on which he published considerably, as summarized in his *Flechtenstoffe* in *Biochemisches Handlexicon* (Hesse 1912). In all, he isolated 102 secondary metabolites in lichens, published in nearly 30 papers. He was later honoured with a professor's title and died in Stuttgart in 1917.

Literature

Hesse, O. 1912: Flechtenstoffe. In: Abderhalden, E. (ed.). Biochemisches Handlexikon **7**: 32–144. Berlin, Heidelberg, New York: J. Springer.

Wilhelm Körber

Gustav Wilhelm Körber was born in Hirschberg in Silesia in 1817 and studied in Berlin and Breslau. His first degree allowed him to become a teacher, but he continued on an academic career, gaining his doctorate on lichen algae and defending a second thesis which allowed him to obtain higher academic positions. He was first promoted to a professorship in 1863, and in 1873 became associate professor at the University of Breslau, where he stayed until his death in 1885. He published extensively, his most well-known works being *Systema lichenum germaniae* (Körber 1855) and the associated *Parerga lichenologica* (Körber 1859–65). He was also a severe critic of Schwendener's theories on lichen development (Körber 1874).

Fig. 13: Wilhelm Körber from Schlesien studied and made academic career in Berlin and Breslau.

Literature

Körber, G.W. 1855: Systema Lichenum Germaniae. Die Flechten Deutschlands (insbesondere Schlesiens) mikroscopisch geprüft, kritisch gesichtet, charakteristisch beschrieben und systematisch geordnet. Breslau: Trewendt & Granier. 458 pp.

Körber, G.W. 1859–65: Parerga lichenologica. Ergänzungen zum Systema Lichenum Germaniae, Lief. I–V. Breslau: E. Trewendt. 501 pp.

Körber, G.W. 1874: Zum Abwehr der Schwendener-Bornet'schen Flechtentheorie. Breslau: Kern. 30 pp.

Gustav Krabbe

Heinrich Gustav Krabbe, born in Ohrbeck close to Hannover in 1855, studied in Tübingen and Berlin, receiving his doctorate in 1882. He was a pupil of Schwendener (Fig. 17) and seemingly had a prosperous career in front of him, focussing his research on developmental and anatomical studies in lichens. However, he died in 1895, publishing in his short life only three works, the most important being related to his studies on development in *Cladonia* (Krabbe 1891).

Literature

Krabbe, G. 1891: Entwicklungsgeschichte und Morphologie der polymorphen Flechtengattung *Cladonia*. Ein Beitrag zur Kenntniss der Ascomyceten. Leipzig: A. Felix. 160 pp.

August von Krempelhuber

Fig. 14: August von Krempelhuber (1813–1882) collected and evaluated lichenological literature up to 1871, thereby sorting out the existing nomenclatural chaos.

August von Krempelhuber was born into a noble family in Munich in 1813, where he later studied forestry at the university, which was to become his future career. Through this work he became interested in lichens and a number of publications appeared in the early 1850s in the journal *Flora*, followed by his lichen flora of Bavaria, altogether some 45 publications (Krempelhuber 1861). Later, with his friend Arnold, they split up their fields of activities, with Krempelhuber concentrating on extra-European lichens. He visited central European countries, England, Sweden and Italy. He knew several languages, English, French, Italian and Swedish, as well as classical languages that proved useful when preparing lichen floras from remote and exotic areas in such places as Argentina, Brazil, New Zealand and the South Pacific Islands. However, he is, above all, known for his great effort in sorting out the chaotic nomenclatural situation and for evaluating publications up to 1871: his *Geschichte und Litteratur der Lichenologie*, of more than 1000 pages, is still a useful reference work for older lichenological literature, authors, taxonomic entities and classification (Krempelhuber 1867, 1869, 1872).

Literature

Krempelhuber, A. von 1861: Die Lichenflora Bayerns oder Aufzählung der bisher in Bayern (diesseits des Rheins) aufgefundenen Lichenen mit besonderer Berücksichtigung der verticalen Verbreitung dieser Gewächse in den Alpen. Denkschriften der Königlich-Baierischen Botanischen Gesellschaft in Regensburg **4**: 1–317.

Krempelhuber, A. von 1867: Geschichte und Litteratur der Lichenologie von den ältesten Zeiten bis zum Schlusse des Jahres 1865 I. Band. München: Selbstverlag. 616 pp.

Krempelhuber, A. von 1869: Geschichte und Litteratur der Lichenologie von den ältesten Zeiten bis zum Schlusse des Jahres 1865 II Band. München: Selbstverlag. 776 pp.

Krempelhuber, A. von 1872: Geschichte und Litteratur der Lichenologie von den ältesten Zeiten bis zum Schlusse des Jahres 1865 (resp. 1870) III. Band. München: Selbstverlag. 260 pp.

Gustav Lindau

Gustav Lindau, born in Dessau in Anhalt in 1866, studied natural sciences in Heidelberg and later in Berlin. Together with Georg Bitter, Gustav Krabbe and Friedrich Tobler, Lindau was also fortunate to have had Schwendener as his teacher and he defended a thesis on the development of apothecia in lichens in 1888. After a few years, Lindau moved to Münster to become director of the botanical garden, but in 1892 he returned to Berlin as an assistant in the botanical garden, and in 1902 was promoted

to full professor. He had almost 40 publications to his credit, mostly based on material of collections from exotic places gained through expeditions which he determined in the Berlin Museum. He also published a popular lichen flora for beginners *Die Flechten, Kryptogamenflora für Anfänger* (LINDAU 1913, 1923). However, he is mainly known for his bibliographic work together with the mycologist P. Sydow which was published in many issues as *Thesaurus Literature mycologiae et lichenologiae* etc. between 1907 and 1917 (LINDAU & SYDOW 1907, 1954). Lindau died in Berlin in 1923. His herbarium and documents all kept in Berlin were destroyed during the bombing raids in 1943.

Fig. 15: Gustav Lindau, professor in Berlin and bibliographer of mycological literature.

Literature

LINDAU, G. 1913: Die Flechten, Kryptogamenflora für Anfänger. Berlin: J. Springer. 250 pp.

LINDAU, G. 1923: Die Flechten. 2. Aufl. Kryptogamenflora für Anfänger, III. Berlin: J. Springer. 252 pp.

LINDAU, G. & SYDOW, P. 1907: Thesaurus litteraturae mycologicae et lichenologicae ratione habita praecipue omnium quae adhuc scripta sunt de mycologia applicata quem congesserunt. Leipzig: Gebrüder Borntraeger. 400 pp.

LINDAU, G. & SYDOW, P. 1954: Thesaurus Literatureae mycologicae et lichenologicae ratione habita praecipue omnium quae adhuc scripta sunt de mycologia applicata quem congesserunt G. Lindau et P. Sydow. [Berlin 1908–1917]. 5 volumes. New York: Johnson Reprint Corp. 652 pp.

Ludwig Rabenhorst

Gottlob Ludwig Rabenhorst was born in Treuenbrietzen in 1806 and chose a career in pharmacy. Pharmacy at this time was strongly associated with botany, so he decided to deepen his knowledge in botany at the University of Berlin. He managed a pharmacy in Luckau until 1840, but in 1841 earned a doctorate at the University of Jena, having developed a comprehensive knowledge in botany, especially cryptogamic botany. He settled in Dresden from 1840 and in nearby Meissen from 1875 until his death in 1881. During his time in Dresden he published the first volumes of *Deutschlands Kryptogamenflora* and launched and published the periodical *Hedwigia*. He had a broad general interest in cryptogams, but he also published nearly 20 publications on

Fig. 16: Ludwig Rabenhorst, editor of *Kryptogamenflora von Deutschland, Österreich und der Schweiz* and the periodical *Hedwigia*.

lichens and distributed exsiccates (Rabenhost 1845, 1850a, 1850b, 1855–1879, 1860). His legacy is, above all, his contributions to the knowledge of the cryptogamic floras of central Europe (Rabenhost 1870), and he is remembered in the well-known *Rabenhorst's Cryptogamenflora* which appeared in a multi-volume second edition after his death.

Literature

Rabenhorst, L. 1845: Deutschlands Kryptogamen-Flora oder Handbuch zur Bestimmung der kryptogamischen Gewächse Deutschlands, der Schweiz, des Lombardisch-Venetianischen Königreichs und Istriens. Zweiter Band. Erster Abtheilung: Lichenen. Leipzig: E. Kummer. xii + 130 pp.

Rabenhorst, L. 1850a: Systematische Uebersicht der auf meiner italienischen Reise beobachteten Cryptogamen. Cl. II. Lichenes. Flora [Regensburg] **33**: 529–537.

Rabenhorst, L. 1850b: Vorläufiger botanischer Bericht über meine Reise durch die östlichen und südlichen Provinzen Italiens [Fortsetzung]. Flora [Regensburg] **33**: 305–313, 322–325, 338–349, 355–363, 372–383, 390–399.

Rabenhorst, L. 1855–1879: Lichenes europaei exsiccati. Fasc. I–XXXVI, Nrs 1–974. Dresden.

Rabenhorst, L. 1860: Cladoniae europaeae exsiccatae. Dresden.

Rabenhorst, L. 1870: Kryptogamen-Flora von Sachsen, der Ober-Lausitz, Thüringen und Nordböhmen mit Berücksichtigung der benachbarten Länder. Zweite Abtheilung. Die Flechten. Leipzig: E. Kummer. xi + 406 pp.

Johannes Reinke

Johannes Reinke was born close to Ratzeburg in Mecklenburg in 1849. Initially he studied theology and philosophy at the University of Rostock. His interest though changed to botany, in which field he published. He became a professor of botany at Göttingen, where he established an institute for plant physiology. From 1885 to 1921 he became a well-known professor at the University of Kiel, where he mainly studied marine and benthic algae. His interest in science, apart from the systematic work he carried out in especially the brown algae, was more theoretical and he introduced the term *theoretical biology*. Seen from this side of his work, he is known for his severe criticism of the Darwinian theory of evolution. His interest in lichens mainly resulted in a number of publications on the phylogeny and natural system of these organisms (Reinke 1895a, 1895b, 1896), and on an alternative evolution of the lichens (Reinke 1908). His scientific contributions on the lichens are not strong when compared with many other 19th century lichenologists, but his theoretical work on their morphology and phylogeny are important in a scientific context. Reinke died in 1931.

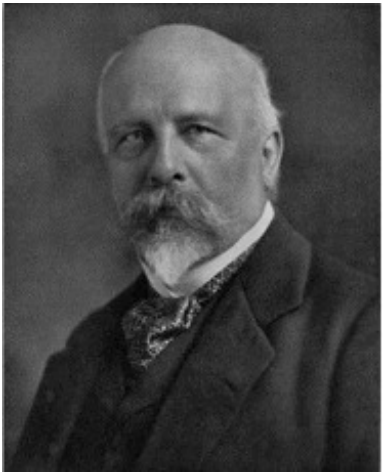

Fig. 17: Johannes Reinke, professor in Göttingen and Kiel, contributed to phylogeny and classification of lichens. He did not believe in a Darwinian evolution and had his own idea regarding evolution, including that of the lichens.

Literature

REINKE, J. 1895a: Abhandlungen über Flechten III. Einige Voraussetzungen einer phylogenetischen Morphologie der Flechten. Jahrbuch für wissenschaftliche Botanik **28**: 39–150.

REINKE, J. 1895b: Abhandlungen über Flechten IV. Skizzen zu einer vergleichenden Morphologie des Flechtenthallus (Schluss). Parmeliaceen, Verrucariaceen. Jahrbuch für wissenschaftliche Botanik **28**: 359–486.

REINKE, J. 1896: Abhandlungen über Flechten V. Das natürliche Flechtensystem. Jahrbuch für wissenschaftliche Botanik **29**: 171–236.

REINKE, J. 1908: Die Flechten und die Abstammungslehre. Deutsche Rundschau **34**: 91–100.

Simon Schwendener

Simon Schwendener was born on a farm near Buchs in the Canton St. Gallen in northeastern Switzerland in 1828. He was expected to take over the farm, but he was a very promising pupil in school and asked his father for financial support for further studies at the University of Geneva. This he was denied because of lack of money, but a small allowance from an inheritance from his grandfather made it possible for him to enter the University of Zürich in 1853. He studied under Oswald Heer, and in 1856 he successfully defended his thesis on *Periodic features in nature, especially in plant kingdom*, a topic suggested by de Candolle during the short time he spent in Geneva. At the same time, the young Carl Wilhelm Nägeli was appointed to a Chair of Botany at the Polytechnic University of Zürich. Schwendener started to carry out anatomical investigations with Nägeli, who in 1857 took a post at the University of Munich. Schwendener was lucky to be offered an assistant position with him and appreciated the scientific atmosphere in Munich which allowed him time to work on his own projects. Here he wrote his thesis for the habilitation which gave him the title of associate professor. His time in Munich was one of the most productive periods of his career since he published some of the most important papers on the anatomy of the lichen thallus (SCHWENDENER 1860, 1863, 1867, 1868a, 1868b). However, another seven years would pass before he was offered a chair of botany in the small University of Basel, which he happily accepted. Here he slowly turned his interest towards other groups, such as the vascular plants, and published a well-known book on the anatomy of the monocotyledons. In 1877 he was offered another professorship, this time in Tübingen, and in 1878 a further chair in Berlin where he was offered the responsibility for general botany together with August Eichler who was teaching the

Fig. 18: Simon Schwendener (1828–1919), discoverer of the lichen symbiosis, a theory, although formerly rejected by many, of fundamental importance to the future of lichenology.

systematic part. Although he had become attracted to the friendly environment of the small town of Tübingen, he accepted the appointment and remained in Berlin until he died in 1919. Schwendener's hypothesis on the nature of lichens, an association of two organisms, was rejected by the leading lichenologists at the end of the 19th century, such as August von Kremphelhuber, Wilhelm Körber, Jean Müller Argoviensis and William Nylander (Honegger 2000). No strong arguments to prove the opposite case were forthcoming, and Körber (1874), in particular, argued aggressively against Schwendener's theory, but could not present any good reasons for a non-fungal origin of the lichens. Schwendener published only 10 papers on lichens, but his discovery of the association between fungi and algae in the formation of the lichen thallus was of fundamental importance to the future of lichenology.

Literature

Honegger, R. 2000: Simon Schwendener (1829–1919) and the dual hypothesis of lichens. Bryologist **103**: 307–313.

Körber, G.W. 1874: Zum Abwehr der Schwendener-Bornet'schen Flechtentheorie. Breslau: Kern. 30 pp.

Schwendener, S. 1860: Untersuchungen über den Flechtenthallus. I. Theil: Die strauchartigen Flechten. Beiträge zur Wissenschaftlichen Botanik (Nägeli) **2**: 108–186.

Schwendener, S. 1863: Untersuchungen über den Flechtenthallus. II. Laub- und Gallertflechten. Beiträge zur Wissenschaftlichen Botanik (Nägeli) **3**: 127–198.

Schwendener, S. 1867: Über die wahre Natur der Flechten. Verhandlungen der Schweizerischen Naturforschenden Gesellschaft in Rheinfelden **51**: 88–90.

Schwendener, S. 1868a: Über die Beziehungen zwischen Algen und Flechtengonidien. Botanische Zeitung [Berlin] **1868**: 289–292.

Schwendener, S. 1868b: Untersuchungen über den Flechtenthallus. II. Laub- und Gallertflechten (Schluss). Beiträge zur Wissenschaftlichen Botanik (Nägeli) **4**: 161–202.

Ernst Stahl

Christian Ernst Stahl was born in the small town of Schiltigheim in Alsace in 1848. He went to the University of Strasbourg where he studied natural sciences, later moving to Halle to earn his doctorate in 1874; from a physiological point of view, his thesis is a major contribution to lichenology since it deals with pioneering experiments involving the developmental history of lichens (Stahl 1874). He was able to carry out experiments which included the synthesis of the lichen *Endocarpon pusillum* from single spores and algal material, observing the formation of apothecia and thalli. In his well-known experiment, only a few years after Schwendener's famous hypothesis, Stahl demonstrated that lichens were actually dual organisms composed of fungi and associated algae (Stahl 1877). After his successful studies in Halle, he spent some time in Würzburg, and in Strasbourg, before being offered a chair in botany at Jena in 1881. He died in Jena in 1919, in the same year as Schwendener (Fig. 18), and his influence on the early theories of developmental history in lichens were of profound importance.

Literature

Stahl, E. 1874: Beiträge zur Entwickelungsgeschichte der Flechten (vorläufige Mittheilung). Botanische Zeitung [Berlin] **1874**: 177–180.

