The idea cannot be demonstrated in an experience, and can hardly be verified. Whoever does not possess it is nowhere aware of it in appearance; those who possess it easily get used to looking beyond, far beyond, the appearance. In order not to lose themselves after such a diastole they of course do return to reality, and likely proceed alternately like this their whole life.[1]

But because matter never exists without spirit, and spirit cannot exist without matter if it is to be active, so matter is capable of enhancement, just as spirit cannot be prevented from attracting and repelling.

Goethe in a letter to Chancellor von Müller, Weimar, 24 May 1828.

From Cottage Garden in Weimar to Botanic Garden in Palermo
Searching for the Primeval Plant

Introduction

There are many ways to approach a consideration of Goethe's primeval[2] plant (*Urpflanze*). One way would be to think of it is as an archetype in the sense of a Platonic idea. From this point of view, all real existing plants, as well as all plants that have sprung from the imagination, would always be incomplete likenesses of a super-sensible entity. Another way is to think of it as Goethe initially did himself. In letters to Herder and Charlotte von Stein he expressed his belief that it should be possible to discover the primeval plant in the form of an actual specimen.

These two approaches mark the extremes of interpretation, and set out the uncertain terrain between something that can be seen in the world of physical realities and something that can be seen only in the mind – an idea.

Just as he believed granite to be the physical expression of a super-sensible archetypal rock, so he also believed that it should be possible to find a plant which is the physical expression of a super-sensible archetypal plant. Long uncertain as to whether this plant existed as a real specimen or only in the realm of ideas, he nevertheless believed that all other plant forms could be derived from it.

As he made his observations and developed his botanic thoughts, Goethe realized that a primeval plant could be neither a concrete specimen waiting to be discovered in some botanic garden or tropical rain forest, nor an abstract idea accessible only to thought, but a means of suspending the conflict between an abstract idea and an actual observation, and combining the two in a single vision or Imagination.

He therefore sought to unite his idea of a single (super-sensible) form from which all (physical) plant forms developed, with their external similarities which his tireless observations over the years had been able to determine. This would be the sensible/super-sensible essence common to all plants, by which a plant is recognized to be a plant; an essential constraint preventing a plant species from straying so far from the norm that it is no longer recognizable as a plant.

His first mention of the *Urpflanze* in writing was as a note in his diary in March 1787, while he was in Naples.

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1 https://www.xn--gedichteundzitatefralle-tpc.de/2020/02/jwvgoethe-aphorismen-wissenschaft-und.html

2 I am translating Goethe's *Urpflanze* into English as "*primeval plant*".

Goethe greatly valued the work of Linnaeus, and never missed an opportunity to praise both the work and the man. Nevertheless he expressed his dissatisfaction with the Linnean taxonomic system as arbitrary, and an inadequate means of expressing his own views of Nature. Although he used the system of Linnaeus throughout his life, he felt it was unnatural, and therefore not suitable for identifying living organisms. He missed a consideration of plants which show different leaf forms as they grow, as well as those which do not follow their regular growth patterns. He had in mind plans for an alternative system of classifying plants, one which made sense to him, and for which an original, primeval plant would serve as a foundation. The primeval plant would be such that it could serve as a template for even the most unusual plants. Finding it proved difficult, and in the end impossible, but he spared no effort in his search. With every new plant species he asked himself the question: In order to accommodate this new form, is it necessary to take something away or to add something to the form I have established thus far?

Letters from Italy give no details, but do express his joy and amazement at the discoveries he made as he approached his goal. The primeval plant however, remained elusive, and in order to accommodate the rapidly increasing number of species examined by Goethe, was by necessity becoming more and more general.

On that fateful day in the botanic garden in Palermo he was faced with such a luxuriant display of plant forms that he had a unique opportunity to compare them with his idea of a primeval plant as he envisioned it at the time. His deep interest in the world of plants and meticulous observations during the past ten years paid off. He discovered that every plant species contains within itself the primeval plant, plus one or more unique identifying characteristics.

Had Goethe continued his investigations in this direction he would have identified those features giving each plant species its uniqueness. Once these had been identified they could then be compared with the unique features of other plant species, and in this way determine their family, genus, and species.

