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"Collections- the Last Great Frontiers of Exploration" : Verrall Lecture at the Royal Geographical Society, March 2016

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Maxwell V. L. Barclay

Natural History Museum, London

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"Collections- the Last Great Frontiers of Exploration"

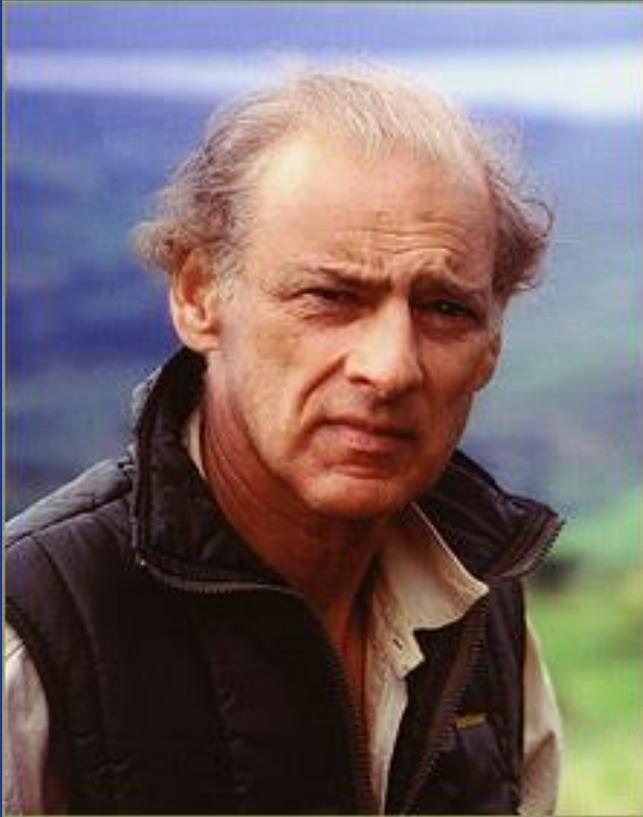
Max Barclay

Curator & Collection Manager

Insects: Coleoptera & Hemiptera

Natural History Museum, London

Lecture theatre named after
Sir Christopher Ondaatje



Donated £100,000 to
save this Van Dyck
painting for the Nation



Unlike 'saving a picture', saving rainforests is not about 'where it is' ... but 'whether it is'





£100,000 could fund 10 expeditions to threatened rainforest areas, which could have collected 20,000-30,000 specimens each, including hundreds of undescribed species that would otherwise be lost forever to all human knowledge for all time

“Millennia of human lifetimes have been spent building and maintaining the world's great natural history collections....”

“Millennia of human lifetimes have been spent building and maintaining the world's great natural history collections.”



Private collections are like streams and tributaries, that eventually flow into the larger rivers of big institutional collections, which ultimately combine in the sea of human knowledge

**If a collector works on their
collection for just an hour
every evening, that is
20,000 hours invested in
even a quite modest private
collection**

$$60 \times 365 \times 1 = 21900$$



Collection of Luigi Magnano (1925 – 2009)

Magnano was an Italian
tailor and the world's
leading expert on the
genus *Otiorhynchus*.

He was also a regular
borrower

Acquired by NHM 2014
350 boxes
45,000 specimens
1208 Type specimens



A primary responsibility of everyone in the room is to do what we can to ensure that there *is* a next generation of collectors... that the Magnano's of this world are not consigned to the pages of history, that those rivers and streams that feed the sea of knowledge don't dry up...

“As stewards of this incredible resource of knowledge, curators have a responsibility to preserve, document, interpret and develop the collections in our care.”



Only by doing this can we provide the best possible support, inspiration and the widest access for the present day community of natural scientists, and hand down as complete and accessible an archive of biodiversity as possible to future generations.



**“With the destruction of natural habitats,
the urgency to collect and document
biodiversity constantly grows, and the
relevance of natural history collections will
only increase.”**



“The Sibyl offered to King Tarquinius of Rome nine books of prophecies; and as the king declined to purchase them, owing to the exorbitant price she demanded, she burned three and offered the remaining six to Tarquinius at the same stiff price, which he again refused, whereupon she burned three more and repeated her offer.