Stahl, E. 1877: Beiträge zur Entwickelungsgeschichte der Flechten. Heft 1 & 2. Leipzig: A. Felix. 55 + 33 pp, 6 Taf.

Fig. 19: Christian Ernst Stahl, lichen physiologist, studied the development of the lichen thallus, the first one who successfully cultured lichens from spore to thallus. Stahl's experiments were of profound importance for continued understanding of fungal and lichen biology.

Ernst Stizenberger

Ernst Stizenberger was born in Konstanz at Bodensee (Lake Constance) in 1827. He obtained his medical degree in Freiburg in 1851, and, with few interruptions, worked as a practising doctor in his hometown Konstanz. However, similar to other medical doctors at that time, he found a deep interest in botany, particularly lichenology, and published frequently from 1860 until his death in 1895. Almost 40 publications of his are concerned with new descriptions, floristic reports, discussions on lichenology, the economic importance of lichens (Stizenberger 1873, 1879) and major contributions on African lichens and the genus *Sticta* (Stizenberger 1890, 1895). He is also known for the description of the genus *Anzia*, one of his earliest publications (Stizenberger 1861). Although not well-known to younger generations of lichenologists, his legacy is his many interesting publications. In the narrow circles of scientists of that time, he was a better known since he was also a close friend of William Nylander.

Fig. 20: Ernst Stizenberger, medical doctor, studied African lichens, and was a close friend of William Nylander.

Literature

Stizenberger, E. 1861: *Anzia*, eine neue Flechtengattung. Flora [Regensburg] **44**: 390–393.

Stizenberger, E. 1873: Botanische Plaudereien über die Flechten (Lichenes). Glarus: F. Schmid. 58 pp.

Stizenberger, E. 1879: Die ökonomische Beziehungen der Flechten. Bericht über die Thätigkeit der St. Gallischen naturwissenschaftlichen Gesellschaft **1877/78**: 202–217.

Stizenberger, E. 1890: Lichenaea africana. Bericht über die Thätigkeit der St. Gallischen naturwissenschaftlichen Gesellschaft **1888–89**: 105–249.

Stizenberger, E. 1895: Die Grübchenflechten (*Stictei*) und ihre geographische Verbreitung. Flora [Regensburg] **81**: 88–150.

Wilhelm Zopf

Fig. 21: Wilhelm Zopf one of the first who studied lichen secondary chemistry.

Wilhelm Zopf was born in Roßleben in Thuringia in 1846. He first became a primary school teacher, but later studied natural sciences in Berlin where he worked as an associate professor at the agricultural university for a few years, before being appointed head of the cryptogamic laboratory at the University of Halle in 1883. In 1899 he became professor and director of the botanical garden of the academy in Münster where he continued his research on fungal biology and systematics, publishing some 40 papers. During his work on fungal biology he became more interested in the secondary chemistry of these organisms, particularly the lichens of which he published 17 papers under the heading *Zur Kenntnis der Flechtenstoffe* from 1892 to 1909 (e.g. Zopf 1897), culminating in his book *Die Flechtenstoffe* (Zopf 1907). He also published on more general problems related to lichen biology (Zopf 1905, 1906). He had a special interest in the genus *Cladonia,* frequently occurring in the heathland of Westphalia (now Nordrhein-Westfalen), and more particularly in its secondary chemistry (Zopf 1908). Zopf died in Münster in 1909 and his name was commemorated by Vainio in his naming of *Cladonia zopfii*.

Literature

Zopf, W. 1897: Zur Kenntniss der Flechtenstoffe (Vierte Mittheilung). Liebigs Annalen der Chemie **297**: 271–312.

Zopf, W. 1905: Biologische und morphologische Beobachtungen an Flechten. I. Berichte der Deutschen Botanischen Gesellschaft **23**: 497–504.

Zopf, W. 1906: Biologische und morphologische Beobachtungen an Flechten. II. 1. Über *Ramalina kullensis* n. sp. Berichte der Deutschen Botanischen Gesellschaft **24**: 574–580.

Zopf, W. 1907: Die Flechtenstoffe in chemischer, botanischer, pharmakologischer und technischer Beziehung. Jena: G. Fischer. 450 pp.

Zopf, W. 1908: Beiträge zu einer chemischen Monographie der Cladoniaceen. Berichte der Deutschen Botanischen Gesellschaft **26**: 51–113.

Hermann Zschacke

Georg Hermann Zschacke, born in Köthen in Anhalt in 1867, was a teacher throughout his life, eventually working in a high school for girls (Höhere Töchterschule) in Bernburg from 1898 until his retirement. However, he had an interest in botany, particularly lichenology, gained from his studies of mountainous regions at home and abroad, visiting the Carpathians before 1914. He was especially interested in the pyrenocarpous lichens (i.e. *Verrucaria* and related groups), contributing 18 publications (Zschacke 1920, 1934). During the outbreak of World War I he was arrested

on Corsica whilst on a botanical tour. He became severly ill during the years of imprisonment and was therefore sent to Switzerland where he attended botanical lectures at Zürich University. He returned to Bernburg in 1917, but had to take early retirement in 1924 because of increasing health problems as a result of his war-time experiences. He died in Bernburg in 1937. His herbarium in Berlin-Dahlem survived the destruction of the Botanical Museum as it had not been incorporated into the main collection at the time of the bombing in 1943.

Fig. 22: Hermann Zschacke, a teacher with a great interest in *Verrucaria* and related Pyrenocarpous groups of lichens.

Literature

ZSCHACKE, H. 1920: Die Mitteleuropäischen Verrucariaceen III. Hedwigia **62**: 90–154.

ZSCHACKE, H. 1934: Epigloeaceae, Verrucariaceae und Dermatocarpaceae. In: Dr. L. Rabenhorst's Kryptogamenflora von Deutschland, Österreich und der Schweiz **9**(1,1). Leipzig: Akademische Verlagsgesellschaft. 695 pp.

3 First half of the 20th century

The period more or less coincident with the 20th century was the most progressive period in the history of science, especially after the Second World War. The two great wars naturally halted scientific development, especially within the German borders, but in spite of these dark times, it is gratifying to observe the return of German scientific advancement, including lichenology. As with earlier centuries, it is difficult to assign those persons born into one century who lived into the next, but those lichenologists listed here were mainly scientifically active in the 20th century.

Christian Erichsen

Christian Friedo Eckhard Erichsen, born in Knifzig in Schleswig in 1867, became a primary school teacher, a profession he remained in for the rest of his career. He possessed an early interest in phanerogams, but it was not until c. 1902 that he started to collect lichens, which he continued to do for more than 40 years. He made several excursions to other European countries, where he also made contacts with many foreign lichenologists. He was particularly interested in publishing his discoveries, especially on the lichen flora of Schleswig-Holstein, resulting in over 70 publications (e.g. ERICHSEN 1934, 1937). He had a special interest in the genus *Pertusaria* (ERICHSEN 1936a, 1936b). His goal was to publish a flora of northwestern Germany, a project he had been involved with over many years,

Fig. 23: Christian Erichsen, a teacher and contributor to the knowledge of the genus *Pertusaria* and the lichen flora of Schleswig-Holstein.

but presumably interrupted by the horror of war-time. However, he died in 1945 just after the peace treaty had been signed, and unfortunately could not see his completed flora which appeared much later as a posthumous publication (Erichsen 1957).

Literature

Erichsen, C.F.E. 1934: Zur Flechtenflora von Schleswig-Holstein und des Gebiets der Unterelbe. Schriften des Naturwissenschaftlichen Vereins für Schleswig-Holstein **20**: 335–356.

Erichsen, C.F.E. 1936a: Beiträge zur Kenntnis der Flechtengattung *Pertusaria*. Feddes Repertorium **41**: 77–101

Erichsen, C.F.E. 1936b: Pertusariaceae. In: Dr. L. Rabenhorst's Kryptogamenflora von Deutschland, Österreich und der Schweiz. **9**(5,1). Leipzig: Akademische Verlagsgesellschaft. pp. 319–728.

Erichsen, C.F.E. 1937: Weitere Beiträge zur Kenntnis der Flechtenflora von Schleswig-Holstein und des Gebiets der Unterelbe. Schriften des Naturwissenschaftlichen Vereins für Schleswig-Holstein **22**: 89–116.

Erichsen, C.F.E. 1957: Flechten von Nordwestdeutschland. Stuttgart: G. Fischer. 411 pp.

Vitus Grummann

Fig. 24: Vitus Grummann, teacher whose biographic-bibliographic handbook of lichenology became highly appreciated.

Vitus Johannes Grummann, born in Jacobsdorf in Silesia close to the Polish border in 1899, became a primary school teacher, working for many years in the Berlin area. However, in the late 1930s, he started to study natural sciences at Friedrich-Wilhelm Universität in Berlin and earned his doctorate in 1939. Although he continued in the teaching profession for the rest of his career, during his university studies he had become inspired by botany, particularly lichens, and contributed 18 publications on various floristic projects (Grummann 1935), including a joint paper with Johannes Hillmann on the cryptogams of Mark Brandenburg (Hillmann & Grummann 1957) and a systematic and floristic catalogue of lichens occurring in Germany (Grummann 1963). He

obviously enjoyed compiling and cataloguing records as demonstrated by his *Biographisch-bibliographisches Handbuch der Lichenologie*, which he unfortunately did not see printed, since he died in 1967. However, the book was completed a few years later by Oscar Klement (Grummann 1974).

Literature

Grummann, V.J. 1935: Die Flechtenflora der Insel Rügen mit Hiddensee. Feddes Repertorium. Beiheft **81A**: 1–56.

Grummann, V.J. 1963: Catalogus Lichenum Germaniae. Ein systematisch-floristischer Katalog der Flechten Deutschlands. Stuttgart: G. Fischer. 208 pp.

Grummann, V.J. 1974: Biographisch-bibliographisches Handbuch der Lichenologie. Lehre: J. Cramer. 839 pp.

Hillmann, J. & Grummann, V. 1957: Kryptogamenflora der Mark Brandenburg und angrenzender Gebiete. Band VIII: Flechten. Berlin, Nikolassee: Gebrüder Borntraeger. 898 pp.

Johannes Hillmann

Johannes Hillmann was born in Berlin in 1881, where he studied natural sciences, and then chose to become a teacher, working in various schools until his retirement in 1939. He started publishing on lichens in 1916, and continued to do so until 1943, when the Second World War must have influenced much of his activities. Of his 36 publications, the most well-known contributions, apart from in his posthumous published work on the lichen flora from Brandenburg (Hillmann & Grummann 1957), are on the families *Parmeliaceae* and *Teloschistaceae* for *Rabenhorst's Cryptogamic Flora* (Hillmann 1935, 1936). He died in Berlin in 1943, and unfortunately his herbarium in Buckow near Berlin was destroyed during the war.

Fig. 25: Johannes Hillmann, a school teacher who contributed extensively to lichenology, particularly to Rabenhorst's *Flora*, where he wrote the large families Parmeliaceae and Teloschistaceae.

Literature

Hillmann, J. 1935: Teloschistaceae. In: Dr. L. Rabenhorst's Krytogamen-Flora von Deutschland, Österreich und der Schweiz **9**(6,1). Leipzig: Akademische Verlagsgesellschaft. pp. 1–36.

Hillmann, J. 1936: Parmeliaceae. In: Dr. L. Rabenhorst's Kryptogamen-Flora von Deutschland, Österreich und der Schweiz. **9** (5,3). Leipzig: Akademische Verlagsgesellschaft. 309 pp.

Hillmann, J. & Grummann, V. 1957: Kryptogamenflora der Mark Brandenburg und angrenzender Gebiete. Band VIII: Flechten. Berlin, Nikolassee: Gebrüder Borntraeger. 898 pp.

Oscar Klement

Fig. 26: Oskar Klement (left) together with A. Henssen and I.M. Lamb (right) in 1964.

Oscar Anton Carl Klement was born in Komotau close to the German-Czech border in 1897, at a time when Bohemia was still a part of the Austrian Empire. Circumstances never allowed him the opportunity to study at a university, so he went into business eventually becoming a director of "Mannesmannröhren und Eisenhandel" in Komotau until 1945. After the Second World War and the unfortunate political tumour, as for many people of German origin who had lived in "Sudetenland" occupied by the Nazis in 1938, as a consequence of the Munich agreement, Klement was forced to leave all his belongings behind, including the herbarium and library. After a few years working as a logger, he was allowed to return to business in Hannover where he also became a director until 1962. Since the 1930s he published close to 100 titles mainly concerning floristic records from various regions, at home and abroad. To his larger works belong his *Prodromus* covering central European lichen communities, the lichen vegetation of the Canaries, and lichens occurring on serpentine in the Balkans (Klement 1955, 1965, Krause & Klement 1962). To his great scientific achievements should also be mentioned his enormous work in completing Erichsen's lichen flora of northwestern Germany (Erichsen 1957) and Grummann's bibliographic work (Grummann 1974) – where in both cases today he should have been cited as the second author. Klement was honoured with a doctorate *honoris causa* from Bonn University in 1959, and died in Lindenberg in Allgäu in 1980.

Literature

Erichsen, C.F.E. 1957: Flechten von Nordwestdeutschland. Stuttgart: G. Fischer. 411 pp.

Grummann, V.J. 1974: Biographisch-bibliographisches Handbuch der Lichenologie. Lehre: J. Cramer. 839 pp.

Klement, O. 1955: Prodromus der mitteleuropaischen Flechtengesellschaften. Feddes Repertorium, Beiheft **135**: 5–194.

Klement, O. 1965: Zur Kenntnis der Flechtenvegetation der Kanarischen Inseln. Nova Hedwigia **9**: 503–582.

Krause, W. & Klement, O. 1962: Zur Kenntnis der Flora und Vegetation aus Sepentinstandorten des Balkans. 5. Flechten und Flechtengesellschaften auf Nord-Euboa (Griechenland). Nova Hedwigia **4**: 189–262.

Georg Lettau

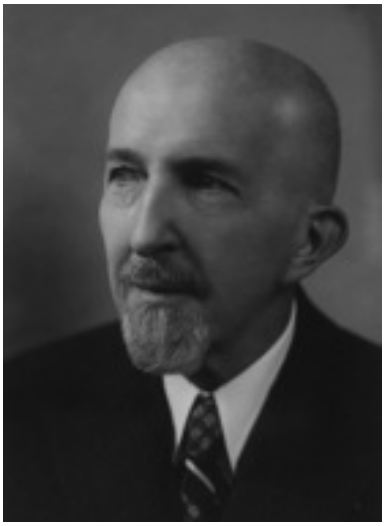

Fig. 27: Georg Lettau, a skilled ophthalmologist who published monographs of several lichen families in *Feddes Repertorium* inspired by A. Zahlbruckner and J. Steiner.

Georg Lettau was born in Weißenfels in the Prussian province of Saxony (now part of Sachsen-Anhalt) in 1878. He first studied natural sciences in Halle and Leipzig, but switched to medical studies in the universities at Freiburg, Heidelberg and München. He began his career as a doctor in Dresden, and as an ophthalmological specialist in Arnstadt in Thüringen and from 1910 in Lörrach in Baden. During the first decades of the 20th century he seemed to have become interested in lichens, being influenced by A. Zahlbruckner and J. Steiner, and he started publishing mainly on lichens from Thuringia. He was more interested in botany than in medicine, but chose to become a physician to secure a safe income. However, he selected ophthalmology as a 'minor subject' to allow him more time for botanical studies. During the period of inflation following the First World War he lost all his savings and for several years had to work solely as a physician to earn his living, but after a break of many years he returned to lichenology, publishing *Monographische Bearbeitung einiger Flechtenfamilien* (LETTAU 1937), his *Flechten aus Mitteleuropa*, which appeared in several issues (partly posthumous), as well as c. 20 other publications (LETTAU 1939, 1944, 1958). He died in 1951. His herbarium formed the basis for the new lichen herbarium at Berlin-Dahlem.

Literature

LETTAU, G. 1937: Monographische Bearbeitung einiger Flechtenfamilien. Feddes Repertorium, Beiheft **69**. 250 pp.
LETTAU, G. 1939: Flechten aus Mitteleuropa, I. Feddes Repertorium, Beiheft **119**. 43 pp.
LETTAU, G. 1944: Flechten aus Mitteleuropa. VIII. Feddes Repertorium **54**: 82–136.
LETTAU, G. 1958: Flechten aus Mitteleuropa XIV (Schluss). Feddes Repertorium **61**: 105–171.

