

OUR BOTANICAL HERITAGE*

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On 31 May 1938 our predecessor professor Pulle delivered an address on the "stocktaking of the heritage of our forefathers" on the occasion of the opening of the enlarged and re-organized Laboratory of special Botany and Plant Geography" of the University of Utrecht. The "renewal" had been radical: a totally new herbarium building had been built in the southern-most part of the old Botanical Garden at the Lange Nieuwstraat in Utrecht. Pulle's address still merits reading. The printed version, in Dutch, was handed out after the delivery of the address. In case Pulle actually read the complete text, this must have taken some ninety minutes. I shall not take that long and I also do not plan to hand you a printed version at the end of the ceremony. Even so I would like to use this opportunity to tell you something about this "heritage", and about the herbarium and its use as well as about the history of our institution.

The use of the term "stocktaking of our forefathers' heritage" goes back to the Dutch agronomist and botanist Willem Frederik van Eeden, who, in his capacity as director of our first "Colonial Museum" wrote a paper in 1896 in the "Indische Mercur": "What are the goals of science in the Netherlands? Contributing its mite towards the general structure of science; the diligent research with respect to our incompletely known colonies; the stocktaking" W.F. van Eeden was also founder of what was later called the "Van Eeden-fonds for botanical research in Suriname and the West-Indian islands". Thanks to this fund our institute could publish its Flora of Suriname and organize numerous exploratory activities in those territories.

In 1896, but also still in 1938 this "heritage", that is in general sense our colonies, entailed the making of an inventory and the development of the natural resources in the East- as well as the West-Indies, a charge which comprised pure as well as applied scientific research. Now the "heritage" includes the duty to support our former colonies with respect to their economical and social development by means of applied science (natural resources, agriculture, forestry) as well as pure research. Our institute still recognises that it has such a task with respect to pure and applied botany.

Why should a "herbarium" play such an important role in this respect? Is a herbarium more than a large pile of dried plants, mounted on paper and annotated with scientific names and annotations as to provenance? One of my professors in the nineteen-forties, teaching a discipline of which we should now speak of as advanced and modern with great perspectives for the future, said to me in 1945, when I told him that I wanted to become a plant systematist: "what a pity! What on earth attracts you in such a hayloft." The prejudices against herbaria and systematic botany were then as formidable as they are to-day in certain quarters even though they are not put so plainly any longer by dignitaries. If we accept that we have to know the plants in this world (something like a million species) before we can advance at the frontiers of botany it will be clear that a

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herbarium has a variety of functions. I should like to illustrate this by mentioning four of the oldest herbaria, all of them from the sixteenth century.

1. The oldest herbarium now known is that of Merini, a medical student at Pisa with Lucca Ghini, who made a collection of 201 plants collected in the botanical garden, dried, pressed and stuck to paper. This herbarium is now in Florence. At the time the professors lectured on the knowledge of medicines during strolls in the botanical garden of their university. Merini dried his plants in order to have a mnemonic device, at home, when preparing himself for the examination. This herbarium dates from 1544. The herbarium was, in this instance, an aid with the study of plants, at home as well as in the laboratory.

2. In the year 1563 the Italian botanist and professor of medicine Andreas Cesalpino made a herbarium of mediterranean plants in some order which enabled him and others to recognise them through his "system". In this instance the herbarium served as an illustration of a scientific concept. This herbarium is now also in Florence.

3. In Utrecht we have a herbarium dating from 1566 made by a pharmacist from Antwerp, Peter Coudenberg, containing numerous Dutch wild and cultivated plants as well as plants from Southern France. This herbarium served the pharmacist to know his herbs. It also gives us information on plants grown in Dutch gardens.

4. At the University of Leiden a herbarium is conserved, made by Rauwolff, a southern German physician and traveller, consisting of plants of the Middle-East. This herbarium enabled botanists to study the plants collected on an expedition in a centre of culture where books, and perhaps other collections, were available for study and comparison with plants from other regions. When studying a group of plants spread over large territories, this study is only possible by comparison with other material. This is the fourth, and in fact the purely scientific aspect of a herbarium.

Six further herbaria are known from the period 1544-1576. Of these ten herbaria two are in the Netherlands.

In the course of the seventeenth and eighteenth century the making of herbaria became more general, thus following the ongoing botanical exploration. Against the end of the eighteenth century we witness the setting up of institutionalized herbaria such as we know to-day. At the moment we have some 2000 institutionalized herbaria, some of them much larger, but many much smaller than our Utrecht herbarium. They contain the archival material on which most systematic botanical research, the identification of species, the setting up of systems, the speculation about evolution, etc. are based.

Herbaria have many functions such as the existence of so-called type-specimens, that are the original specimens used by an author to describe a new species. These "types" determine in first instance the value of a herbarium: they enable later scientists to check the work of their predecessors and their existence is a guarantee that the same plant retain the same names. In Utrecht we have mainly types from the neotropics and our herbarium is therefore regularly consulted by visitors who study the flora of South and Central America.

The number of specimens per species in a herbarium is of importance to study that species in its various phases of life as well the variability caused by minor differences in its environment. This enables the plant systematists to draw up a scientifically correct description, which will enable others to use our publications in such a way that we all use the same names for the same plants.

Sometimes a large herbarium gets lost. The herbarium of Berlin, for instance, was destroyed in 1945 by war action. Many botanists are faced with difficulties because much of the work of the great German school of 1860-1939 can no longer be checked.