Tarquinius then relented and purchased the last three at the full original price and had them preserved in a vault beneath the Capitoline temple of Jupiter. .”

**As a society, we are still at the
“refusing and burning”
stage,**

**but a few of us, notably collectors and
natural history collections staff, have
recognised the need to conserve what
knowledge we can for the present and the
future...**

“Discovery and exploration of the natural world is a part of the human condition.. Exploration, along with sports, music, and art, belongs to a class of human activities that represent “endeavours without end.”..

Ferro & Flick, 2015
THE COLEOPTERISTS BULLETIN 69(3)



The Royal Geographical Society is a very appropriate venue from which to talk about biodiversity exploration...

For Geographical exploration you need to have detailed and accurate maps of what is already known.....



In Biodiversity exploration, those “maps of what is already known” are called natural history collections

And just as maps are an ordered and schematic key to the world to facilitate interpretation...



So collections, and the taxonomic principles they enshrine, are an ordered and schematic key to the living world...



Organised so it is accessible as a tool and an engine for many sciences, but particularly for taxonomy... ..



What's exciting about taxonomy?

“It is the one field with the audacity to create an inventory of every living thing on the entire planet and reconstruct the history of the diversity of life. Who else would tackle 12 million species in 3.8 billion years on the entire surface of the planet? If that isn't real science, I don't know what is. It infuriates me that taxonomy is marginalized as a bookkeeping activity, when in fact it has the most audacious research agenda of any biological science.”

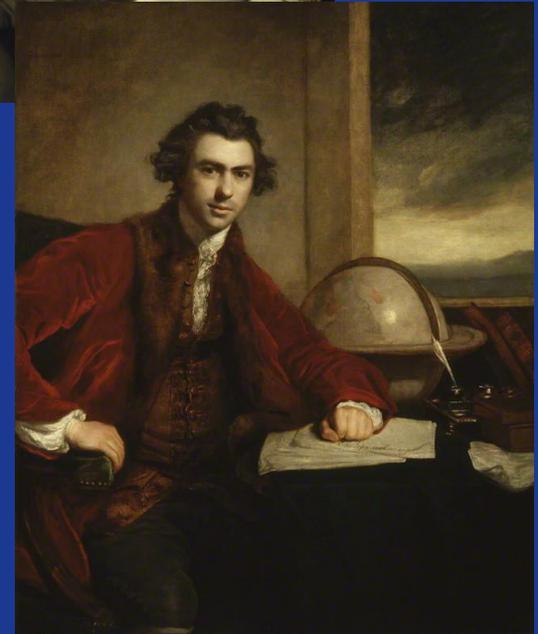


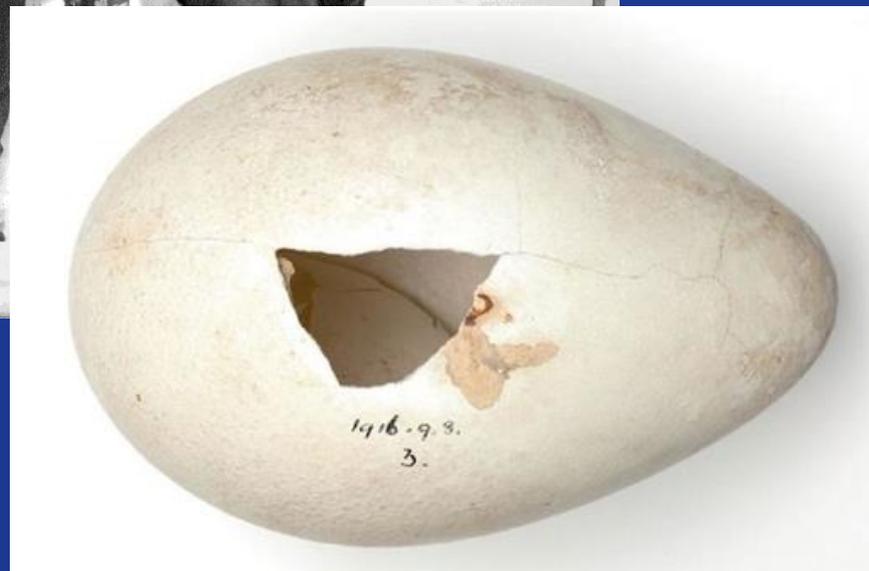


Because of the similarity of our objectives, many of the heroes of the Royal Geographical Society are also contributors to the Natural History Museum's collections

