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"All science is either physics or stamp collecting." This statement, attributed to Ernest Rutherford, is perhaps my favourite example of the *either-or fallacy*. Science is either physics or stamp collecting. Rather condescending towards a field like biology, isn't it? Perhaps we should be grateful that 'stamp collecting' is still allowed to hide under the *Science* umbrella. But nonsense is nonsense, whatever the reputation of the person who said it. For what we have here is a false dilemma. It's not a matter of either-or. 'Physics' and 'stamp collecting' are more like two extremes of a continuum (and I would suggest that pure mathematics rather than physics occupies one extremity). All science is a mixture of observation, classification, induction and deduction, in various proportions.

Even Rutherford's own field of particle physics has an element of stamp collecting in it. Is there so much difference between classifying and describing subatomic particles and classifying and describing orchids? It seems to me that the main difference lies in the difficulty of making observations. It can be enormously complicated and expensive to observe an elementary particle, whereas observing an orchid requires at most a decent microscope (admittedly, finding the orchid in the first place can be challenging). Nor is it the case that the physicist's particles are embedded in a theory and the species of the biologist are not. I would argue that species are theoretical constructs almost as much as electrons and Higgs bosons are. Species exist in space and time; we can never observe them directly in all their aspects. We must make deductions about them based on limited observations. We have an underlying theory called the Theory of Evolution that guides us in our endeavours.

Is the difference between physics and biology perhaps that the former can make predictions, and the latter cannot? Clearly not. Phylogenies allow us to make predictions about the properties of species that have not yet been examined for those properties. Our knowledge of orchid pollination may allow us to predict what pollinates a given orchid even if nobody ever saw the actual pollinator (I don't think I need to retell the *Angraecum sesquipedale* tale here). Biogeography allows us to predict the floristic composition of a forest that has never been visited by a botanist. Palaeontology allows us to predict that we will not find a rabbit fossil in a Precambrian deposit (to steal a famous example).

Maybe we should recognize that we are all trying to understand the world we live in, and that it is rather narrow-minded to glorify one area of science at the expense of another. And besides, what's wrong with stamp collecting?

André Schuiteman
Kew

Upcoming Conferences

We welcome any news about future orchid conferences for promotion here. Please send details to André Schuiteman (a.schuiteman@kew.org) as far in advance of the event as possible, remembering that the *Orchid Research Newsletter* is published only in January and July of each year.

The 2018 European Orchid Show and Conference (https://eocce2018.com) will be held in Paris 23–25 March, 2018. It is being organized for the European Orchid Council by L'Orchidée en France, a joint association between the Société française d'Orchidophilie, the Société nationale d'Horticulture de France, France Orchidées and the Fédération française des Amateurs d'Orchidées. Scientific meetings are planned for 24 and 25 March. These intend to provide an informed perspective on the future of orchids. In recent years, many new tools, ranging from large-scale sequencing and proteomics to development of interactive databases, together with ongoing research efforts using more traditional approaches, have allowed many advances in orchid research. Market demand has also greatly increased, prompting new developments in breeding and culture. Unfortunately, environmental change and other anthropic disturbances have, at the same time, sharply increased, threatening orchids in the wild.

The Paris 2018 conference will offer an excellent opportunity to discuss the current knowledge and perspectives on orchids in a meeting place of easy access. There will be poster presentations, and talks are arranged in four sessions:

Session 1: Conservation and restoration in a changing world—Keynote speaker: **Tiiu Kull**

Session 2: Orchids in the era of genomics—Keynote speaker: **Barbara Gravendeel**

Session 3: Ecology of mutualism—Keynote speaker: **Marc-André Selosse**

Session 4: Biotechnology and breeding—Keynote speaker: **Hong-Hwa Chen**

Postscript to the 22nd World Orchid Conference

The 22nd World Orchid Conference was held 6–13 November 2017 in Guayaquil, Ecuador, with almost 600 registrants from 40 countries and all continents except Antarctica. Many registrants attended despite suffering through devastating hurricanes (especially major hurricanes Irma, Harvey, and Maria), forest fires, and earthquakes as well as man-made disasters. Nothing can keep an orchid-lover down!

