PLANT PRESS with pine plates and interleaved pressing paper.

Pressing paper peat

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Taking a summer stroll in the countryside, across once-flooded fields, or perhaps along a grassy ditch, one may occasionally encounter something that looks like paper:

> an irregular tissue, that lies close to the ground or, as often happens, hangs across the tops of the grass stalks, and is then dried and bleached by the sun, so that it remains after drying out as large or small greenish yellow, greyish or white parched membranes, sometimes quite paper-like, which have assumed different forms according to the nature of the ground.

This was how Hampus von Post described the material in the 1840s. Over the centuries, people have speculated whether this could be paper that has fallen from the sky – the Germans call it *Meteorpapier* – or floated ashore from shipwrecks. But eventually botanists and chemists agreed that the papery tissue is composed of algae, and can be regarded as a type of mud. It has many names, being variously called *Wiesenpapier* – meadow paper – paper snow and "paper peat". In Swedish, it is sometimes given the more specific name of *gråpapperstorv* – pressing paper peat – because it resembles "packets of pressing paper".

Pressing paper is a soft and grainy paper, with a capacity to absorb liquid that makes it invaluable to field botanists. Plants must be dried and pressed before they can be added to collections. Even if a grass can dry in a day, orchids, alliums and stonecrops may need several weeks and many layers of pressing paper before they are dry enough and flat enough to be mounted on a herbarium sheet and preserved for posterity.

Herbaria, collections of dried, pressed and categorised plants, have long been at the heart of botanical research. These carefully preserved plants are used to map distribution and family relationships, frequency and variation,

A SHEAF OF HANDMADE PRESSING PAPER, produced at Ösjöfors handmade paper mill.

and many millions of sheets are found in natural history collections around the world. As soon as it was founded in 1739, the Academy of Sciences began compiling a cabinet of curiosities, with plants, animals and other specimens collected by its members or donated by benefactors, circumnavigators, and nature lovers. The best known are Linnaeus' apostles who, putting their lives at stake, travelled around the world in order to send home material for the professor's collections. But provincial doctors, vicars, teachers and military men also explored their home ground and contributed to the Academy of Sciences' herbarium. In the 18th century, this motley group of botanical collectors corresponded well with the idea of the Academy as an institution which gathered information from the public in order to improve Swedish science and economy.

Still, even after the boundaries between different scientific roles began to be more defined in the 19th century, there was room for plant collectors who were not specialists in botany. Academic positions were few, and collections were largely accumulated by merchants and missionaries, and by local priests and officials, just as they were a century before. Gradually, they were also opened up to the public, and the new bourgeoisie was able to observe the results of its collecting fervour at natural history museums around the country. The Professor Bergianus and his assistants did not work alone at the Swedish Museum of Natural History's botany department – numerous interested amateurs spent their free time identifying, ordering and caring for the plant collections.

And, whether they wanted to or not, generations of children were dragged into collecting. In the mid-19th century, it was written into school regulations that all boys at grammar school – because only boys attended state grammar schools – had to gather plants during the summer holidays. Every year, between 50 and 150 plants were to be picked and mounted, and then presented to the teacher at the start of the autumn term. But producing a beautiful herbarium required both skill and equipment; plants had to be localised and identified and, if the school flora proved inadequate, more comprehensive handbooks and guides to the local plant world might be necessary. Plants had to be carefully gathered so that all the important parts were included, pressed, mounted and correctly labelled. In addition, a vasculum was needed to gently carry them home, as well as a plant press, herbarium sheets, sticky labels and, not least, pressing paper.

For a century, all Swedish grammar school boys were forced to spend at least some of their summer holidays collecting plants and making herbaria. Pressing paper was a part of life, even if plant collecting was described by some teachers and pupils as "forced labour". So perhaps it is no surprise that the student who, strolling through the countryside, came across "a variety of mud that, when dried, can be divided into thin layers or sheets" thought about the "packets of pressing paper" he had used for the herbaria of his schooldays.