Fritz Mattick

Wilhelm Fritz Mattick was born in Dresden in 1901 and first studied at a seminar to become a teacher, but whilst teaching at school he continued his studies at the technical university in Dresden, earning a doctorate in 1927. He became an assistant at the Technical University of Dresden, and in 1932 accepted a position as a research assistant in the Botanical Museum in Berlin where he mainly became responsible for the lichen collections, in addition to plant geographical recording, which he maintained until 1945 despite the wartime interruption during which he served in the army based

Fig. 28: Fritz Mattick, plant biologist, bryologist and lichenologist, started *Nova Hedwigia* in 1959 together with Johannes Gerloff.

Fig. 29: Walter Migula, well-known for his cryptogamic floras of Germany, Austria and Switzerland.

in northern Norway. After the war he was dismissed for political reasons and worked for a while with Reinold Tüxen on his biogeographically-based research projects. Mattick was, however, recalled to Berlin in 1947 and reinstalled in the Botanical Museum, receiving the title of curator in 1953. He was foremost a lichenologist, but had many interests in other fields of biology and published considerably on general biological problems, botanical history and biogeography. In 1958 he became an honorary professor in plant geography, which was one of his main interests. After retirement in 1966 he published little, mainly reviews. He is especially known for having initiated together with Johannes Gerloff the journal *Nova Hedwiga* in 1959, both seeing the need for a journal devoted to cryptogams. Mattick was not so prolific lichenologically when compared with successors such as Follmann and Sipman, but his c. 50 publications cover many aspects of tropical and arctic lichenology (Mattick 1940, 1950a, 1950b). Many Germans of his generation were severely affected by the war, and during his service in northern Norway Mattick was informed that all his family, home, belongings and scientific documents were gone – anyone would have had difficulties to rise again after such a loss. He died in 1984 having lived through much of the dramatic history of 20th century Germany.

Literature

Mattick, F. 1940: Die Flechten der Hawaii-Inseln. Feddes Repertorium **49**: 187–206.

Mattick, F. 1950a: Die Flechten Spitzbergens. Polarforschung **19**(2): 261–273 "1949".

Mattick, F. 1950b: Das Problem der bipolaren Flechten. Polarforschung **20**: 341–345.

Walther Migula

Emil Friedrich August Walther Migula was born in Zyrowa in Upper Silesia (presently in southern Poland) in 1863. He studied at the

University of Breslau from where he obtained his doctorate in 1888. He then became an associated professor at the technical university in Karlsruhe, before he accepted a position at the forest academy in Eisenach in 1895. He retired in 1929, and died in Eisenach 1938, being known for his work and 15 publications on the cryptogamic flora of Germany, Austria and Switzerland (Migula 1929/1931).

Literature

Migula, W. 1929/1931: Flechten. In: Thomé: Kryptogamen-Flora von Deutschland, Deutsch-Österreich und der Schweiz **12**, Abt. 4. Berlin: H. Bermühler **I**: 527 pp. , **II**: 868 pp.

Heinrich Sandstede

Johann Heinrich Sandstede was born in Zwischenahn close to Oldenburg in north-western Germany in 1859, where he lived for almost a century before dying in his hometown in 1951. The career for young Sandstede, similar to many people in those days, was more or less settled, namely working in his father's bakery. He went on the traditional long walks in Bavaria and the Rheinland, a custom of those days, to learn more of his future profession. After a few years he was back in his hometown and his father's bakery, to become head baker in 1912. However, he had developed an interest in lichens from his excursions in the heathlands of northern Germany and his first publication appeared in 1889 (Sandstede 1889). Many more publications on the lichen flora of the same region followed, as well as on the genus *Cladonia*, which seems to have been his main interest (Sandstede 1906, 1912, 1913). Although he never had the opportunity to study at university, he was very proud to receive an honorary degree from the University of Münster in 1930. His largest and most important publication was on the Cladoniaceae in *Rabenhorst's Kryptogamenflora* (Sandstede 1931). He also distributed his well-known *Cladoniae exsiccatae* (Sandstede 1930) and published nearly 40 papers. What is generally not known about him is his friendship with Paul von Hindenburg, Reichspräsident after the First World War. Clearly Sandstede visited Hindenburg many times in Berlin and von Hindenburg paid his old friend a visit in Oldenburg on at least two occasions, but we have not found anything of lichenological interest that rubbed off on Hindenburg!

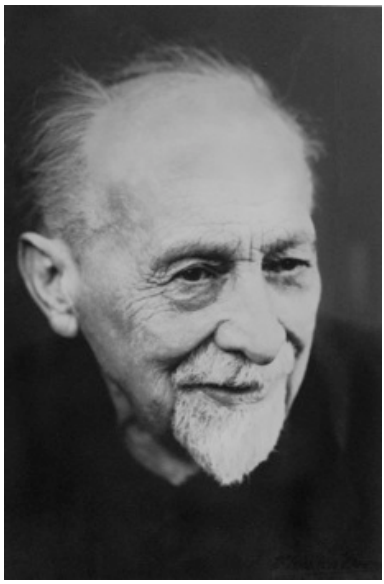

Fig. 30: Heinrich Sandstede, the baker from Oldenburg who never received a formal education, made major contributions to the study of the genus *Cladonia* for which he received an honorary degree from the University of Münster.

Literature

Sandstede, H. 1889: Beiträge zu einer Lichenenflora des nordwestdeutschen Tieflandes. Abhandlungen des naturwissenschaftlichen Vereins Bremen **10**: 439–480.

Sandstede, H. 1906: Die Cladonien des nordwestdeutschen Tieflandes und der deutschen Nordseeinseln. Abhandlungen des naturwissenschaftlichen Vereins Bremen **18**: 384–456.

Sandstede, H. 1912: Die Flechten des nordwestdeutschen Tieflandes und der deutschen Nordseeinseln. Abhandlungen des naturwissenschaftlichen Vereins Bremen **21**: 9–243.

Sandstede, H. 1913: Die Cladonien des nordwestdeutschen Tieflandes und der deutschen Nordseeinseln. II. Abhandlungen des naturwissenschaftlichen Vereins Bremen **21**: 337–383.

Sandstede, H. 1930: Sandstede, Cladoniae exsiccatae. Berichtigte Uebersicht. Westerstede, 63 pp., [published by the author].

Sandstede, H. 1931: Die Gattung *Cladonia*. In: Dr. L. Rabenhorst's Kryptogamen-Flora von Deutschland, Österreich und der Schweiz. **9**(4,2). Leipzig: Akademische Verlagsgesellschaft. pp. 1–531.

Alwin Schade

Friedrich Alwin Schade, born in Putzkau in the vicinity of Dresden in 1881, had a long life, enduring the horrors of the two world wars. In 1901 he began his studies in biology, chemistry and geography at the University of Leipzig. From 1906 he was engaged as a teacher in biology and anthropology at a high school in Dresden, but managed to maintain his interest in botany through further studies, earning a doctorate from Jena in 1912, his thesis on the ecology of plants growing on rocks in Saxony supervised by the well-know Stahl (Schade 1913). In 1916 he was called for war service, but was captured and sent to an English prison camp. In the Second World War, he and his family were in Dresden, and lost all their belongings during the horrific air raid on 13–14 February 1945. He was officially retired in 1946, but because of the post-war situation he was allowed to stay on as teacher until 1951. Despite the loss of his herbarium, books and documents, he started to build up a new collection and also published regularly, particularly on genera such as *Umbilicaria* and *Cladonia* (Schade 1955, 1957, 1965) and on the history of cryptogamic botany. One of his special merits was the clarification of regenerative thallus growth forms after damage by feeding snails. In 1966 he received an honorary doctorate from the University of Dresden for his service to science and especially lichenology. He died in Putzkau in 1976, having seen much of the historical and scientific change in central Europe for almost a century. His herbarium went to the Natural History Museum at Görlitz, now part of the Senckenberg Museum.

Literature

Schade, A. 1913: Pflanzenökologische Studien an den Felswänden der sächsichen Schweiz. Botanische Jahrbücher [Engler] **48**: 119–211.

Schade, A. 1955: Zur sächsischen Flechtenflora insbesondere aus der Familie der Umbilicariaceen. Nova Acta Leopoldina, N.F. **17**: 191–286.

Schade, A. 1957: Beiträge zur Kenntnis der Flechtengattung *Cladonia* (Hill.) Web. mit dem Fundortsverzeichnis der sächsischen Arten. Subg. I. *Cladina* (Nyl.) Vain. Die Flechten Sachsens V. Abhandlungen und Berichte. Naturkundemuseums Görlitz **35**: 45–112.

Schade, A. 1965: Beiträge zur Kenntnis der Flechtengattung *Cladonia* Hill ex G. H. Web. mit dem Fundortsverzeichnis des sächsischen Arten B. Chasmariae (Ach.) Flk. (Forts.) Flechten Sachsens IX. Abhandlungen und Berichte. Naturkundemuseums Görlitz **40**: 1–30.

Herbert Schindler

Arthur Walther Herbert Schindler, born in 1907 in Zittau, lost his father at the end of World War I and moved with his mother to Dresden where he attended the Kreuzgymnasium with Alwin Schade among his teachers. He later studied natural sciences in Dresden and Danzig (now Gdańsk, Poland) and obtained his doctorate of technical sciences in Dresden for work on wood structures with Friedrich Tobler. He also passed the examinations to become a teacher and started his teaching career in Plauen, but soon went into the pharmaceutical industry, working in Radebeul near Dresden and Leipzig and, after the Second World War, in Karlsruhe and Heidelberg. When he became interested in lichens he found that his former teacher Alwin Schade was the leading lichenologist in Saxony at this time and they soon developed a life-long friendship. Beside his very successful professional work with over 100 publications including two books, he also published nearly 40 floristic and plant geographical papers before the Second World War (SCHINDLER 1937, 1940) and after his retirement in 1972 (e.g. SCHINDLER 1975). He was always interested in distribution patterns of lichens and published his results in the series *Beiträge zur Geographie der Flechten* and *Die höheren Flechten des Nordschwarzwaldes*. Although the latter series concentrates on macrolichens in the northern Black Forest, not to far from Karlsruhe where he was living, he also published results from collecting trips to Alaska and Turkey (SCHINDLER 1990, 1998). He incorporated all of his collections himself into the lichen herbarium of the Natural History Museum at Karlsruhe, which he had curated over more than a quarter of a century. He died on the last day of 1998 after a long life with two successful careers.

Literature

SCHINDLER, H. 1937: Flechtenflora von Rudolstadt. Ein Beitrag zur Lichenographie von Thüringen. Beihefte zum Botanischen Centralblatt **56**, Abt. B: 327–352.

SCHINDLER, H. 1940: Beiträge zur Geographie der Flechten VI. Die Verbreitung von *Lecanora lentigera* (Web.) Ach. in Deutschland. Berichte der Deutschen Botanischen Gesellschaft **57**: 389–399.

SCHINDLER, H. 1975: Über die Flechte *Parmelia contorta* Bory und ihre bisher bekannte Verbreitung. Herzogia **3**: 347–364.

SCHINDLER, H. 1990: Zweiter Beitrag zur Flechtenflora von Alaska. Herzogia **8**: 335–356.

SCHINDLER, H. 1998: Beitrag zur Flechtenflora von Westanatolien, Türkei. Herzogia **13**: 234–237.

Friedrich Tobler

Friedrich Tobler was born in 1879 in Berlin, but he was a Swiss citizen since his father, at that time the Chair of Romance Studies at the University of Berlin, was Swiss. He studied natural sciences at Heidelberg, Berlin and Leipzig, and in 1901 obtained his doctorate from Berlin with a non-lichenological thesis supervised by Simon Schwendener. In 1905 he became an assistant to Wilhelm Zopf at the University of Münster where he received his habilitation in the same year, and was promoted to professor in 1911. After extended travels in Africa and military service during the war, he became Head of the Research Institute of Textile Fibres at Sorau (now Żary, Poland). Between 1926 and 1945 he was Head of Botany at the Technical University of Dresden and also the Director of the Botanical Garden. As well as his researches on economic botany, he published nearly 50 papers on lichens, especially their physio-

logy and biology, which culminated in two books (Tobler 1925, 1934). After his retirement he lived in Switzerland where he died in 1957 in Trogen.

Literature

Tobler, F. 1925: Biologie der Flechten. Entwicklung und Begriff der Symbiose. Berlin & Leipzig: Gebr. Borntraeger. vii + 265 pp.

Tobler, F. 1934: Die Flechten. Eine Einführung in ihre allgemeine Kenntnis. Auf Grund neuerer Forschungen und kritisch dargestellt. Jena: G. Fischer. 85 pp.

Hans Ullrich

Fig. 31: Hans Ullrich while presenting his herbarium to the authorities of the Harz National Park in 1996.

Hans Ullrich, born in 1913 in Quedlinburg at the northern rim of the Harz Mountains, belongs to the group of very enthusiastic amateurs which played an important part in maintaining lichenology in Germany at a time when positions for lichenologists at universities were rather scarce. He studied architecture at the Technical University of Stuttgart were he passed the first examination in 1936. After some practical experience he earned his diploma degree after some final examinations in Berlin in 1941. After the Second World War he decided to live in Langelsheim and later in Goslar in Lower Saxony instead of his home town. Despite his successful professional career, he was very strongly interested in lichens, first in cooperation with Klement, and later with Poelt and Hertel. He published floristic papers on the regional lichen flora over a period of 40 years (e.g. Ullrich 1962, Ullrich & Poelt 1968, Ullrich & Schlicht 2001) and did much for the protection of lichen-rich sites. He also organized major collecting trips with Poelt and Hertel to western Greenland and to Spitsbergen/Svalbard (Hertel & Ullrich 1976). He died in 2002, having seen the reunification of Germany and greatly enjoyed his return visit to Brocken following the departure of the military. His collections are now housed in the administration of the Harz National Park.

Literature

Hertel, H. & Ullrich, H. 1976: Die Flechten von Amsterdamöya (Svalbard). Mitteilungen der Botanischen Staatssammlung München **12**: 417–512.

Ullrich, H. 1962: Eine neue amphibische Flechtengesellschaft der Harzbäche, das Lecideetum hydrophilae. Berichte der Naturhistorischen Gesellschaft Hannover **106**: 49–54.

Ullrich, H. & Poelt, J. 1968: *Lecanora picea* und *Lecidea praeruptorum*, zwei verkannte und übersehene Arten auf Quarziten des Harzes. Herzogia **1**: 73–77.

Ullrich, H. & Schlicht, R. 2001: Flechten am Rammelsberg. In: Roseneck, R. (ed.): Der Rammelsberg. 1000 Jahre Mensch – Natur – Technik. Goslar, Bd. **2**: 390–401.

4 New techniques and methods

The modern period following the enormous scientific development during the second half of the 20th century was also a successful period for Germany. Destroyed universities were rebuilt and a large number of new ones were established all over the country during the 1960s and 1970s, filling the new facilities with a new generation of enthusiastic younger teachers and students. Some of these pioneering academic teachers are no longer with us, such as Benno Feige (Fig. 36), Aino Henssen (Fig. 41), Siegfried Huneck (Fig. 43), Christian Leuckert (Fig. 52), Elisabeth Peveling (Fig. 54) and Josef Poelt (Fig. 55), and others have retired, such as Fred Daniëls (Fig. 35), Gerhard Follmann (Fig. 38), Hannes Hertel (Fig. 42), Martin Jahns (Fig. 44), Klaus Kalb (Fig. 47), Ludger Kappen (Fig. 48), Otto Lange (Fig. 51) and Volkmar Wirth (Fig. 66). All these in different ways contributed to the education of generations of students through their lectures and researches on ecology, ecophysiology, environmental change, lichens and air pollution, secondary chemistry, ultrastructure, population genetics, biodiversity and systematics. Numerous doctoral theses were defended and an enormous amount of scientific research was published. The persons listed below either belong, or have belonged, to different university departments or research groups, or associated with regional museums or private environmental agencies.

Wolfgang von Brackel

Wolfgang von Brackel was born in Bamberg in northern Bavaria in 1952. He studied biology at the University of Erlangen, earning his master's degree in 1980, after which he chose to establish himself as a freelance biologist working for private companies, rather then competing for a career within the universities. He is presently associated with the Institut für Vegetationskunde und Landschaftsökologie (IVL) near Erlangen, where he researches both lichens and lichenicolous fungi (Brackel 2005, 2006, 2007a, 2007b). Von Brackel belongs to a small group of extremely qualified field biologists.

Fig. 32: Wolfgang von Brackel (to the right), currently in the Institut für Vegetationskunde und Landschaftsökologie, seen here with Hannes Hertel at a symposium in München in 2008.

Internet

http://www.ivl-web.de/von_brackel.htm

Literature

Brackel, W. von 2005: Flechten, flechtenbewohnende Pilze und Moose im NSG Sandgrasheide Pettstadt. In: Flora und Vegetation im östlichen Franken. Hemhofen: Veröffentlichungen des Berufsverbandes der Ökologen Bayerns. pp. 85–96.