In the abstracts submitted for oral presentations, there were almost 30 occurrences of the word 'change'. Change. The orchid world, indeed the whole world, is undergoing change as never before seen in modern times. Nomenclatural changes in the plant kingdom, technological change, habitat changes, climate change. Just last November a major U.S. government report was published, written by 13 federal agencies including the National Aeronautics and Space Administration (NASA), the National Oceanic and Atmospheric Administration (NOAA), and the Environmental Protection Agency (EPA). It emphasized the link between human activity and the quickening pace of climate change. The last 3 years have been the warmest on record. Global temperatures will rise by 5 degrees C by 2100. Sea levels have risen by 8" since 1900 but half of that in the last 25 years. Unchecked, sea levels will rise several more inches in the next 15 years and by 4 feet by 2100. It is already affecting coastal cities with tidal flooding. Heavy rains, heat waves, and forest fires are more common.

A major theme of this Conference and preceding World Orchid Conferences was conservation in the face of such environmental changes, both natural and man-made. We had 85 speakers and about 60 posters on display addressing conservation as well as orchid systematics, ecology, hybridization and judging, art, floras, pollination, taxonomy, and pleurothallids, which make up the bulk of Andean orchid species. There was a day-long symposium on Andean orchids chaired by Alex Hirtz and one on the world's most commercially important genus, *Vanilla*, organized and chaired by Nicola Flanagan. The World Orchid Conference Trust awarded a prize to what it considered the best poster, titled "Dating *Barbosella* (Orchidaceae: Pleurothallidinae) divergences using molecular data" and presented by Mônica Bolson and Eric C. Smidt. The 22nd WOC organizers also awarded three poster prizes at the closing ceremony to Amy Bump et al., Aline C. Martins et al., and Hector Herrera et al. We kept the student registration fee as low as possible and also waived the fee altogether for the seven best student abstracts as judged by the Conference Committee. Last but not least, the World Orchid Conference Trust sponsored two brilliant and hard-working students to attend this WOC—Nhora Helena Ospina-Calderón from Colombia and Yader Ruiz Cruz from El Salvador (now studying in Mexico). It is the students who will face daunting changes ahead for orchids, so we feel it is incumbent on us to support and encourage them. I challenge future World Orchid Conference Organizing Committees to do likewise.

There are also tragic, personal changes that affect us immediately and deeply. One of the orchid world's most devoted conservationists, Dr. Holger Perner, was scheduled to speak but died suddenly last April. Dr. Perner not only developed ex situ methods for propagating Chinese cypripediums and blueberries that transformed the economy of an entire village in Sichuan, China, he was also a prolific author in orchid books and magazines. He received the prestigious Foreign Friendship Award for his work

from the Peoples' Republic of China. He was a devoted husband to Wenqing and loving father to Isabell and Stefanie. Wenqing gave a talk on Chinese cypripediums in Holger's place. In Holger's honor, two prizes of $500 each in his name were awarded at the closing ceremony to Nhora Ospina Calderón and Melissa Díaz-Morales for the two best student lectures. Monies for the prizes were kindly donated by Pavel Kindlmann, Iva Traxmandlova, Zuzana Štípková, and the Slipper Orchid Alliance (Barbara Tisherman, President).

The 23rd World Orchid Conference will be held in Taichung City, Taiwan, in 2020 and the 24th provisionally in Perth, Australia, in 2023. As a member of the World Orchid Conference Trust, I hope to see you all again then if not before.

The Proceedings of the 22nd WOC, which we plan to publish this year, may be ordered online at www.woc22.com. It will be filled with spectacular photos of the show and benchmark papers appealing to all segments of the orchid world, especially orchid scientists and students.

Alec Pridgeon
Kew

Plenary speakers at the 22nd World Orchid Conference: (left to right) James Ackerman, Mark Chase, Mike Fay. Photo by Nicola Flanagan.

News from Correspondents

Please submit any news about recently completed research, future research plans and needs, change of address, upcoming or recent fieldwork, etc. to André Schuiteman (a.schuiteman@kew.org). Graduate students are especially encouraged to share the subjects of their thesis or dissertation with the international community.

Laura Azandi Ngnintedem is a PhD student at the University of Yaounde I in Cameroon working on the systematics, reproductive biology and conservation of *Cyrtorchis* Schltr., an African angraecoid orchid genus. Her thesis project is funded by the American Orchid Society (AOS) and is undertaken under the supervision of Prof. Bonaventure Sonké (Cameroon), Dr. Vincent Droissart (France) and Dr. Tariq Stévart (Belgium).