Pressing paper peat was itself subject to the same classification process as plants, animals and minerals. The botanist Hampus von Post conducted a careful review of the soil's origin, composition and scientific classification in his essay "Studier öfver nutidens koprogena jordbildningar, gyttja, dy, torf och mylla" [Studies of contemporary coprogenic soil formation, gyttja, dy, peat and mull], printed in *Vetenskapsakademiens handlingar* 1862 [*Transactions of the Academy of Sciences* 1862]. In von Post's classification, *gyttja* is a grey mass, elastic when moist, that consists of decomposed plants, the faeces of aquatic animals and diatom shells. *Dy* also includes organic matter, is fibrous and more of a black-brown colour, while the plant matter found in peat is largely intact and has fewer traces of algae and animal species. *Mull*, finally, is powdery dark earth containing plant matter, also known as plant soil or humus. All these soil types come in several varieties, found in different places and displaying different characteristics, such as mineral mull, coniferous mull, peat dy, littoral peat, schwingmoor, river gyttja, marine gyttja – and paper gyttja.

Von Post had to accommodate his botanical activities to his limited circumstances. Despite his passion for botany, he joined the military in order to support himself and to follow family tradition. And, just after succeeding in obtaining a teaching position at Ultuna agricultural institute, he had to resign and manage the family business at Reijmyre glassworks. He was forced

PUPILS FROM ALINGSÅS mixed school on a botanical excursion.

to take whatever botanical opportunities presented themselves, and admonished other botanists to curb their lust for glory and instead to devote themselves to unexceptional species in dull or inaccessible locations.

> We are not always able to visit gardens of Eden, but are rather thrown towards one and then another area of life, and we must learn to appreciate even that which – we believe – is insignificant, small and flat, which presents itself to us in such less fortunate places.

Pressing paper peat is probably amongst nature's more insignificant phenomena. But it draws attention to the material culture of science, to the everyday tools that are vital to scientific practice without being explicitly

discussed. It indicates too, how activities that may be called scientific also take place outside universities and research institutions. The schoolboys struggling with pressing paper could – if they had not entirely lost their enthusiasm for collecting plants – become involved in sending information about their findings to botanists and plant geographers, who were too few and too busy to spend much time collecting plants. Nowadays, the people called "amateurs", in fields such as botany, ornithology, and astronomy, produce knowledge that is in demand in academic research as well as nature conservation.

When, in 1842, Hampus von Post encouraged Sweden's young botanists to focus their attention on the "insignificant, small and flat", he imagined botanical science as an "association" or "shared excursion", comprising of "[m]aster, apostles and novices", and which would benefit most if the "scattered and differing abilities and degrees of knowledge could be united, so that all had their small share and interest in the progress of science". The contemporary participants in this shared excursion may not be the same as in von Post's time, but science remains, even today, a concern for people of different backgrounds, occupations, educations and interests – researchers, amateurs, officials and activists.

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Hampus von Post and 19th-century soil science, geology, and botany can be read about in Erland Mårald, *Jordens kretslopp: Lantbruket, staden och den kemiska vetenskapen 1840–1910* (Umeå, 2000); Christer Nordlund, *Det upphöjda landet: Vetenskapen, landhöjningsfrågan och kartläggningen av Sveriges förflutna, 1860–1930* (Umeå, 2001); and Gunnar Eriksson, *Elias Fries och den romantiska biologien* (Uppsala, 1962). Among von Post's own writings, I have primarily used "Studier öfver nutidens koprogena jordbildningar, gyttja, dy, torv och mylla", *Vetenskapsakademiens handlingar*, 1862, and "Några ord till Fäderneslandets yngre botanister", *Botaniska Notiser*, vol. 4, 1842. I have written about amateurs and plant collecting in schools, its practical problems and importance for nature conservation in the article "Linneanska traditioner? Skolor, jubileer och botanisk praktik", in Staffan Bergwik, Michael Godhe, Anders Houltz & Magnus Rodell (eds.), *Svensk snillrikhet? Nationella föreställningar om entreprenörer och teknisk begåvning 1800–2000* (Lund, 2014). Another concrete example of botany's material culture is found in David Allen's short essays on the vasculum, the container used to keep plant samples in the field: "The history of the vasculum", *Proceedings of the Botanical Society of the British Isles*, vol. 3, 1959; "Some further light on the history of the vasculum", *Proceedings of the Botanical Society of the British Isles*, vol. 6, 1965.