Brackel, W. von 2006: Epiphytische Flechten in den Tannenwäldern Taubenberg. Epiphytic lichens in fir forests at the Taubenberg. Waldoekologie Online **3**: 31–41.
Brackel, W. von 2007a: Weitere Funde von Flechtenbewohnenden Pilzen in Bayern Beitrag zu einer Checkliste III. Berichte der Bayerischen Botanischen Gesellschaft **77**: 5–25.
Brackel, W. von 2007b: Zur Flechtenflora der Serpentinitfelsen in Nordostbayern. Hoppea **68**: 253–268.

Burkhard Büdel

Fig. 33: Burkhard Büdel, professor in Kaiserslautern, ecophysiologist with a considerable knowledge of lichens with procaryotic algae.

Burkhard Büdel was a member of the well-known group of pupils Aino Henssen gathered around her and inspired for further work during her active tenure as professor at Marburg University. Büdel worked mainly on Southern Hemisphere lichens with cyanophilic photobionts exposed to extreme habitats (Büdel 1987, Büdel et al. 2000). His main research has developed from his interest in their systematics and ecological adaptation (Lange et al. 1994, Schultz & Büdel 2002, Ullmann & Büdel 2001). After his PhD and successful post-doctoral work in Würzburg with Otto Lange, he received his habilitation, becoming Professor of Botany responsible for lower plants at Rostock University in 1995. Büdel learnt much from Lange and has since then always tried to combine his knowledge in systematics, ecology and ecophysiology (Büdel 2007). After a few years, Büdel was appointed Head of Botany at Kaiserslautern University where he has developed a research group focussing on ecology and ecophysiology of pro- and eucaryotic algae and lichens, ecophysiology of soil crusts in arid and semi-arid regions of the world, and the functional morphology and anatomy of lower plants. He is actively publishing on these subjects, in over 90 papers, being internationally well-known and respected.

Internet

http://www.uni-kl.de/wcms/bio-buedel_burkhard.html

Literature

Büdel, B. 1987: Zur Biologie und Systematik der Flechtengattungen *Heppia* und *Peltula* im südlichen Afrika. Bibliotheca Lichenologica **23**. Berlin, Stuttgart: J. Cramer. 105 pp.
Büdel, B. 2007: Otto Ludwig Lange – 80 years: Eco-physiology – the key to understanding the function and distribution patters of plants and lichens. Flora **202**: 590–607.
Büdel, B., Becker, U., Follmann, G. & Sterflinger, K. 2000: Algae, fungi, and lichens on inselbergs. In: Porembski, S. & Barthlott, W. (eds). Inselbergs. Biotic diversity of isolated rock outcrops in tropical and temperate regions. Ecological Studies **146**: 69–90. Berlin: Springer.

Lange, O.L., Büdel, B., Zellner, H., Zotz, G. & Meyer, A. 1994: Field measurements of water relations and CO_2 exchange of the tropical, cyanobacterial basidiolichen *Dictyonema glabratum* in a Panamanian rainforest. Botanica Acta **107**: 279–290.

Schultz, M. & Büdel, B. 2002: Key to the genera of the Lichinaceae. Lichenologist **34**: 39–62.

Ullmann, I. & Büdel, B. 2001: Biological soil crusts of Africa. In: Belnap, J. & Lange, O.L. (eds). Biological soil crusts: structure, function, and management. Ecological Studies **150**: 107–118. Berlin, Heidelberg: Springer.

Rainer Cezanne

Fig. 34: Rainer Cezanne (in the centre), a freelance biologist, seen here at a BLAM excursion with Dieter Zimmermann (left) and Marion Eichler. All three belong to a small group within BLAM who can impressively identify nearly everything with the hand lens.

Rainer Cezanne, born in 1956 in Walldorf in Hessia, studied biology at Darmstadt where he obtained his master's degree in 1983. Since 1986 he has been engaged as a freelance biologist recording ecological changes to the countryside in the vicinity of Darmstadt. Cezanne, nearly always together with his partner Marion Eichler, has mainly been publishing on lichens from the Hessian region, and on threatened lichens (Cezanne et al. 2002, 2008). He is one of the most skilled persons in identifying lichen biodiversity.

Internet

http://www.bg-ang-oekologie.de/flechten.html

Literature

Cezanne, R., Eichler, M. & Thüs, H. 2002: Nachträge zur "Roten Liste der Flechten Hessens." Erste Folge. Botanik und Naturschutz in Hessen **15**: 107–142.

Cezanne, R., Eichler, M., Hohmann, M.-L. & Wirth, V. 2008: Die Flechten des Odenwaldes. Andrias **17**: 1–520.

Fred Daniëls

Fig. 35: Fred Daniëls (to the left) and Peter James, at a lichen symposium in Wageningen 1994.

Fred Daniëls was born in Arnhem, The Netherlands in 1943. After studying biology at the University of Utrecht during the 1960s he defended a thesis on the vegetation of Southeast Greenland in 1980. He continued as a staff member at the Institute of Plant Systematics (later also Ecology) in Utrecht until 1987, when he became a professor in plant ecology at the University of Münster. He has worked on all aspects of plant ecology, particularly vegetation analysis and mapping within arctic and boreal regions, especially Greenland, as well as heathlands of Western Europe. He has a special interest in lichen communities dominating arctic and alpine heathlands (Bültmann & Daniëls 2000, 2001, 2009, Daniëls 1995, Daniëls et al. 2000, 2008) and was the senior editor of the jubilee volume for Follmann (Daniëls et al. 1995).

Internet

http://www.uni-muenster.de/Biologie/Mitarbeiter/Daniels.html

Literature

Bültmann, H. & Daniëls, F.J.A. 2000: Biodiversity of terricolous lichen vegetation. Berichte der Reinhold-Tüxen-Gesellschaft **12**: 393–397.

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Bültmann, H. & Daniëls, F.J.A. 2009: Lichens and vegetation – a case study of Thamnolietum vermicularis. In: Thell, A., Seaward, M. R. D. & Feuerer, T (eds): Diversity of lichenology – anniversary volume. Bibliotheca Lichenologica **100**: 31–47.

Daniëls, F.J.A. 1995: Notes on *Cladoniae* from the National Park Ozark National Scenic Riverways, Missouri, United States of America. In: Daniëls, F.J.A., Schulz, M. & Peine, J. (eds). Flechten Follmann. Köln: University of Cologne, pp. 501–509.

Daniëls, F.J.A., Bültmann, H., Lünterbusch, C. & Wilhelm, M. 2000: Vegetation zones and biodiversity of the North-American Arctic. Berichte der Reinhold-Tüxen-Gesellschaft **12**: 131–151.

Daniëls, F.J.A., Lepping, O. & Minarski, A. 2008: Die Bedeutung der Kryptogamengesellschaften für die Zustandsbewertung des gesamten Ökosystems erläutert am Beispiel der Flechten. Berichte der Reinhold-Tüxen-Gesellschaft **20**: 147–162.

Daniëls, F.J.A., Schulz, M. & Peine, J. (eds) 1995: Flechten Follmann. Contributions to lichenology in honour of Gerhard Follmann. Köln: University of Cologne. 580 pp.

Reinhard Doll

Reinhard Doll was born in 1941 and studied biology at the University of Rostock where he received his PhD with a taxonomic paper on *Taraxacum* in 1972. His second thesis on the evolution of *Taraxacum* was defended at the Humboldt University of Berlin in 1977. Later he held a teaching position at the Botany Department of the University of Greifswald, remaining in office there until 1992. His most important

contribution to lichenology is his book *Die Flechten, Eine Einführung* (DOLL 1982). The text comprises a large taxonomic component, where the lichens are accordingly organized into a system, followed by identification keys to taxa occurring in the former GDR; a general introduction includes definitions and structures in lichens, chemistry, ecology, and lichens in bioindication, much of which is seemingly influenced by the well-known book by Henssen & Jahns, *Lichenes, Eine Einfürung in die Flechtenkunde*, which during these times was not accessible in GDR bookstores. The quality of the book is of course not comparable with western standards, but Doll's *Flechten* played an important academic role in the closed GDR society at that time.

Literature

DOLL, R. 1982: Flechten. Eine Einführung. Die Neue Brehm-Bücherei **40**. Wittenberg Lutherstadt: A. Ziemsen. 243 pp.

Marion Eichler

Marion Eichler (Fig. 34), born in 1957 in Dreieichenhain, Hessia, graduated on a master's thesis in biology in 1985 at the University of Darmstadt. In 1989 she started work as freelance ecologist, often collaborating on lichen projects with her partner Rainer Cezanne (CEZANNE et al. 2002, 2008). Eichler belongs to a group of very qualified field lichenologists.

Internet

http://www.bg-ang-oekologie.de/flechten.html

Literature

CEZANNE, R., EICHLER, M. & THÜS, H. 2002: Nachträge zur "Roten Liste der Flechten Hessens." Erste Folge. Botanik und Naturschutz in Hessen **15**: 107–142.

CEZANNE, R., EICHLER, M., HOHMANN, M.-L. & WIRTH, V. 2008: Die Flechten des Odenwaldes. Andrias **17**: 1–520.

Gisela Ernst

Gisela Meta Elisabeth Ernst, born in Hamburg in 1928, was an amateur lichenologist who worked as a biology teacher; she chose to retire at 60 years age, hoping to spend many years on her hobby, studying lichens. She developed a close friendship with Tassilo Feuerer (Fig. 37), and together they recorded the changes in the lichen flora of the Hamburg area (ERNST 1997, ERNST & HANSTEIN 2001, FEUERER et al. 1996). Ernst died in Ahrensburg in 2001, and is commemorated through c. 15 publications, her outstanding knowledge of species, and the species *Parmelia ernstiae* that she discovered (FEUERER & THELL 2002).

Literature

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Guido Benno Feige

Fig. 36: Benno Feige, professor of botany at Essen (left) with J. Poelt at the IAL2 congress in 1992.

Guido Benno Feige was born in Salzwedel in the Prussian province of Saxony (now Sachsen-Anhalt) in 1937. He started his university studies in chemistry at Jena in the former GDR, but two years later he managed to escape the iron curtain and continued his studies in chemistry, biology and geography at the University of Würzburg. In 1967 he defended a thesis on a theme related to physiology of the symbiotic partners in lichens, which also later concerned his habilitation at the University of Köln where he had moved to become a research assistant in 1970. In 1980 he was offered the Chair in Botany in Essen, where he stayed for 23 years until his retirement in 2003; here he directed a very successful department surrounded by a number of research assistants and many students. He was a much appreciated and inspiring teacher and a very good supervisor for his students, many of whom have become well-known teachers and scientists, such as Manfred Jensen, Thorsten Lumbsch and Imke Schmitt. He published more than 100 scientific papers (Feige et al. 1992, 1993a, 1997) and had a special interest in lichen secondary chemistry, establishing excellent facilities for HPLC analysis (Feige et al. 1993b, Geyer & Feige 1987, Geyer et al. 1984). He died in Essen in 2007, and his legacy is in his pedagogic and scientific activities, having established a lichen herbarium, now transferred to Halle, and a new botanical garden in Essen. He was honoured with a Festschrift in connection with his retirement in 2003 (Jensen 2003).

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Tassilo Feuerer

Tassilo Feuerer was born in 1949 in Munich, where he studied biology at the university where Hannes Hertel became Feuerer's supervisor for a thesis work on the non-yellow species of *Rhizocarpon*. In 1984 Feuerer was appointed as Curator of Cryptogams in the Hamburg Herbarium, where he has remained to this day. Apart from his systematic work on lichens, especially *Rhizocarpon* (Feuerer 1991), he has focussed on recording and managing databases of lichens (Feuerer & Ernst 1993a, 1993b, 1995, Feuerer et al 2004). He has travelled and collected extensively, preferably in South America, and has a general interest and knowledge in biodiversity and phylogeny of lichens (Feuerer & Hawksworth 2007, Thell et al. 2004); he also maintains an appreciated web-site of checklists and collectors of lichens and is a great collector himself with more than 60 000 numbers.

Fig. 37: Tassilo Feuerer (right) and Matthias Schultz, good friends and colleagues in Hamburg University, shortly after 2000.

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Gerhard Follmann

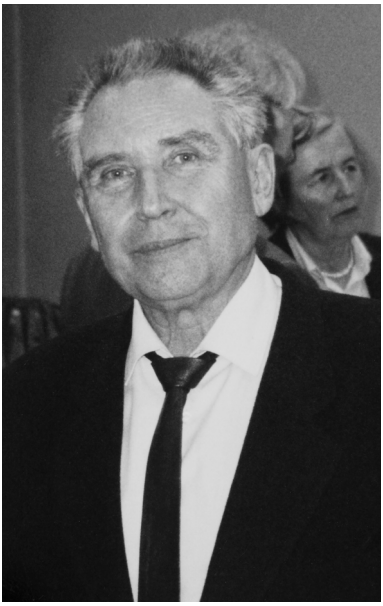

Fig. 38: Gerhard Follmann at his retirement party 1995.

Gerhard Follmann was born in Kassel in 1930, but his university studies in natural sciences were in Marburg, with a short break in Innsbruck, and then back in Marburg where he received his first degree for work on transport processes in diatoms. In 1955 he moved with his supervisor to the Technical University in Braunschweig where he received his doctorate in 1957 on the same theme. By chance he got an opportunity to work as a research professor at the Agricultural University of Santiago in Chile. This adventure lasted until 1966, but as a consequence of the political disturbance there, he had to return home with his family. During the years in Chile he changed his interest from physiology to lichen biology and systematics. He also travelled considerably within Chile and visited many lichen-rich areas bordering the deserts. During this period he started his long association with Siegfried Huneck in Halle, a specialist in lichen secondary chemistry. Together they published a long series of papers as *Mitteilungen über Flechtenstoffe* or *Zur Chemie chilenischer Flechten* from 1963 to 1980 (Follmann & Huneck 1968, 1969, Huneck & Follmann 1965, 1966). After the inspiring years in Chile, he was offered the position as Curator at the Berlin Herbarium after Fritz Mattick. However, Berlin in those days was another turbulent place for political and social conflicts leaving nobody untouched. This is why he (as did Poelt later) decided to leave Berlin for a quieter place to work. Follmann became Director of the Natural History Museum in his hometown Kassel in 1970. However, he was not a person who sought tranquillity and inactivity, but always looked for new challenges, first being engaged as Professor of Botany in the newly established University of Kassel from 1975, and then finally offered the Chair in Ecology and Plant Systematics in Köln in 1982. During the successful years in Köln he published c. 250 papers, having a special interest in the lichen family Roccellaceae and in the lichen flora of subtropical islands (Follmann 2001, Follmann & Mies 1986). He was honoured by a Festschrift in connection with his retirement in 1995 (Daniëls et al. 1995).

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Thomas Friedl

Thomas Friedl was born in Munich in 1960. During his university studies in Marburg, Aino Henssen became his first mentor of lichenology, introducing him in particular to problems connected with the symbiotic algae. He obtained his diploma in biology with Aino Henssen as his supervisor in 1985, after which he moved to Bayreuth where he gained his PhD in 1989 (Friedl 1989). He continued working in Gerhard Rambold's laboratory to extend his knowledge of both free-living algae and algal symbionts as an assistant professor, during which time he obtained his habilitation (Rambold et al. 1998). Before accepting a professorship in Göttingen in phycology in 1999, he spent two years working with Burkhard Büdel in Kaiserslautern (Fig. 33). Friedl's work with symbiontic partners in lichens, comprising some 30 publications, has been of great importance in inspiring many others to work in related projects (Romeike et al. 2002, Simon et al. 2005).

Fig. 39: Thomas Friedl, professor in phycology in Göttingen, particularly interested in the algal symbionts of lichens.

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Andreas Gnüchtel

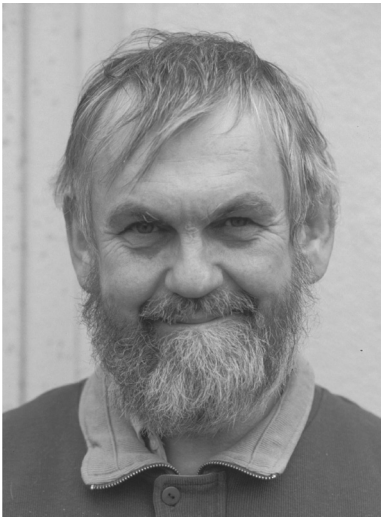

Fig 40: Andreas Gnüchtel, mathematician, software developer and database expert from Dresden.