Captain James Cook and Sir Joseph Banks

Endeavour Voyages 1760s







Dr.
Livingstone

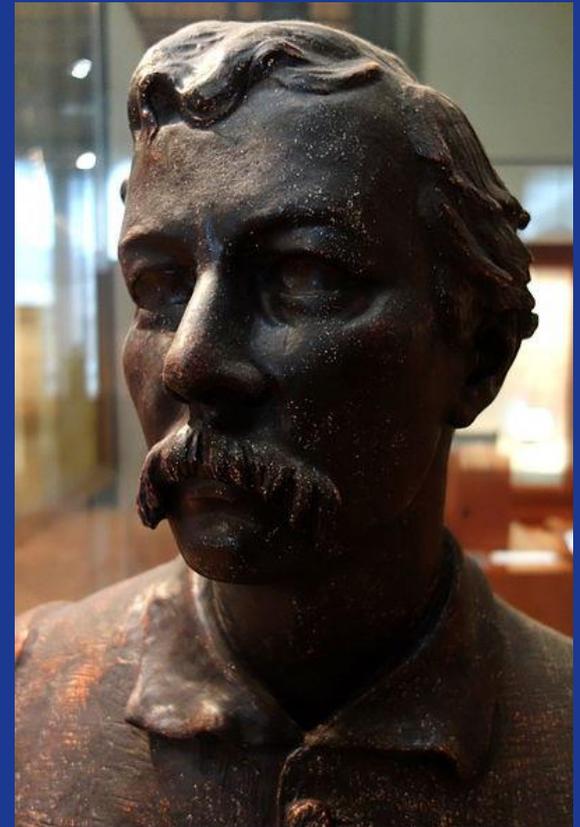
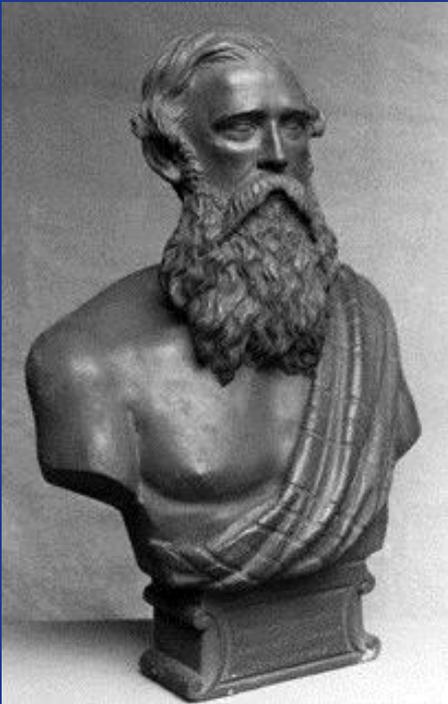


