

Kessler/Stuppy: *Seeds – Time Capsules of Life*

Flower Power Revolution

Seeds are the most complex organs that plants produce and they have been doing it for 360 million years.

Now a stunning new book delves into the noble history of the humble seed.

The famous Royal Botanic Gardens (RBG) in Kew hold a subterranean secret. It's located in the beautiful High Weald of Sussex at Wakehurst Place, 63 kilometres south of the City of London. RBG Kew has a local branch here, another outstanding botanic garden and conservation area,



but the secret is hidden under the garden's surface, in the form of a mighty hollow cube of concrete, embedded deep in British mould. Inside, there is a floor area of about 930m² with thousands of security containers arranged in it, kept constantly cool at minus 20 degrees Celsius. These containers contain an inestimable treasure, the seeds of nearly all the higher plants of Great Britain, preserved for centuries.

An ambitious conservation project

The buried cube of concrete, with the Wellcome Trust Millennium Visitor's Building above, is better known under the name Millennium Seed Bank (MSB) – the largest *ex situ* conservation project ever conceived. Fully equipped, it could preserve perhaps as much as 40% of the world's seed-bearing species. The short-term objective, however, is to bank seed from at least 10% of the world's wild plant species by the end of the decade (more than 24,000 species, including the rarest, most threatened and most useful species known to man). This task certainly appears to be worthwhile; in 2003, the MSB project was designated an Unesco World Heritage Site. Nevertheless, it sends a shiver down the spine of many a visitor to the MSB when realising that the reason behind this €117 million project is the unfolding ecological destruction of planet earth.

A good deal of science is also performed at Wakehurst Place. The Royal Botanic Gardens employ about 200 scientists, whose research spans a broad range, from DNA barcoding and DNA banking over cy-

togenetics and molecular systematics to horticultural taxonomy and nomenclature. One of these 200 is Wolfgang Stuppy, a seed morphologist of German descent. Stuppy aims to find out the interactive relationship of structure and function of seeds. To put this more simply, do forms follow function or did evolution prefer the other way around? Stuppy's research should also have practical applications, for example, in the improvement of long term storage of MSB seeds. To visualise the fin-



Impressive pictures, eloquent presentation: *Darlingtonia californica* from "Seeds".

est internal structures of seeds, he has actually utilised high resolution computer tomography in a new scientific approach.

An impressive illustrated book

In Stuppy's illustrated book *Seeds – Time Capsules of Life*, published end of 2006, one finds the usual scanning electron microscopy (SEM) and close-up photographs. But, wait a minute! Did I say "usual"? This book with its impressive, black background illustrations on heavy high gloss paper is anything but "usual". It is sensational. Lots of splendid books on nature and science have been published in recent years but this one out-rides them all. For three main reasons: brilliant pictures, brilliant words, brilliant presentation.

Responsible for the pictures is British artist Rob Kessler. Starting from (monochrome) SEM photographs of all kinds of seeds, he (mis)coloured several hundred images in a sophisticated manner and created a stunning masterpiece of a book. We admire a forgotten 30 x 30 centimetre 3D painting by M.C. Escher, but in reality it's a flimsy 1.5 millimetre *Stellaria pungens* seed (a Caryophyllaceae species). We catch sight of a yellow rubber dinghy – April Fool! It's really a seed from rock sea-spurrey (*Spergularia spec.*). We assume that we are looking at a giant raspberry but in fact it's a 1.43mm long seed of *Echinocereus* (a cactus genus) greatly enlarged. The depth effect is phenomenal. One could almost touch the seed structures jutting out from the pages.

An eloquent ride through the biology of higher plants

At the same time, the author duo's scientific head, Wolfgang Stuppy, whisks the reader off on a fascinating and eloquent journey through the evolutionary genesis and complex biology of higher plants. Accompanying Stuppy enlightens the reader to why sometimes seeds are naked, males are *micro* and females are *mega* and where the biggest cones in the world can be found (in California, with a weight of up to 45 kg). Stuppy writes on *mad gymnosperms*, about *the love tubes of Welwitschia* and *the Flower Power Revolution* during the late Jurassic, 140 millions years ago. This entertaining style ensures the reading of *Seeds* is a pure pleasure.

Papadakis publishes the book in collaboration with the Royal Botanic Gardens, Kew. It comes in an oversize format and the strong colours on thick paper with a gloss finish make it look as valuable as its contents. Only the fragile binding is somewhat disappointing as after a short while the pages tend to come loose from the spine. So turn the pages carefully!

WEANÉE KIMBLEWOOD

Rob Kessler & Wolfgang Stuppy: *Seeds – Time Capsules of Life*. Papadakis Publishers, 2006. 264 pages, GBP 35.00 (€52.50).