Andreas Gnüchtel, born in Dresden in 1949, studied mathematics at the University of Leipzig. He is presently engaged as a software developer and a scientific associate at the Depertment of Botany at the Technical University of Dresden. He has held a long-time interest in biology and especially for higher plants, using his knowledge in database applications in the compilation of red lists and checklists for lichens, both in Saxony and in Germany (Wirth et al. 1996, 2010).

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Aino Henssen

Fig. 41: Aino Henssen, in her flat in Marburg October 2008, was one of the most prominent lichenologists in Germany during the second half of the 20th century (see also Fig. 26).

Aino Marjatta Henssen was born in Elberfeld in Westphalia in 1925 and attended the University of Marburg, where she obtained a doctoral degree in 1953. Her thesis was, however, not on lichens but on the physiology of the Lemnaceae. It was not until she spent several years abroad on various post-doctoral assignments and scholarships that she became interested in lichens, especially during her time in Uppsala in the late 1950s and early 1960s (Henssen 1963). In 1963 she was appointed Curator of Cryptogams in Marburg following her habilitation in 1965, entitling her to apply for a professorship which she received in 1970. She was Professor in Systematic Botany for 20 years, during which time she mainly studied and developed methods of elucidating ana-

tomical structures and ontogenetic development of reproductive structures in lichens (Henssen 1976, Henssen et al. 1981). Her laboratory was always full of students at all levels of their education, which she enthusiastically supported in a very personal way. She published or co-authored more than 100 papers, many of which concern the family Lichinaceae. Above all she is known for her book *Lichenes, Eine kurze Einführung in die Flechtenkunde*, which she co-authored with her former pupil Martin Jahns (Henssen & Jahns 1974). The larger part of this important book presented a lichen system based on ontogenetic studies of the ascocarp. The book, although written in German, was for many years a standard reference to lichen biology in general. Several prominent lichenologists studied with her, including Burkard Büdel (Fig. 32) and Thorsten Lumbsch (Fig. 73). Her studies on the ontogeny of the ascocarps and their importance for classification had a large influence on further studies of ascoma and ascus structures in lichenized ascomycetes. She was honoured on the occasion of her retirement with a volume of *Bibliotheca Lichenologica* (Jahns 1990), and was awarded the Acharius Medal in 1992. She died in Marburg on 29 August 2011, having spent the last few years in a nursing home.

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Hannes Hertel

Hannes Hertel was born in 1939 and grew up in Bavaria, studying at the University of Munich where he was inspired by his teacher, Josef Poelt, on his courses on bryophytes and lichens. When Poelt was called to a chair in the Freie Universität Berlin in 1965, Hertel decided to follow him, and within two years successfully presented his doctoral thesis on calcicolous forms within the genus *Lecidea* (Hertel 1967). Then followed a series of well-known publications on entities related to *Lecidea* and the Lecideaceae such as the unique hymenial parasite of *Arthonia* (Hertel 1969a), on the genus *Trapelia* (Hertel 1969b), the new family Trapeliaceae (Hertel 1970a), and on parasitic species within *Lecidea* (Hertel 1970b). There are many other interesting publications from the early years when he was in Berlin. When Poelt left Berlin for Graz in 1972, it was also time for Hertel to leave the politically, culturally and also partly scientifically closed city; he returned to Munich, being appointed as curator of the lichen and bryophyte herbarium in the Botanische Staatssammlungen, a position which Poelt had also occupied before his time in Berlin. All of Hertel's publications up to the mid-1980s were published in German, including his major work on sub-

Fig. 42: Hannes Hertel (see also Fig. 32), a productive lichenologist specializing in lecideoid lichens and supervisor of several well-known lichenologists, seen here at the symposium *Ökologische Rolle der Flechten* in Munich 2008 together with Sieglinde Ott.

Antarctic lecideoid species he published in connection with the monumental Festschrift for his teacher's 60th anniversary (Hertel 1984). The first publication in English appeared in the proceedings of the celebrated Münster symposium (Hertel 1987). Although most of his c. 130 publications are published in his own name, there are many exceptions especially from the time when he had an active group of promising doctoral candidates in the late 1980s and early 1990s, with students such as Schneider, Kilias, Feuerer, Triebel and Rambold. One of Hertel's successful students Rambold is now a well-known professor at Bayreuth and there were several important joint publications from this productive period of his career (Hertel & Rambold 1987, 1990, 1995). Hertel was presented a jubilee volume in connection with his retirement in 2004, the most voluminous in the series so far (Döbbeler & Rambold 2004).

Internet

http://www.botanischestaatssammlung.de/index.html?/staff/hertel.html

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Siegfried Huneck

Fig. 43: Siegfried Huneck (on the left) with Mark Seaward on the retirement party of Benno Feige in Essen.

Siegfried Huneck was born in 1928 and studied at the University of Jena where, in spite of political difficulties, he completed his PhD thesis on the chemistry of amino-derivatives of pentacyclic triterpenes in 1957. As this institute did not share his interest in the chemistry of natural products, he moved to the Institute of Plant Chemistry at the University of Dresden, where his habilitation was completed in 1964. As a non-conformist, however, Huneck was unable to pursue an academic career, so he moved to the Institute for the Biochemistry of Plants (IBP) in Halle as a scientific assistant, where he was allowed to work on the chemistry of natural compounds in lichens, as well as in liverworts and higher plants. Neverthless, he came in contact with, and was supported by, a number of foreign colleagues, and it was from Halle that many of his papers on the chemistry of lichen products originated. The Huneck-Follmann team belongs to those profitable contacts which yielded so many publications (Huneck & Follmann 1965, 1966). Ultimately, Huneck was the author or co-author of c. 350 publications, the majority of which concern the chemistry of lichen substances. These papers are noted for their accuracy and diversity. His *magnum opus* is his book on lichen substances co-authored with Yoshimura, an indispensable tool for the isolation, identification and structural analysis of the c. 700 substances in lichens (Huneck & Yoshimura 1996). The first part covers all necessary methods for the analysis of lichen metabolites; the second part gives analytical and spectroscopical data of all known lichen substances, as well as a key to their identification. Huneck was honoured with a jubilee volume of *Bibliotheca Lichenologica* in connection with his retirement in 1993 (Feige & Lumbsch 1993) and during the IAL meeting in Salzburg in 1996 he was awarded the Acharius Medal for his distinguished services to science. Siegfried Huneck died on 9 October 2011.

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Martin Jahns

Fig. 44: Martin Jahns in Norway 2007.

Hans Martin Jahns was born in Holzminden in 1941 and commenced his university studies in 1960 at the University of Marburg, where he met up with Aino Henssen, earning his doctorate in 1967. Thereafter he obtained a position in the Botanisch Laboratorium d. Rijksuniversiteit at Groeningen, where he stayed until 1972, he published numerous scientific papers, mainly concerned with the development of apothecia and the thallus in the Cladoniaceae and related forms, and also on taxonomy (Jahns 1970, 1971, 1972). He also contributed to Ahmadjan & Hale, *The Lichens* (Jahns 1973), in *CRC Handbook of Lichenology* (Jahns 1988), but his most acclaimed work, co-authored with Aino Henssen, was *Lichenes*, *Eine Einführung in die Flechtenkunde* (Henssen & Jahns 1974). These three contributions are important cornerstones on morphological development in lichens and general morphology. In the early 1970s he obtained a position at the University of Frankfurt where he stayed for more than ten years, moving to the University of Düsseldorf in 1987 to become Director of the Institute of Botany. Here he stayed until his retirement in 2006, the last ten years also as Prorector, a heavy administrative position responsible for research and teaching. Jahns has published a large number of papers where he frequently describes the detailed morphology related to and depending upon the environmental situation (Jahns 1984). He has also studied the ecology and ecophysiology of lichens, including water relations and microclimatic conditions of lichen habitats (Jahns 1984, Jahns et al 1982, Jahns & Ott 1997). He is more widely known through his book *Farne, Moose, Flechten,* published in 1980 and later translated into several languages, which was one of the forerunners of popular lichen guides with excellent photos in colour (Jahns 1980). From 1996 to 2000 he was President of the International Association for Lichenology, and more recently a Festschrift has been prepared in his honour (Kärnefelt et al. 2012).

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Manfred Jensen

Fig. 45: Manfred Jensen (on the right), lichen physiologist, seen here at a BLAM meeting together with Randolph Kricke.

Manfred Jensen, who is mainly a plant physiologist with a research focus on photosynthesis, was hired by Feige during his active time as professor in Essen. Jensen's c. 50 publications are mainly concerned with lichen physiology, especially related to environmental change of the lichen thalli (Jensen & Feige 1991, Jensen & Kricke 2002, Jensen et al. 1997, 1999). He edited a large Festschrift on the occasion of Benno Feige's retirement in 2003 (Jensen 2003). Jensen has a position as teacher and supervisor at the university of Duisburg-Essen where he offers a large number of courses in different fields of botany.

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Volker John

Fig. 46: Volker John, enthusiastic curator in the Pfalzmuseum für Naturkunde in Bad Dürkheim, has a special interest in the lichen flora of Turkey, here at a BLAM meeting around 2000.

Volker John, research scientist and curator of botany at the Pfalzmuseum für Naturkunde in Bad Dürkheim in Rheinland-Pfalz, was born in Spiesen in Saarland in 1952. He studied biology, chemistry and geography in Saarbrücken and in 1986 defended a thesis on phytogeography. John has mainly worked on the local lichen flora especially related to red-listed species and biomonitoring (John 1990, 2006, John & Schröck 2001). He has published over 100 papers, as well as being actively engaged in a major project on the lichen flora of Turkey, including the distribution of the exsiccate *Lichenes Anatolici Exsiccati* (John & Breuss 2004, John & Türk 2006). Indeed, John was *the* person who made the study of Turkish lichens well known to the international community. Apart from this and a very active role in the Pfalzmueum, he has been an active member of BLAM and OPTIMA for many years. He was a co-editor of the Festschrift for Volkmar Wirth (Türk et al. 2008).

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Klaus Kalb

Fig. 47: Klaus Kalb, well-kown and appreciated lichenologist specializing on tropical lichens, seen here in the Netherlands 2009 (see also Fig. 61).

Klaus Kalb was born in 1942 and grew up in a beautiful part of southern Bavaria, where he later studied biology, chemistry and geography at the University Erlangen-Nürnberg in order to become a school teacher. He was greatly interested in lichens and decided to register for a doctorate. His thesis work was on the lichen communities in Ötztaler Alpen, an area extremely rich in lichens and bryophytes (Kalb 1970). A year earlier, he had embarked on a career as a grammar school teacher in Neumarkt, a secure position he held for 35 years until his retirement. However, this position gave him spare time to devote to the study of lichens, resulting in c. 120 publications and the distribution of exsiccates, especially on tropical lichens (Kalb 1983, 1987, 1991, 1994, 2001). An opportunity to research tropical lichen vegetation came in 1978 as a result of a teaching position he accepted in a German school in Sao Paulo, Brazil. There he remained for three years, during which time he maintained contact with university colleagues. In 1989 he gained his habilitation from the University of Regensburg, which also made him an associated professor allowing him to take part in teaching and excursion activities. Here he also attracted several students with whom he published comprehensive papers on manly tropical groups of lichens (Frisch & Kalb 2006, Frisch et al. 2006, Kalb et al. 1995, 2004, 2008, Staiger & Kalb 1995). Kalb, one of the leading authorites on tropical lichens, was honoured with a jubilee volume in connection with his retirement in 2007 (Frisch et al. 2007).

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http://klauskalb.kilu.de/

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Ludger Kappen

Fig. 48: The charismatic retired professor Ludger Kappen (left), enthusiastic teacher and ecophysiologist, and Allan Green at the symposium *Ökologische Rolle der Flechten* in München 2008.

Ludger Kappen, born in Boppard am Rhein in 1935, went to school in Goslar before undertaking university studies in Freiburg and Göttingen where he studied natural sciences. He gained his doctorate from Göttingen in 1963, the theme of his thesis mainly related to the physiology, particularly cold resistance, in ferns. In 1967 he was offered a position as a research assistant associated with Lange's Chair of Ecophysiology in Würzburg; this would prove to be a very successful period in Kappen's career (Kappen & Lange 1970, Kappen et al. 1979). Ten years later he was promoted to associate professor with teaching responsibilities mainly for ecology and vegetation, and also plant systematics. In 1981 he was called to a chair at the Botanical Institute in Kiel being responsible for a new branch of ecophysiology, and director of the new institute. From here he became director of a new department for polar research in Kiel in 1984, and a few years later director of a new department for ecosystem research in which he remained until his retirement in 2000. During the 19 years he spent in Kiel he had an enormously active career being nationally and internationally involved in research projects and extensively travelling abroad, mainly

to polar and arid regions. He also published more than 100 papers together with colleagues or students (Kappen 1985a, 1985b, 1988, Schroeter et al. 1991, 1992, 1994, 1995). As a teacher he was very much appreciated by his students, and as a pedagog he is in a class of his own. Kappen was honoured with a jubilee volume in connection with his retirement and awarded the Acharius Medal in 2004 (Schroeter et al. 2000).

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Ulrich Kirschbaum

Ulrich Kirschbaum was born in 1943 and studied to become a teacher in biology, geography and chemistry at the University of Gießen during 1965–1969. After having completed his studies, he continued as a research associate in the Department of Plant Ecology at Gießen, which made it possible for him to earn a doctorate in 1973. Thereafter he obtained a research position until 1980 when he was promoted to professor. His main interest has been the use of lichens in bioindication (Cezanne et al. 2008, Kirschbaum & Windisch 1995, Kirschbaum et al. 2006). For three decades he was head of the working group for 'Biomonitoring with lower plants' of the *Verein Deutscher Ingenieure* [*Association of German Engineers*], being responsible for the first lichen guidelines for monitoring atmospheric pollution. He is also one of the authors of *Flechten erkennen – Umwelt bewerten*, which recently appeared in a new and enlarged edition (Kirschbaum & Wirth 2010).

Fig. 49: Ulrich Kirschbaum, enthusiastic student of epiphitic lichens, lichen photographer and book author at a BLAM meeting around 2000.

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Johannes Knoph

Johannes-Günther Knoph was born in 1951 in Gerolsbach in Upper Bavaria. He was a PhD student supervised by Christian Leuckert during his most active time as professor in the Department of Systematic Botany at the Free University in Berlin. Since Leuckert was mainly interested in secondary compounds for taxonomic studies, he and Knoph became a successful team working on the genus *Lecidella* containing xanthones (Knoph 1990) and other groups of lecideoid lichens (Knoph & Leuckert 1994, 2004, Leuckert & Knoph 1993). Unfortunately, financial support of the department ended after Leuckert's retirement in 1995 and Knoph went to a position at the University of Jena where he has been working as scientist in the Systematic Botany Department until 2001. After a severe illness he had to take early retirement. He is now living in Berlin.

Fig. 50: Johannes Knoph at the Biosynthesis Congress in Berlin 2011.

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Otto Lange

Otto Ludwig Lange was born in Dortmund in Nordrhein-Westfalen in 1927. His family moved to Göttingen where he went to school. After the war, he returned to his studies at the Universities of Göttingen and Freiburg during 1946–1952, receiving a teacher's certificate and a doctorate from Göttingen. A few years later he was awarded his habilitation with a thesis on temperature relations and heat resistance of desert and savannah plants in Mauritania. He became a lecturer at the University of Darmstadt, 1961–1963, after which he obtained a chair at the Department of Forestry and Genetics in Göttingen. In 1967 he was appointed to the Chair of Botany at the University of Würzburg where he stayed, in spite of several calls to attractive positions at other universities in Germany and abroad, until his retirement in 1992. His 25 years' tenure in Würzburg is characterized by an enormous scientific activity, comprising long periods of fieldwork combined with analysing data in the laboratory and writing scientific reports. By the time of his retirement there were 230 publications to his credit, which has risen to an amazing 370 since becoming emeritus (Lange 1973, 2001, Lange & Kappen 1972, Lange & Redon 1983, Lange et al. 1993, 1994, 2007). His scientific career began with investigations of heat, frost and drought resistance of lichens, bryophytes and vascular plants in many different biomes, often characterized by extreme environmental conditions (Kappen & Lange 1970, Kappen et al. 1979). His pioneering field experiments were facilitated through his design of unique equipment to measure gas exchange in the field (Lange 1953, 1969). However, he has a broad biological and ecological interest, and has never concentrated his field experiments on lichens alone; by also examining other groups of organisms he has provided a more balanced analysis of the results. About 45 % of his publications concern lichens, while the majority deal with other organisms (Büdel 2007). He was the first scientist to demonstrate that lichens with eucaryotic photo-

Fig. 51: Otto Lange, a great authority in lichen physiology and lichen biology in general, winner of the Leibnitz Award, seen here with Felix Schumm (on the right) in Karlsruhe 2008.

bionts could attain positive net photosynthesis with high air humidity alone, while lichens containing procaryotic photobionts require liquid water for photosynthesis, as cyanobacterial cells cannot become turgid with high air humidity alone. He soon realized the importance of combining fieldwork with experiments in the laboratory to strengthen a theoretical framework, and has spent long periods in various habitats in many different parts of the world. Lange has not only been a successful scientist and teacher, but he also early realized the importance of engagements in scientific networks such as in different societies, research boards and editorial groups where he developed enormous experience over the years (Belnap & Lange 2001). During his long experience as academic teacher, many generations of students have had the opportunity to listen to his splendid and lectures. Many pupils, including well-known lichenologists have worked in his laboratories, such as Ludger Kappen, Bukhard Büdel, Roman Türk and Volkmar Wirth. Tom Nash and Allan Green have also spent long periods there as guest researchers. As Büdel remarked, Lange's "life's work has been an extremely prolific combination of observation, laboratory and field analyses, theoretical penetration, and physical-technical innovations, all driven by his outstanding and infectious passion for nature" (Büdel 2007). Lange was awarded the Acharius Medal in 1992, and has been duly honoured several times with birthday tributes, special volumes and Festschrifts (e.g. Feige et al. 1997, Kappen 1997). He was elected a member of the *Leopoldina* (National Academy of Sciences) in 1972, and one of the winners of the "German Nobel Prizes", the Gottfried Wilhelm Leibniz Awards in 1986, for distinctive services in science.