Zambezi
coll. by Dr.
Livingstone

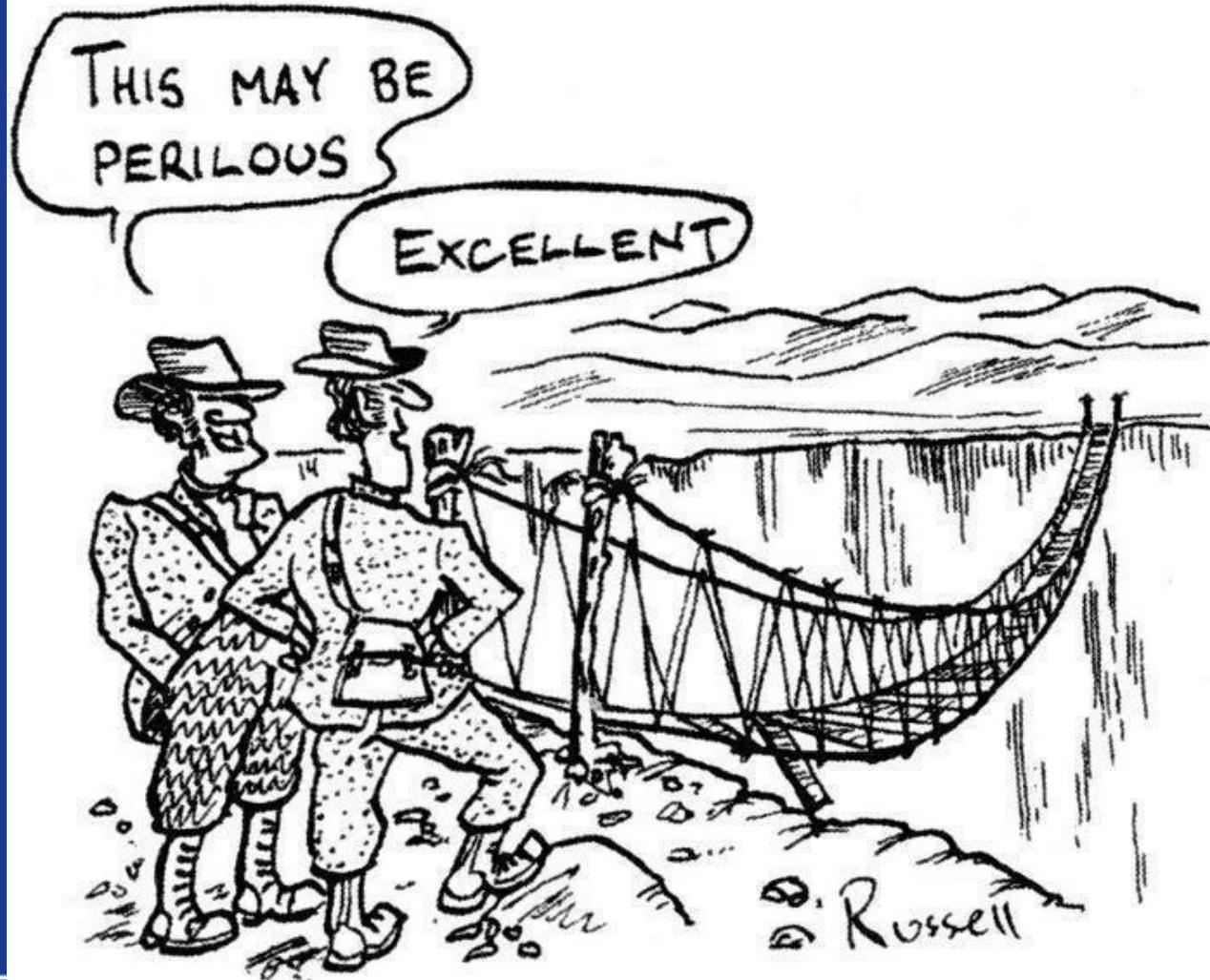
BMNH{E}
1924-176
E. Y. Western



Speke, Stanley, Burton & Thesiger



Victorian risk assessment



MARY KINGSLEY

1862- 1900



"When you have made up your mind to go to West Africa the very best thing you can do is get it unmade again, and go to Scotland instead....."

(Avuncular advice to MK: ignored)

".... and get some introductions to the Wesleyans; they are the only people on the Coast who have got a hearse with feathers."





Fortunately she ignored most of this advice...

Pseudodictator kingsleyae
Juhel, 2015

Only existing specimen, one of 7 beetles collected by Mary Kingsley on the 'Gold Coast'



Bahia Blanca,
Argentina.
C. Darwin.

B. Blanca

***Darwinilus sedarisi* Chatzimanolis, 2014**
New genus, new species

The discovery of specimens of interest in Museum collections can be misinterpreted by the Media and the general public

Media interpretation: like the end of 'Raiders of the Lost Ark...'



These articles always focus on the time lag rather than how fantastic that someone collected it and preserved it at all, and it was preserved safely for all that time until someone with the right expertise came along.

That's what collections are for. When that happens I hope they'll say "how nice that this dead coleopterist picked up this new caddis fly in a forest that has long since been cut down" rather than "why has this damn museum left this on a shelf neglected gathering dust for so long".