Cyrtorchis has been proved to be monophyletic, but species delimitation of its members was not clearly resolved. Azandi's PhD research aims to (i) elucidate the taxonomy, (ii) explore its reproductive biology, thereby contributing to the conservation of African orchids. In the framework of this project, she has provided a synoptic revision of the genus with 15 taxa recognized in Central Africa (Azandi et al., 2016), along with an identification key. This preliminary step towards a global revision brought one new species to light, viz. *Cyrtorchis submontana* Stévart, Droissart & Azandi. She plans now to use additional morphometric and molecular studies to accurately clarify the species delimitation within taxonomic complex identified during the synoptic revision.

Azandi will build on this taxonomic backbone to study more in-depth the reproductive biology of some species of the genus cultivated in the African regional shade house network (http://www.orchid-africa.net/ombriere.asp). The genus is made up of numerous species with complex floral structure that may involve interesting sphingophilous syndromes. Laura started developing a protocol to study the reproductive biology of species in their natural habitat as well as in ex situ living collection. This involves daily monitoring of flowering individuals, recording of videos and pictures using a camera trap and capturing of potential pollinators by means of light traps.

The IUCN conservation status of recognized taxa will also be assessed to help focusing the present ex situ conservation effort and thus assure adequate preservation of the most threatened species. A seed bank of the most threatened species will be established using the African regional shade house network. Controlled pollination is ongoing in the Yaoundé shade house (Cameroon) in order to produce viable seeds to supply the first orchid seed bank of tropical Africa. Some factors (e.g. self- versus cross-pollination) that could affect the efficiency of hand-controlled pollinations are being tested.

Azandi, L., Stévart, T., Sonké, B., Simo-Droissart, M., Avana, M.-L., and Droissart, V. 2016. Synoptic revision of the genus *Cyrtorchis* Schltr. (Angraecinae, Orchidaceae) in Central Africa, with the description of a new species restricted to submontane vegetation. *Phytotaxa* 267(3): 165–186.

Obituary

Elżbieta Grochocka (1985-2017)

Elżbieta "Ela" Grochocka, a young orchid researcher from Poland, unexpectedly passed away in April 2017. Taking her inspiration from Joanna Mytnik, Ela was engaged in many studies on African Orchidaceae. Together with the team at the University of Gdańsk she worked on the classification of *Angraecum s.l.* Most recently, she was exploring the taxonomy of *Angraecum* sects. *Nana*, *Angraecoides* and *Pectinariella*, including their pollination biology. Ela also participated in research on the phylogeny and classification of Vandeae, and contributed to the third volume of *Orchids of West-Central Africa* (Szlachetko et al.). She conducted research in several European herbaria [including Kew—Ed.], receiving funds from SYNTHESYS—the European Union-funded Integrated Activities grant.

Ela was involved in conservation activities in Poland, e.g., translocation of protected orchid species, vegetation recovery in raised bogs of Pomerania Province, conservation of the coastal populations of *Eryngium maritimum*, and assessing the impact of tourism in the Mechelińskie Łąki Nature Reserve.

She had a great passion for education and science promotion. Ela was good at instilling curiosity in her students, encouraging their desire to learn. In the last few years she also conducted workshops during the Baltic Science Festival, engaging with people from Pomerania, regardless of age and education level.

She lived life to the fullest and passed away far too soon.

Marta Kolanowska
Global Change Research Institute, Czech Academy of Sciences, Brno, Czech Republic

Recent Orchid Nomenclature

New orchid names may be retrieved from the IPNI website: http://www.ipni.org/ipni/plantnamesearchpage.do. Click on "Show additional search terms" on the right-hand side of the screen. After the search page appears, type in **Orchidaceae** under family name and (for example) **2010-11-30** under "Record date" and "Added since." This will pull up a list of all names added to the IPNI database since 30 November 2010. Also be sure to check the World Checklist of Selected Plant Families (http://apps.kew.org/wcsp/) for accepted names and synonyms as well as for building your own checklists.

Reviews

Renziana. Vol. 5. *Coryanthes.* 2017. Schweizerische Orchideenstiftung am Herbarium Jany Renz (SOF), Basel. 99 pp. A4-sized. ISSN 2235-0799. Price: CHF 15/€ 20.

Renziana is a journal published since 2011 by the Swiss Orchid Foundation. Initially it appeared once a year, but this fifth volume follows a break of three years. Every issue is dedicated to a single orchid genus: Vol. 1—*Paphiopedilum*; vol. 2—*Phalaenopsis*; vol. 3—*Vanda*; vol. 4—*Cattleya*; vol. 5—*Coryanthes*. Except for *Coryanthes*, these are all genera of outstanding horticultural importance. Each volume contains a pictorial gallery of all the known species, which is extremely useful when you want to identify a species or verify the name on a label. They also have chapters on the history of the genus, classification, cultivation, etc. All are written by well-known experts.