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Christian Leuckert

Fig. 52: Christian Leuckert, a very active professor in Berlin, had a central role in lichen chemistry for several decades, here at the IAL2 congress 1992.

Christian Leuckert, born in Radeberg in the vicinity of Dresden in 1930, first studied to become a school teacher, but after a few years teaching he realized that he wanted something more with his life and decided to go back to university, firstly to Leipzig and later to the Free University of Berlin, in order to study natural sciences. In Berlin he chose biology and chemistry, turning to an interest in chemotaxonomy, and later defending a thesis on chemo-taxonomic characters in the Asteraceae in 1965. Coincidentally, Poelt came to a Chair in Systematic Botany at the Free University in 1965 and he immediately wished to establish a new laboratory for chemo-taxononomy, seeing Leuckert as a promising young scientist for such work (Hertel & Leuckert 1969). Apart from his teaching and research with various projects, now mainly on lichens, Poelt also saw an excellent administrator in Leuckert, and soon Leuckert was helping Poelt with all kinds of administrative duties. In 1970 Leuckert received his habilitation in systematic botany and in pharmcognosy and was appointed as professor, a position in which he remained until his retirement in 1995. Leuckert published nearly 100 papers, most frequently as part of a team with other colleagues and/or his own doctoral candidates (Hanko et al. 1985, Hecklau et al. 1981, Leuckert & Kümmerling 1991, Kümmerling et al. 1993, Knoph & Leuckert 1994). He was honoured with a Festschrift from his pupils on the occasion of his 65th birthday in 1995 (Knoph el al. 1995) and during the IAL meeting in Salzburg in 1996 received the Acharius Medal for his distinguished services to science. He passed away on 27 January 2011 (see Hertel 2011).

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Birgit Litterski

Fig. 53: Birgit Litterski together with Gunnar Degelius at the IAL2 congress in 1992, Hemmeslöv, Sweden.

Birgit Litterski came from the northern part of former GDR and began studies in biology, especially ecology, at the University of Halle where she obtained her doctorate in plant ecology in 1990. She then obtained a research assistantship in the Department of Botany at Greifswald, but later became more connected in her studies to the economic development of agricultural land. In 1998 she gained her habilitation for a thesis on the biogeographical and ecological evaluation of the lichen flora of the provinces Mecklenburg-Vorpommern, an area on which she continued to publish (de Bruyn el al. 1999, Litterski 1992, 1999, Litterski & Schiefelbein 2008, Schiefelbein & Litterski 2007).

Internet

http://www.uni-greifswald.de/~laoekon/ps_birgit.htm

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Georg Masuch

Georg Masuch was born in 1936 in Alt Wartenburg near Allenstein in East Prussia [now part of Barczewko in Poland]. At the end of the Second World War, the family had to leave their home and settled in northwestern Germany. From 1958 to 1961 he studied at the Pedagogical University at Alfeld to become a school teacher, but thereafter he continued with studies of natural sciences, mainly biology, at the University of Münster, obtaining his doctorate in 1967 for cytological work on higher plants using electron microscopy. After one year of practical teaching experience in 1968/69 at Warendorf, he went to the High School (Gesamthochschule, today a university) of Paderborn where he became professor of biology and didactics. Besides other research and teaching projects, he became interested in lichens and published on lichen bioindication (MASUCH 1980, MASUCH & GREVEN 1990). His lichen studies culminated in the book *Biologie der Flechten* which contains very detailed protocols for lichen studies and a number of fine REM photographs of lichen structures (MASUCH 1993). In 2002 he retired from the university and is still living in Paderborn.

Literature

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Sieglinde Ott

Sieglinde Ott (Fig. 42) came into contact with Jahns through her studies in biology at the University of Frankfurt, obtaining her doctorate in 1985. She then followed Jahns to his new position in Düsseldorf, deepening her studies on the ecology, ecophysiology, evolution and adaptation capacities of lichen populations, especially in habitats subjected to severe conditions. More recently she has focussed on the mechanical reproductive pathway in *Xanthoria-Physcia* lichen communities (OTT 1987a, 1987b) and lichen ecosystems and lichen biodiversity in the Antarctica where she has been a member of several research expeditions (OTT et al. 1997a, 1997b, OTT & SANCHO 1993, OTT & SCHEIDEGGER 1992). She continues to add to the knowledge initiated by Jahns on the ecological-morphological adaptation of lichen populations in their establishment.

Literature

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Elisabeth Peveling

Fig. 54: Elisabeth Peveling at the important IAL meeting, *Progress and Problems in Lichenology in the Eighties*, which she organized in Münster in 1986.

Elisabeth Peveling grew up in the Ruhr area of Germany where she was born in 1932. She studied natural science at the Universities of Münster, Innsbruck and Göttingen, and her doctorate, concerned with carylogical investigations of the Cucurbitaceae, was awarded in 1960. She was then employed as a scientific assistant at Münster University, and during the mid-1960s visited the United States where she became acquainted with electron microscopy and SEM (Peveling 1968), gaining her habilitation in 1969 in Münster on a thesis entitled *Die Feinstruktur vegetativer Flechtenthalli nach Untersuchungen mit dem Durchstrahlungs- und Oberflächen-Raster-Mikroskop* (Peveling 1969, 1970). In the same year she became a Professor at the Botanical Institute, a position she held for the rest of her career, continuing her research on the ultra-structure of lichen symbionts into the 1980s. She published over 60 papers, several of them well-known among lichenologists, such as the chapter on fine structures in *The Lichens* (Peveling 1973). She also organized the important and successful meeting, *Progress and Problems in Lichenology in the Eighties*, held in Münster in 1986 which was attended by 150 participants from 15 countries (Peveling 1987). This was later referred to as IAL1, and set the course for future IAL meetings. Peveling, who died in 1993, was indeed a forerunner in that she succeeded in a scientific career and reached the highest academic rank in Germany during a time when women rarely even tried to compete for such positions.

Literature

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Josef Poelt

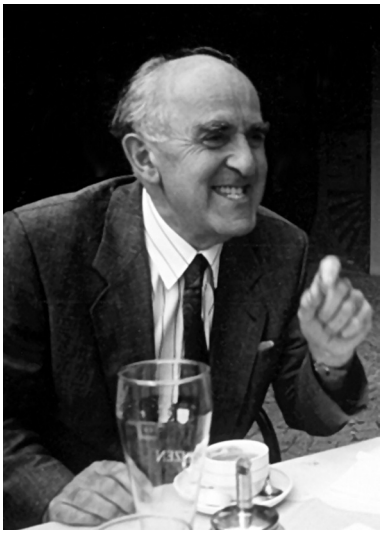

Fig. 55: Josef Poelt, one of greatest lichenologists of all time seen here at the International Mycological Congress in Regensburg 1990 (see also Fig. 36).

Josef Poelt, one of greatest lichenologists of all time, was born in the small town of Pöcking on the north-western side of Starnberger See in 1924. At an early age he developed an interest in botany, but at the end of his schooling at the beginning of 1943 he was sent to the eastern front in southern Russia. He managed to survive this horrific time, like Mattick and Grummann. In the summer of 1945 he returned to Pöcking, where he came in contact with Hermann Paul, a specialist in bryophytes and rust fungi, who introduced him to the world of cryptogams, and in the autumn of 1946 he continued his studies in biosciences at the University of Munich. Already in 1950 the enthusiastic young student had gained his doctorate for a thesis entitled *Die Moosvegetation im Gebiet des Starnberger Sees*, after which he was offered a position as assistant in the Botanical Garden. In 1954, he became associated with the crytogamic herbarium, first as Curatorial Assistant, then as Curator in 1957, and Senior Curator in 1959. In the same year, he completed his habilitation with the publication *Die lobaten Arten der Flechtengattung Lecanora in der Holarktis* by which time he was already well advanced with his research projects and his publication list included 45 papers (Hertel & Oberwinkler 1996, Hertel et al. 1996). The work he commenced in Munich, which continued in Berlin and later in Graz, such as *Mitteleuropäische Flechten,* numbered I–IX, continued until 1970. He had also been working on a draft key to European lichens for some years, which first appeared as *Bestimmungsschlüssel der höheren Flechten von Europa* (Poelt 1962); a modern key to the lichens was urgently needed and this book successfully served that purpose, as did the much enlarged second edition of 757 pages (Poelt 1969). Two supplements co-authored by one of his best friends Antonin Vězda appeared later (Poelt & Vězda 1977, 1981). He also found time, with the help a number of lichenologists, such as Georges Clauzade, Hans Doppelbaur, Maximilian Steiner, Hans Ullrich and Eduard Frey, to prepare an exsiccate series, *Lichenes Alpinum*, which appeared between 1956 and 1967 in 13 fascicles (Poelt & Steiner 1963).

In the autumn of 1965 he was ready for a new challenge and was invited to take a chair at the Free University of Berlin and to become head of the new and expanding Institut für Systematische Botanik und Pflanzengeographie. Although Berlin was at that time a turbulent region, he was obviously offered good conditions because he had shortly before turned down a similar call from Innsbruck, with a tradition of research in cryptogams. Nevertheless, in the relatively short time he spent in Berlin from 1965 to the beginning of 1972 he produced over 50 publications, six PhD candidates completed their theses, he was among the first to organize an international lichen symposium as a separate event from the International Botanical Congresses, and he was one of the founders of *Bryologisch-Lichenologische Arbeitsgemeinschaft für Mitteleuopa* (BLAM) with its periodical *Herzogia*. However, concern for his young wife's unfortunate illness and the unpleasant political circumstances in Berlin resulted in him happily accepting an invitation to become Head of the Institute of Systematic Botany at Graz, Austria. Poelt who was awarded the Acharius Medal in 1992, was an admired scientist and teacher of generations of younger lichenologists. Everybody wanted to talk to this extraordinary person on excursions and at meetings. His unique personality and international standing is clearly shown in the Festschrift (a great volume of 900 pages) presented to him on the occasion of his 60th birthday (Hertel & Oberwinkler 1984).

Literature

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Gerhard Rambold

Gerhard Rambold, born in Pocking (Bavaria) in 1956, grew up in a family with strong musical interests, so a future career in this area would have been likely. However, even before his university studies in Munich, he had become fascinated by biology. Here, through contact with Hertel, who had already gathered some students around him, he chose an uncertain academic career specializing in lichenology; his doctoral thesis was on lecideoid lichens in Australia (Rambold 1989), and for his habilitation he studied inter-lecanoralean associations, and together with his partner Dagmar Triebel, other important publications also resulted (Rambold & Triebel 1992, 1999). In 1999 he was appointed to a position as professor in the University of Bayreuth, where he has

supervised several PhD students and postdoctorates (Rambold et al. 1998). He is particularly interested in bioinformatics, and at Munich developed LIAS – a Global Information System for Lichenized and Non-Lichenized Ascomycetes, integrating databases for the documentation of descriptive characters, character definitions, checklist data, taxon names and concepts. He was one of editors in the large jubilee volume for Hertel (Döbbeler & Rambold 2004) and has also been engaged in international biodiversity projects in Southern Africa (Zedda & Rambold 2009, Zedda et al. 2011). Within the last decade his research interest have focussed on molecular ecology of fungi and on theoretical aspects of structuring descriptive data and establishing multilingual approaches to identify lichens (Peršoh et al. 2011, Peršoh & Rambold 2011).

Fig 56: Gerhard Rambold, university professor in Bayreuth and successful user of IT as a tool in lichenology, seen here together with his former pupil Derek Peršoh (on the right) at the IAL5 Congress in Tartu 2004.

Internet

http://www.mycology.uni-bayreuth.de/mycology/de/mitarbeiter/mit/mitarbeiter_detail.php?id_obj=14072

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Peter Scholz

Fig. 57: Peter Scholz with M. Hauck (left) in Tartu 2004.

Peter Scholz, born in 1956 in Lichtenstein in Erzgebirge, grew up in the former GDR in the small towns of Schmölln and Schkeuditz. He first studied to become a teacher and obtained his diploma in biology and chemistry in 1981. While he was teaching in Markkleeberg he became interested in lichens; besides his teaching duties, he worked on the lichen flora of the Harz Mountains in collaboration with the University of Halle, the thesis which resulted earning him a doctorate in 1992. After the collapse of the GDR in 1990, he very soon took the opportunity to travel freely abroad to many parts of the world to deepen his interest in biogeography and diversity of lichens, at the same time making new contacts with foreign scientists. He very much enjoyed the new, more open international scientific world. He was formerly editor of the *IAL Newsletter*, he is a frequent guest in national and international meetings, and takes an active part in the publication of material for red-lists, environmental change, checklists etc. (Scholz 1992, 1993, 2000, 2007).

Literature

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Burkhard Schroeter

Burkhard Schroeter, born in Hannover 1959, studied biology and chemistry at the University of Hannover and Kiel 1978–1986 to become a teacher, a profession he postponed until 2004–2006 when he taught at the Max Planck College in Kiel. In between, he was a member of Ludger Kappen's (Fig. 45) lichen physiology team (Kappen et al. 1998a, b), presenting his doctoral dissertation in 1991, and receiving his habilitation in 1998. Thereafter he was a researcher in the department of ecosystem research in Kiel and visiting professor in Graz in 2000 and Madrid 2001–2002, where he was awarded the Ramon y Cajal research prize from the Spanish Ministry of Science. He has contributed to lichenology with 65 scientific papers and was senior editor of the Festschrift for Kappen (Schroeter et al. 2000). His list of publications is still growing (Green et al. 2011, Schroeter et al. 2001), but today he is also busy with administrative work and teaching in the University of Kiel.

Literature

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Fig. 58: Burkhard Schroeter, a successful academic teacher and significant contributor to lichen physiology research.

Rudolf Schubert

Rudolf Schubert was born in Kobitzschwalde near Plauen in 1927 and studied at Martin-Luther-University Halle-Wittenberg shortly after the war, completing his thesis in 1952. Here he became assistant, associate professor in 1956, professor in 1964 and full professor of botany in 1969; he remained there until his retirement in 1991. While his main research interests were mostly in plant sociology, he maintained an interest in cryptogams, especially in bryophytes and lichens (Schubert 1983, Schubert & Stordeur 2011). He started his lichen studies with Oskar Klement in the Harz Mountains, and continued to collect and publish on lichens of Cuba, Mongolia, India and Iraq (Schubert & Klement 1961, 1966, 1971). He used his position as head of geobotany to include lichens in the research programme of his institute during a period when lichenology in eastern Germany was at a low ebb. By this it became possible for Birgit Litterski and Peter Scholz to prepare lichenological theses under his supervision, and Regine Stordeur as per-

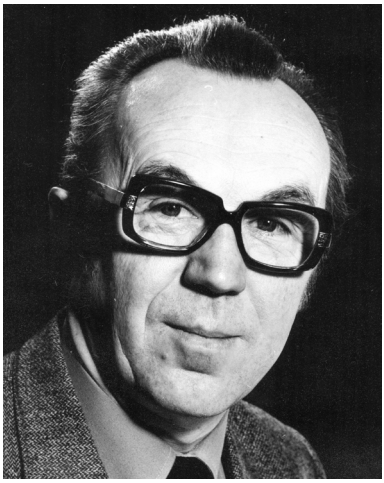

Fig. 59: Rudolf Schubert, head of the botanical institute and initiator of lichenological investigations in the GDR.

manent member of staff could switch to work mainly with lichens. He now lives in Halle (Saale).