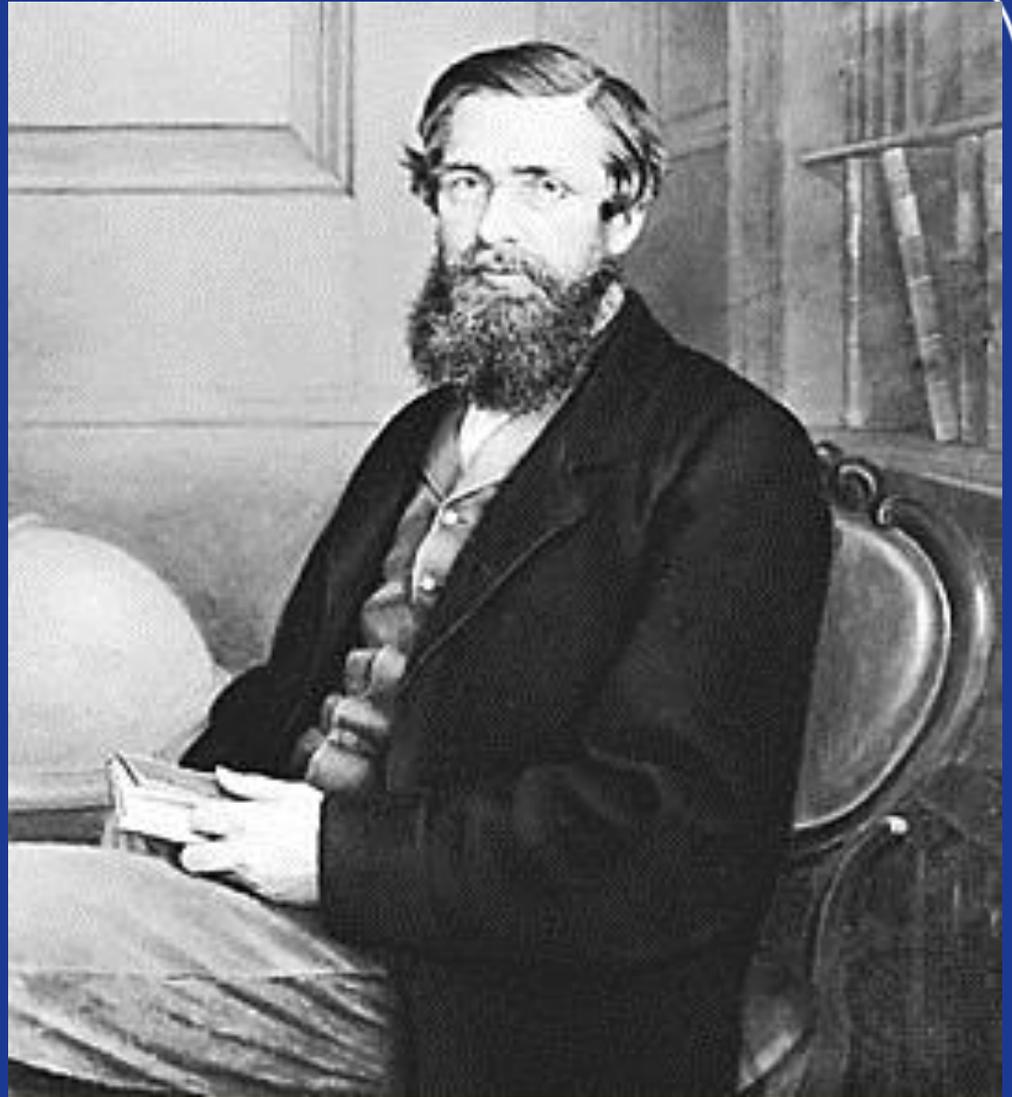
Newspapers ALWAYS mention 'dust', though none of our insect specimens have dust on them.

I collect beetles, and while doing so, I pick up insects from other groups which I am not knowledgeable about- and neither are any of my colleagues. This is because biodiversity is vast, and scientific institutes are few and small, and maybe in any given generation there is not a specialist for everything. However, I preserve them, label them, lodge them in the right part of the museum and probably after I'm dead someone will come along and describe some of them.