"A herbarium is not a wine-cellar" was one of Pulle's remarks in 1938. The quality of this collection does not improve by letting it alone. A herbarium is a collection to be used. Only by use, through annotations on the labels and the resulting publications, is the scientific value enhanced. It should therefore be permanently accessible and ready for use. Without the use of a herbarium our research stops. Plans to "store away" the herbarium, as was once considered for the Utrecht herbarium, would have meant the end of our work.

On this occasion I should give you a short account of the history and development of our institute. If I would try to do this adequately I would need the ninety minutes of Pulle. Let me therefore give only a bird's eye-view.

We have two outstanding personalities: Miquel and Pulle, both present here in the spirit as well as a bust of the former and an oil-painting of the latter.

Botany has been taught in Utrecht from 1636 onward. We had a botanical garden and a professor from the beginning, but it stayed this way for a long time, in fact until 1862, that is for 226 years. In this respect Utrecht was slow in growing. In England, France and Germany the modern work in institutes with herbaria, libraries and, mostly, a small scientific staff started around 1800. Utrecht was 62 years behind the times in this respect. Leiden, though, started much earlier. The history of our herbarium can be considered to have started in 1816 when the University bought the herbarium of some 3000 specimens made by Mathias van Geuns (1735-1817). This herbarium just fitted in the cupboard which is still present in the room of one of our professors. It was rarely used. Van Geuns' successor, the agronomist Jan Kops neither used it nor added to the collections. After the Belgian uprising in 1831, we had for a few years even a second professor of botany, C.A. Bergsma, who had been professor of technical chemistry in Gent and had to leave with the Belgian uprising and the foundation of the present Belgian state. It was clear that he had to leave Gent because he came from the northern part of the Netherlands. The Dutch government received the Northern Netherlands employees from the South in a decent way, even though at a minimum of expense. Bergsma became a "extraordinary" professor in 1831 and Kops' successor in 1835. He was a picturesque character who published almost nothing, and whose fame came mainly from his practice to sell cultivated plants and cut-flowers on the Utrecht market, an activity not approved by the Utrecht administration. Bergsma died in 1859 and Miquel succeeded him in that same year. The latter remained as such until his death in 1871, from 1862 also as director of the Rijksherbarium in Leiden even though he was resident in Utrecht.

Miquel was the first botanist in Utrecht who was really interested in our "botanical heritage". He wrote for instance the first Flora of the Netherland Indies and was fact the first plant systematist of international standing in Utrecht. However, he hardly succeeded in setting up a school. Only one of his students rose to international standing: Scheffer, the man who played an important part in the setting up of the chain of experiment stations, run by the government, in the Netherlands East Indies.

Miquel had a fairly large herbarium. He sold this to the University of Utrecht when appointed director of the Rijksherbarium. The rules of this institution did not permit the director to have a private herbarium. Miquel's herbarium is the actual basis of the present Utrecht collections. For our herbarium the Miquel collections are especially important because they contain his material from Suriname.

After Miquel's death the "modern" sciences launched their first attack on plant systematics at Utrecht. His successor Rauwenhoff was a true plant physiologist, which meant at the time more or less the same as "molecular biology" now. Even so Rauwenhoff had

a good knowledge of plant systematics and an excellent library. During his tenure, however, no plant systematic research was carried out. There was neither an active herbarium nor an institutional library. However, the light broke through again on Rauwenhoff's retirement in 1896. F.A.F.C. Went succeeded him; a scientist whose fame was based on his research in plant physiology but who had a great interest in the "heritage" and in tropical research in general.

One of Went's students, A.A. Pulle, a pharmacist by training, was employed by him to study the flora of Suriname. The Miquel herbarium could serve as a basis for his thesis, which constituted an enumeration of the phanerogams of Suriname. Went's consuming interest in the tropics, East as well as West, led to intensive research in Utrecht in the field of plant physiology, phytopathology as well as plant systematics.

In the nineteen-twenties Pulle could even appoint some assistants and gradually trained an increasing number of doctoral students. Almost all older dutch plant taxonomists stem from this school. One of the first was C.G.G.J. van Steenis, followed e.g. by H.J. Lam, D.F. van Slooten, F. Verdoorn, R.C. Bakhuizen van den Brink Jr., F.P. Jonker, A.J.G.H. Kostermans, J. Lanjouw, S.J. van Ooststroom, J.J. Swart, H. Uittien, V. Westhoff and myself as his last "promovendus".

After the appointment of J. Lanjouw as a permanent member of the staff the Flora of Suriname could be started. This had been an idea of Pulle for some time, but the implementation became possible only when some permanent staff-members could be employed. Apart from the workers on the Flora several students of Pulle became monographers of large plant groups who also dealt with the entries of their families for the Flora. Pulle insisted that the treatments in the Flora had to be supported as much as possible by monographic work.

Through these activities the herbarium grew from some 50.00 to 300.000 specimens; at the moment the number is near 750.000 specimens, including the "lower" plants.

In 1969 our institute was moved from its classical location at the Lange Nieuwstraat and the old botanical garden to the new campus east of Utrecht: the Uithof. The institute was housed on the three top floors (19-21), but the herbarium was located in the cellar of the so-called Transitorium II. We received the oral assurance that within six years we should move to our definitive location in the Uithof: a separate botanical institute. This building was never set up.

In 1985 the herbarium moved to the 18th floor: a great step forward. The herbarium is now, after 16 years, again close to the library, the rooms of the scientific and supporting staff, students and the wood collection.

Utrecht botany is no longer a local affair, as it was at the beginning of the century. We now have an institute of international standing with a good reputation especially because of the Flora of the Guianas and Annonaceae projects as well as its activities in bryology.

I repeat, it is still our duty to make an inventory of our tropical botanical heritage. Our institute should remain in being in order to perform its cultural and scientific tasks on the national as well as on international levels.