Literature

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Felix Schumm

Fig. 60: Felix Schumm, retired teacher and a highly respected spare time lichenologist (see also Fig. 51).

Felix Schumm was born in 1946. After his studies of natural sciences, he became a teacher in mathematics, physics and informatics in the Stuttgart region. During his spare time he developed a keen interest in biology, and especially lichenology, in which field he has published frequently. He has built his own personal laboratory for lichenology, including equipment for TLC (Schumm 2011). His most important contributions concern lichens from the subtropical Atlantic islands, e.g. Madeira and the Canary Islands, and from the tropical Seychelles Islands (Aptroot & Schumm 2011, Schumm 2008, Schumm & Aptroot 2010) and he also distributes an electronic newsletter *Archive for Lichenology*.

Internet

http://fschumm.de/

Literature

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Harrie Sipman

Fig. 61: Harrie Sipman, hardworking curator in Berlin and major researcher of of the tropical lichen floras, receiving his Festschrift, with Klaus Kalb to the left, Utrecht 2009.

Henricus Johannes Maria Sipman was born in Sittard in the Netherlands in 1945 and studied at the famous University of Utrecht, where after preliminary studies he was appointed to the Herbarium and the Institute for Systematic Botany from 1972 to 1982. In 1983 he successfully defended his PhD on the family Megalosporaceae (Sipman 1983). Unable to find a suitable tenure position in the Netherlands, he applied for the curatorship of lichens in the Botanical Museum at Berlin-Dahlem and was successful to the satisfaction of the lichenological world. Here he has remained, intensifying his studies of tropical and subtropical lichens, which started during his time in Utrecht as a graduate student under the supervision of the energetic Robbert Gradstein. He has many on-going projects, including work on the lichen floras of Colombia, Costa Rica, Guiana and New Guinea, a key to the lichen genera of the Neotropics, the lichen flora of Costa Rica, and over 250 publications to his credit (Gradstein & Sipman 2002, Seaward et al. 2008). He collaborates with many well-known specialists such as André Aptroot, Teuvo Ahti, Paul Diederich, Mark Seaward, Emmanuël Sérusiaux and Richard Harris. In recent years he joined the project *TICOLICHEN* led by Robert Lücking (Lücking et al. 2007). He was recently honoured by many colleagues who contributed to the Festschrift celebrating his 64th birthday (Aptroot et al. 2009).

Internet

http://www.bgbm.org/bgbm/STAFF/Wiss/Sipman/

Literature

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Norbert Stapper

Fig. 62: Norbert Stapper at the BLAM meeting in 2008.

Nobert Stapper, born in Düsseldorf in 1958, studied biology and biochemistry. After obtaining his doctorate in biochemistry he decided to pick up his former interest in biology, particularly cryptogamic botany, establishing a private business for *Ökologische Studien* in the Düsseldorf region. His main interests are bioindication, biodiversity, ecology and photography of lichens, themes on which he has published (Frahm et al. 2006, 2010, Stapper & Kricke 2004). Stapper is a member of the working group for 'Biomonitoring with lower plants'. He also belongs to a group within BLAM with excellent qualifications on biodiversity of several groups of cryptogams, and manages the website for BLAM.

Internet

http://www.stapper.monheim.de/persopublic.html

Literature

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Maximilian Steiner

Maximilian Steiner was born in Vienna in 1904, where he studied biology and received a doctorate in 1926, and became an assistant in the Department of Plant Physiology. In 1930 he was offered work in the colour industry in Ludwigshafen in Germany, after which he remained in Germany to follow an academic career, obtaining a research assisantship in Stuttgart and gaining his habilitation in 1935. From 1939 he was at the University of Göttingen, and in 1940 he was offered a position in the Department of Pharmacobotany, being promoted to full professor in 1951. Although he was mainly a plant physiologist with an interest in the physiology of secondary metabolic products in lichens, he frequently published on lichen systematics, especially concerning lichens from the Alps and from Afghanistan where he travelled (Steiner & Poelt 1982, 1984, 1986). He also contributed material for the exsiccate *Lichenes Alpinum* (Poelt & Steiner 1963) and organized the first IAL excursion to the Alps in 1973 (Kärnefelt & Thell 2007). He died in Herbetshausen in Bavaria in 1988.

Literature

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Fig. 63: Maximilian Steiner organized the first IAL meeting as an excursion to the Alps in 1973.

Regine Stordeur

Regine Stordeur (née Kirsten) was born in the former GDR in 1950 and studied biology and chemistry at the University of Halle to become a teacher. There she also earned her doctorate for a thesis on the ecology of higher plants. Today she is associated with the Department of Biology at Halle, where she has been engaged in mapping and recording lichens (Stordeur 1990, Schulze et al. 2004, Stordeur & Ernst 2003). She was the senior editor of *Herzogia*, an occupation which she managed excellently for many years, and is currently the senior editor of *Schlechtendalia*, the botanical journal of the Botanical Institute of the University of Halle-Wittenberg, which also publishes lichenological contributions.

Fig. 64: Regine Stordeur, at a BLAM meeting in the mid-1990s.

Literature

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Stordeur, R. & Ernst, A. 2002: Beitrag zur Flechtenflora des Kyffhäuser-Gebirges. Schlechtendalia **8**: 47–78.

Dagmar Triebel

Fig. 65: Dagmar Triebel, seen here with a Swiss colleague, Christoph Scheidegger, in Munich 2008.

Dagmar Triebel, born in 1957 at Essen, studied at the University of Munich where she completed her thesis work on lichenicolous ascomycetes on lecideoid lichens under the supervision of Hertel (Triebel 1989). Currently she is research scientist and senior curator of fungi and algae at the Botanische Staatssammlung in Munich, as well as Head of the IT Centre of the Bavarian State Collections, being responsible for developing database systems and managing bio- and geo-diversity research data. At the beginning of her career her research focussed on phylogeny and biodiversity of the the Ascomycota; she is particularly interested in lichenicolous fungi, a group on which she has published more than 50 papers, some co-authored by her partner Gerhard Rambold (Rambold & Triebel 1992, 1999, Rambold et al. 1993, Roux & Triebel 1994). Triebel was the winner of the first Mason E. Hale Award for the best doctorate thesis, which she received at the IAL meeting in 1992. Within the last decade her research topic has switched to biodiversity informatics.

Internet

http://www.botanischestaatssammlung.de/index.html?/staff/triebel.html

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Gernot Vobis

Gernot Vobis studied with Aino Henssen at Marburg from the mid-1970s, as part of an active group of diploma and doctorate students such as Bernd Renner and Gerhard Keuck. Vobis specialized on the development and structure of pycnidia and conidia, the thesis subsequently published in *Bibliotheca Lichenologica* (VOBIS 1980). He stayed for a while in Marburg, also taking part in other projects with Henssen (HENSSEN et al. 1981) and was the co-author, his first publication, with Mason Hale in the famous description of the new lichen genus *Santessonia*, occurring in the Namib dessert (HALE & VOBIS 1978). After this he obtained a position at the University of Bariloche in Argentine, where he has remained, mainly engaged as a teacher with little financial opportunities for research.

Literature

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VOBIS, G. 1980: Bau und Entwicklung der Flechten-Pycnidien und ihrer Conidien. Bibliotheca Lichenologica **14**. Vaduz: J. Cramer. 141 pp.

Volkmar Wirth

Volkmar Wirth was born in 1943 in Herrnhut in Saxony, but after the war the family moved to Zell in Schwarzwald [Black Forest]. By 1963 he was already publishing on plant biodiversity, but lichens, the group of organisms that would dominate his career so successfully, were not included. A few years after the first BLAM excursion, supporting studies of diversity of bryophytes and lichens in central Europe, he organized an excursion to Schwarzwald in 1971, From 1969 to 1972 he was associated with the Botanical Institute at Freiburg University where he defended his thesis on lichens growing on siliceous rocks (WIRTH 1972), and from 1972 he spent a few years with Otto Lange in Würzburg where he received his habilitation. In 1975 he became a botanist at the Staatlichen Museum für Naturkunde in Stuttgart, where he was to remain until he received the Directorship of the Staatlichen Museums für Naturkunde in Karlsruhe in 2001, where he stayed until his retirement in 2008. It was during this active period in his career that he became internationally well-known from his flora work, starting with the pocket flora, first published as *Flechtenflora* in 1980 (WIRTH 1995b), and the beautiful-

Fig. 66: Volkmar Wirth, distinguished lichenologist, internationally well-known for his outstanding flora works in Munich 2008.

ly illustrated book, *Die Flechten Baden-Württembergs* (Wirth 1987) and its much enlarged and revised second edition (Wirth 1995a). He has also co-authored other books such as *Farbatlas Flechten und Moose* (Wirth & Düll 2000), and its enlarged edition in Spanish (Wirth et al. 2004), as well as publishing red-lists and papers on the development of postglacial lichen biota (Wirth 2008, 2010, Wirth et al. 1996, 2010). Wirth, who is especially committed to nature conservancy and the protection of lichens and their habitats, was honoured with a jubilee volume on his retirement (Türk et al. 2008).

Literature

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Wirth, V. 1995b: Flechtenflora. Bestimmung und ökologische Kennzeichnung der Flechten Südwestdeutschlands und angrenzender Gebiete. 2nd edition. Stuttgart: E. Ulmer. 661 pp.

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Wirth, V., Schöller, H., Scholz, P., Ernst, G., Feuerer, T., Gnüchtel, A., Hauck, M., Jacobsen, P., John, V. & Litterski, B. 1996: Rote Liste der Flechten (Lichenes) der Bundesrepublik Deutschland. Schriftenreihe für Vegetationskunde **28**: 307–368.

Helmut Wunder

Helmut Jakob Wunder was born in Bad Aibling in Oberbayern in 1940. He began his studies in biology, chemistry and geography at the University of Munich in 1960, where he earned his degrees that allowed him to teach in schools at higher levels. During the inspiring university years, however, he met Josef Poelt (Fig. 54) and the small group of enthusiastic students he had gathered around him, such as Oberwinkler and Hertel. When Poelt moved to Berlin in 1965 it was of course a great change for the students to lose their inspiring teacher, so Wunder, like others, followed him there in 1968 to embark on a PhD project on the black-fruited species of *Caloplaca*. This work was completed in 1973, earning him his doctorate (Wunder 1974). In the meantime, Poelt had moved to Graz in 1972, and along with Hertel, Wunder left Berlin and returned to Munich to become a school teacher. He continued to work in

school education in various positions until he was offered a job as botanist in the National Park of Berchtersgarden in 1983. During this period of his life he became a close friend of Roman Türk in Salzburg and they co-authored several papers on the cryptogamic flora of Berchtersgaden (TÜRK & WUNDER 1991, 1994, 1997, 2000). Wunder died in 2001.

Fig. 67: Helmut Wunder, one of Josef Poelt's earliest pupils, at the International Botanical Congress in Berlin 1987.

Literature

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WUNDER, H. 1974: Schwarzfrüchtige, saxicole Sippen der Gattung *Caloplaca* (Lichenes, Teloschistaceae) in Mitteleuropa, dem Mittelmeergebiet und Vorderasien. Bibliotheca Lichenologica **3**. Lehre: J. Cramer. 186 pp.

Gregor Zimmermann

Dieter Gregor Zimmermann, born in Marbach in Baden in 1942, is an amateur lichenologist living in Düsseldorf, making his living as a pianist. He is extremely skilled in identifying species, especially those that are not seen with the naked eye, and is a well-known member of the BLAM, regularly attending excursions, where his impressive knowledge in lichen biodiversity is demonstrated. He has co-authored papers with several well-known lichenologists (LUMBSCH et al. 2009, ZIMMERMANN et al. 2003) and belongs to the small group of persons within BLAM who impressively can identify anything with his hand lens.

Fig. 68: Dieter Gregor Zimmermann keen amateur lichenologist (see also Fig. 34).

Literature

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Zimmermann, D.G., Heibel, E. & Lumbsch, H.T. 2003: Beiträge zur Flechtenflora Westfalens II: Bemerkenswerte Flechtenfunde aus zwei Gebieten im Sauerland. In: Jensen, M. (ed.): Lichenological contributions in honour of G.B. Feige. Bibliotheca Lichenologica **86**: 485–491.

5 Prospectives

Presently there is a new generation of very active German scientists associated with university departments or regional museums (some outside Germany) who are involved in various projects related to the biodiversity and ecology of lichens in a changing climate, as well as finding new ways of demonstrating molecular evolution in lichenized fungi and their allied symbiontic partners. Some of these persons are listed below.

Andreas Beck

Fig. 69: Andreas Beck, responsible for the lichen collections and the molecular laboratory in Munich, organized the symposium *Ökologische Rolle der Flechten* in 2008.

Andreas Beck, born in Munich in 1969, studied in Bayreuth and obtained his doctorate for a project supervised by Rambold. He is especially interested in lichen photobionts from a phylogenetic perspective (Nyati et al. 2007, Peršoh et al. 2004, Rambold et al. 1998, Tibell & Beck 2002). Currently he is research scientist and curator of lichens and bryophytes at the Botanische Staatssammlung in Munich, where he manages the collections and the molecular laboratory. In 2008, he co-organized a meeting on lichen ecology, *Ökologische Rolle der Flechten*, supported by Bayerische Akademie der Wissenschaften, the proceedings of which he edited (Beck et al. 2009).

Internet

http://www.botanischestaatssammlung.de/index.html?/staff/beck.html

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Uwe de Bruyn

Uwe de Bruyn, born in 1966, is a botanist and ecologist from Lower Saxony living in Oldenburg who is active in various projects related to the disappearance of lichens, red-lists, and checklists of cryptogams (de Bruyn 2005, de Bruyn et al. 2005, Wirth et al. 2010).

Fig. 70: Uwe de Bruyn (middle), lichen ecologist and environmentalist, seen here together with M. Hauck and S. Stofer at the retirement party for Volkmar Wirth in 2008.

Internet

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Literature

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Helga Bültmann

Helga Bültmann, born in 1966, studied biology at Münster University where she came in contact with Fred Daniëls, under whose supervision she received her doctorate. Today she is associated with the Department of Plant Ecology there, being interested in terricolous lichens, biodiversity, bioindication and environmental change in lichen communities. She has also been working in habitats in the northwestern heathland in Nordrhein-Westfalen and in arctic Greenland (Bültmann 2005a, 2005b, Bültmann & Daniëls 2000, 2001, 2009, Daniëls et al. 2000).

Internet

http://www.uni-muenster.de/Biologie.Pflanzenoekologie/en/staff/bueltmann.html

Literature

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Fig. 71: Helga Bültmann is particularly interested in bioindication and climatic change.

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Frank Bungartz

Frank Bungartz was born in Germany in 1967, where he studied biology. Being less inspired for continued graduate studies at home, he took the opportunity to go to the USA, where he became a PhD student with Tom Nash in Arizona State University in Tempe. He completed his doctorate in 2004 on the genus *Buellia* in the Sonoran Desert (Bungartz 2004, Bungartz et al. 2004) and continued to support Nash in editing the *Greater Sonaran Desert Flora* (Nash et al. 2002, 2004, 2007). He is now located as a senior scientist at the Charles Darwin Research Station on Isla Santa Cruz of the Galapagos Islands. Bungartz was a co-editor in the interesting volume dedicated to Tom Nash (Bates et al. 2011) and belongs to the group successful German scholars who are working abroad.

Fig. 72: Frank Bungartz, completing his doctoral studies within the Sonoran Desert lichen flora project, is currently part of the biological research team in the Galapagos Islands.

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Nash, T.H., Ryan, B.D., Gries, C. & Bungartz, F. (eds) 2002: Lichen flora of the Greater Sonoran Desert Region. Vol. **1**. Tempe: Lichens Unlimited, Arizona State University. 532 pp.

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Nash, T.H., Gries, C. & Bungartz, F. (eds) 2007: Lichen flora of the Greater Sonoran Desert Region. Vol. **3** (Balance of the microlichens and the lichenicolous fungi). Tempe: Lichens Unlimited, Arizona State University. 567 pp.

Jutta Buschbom

Jutta Buschbom, born in Würzburg in 1968, studied biology at her home university earning a master's degree in 1988. Thereafter she moved to Kiel, where she worked for another diploma programme on lichen ecology with Kappen as her supervisor. She was awarded several grants making it possible for her to learn more on lichen biology in several well-known laboratories in the USA, being at one time curatorial assistant at the Field Museum in Chicago, and as a researcher, combined with work for a PhD, on evolutionary processes in the genus *Porpidia* commenced in Lutzoni's laboratory. She gained her PhD from the University of Chicago (Buschbom & Mueller 2004, 2006) and is now working in a genetics laboratory of the Institute of Forest Genetics and Forest Plant Breeding in the vicinity of Hamburg, allowing her little time for work on lichens.