Alfred Russel Wallace

1823- 1913



Amazonia with Henry Walter Bates

Collection lost in a ship board fire



Image: 'Look and Learn' 1969

Used the insurance money to fund an 8 year trip to the 'Malay Archipelago'

- Huge collections including 80,000 beetles
- Conceived 'Sarawak Law', mechanism of Natural Selection and 'Wallace Lines' of biogeography
- Published travel book 'The Malay Archipelago' which was never out of print



Ornithoptera croesus Wallace, 1859

On taking it out of my net and opening the glorious wings, my heart began to beat violently, the blood rushed to my head, and I felt much more like fainting than I have done when in apprehension of immediate death. I had a headache the rest of the day, so great was the excitement

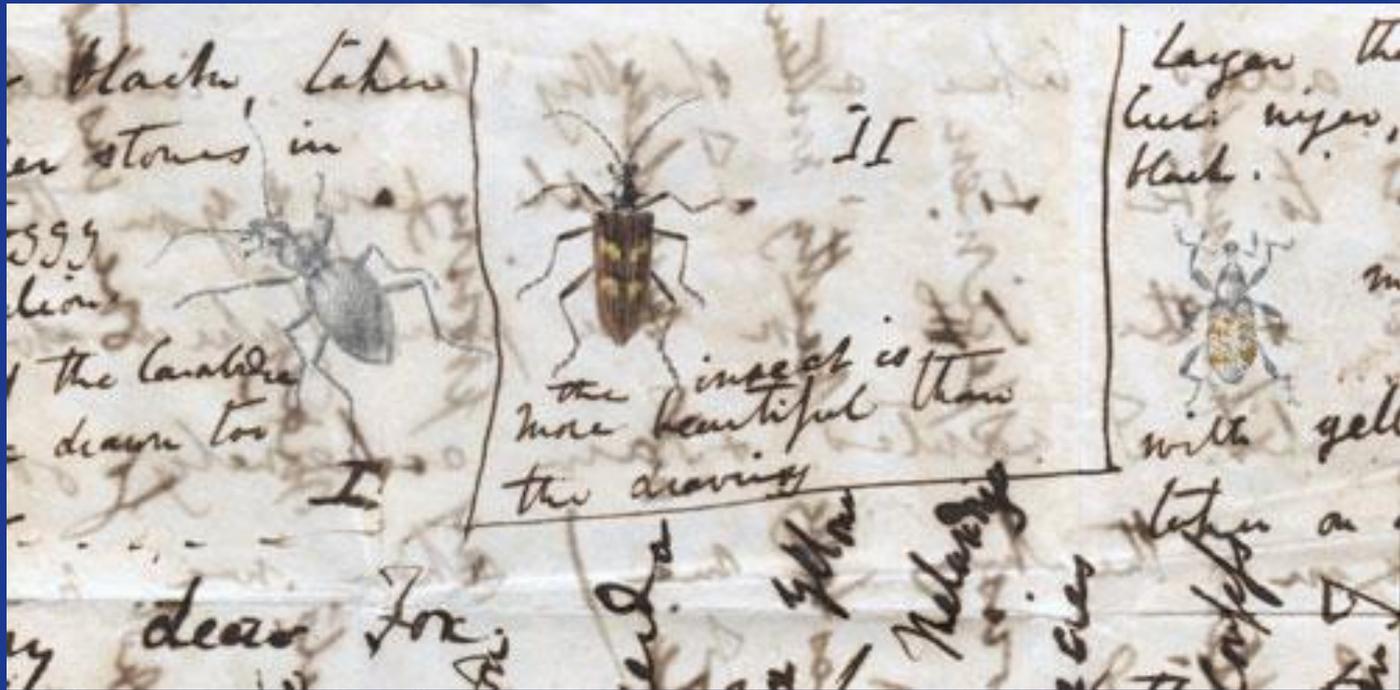




Lomaptera esmeralda
Type. Wallace.

~~Stungwell~~ ~~W~~
Proc. E.S. Trans. Ent. Soc., 1868. II.
1867. p. 201 de. Buhl. h. 539

~~Stungwell~~ ~~W~~
Proc. E.S. Trans. Ent. Soc., 1868. II.
1867. p. 201 de. Buhl. h. 539



- Asian Cetoniine types from the collection of Milan Krajcik, a contemporary Czech doctor





Most recent taxon I described: no old specimens. Nothing in any of the museums I have visited, and nothing known that was collected before 1950....

Wallace was collecting at a time when Singapore was a fishing village, when tigers and leopards were a real risk worth taking precautions against, when oil palm trees only grew in a few forests of West Africa...