This fifth volume is no exception to the established format; in fact, it is an improvement in that each of the 49 species is not just illustrated but also discussed individually. Apart from a preface by Phillip Cribb and a chapter on cultivation by Walter Tresch and Wilfried Schmidt it was entirely written by Günter Gerlach, who is unquestionably the go-to person for *Coryanthes*. This Neotropical genus, colloquially (and prosaically) known as the bucket orchid genus, is of limited horticultural value but is no doubt one of the most remarkable of all orchid genera. If *Coryanthes* had only been known from descriptions by travellers the latter would probably have been dismissed as being slightly less trustworthy than the Baron von Münchhausen. But these fantastic orchids are real enough, and it is a pleasure to see them in all their bizarre glory in this affordably-priced volume. The classification is brought up-to-date, and some past mistakes are corrected. There are chapters on ecology, pollination and scents that are all most informative and well-illustrated. My only criticism is that the excellent and well-reproduced colour photos are printed on matte paper, which makes them appear less brilliant than they could have been. It is at present uncertain if further volumes will be produced; it may help if you buy a copy of this latest instalment.

André Schuiteman

Stone, J. and Cribb, P. 2017. *Lady Tankerville's Legacy—A Historical and Monographic Review of Phaius and Gastrorchis.* Natural History Publications, Kota Kinabalu, in association with Royal Botanic Gardens, Kew. 278 pp. 18.3 × 25.4 cm. ISBN 978-983-812-181-1. Price: RM 230/*c.* £ 43.

The most common species of *Phaius*, both in cultivation and in the wild, is undoubtedly *P. tankervilleae*, which is notorious for the varied spellings of its specific epithet in the literature. This epithet, due to Sir Joseph Banks, commemorates the Lady Emma Tankerville mentioned in the title, who appears to have had this species in her collection of exotic plants back in the late eighteenth century, although she was not the first to flower it. Apart from lending her name to 'that' *Phaius* (Banks initially described it in *Limodorum*) there is not—contrary to what the title may suggest—much of a Lady Tankerville legacy to speak of in the context of this publication. The book is in fact a taxonomic overview of the genera *Phaius* and *Gastrorchis*, and as such fills a rather inexplicable gap in the literature. Apart from *P. tankervilleae*, many other species in these two genera possess large and showy flowers, but they have not (yet) become all that popular in cultivation.

Although sometimes considered a single genus, it is certainly defensible to treat *Gastrorchis* and *Phaius* as separate genera, as they are not sister groups according to recent phylogenetic studies. However, *Phaius* itself does not appear to be monophyletic, as noted by the authors. That aside, the main aim of this book is to cover all the known species, and it does so in an attractive and user-friendly way. Unlike many other works of this kind, text, photos and line-drawings are intermixed rather than presented in separate sections. One can argue which kind of arrangement is best for identification purposes, but the mixed approach is certainly more suitable for browsing, in my opinion.

The first author, Judi Stone, is a botanical artist (mainly working for Kew) with a PhD in biochemistry. Her delicate line drawings have accompanied the descriptions of numerous new orchid species, and have appeared in floras and in *Genera Orchidacearum*. The line drawings in this volume are of course from her hand.

Phaius is here divided into two sections, and there are keys to the identification of the species, 41 in *Phaius* and 9 in *Gastrorchis*. For each species there is a concise description, a line drawing, usually two or more colour photographs, and a dot map. It is not made explicit in the book what the sources for the dots maps are or which specimens have been studied.

Some species are still poorly known and their status may be subject to change when more and better material becomes available. But for most of the species this attractive book provides a definitive account, and for that reason is not to be missed. The quality of the production is as we have come to expect from this publisher—in other words, excellent.

André Schuiteman

Recent Literature

We are grateful to Paolo Grünanger for supplying references from journals dedicated to European orchids. If you are aware of any relevant citations published between January 2017 and October 2017 not listed here or in the previous issue, please send them—in the exact style below—to André Schuiteman (a.schuiteman_kew.org) for publication in the next issue (July 2018). Write "ORN references" in the subject line of the email. Book citations should include author(s), year of publication, title, publisher, and place of publication (in that order). Journal titles should be spelled out in full.

Anatomy and morphology

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