Fig. 73: Jutta Buschbom (left) and Heidi Döring (right) at the IAL5 Congress in Tartu in 2004.

Internet

http://www.vti.bund.de/de/startseite/institute/fg/personal/wissenschaftliches-personal/buschbom.html

Literature

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Heidi Döring

Heidi Döring (Fig. 73) studied at the University of Marburg, working on ascoma ontogeny (Döring & Lumbsch 1998) and contined her studies at the University of Bayreuth with Rambold, after which she did postdoctoratal work with Mats Wedin in Umeå. Since 2005 she has been a staff member and laboratory manager at the mycological section at Kew. Her interests include the phylogeny of European *Exobasidium* species and infraspecific genetic variation, and species delimitation in lichenized fungi,

particularly the genus *Stereocaulon*. She has published 20 papers on molecular phylogenies on lichenized and non-lichenized ascomycetes (Döring & Wedin 2000, Lumbsch et al. 2001, Wedin et al. 1999). At Kew she is undertaking molecular studies on a wide range of systematic subjects, as well as looking after the living culture collections.

Internet

http://www.kew.org/science/mycolstaff.html

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Wedin, M., Döring, H. & Mattsson, J.-E. 1999: A multi-gene study of the phylogenetic relationships of the Parmeliaceae. Mycological Research **103**: 1185–1192.

Oliver Dürhammer

Oliver Dürhammer, born in 1967 in Offenbach am Main, studied biology and chemistry at the University of Regensburg. He presently works as a teacher, but is associated with the Department of Botany at Regensburg, working on various projects on recording bryophytes and lichens, especially in Bavaria (Dürhammer 2003, Dürhammer & Türk 2000, Kanz et al. 2005). He is also a co-author of the new checklist of lichens (Wirth et al. 2010) and maintains a database for German lichens and their distributions.

Fig. 74: Oliver Dürhammer, presently a teacher, is engaged in projects on biodiversity change, particularly in the lichen and moss flora around Regensburg.

Internet

http://www.yasni.de/ext.php?url=http%3A%2F%2Fwww.dueroli.de%2F&name=Oliver+Dürhammer&cat=filter&showads=1

Literature

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Andreas Frisch

Andreas Frisch studied biology at the University of Regensburg, where Kalb was his supervisor for a research project on the Thelotremataceae in tropical Africa, the work being published in a special volume of *Bibliotheca Lichenologica* etc. (Frisch 2006, Frisch & Kalb 2006, Frisch et al. 2006). For the past few years he has held a post-doctorate position working with Göran Thor at the Agricultural University in Uppsala (SLU) on the Arthoniales and other groups of lichens. He was a co-editor of the jubilee volume for their supervisor Kalb (Frisch et al. 2007). Frisch has now moved on to a new research period working on Arthoniales with Japanese colleagues.

Fig. 75: Andreas Frisch, supervised by Klaus Kalb, studied tropical Telotremataceae lichens, but recently turned his attention to the Arthoniales.

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Markus Hauck

Markus Hauck, born in 1970, began his biology studies at the University of Göttingen in 1991; he gained his diploma in 1997 and his doctorate, for a thesis on the ecology of epiphytic lichens in a montane spruce forest, in 2000. He received his habilitation in 2003, also from the University of Göttingen. Currently he is Head of the Department of Plant Ecology and Ecosystem Research there, being promoted to professor in 2010. His main research interests concern global change, ecology, plant ecophysiology, functioning of lichen secondary products, biodiversity and nature conservation, resulting in an enormous number of papers from his laboratory (Hauck & Wirth 2010, Hauck 2008, 2009, Hauck et al. 2006, 2007, 2009, Hauck & Huneck 2007, Hauck et al. 2007). He was a co-editor of the jubilee volume for Wirth (Türk et al.

Fig. 76: Markus Hauck (on the right), energetic young professor in ecology in Göttingen, with Frank Kauff and Michaela Schmull at the IAL5 Congress in Tartu (see also Fig. 57 and 70).

2008). Markus Hauck belongs to a group of professors who presumably will have a great influence on lichenological research during the next decades.

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Frank Kauff

Fig. 77: Frank Kauff (to the right), successful young professor in Kaiserslauten, expert in molecular studies with Orvo Vitikainen, representing different generations and specialities in lichenology (see also Fig. 76).

Frank Kauff was born in Alzey in southwestern Germany in 1969 and studied at the University of Kaiserslautern where he earned a diploma in biology in 1996. He continued there undertaking graduate work with Büdel and gained his doctorate in 2001. He then went to the USA for a post-doctoral period to work with Lutzoni (Lutzoni et al. 2004), returning to Kaiserslautern in 2006 as an assistant professor in molecular phylogenetics, since when he has been highly successful in his co-operation within large research projects, publishing on the evolutionary and phylogentic field of fungal and lichen biology (Miądlikowska et al. 2006, Schoch et al. 2009, Crespo et al. 2010), as well as adaptations to climatic changes (Geml et al. 2010).

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Robert Lücking

Robert Lücking (Fig. 78) was born in Ulm in 1964 and studied at its university; his master's and PhD theses, which he gained in 1990 and 1994 respectively, were both concerned with the taxonomy, biodiversity and ecology of foliicolous lichens (Becker & Lücking 1995, Lücking 1992, 1997, 1999, 2008). In the late 1980s and early 1990s he spent almost three years in Costa Rica, collecting material for what would later become one of his main scientific interests. After his PhD, he made good use of a two-year post-doctoral opportunity in Ulm to deepen his knowledge of Neotropical foliicolous lichens, following a short term assignment as visiting professor in Recife, Brazil. In 1998–2001, he continued his studies at the University of Bayreuth with Rambold in order to gain his habilitation. In 2001 he was appointed as Adjunct Curator of Lichens at the Field Museum of Natural History in Chicago, being promoted to Research Collections Manager for Mycology. Here he continues to develop his already strong profile as a researcher in biodiversity of tropical lichens, particularly for Neotropical foliicolous lichens, publishing extensively in over 130 publications (Ferraro et al. 2001, Grube & Lücking 2002, Lücking 2003, Lücking & Kalb 2000, Lücking et al. 2005, 2007a, 2007b, 2007c, Rivas Plata et al. 2006, 2010), including his remarkable book (868 pages) on *Foliicolous Lichenized Fungi* (Lücking 2008), for which he was awarded the DeCanodolle Prize in 2008. Recently he co-edited the interesting volume dedicated to Nash (Bates et al. 2011).

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Thorsten Lumbsch

Helge Thorsten Lumbsch, born in Frankfurt am Main in 1964, showed an interest in lichens already as a schoolboy. In the mid-1980s he entered the University of Marburg for preliminary studies in biology, where he met Henssen, and, as a result of the enthusiastic atmosphere generated by the PhD students around her, decided to choose lichenology as subject for a future career. After his master's degree, and upon Henssen's retirement, he moved to Essen to work in Feige's laboratory, where he was warmly accepted as a new PhD candidate to work on various groups of crustose lichens, especially the *Lecanora subfusca* group which was the theme for his dissertation in 1993. Here he stayed for another decade, completing his habilitation in 1997, followed by a period as associate professor until 2003 when, according to his own words, he got his first real job being appointed Associate Curator at the Field Museum of Natural History in Chicago. He has been extremely productive, developing rapidly into a leading scientist on systematics and evolution of lichenized fungi. His publications' list for a person of his age is impressive with more than 320 papers (Döring & Lumbsch 1998, Feige et al. 1993, LaGreca & Lumbsch 2001, Lumbsch 1989, 1994, 1997, 2004, Lumbsch et al. 2001, 2006, 2007a, 2007b, 2009, Printzen & Lumbsch 2000). Currently he is leading several large projects on the evolution of ascomata in lichen-forming ascomycetes, the systematics of the Thelotremataceae, the diversity and

Fig. 78: Thorsten Lumbsch (right) and Robert Lücking (kneeling), major players in organizing the Parmeliaceae Workshop in Chicago in 2010.

phylogeography of Antarctic lichens, and monographic studies of the genus *Lecanora* s.lat. He is a frequent lecturer at international meetings and we will certainly see much more of him in the future.

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Volker Otte

Volker Otte, born in eastern Berlin in 1968, studied biosciences at the University of Halle, where he came into contact with R. Stordeur, who became his tutor in lichenology. He later continued his studies at the Humboldt University of Berlin were he defended his thesis in 2001 (OTTE 2002). He developed an interest in the lichen floras in endangered situations exposed to environmental changes (LITTERSKI & OTTE 2002, OTTE 2008a, b, XYLANDER et al. 2007), and currently is working in the Senckenberg Museum für Naturkunde at Görlitz (on the border to Poland), where he is undertaking projects mainly related to biodiversity and environmental change.

Fig. 79: Volker Otte, working in the Senckenberg Museum in Görlitz, currently researches lichen floras exposed to environmental change.

Internet

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Derek Peršoh

Derek Peršoh (Fig. 56), born in 1970 and raised in Ottobrunn in Munich, became a doctoral student under the supervision of Rambold in Bayreuth in 2000; he worked on several projects within mycology and lichenology: namely phylogeny of lichenized and non-lichenized fungi, distribution of characters, fungal biodiversity of lichens and plants (BECK & PERŠOH 2009, PERŠOH et al. 2004). One of his most thrilling discoveries was the systematic position of the parasitic microlichen *Phacopsis* [*Nesolechia*] in Parmeliaceae (PERŠOH & RAMBOLD 2002). After he presented his thesis in 2006, he stayed for two more years in Bayreuth, studying fungal diversity in soil, whereafter he returned to Munich to his present position as Postdoctoral Research Fellow at the Ludwig Maximilian University where he continues his researches on lichenized and non-lichenized fungi (DAVYDOV et al. 2010).

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Christian Printzen

Christian Printzen studied biology at Köln University and defended a master's thesis on the lichen flora on the Isles of Scilly (Great Britain) supervised by Follmann. He continued his studies for a PhD with Hertel, defending his thesis on the genus *Biatora* in Europe in 1995 (Printzen 1995). He then accepted a temporary research position within the lichen group of the Botany Department at the University of Bergen, and at the end of 2002 he was appointed Curator of Cryptogams at the Senckenberg Museum at Frankfurt were he has been able to develop a prolific research programme on lichenized fungi, especially related to evolutionary questions, biogeography and dispersal, as well as on symbiotic associations between fungi and green algae or cyanobacteria (Perez-Ortega et al. 2010, Printzen 2008, Printzen & Lumbsch 2000, Printzen et al. 2003, 2005, 2008, Spribille et al. 2009, Wirth et al. 2008).

Fig. 80: Christian Printzen, hardworking curator of cryptogams at the Senckenberg Museum in Frankfurt, has research interests in lichen biology, phylogeography, biodiversity and molecular phylogentics.

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Ulf Schiefelbein

Ulf Schiefelbein, born in 1966, is a local lichenologist active in Mecklenburg-Vorpommern and residing in Ueckermünde. He studied biology in Slovakia and started work for a nature conservation authority, and defended his thesis at the University of Greifswald in 2005 (Schiefelbein 2006). He has studied lichen communities and zonations along the Baltic coast and has been engaged in recording red-listed and non-threatened species in the area, often together with local colleagues (Litterski & Schiefelbein 2008, Schiefelbein 2009, Schiefelbein & Litterski 2007).

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Fig. 81: Ulf Schiefelbein one of the most active lichenologists in the northeastern part of Germany.

Imke Schmitt

Fig. 82: Imke Schmitt, promising future scholar in molecular phylogenetic research, returned to Germany and a position as professor in Frankfurt after a period as curator in St Paul, Minnesota.

Imke Schmitt studied at the University of Duisburg-Essen receiving degrees in biology and English, in addition to sports, in 1999 and 2001. During her biology studies she was inspired by Feige and his research assistant Lumbsch. Prior to her diploma work in 1998 she had already had a research period with Mats Wedin, then at the Natural History Museum in London, where she had an opportunity to learn more about molecular systematics of lichenized fungi. After her doctorate in 2002, she was awarded a postdoctoral fellowship to work with Lumbsch in the Botany Department at the Field Museum in Chicago in 2003. During this time she also spent time at the labs of Ulrik Søchting (Copenhagen) and Maria Paz Martin (Madrid). After a brief period as an associate in a research institute in Jena she was appointed assistant professor and curator at the Department of Biology, University of Minnesota St. Paul. In August 2010, she returned to Germany as professor in the Department of Ecology, Evolution and Biodiversity at the University of Frankfurt. She is now a promising leader with the possibility of developing the teaching and research on the evolution of lichenized fungi, and molecular phylogentics and evolution of biosynthetic genes, as well as in other fields she has proved to be so successful (Schmitt et al. 2005, 2006, 2008, 2009a, 2009b, 2010).

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Michaela Schmull

Michaela Schmull was born in 1971 and grew up in the vicinity of Göttingen, where she studied biology and botany at the university, earning her doctorate under the supervision of Robbert Gradstein. She then moved to the Farlow Herbarium, where she works as a research associate, focussing on corticolous species of the genus *Lecidea.* Her publications cover various projects on the systematics and ecology of the lichens (HAUCK et al. 2006, SCHMULL & SPRIBILLE 2005).

Fig. 83: Michaela Schmull, seen here in Tartu in 2004, later received a research position in the Farlow Herbarium (see also Fig. 76).

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Matthias Schultz

Matthias Schultz (Fig. 37) was born in the Prignitz region of the former GDR in 1972. He studied biology in Rostock and later followed his teacher Büdel to Kaiserslautern, where he developed a special interest in the cyanobacterial-containing lichens in the Lichinaceae. Presently he is engaged as a research associate at the Department of Systematic Botany in Hamburg, where he has been able to continue work on phylogeny of cyanobacterial lichens and to take part in projects, such as that associated with the *Greater Sonoran Desert Lichen Flora* (SCHULTZ 2007), and others related to cyanbacterial lichen floras (SPATAFORA et al. 2006, SCHULTZ 2005, SCHULTZ & APTROOT 2008, SCHULTZ & BÜDEL 2002, THÜS & SCHULTZ 2009). Lately, however, he has been more occupied with databasing and recording in biodiversity related projects.

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Bettina Staiger

Fig. 84: Bettina Staiger received her PhD from Regensburg for a splendid thesis on tropical Graphidaceae.

Bettina Staiger was born in Stuttgart in 1968 and studied natural sciences and biology at the University of Regensburg from 1988 until 1995, where she got to know Kalb and chose to work under his supervision on a thesis on tropical lichens, especially the Graphidiaceae. She successfully completed her work in 2002 on a large and very comprehensive monograph published in *Bibliotheca Lichenologica* (Staiger 2002), for which she was awarded the DeCandolle Prize in 2005. She has also had a very productive time co-authoring papers with Kalb on many other groups of lichens, such the genera *Ramboldia, Haematomma* and *Diorygma* (Kalb et al. 1995, 2004, 2008, Staiger & Kalb 1995, Staiger et al. 2004). She was a co-editor of the jubilee volume for their supervisor (Frisch et al. 2007).

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Holger Thüs

Holger Thüs was born in Ratingen in North Rhine-Westphalia and studied biology at the University of Mainz. He was awarded his doctorate at the University of Frankfurt in 2001 for a thesis dealing with aquatic lichens (THÜS 2002) and thereafter took advantage of a post-doctorate opportunity to work with Büdel in Kaiserslautern. He is particularly interested in the Verrucariaceae, being an expert on aquatic species (GUEIDAN et al. 2009, THÜS & NASCIMBENE 2008, THÜS & SCHULTZ 2009). Since 2008, he has held a curatorial position at the Natural History Museum in London.

Fig. 85: Holger Thüs, presently working at the Natural History Museum in London.

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Nora Wirtz

After studying biology and arts at the University of Duisburg-Essen, Nora Wirtz entered a PhD research programme at the Field Museum in Chicago. Here she has studied the lichen symbiosis in extreme environments such as the Antarctic, the Arctic and high Andes, as well as the vegetation history of bipolar species using molecular tech-

Fig. 86: Nora Wirtz at the banquet at the IAL5 Congress in Tartu in 2004.

niques (Wirtz et al. 2003). Among her most important contributions are phylogeny studies of the genus *Usnea*, including delimitations of the genus and species, using several molecular markers (Wirtz et al. 2006, 2008).

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Index to people

All persons mentioned in the text are included. Main articles are given in **bold**, illustrations in *italics*.