He was collecting in lowland forests, growing on rich alluvial soils that went right down to the sea coasts....

So.. the assumption that, so long as there is some rainforest left for example on Borneo, the 'fauna of Borneo' is still available to study, is flawed...

there is not just one 'fauna of Borneo' and the fauna available for study changes over time as well as over place..

We are not dealing with a single robust and continuous fauna or an ongoing opportunity. We invest so little time in sampling biodiversity that almost every expedition and every opportunity is unique.

... the only reason we have a data point for 1860s Borneo/ Indonesia is because one self funded individual decided that was what he wanted to do with 8 years of his life...

Because ecologists have normal human life spans, this concept is not properly understood or worked out..

I call it
Onion Theory



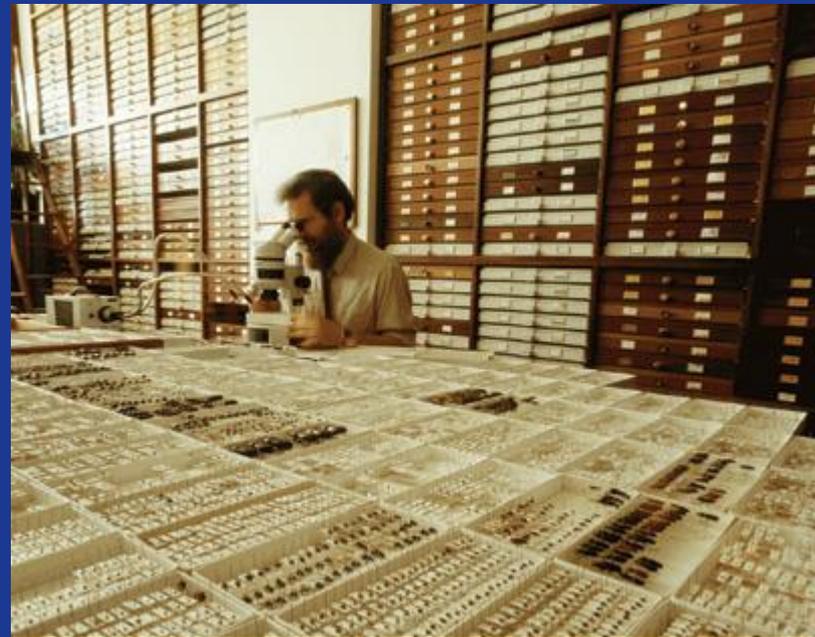
We only know about it at all because we have natural history collections....

We only know about it at all because we have natural history collections....

And natural history collections are distillations of the natural habitats of the world across both time and space.....

In fractional distillation of a chemical, it is split into its constituent parts so they can all be examined separately, and its composition can be understood.

A collection is nature, sorted and separated for taxonomy..



Why is taxonomy important today?

“I think future generations will be appalled with us, that it was so easy to explore biodiversity and where we came from ... and we chose not to (because we were doing parlor tricks with DNA at the time everything was going extinct).”



Why is taxonomy important today?

Taxonomy is more important than ever. What with the biodiversity crisis, species are disappearing faster than we can name them. When species are going extinct as fast as they are, and they leave no fossils behind, it's really a matter of now or never that we learn about these species."



So, what we are doing in collections, and have been doing since the time of Sir Hans Sloane and Sir Joseph Banks, is building a new ‘fossil record’, an archive of the biodiversity of the planet that is as comprehensive as we can make it..

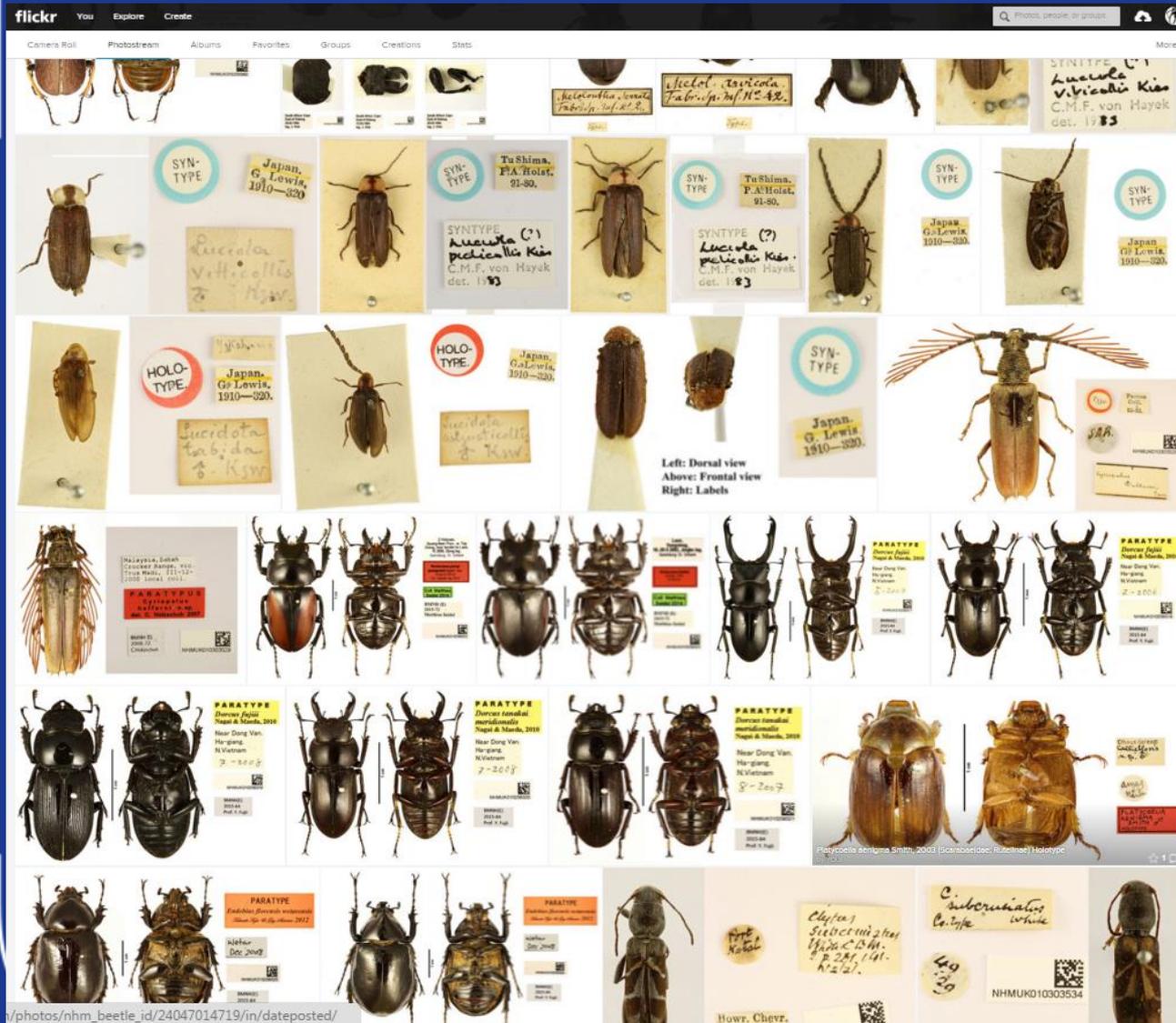
Collections' fundamental roles, are as repositories of specimens and information, where the world's biodiversity is archived, assembled, preserved and made accessible for present and future study, and to generate present and future knowledge about the natural world.

we can't just expect people to know what we're doing and why..

We need to publicise our work; we can't sit in an Ivory Tower just knowing what we do is right, we have to go out there and explain to the world why it is important.

No generation has every really grasped the value of biodiversity exploration, and we are now down to the last few unburnt volumes of the Sibylline Books..





Part of the responsibility of having such an archive is to make it available as widely as possible

Societal impacts of Natural History are iterative and play out over many generations – but there are unintended, unpredictable large scale consequences from collecting, basic research and the need to explore the world..

So remember the synchrony, between personal collections, institutional collections, and the sum of human knowledge..



Private collections are like streams and tributaries, that eventually flow into the larger rivers of big institutional collections, which ultimately combine in the sea of human knowledge

This lecture is dedicated to collectors of insects, past present and future....

and to all those who help ensure that collecting has a future...

Thank you