But even before his return from Italy in the summer of 1788, Goethe botanical work began to take a new direction. He had found what he had been searching for, and began the difficult task of describing in concrete terms what he had experienced in a kind of super-sensory vision in the botanic garden of Palermo. While still in Rome, and with the help of his friend Karl Moritz he attempted to make his vision explicit by writing it down. Back in Weimar he developed his ideas further, and was able to give them a final form in an essay, which he published (without reference to a primeval plant) as *Metamorphosis of Plants* in 1790.

The purpose of this essay is to follow as closely as possible in his own words Goethe's journey of discovery, and to introduce some of the lifelong friends in whom he confided, and who helped him on his way.

The *Gartenhaus*

Six months after his arrival in Weimar, on 26 April 1776, Goethe took possession of the 'Garden House' (*Gartenhaus*), together with a plot of land adjoining the river Ilm, just outside the town walls, a present from his new friend Duke Karl August[3].

3 Duke Karl August of Saxe-Weimar Eisenach (1757-18) was brought up under the regency and supervision of his mother, the dowager Duchess Anna Amalia (1739-1807). In 1771 Christoph Martin

Figure 1 *Charlotte von Stein*. After a self-portrait from 1790, engraved by G. Wolf.

Charlotte von Stein (1742-1827) was an educated and cultured woman, and an incompatible match for her more roughhewn husband, the court's chief equerry, Freiherr Gottlob Ernst Josias Friedrich von Stein (1735-1793), whom she married at the age of twenty-two. The marriage was a political one, and unhappy from the start. She gave birth to seven children, of whom all four daughters and one son died. Only her oldest and youngest sons survived. She entrusted the youngest, Fritz (1772-1844) to Goethe as his personal tutor. Fritz moved into Goethe's house in 1783, living there until the latter's departure for Italy three years later.

Her meeting with Goethe towards the end of 1775 was the beginning of a deep friendship, unlike anything either of them had previously experienced. In Charlotte von Stein he found a kindred spirit, the likes of which he would not meet again. She immediately recognised his exceptional qualities, and he in turn her intelligence and distinguished demeanour. She had been thoroughly schooled in the conventions of courtly life, and over time was able to calm his youthful excesses. She became his muse, his source of inspiration, and was able to compensate for the loss he experienced when his sister Cornelia married in 1773, and moved out of his life.

There is no doubt that his love for Charlotte, expressed in many of the 1650 letters he wrote to her, especially during the early stage of their relationship, helped him overcome his crude and unsophisticated impulses, calm his emotional turmoil, and strengthen his character.

Extensive repair work was required on the two storied cottage before he was able to move in later that summer. After the house had been renovated, Goethe began to bring order into the overgrown garden. During the autumn the steeply sloping part was re-terraced, topsoil brought in, and the neglected kitchen garden was prepared for spring sowing. By the following summer the revitalized beds began to produce potatoes, lettuces, beans, strawberries, asparagus, and other kitchen produce. Goethe was particularly proud of his asparagus, and never failed to send the first crop of the season to Frau von Stein.

The borders were planted with roses, and a variety of 'cottage garden' flowers, including hollyhocks and dianthus. An orchard was established, as well as a park, the so-called "English' garden. Here oaks, beeches, and lime trees were planted, together with spruce, juniper, and the tall growing Weymouth pines. Over the years he added exotic species such as ginkgo, tulip tree, bald cypress and silver maple.

In 1777 he unveiled the "Stone of Good Fortune", the '*Agathe tyche'*, one of the earliest abstract sculptures in Germany. A sphere, representing mobility and indecision, rests on a cube, symbolising stability and inertia. The unpredictability of the goddess Fortuna has been brought to rest in Goethe's garden. Now 28 years old, he had found, not only stability, but also his destiny in Weimar.

Wieland was appointed as his tutor, and in 1774 Karl Ludwig von Knebel (1744-1834) was invited to Weimar to tutor his younger brother Frederick Constantin (1758-1793). In the same year the princely brothers, accompanied by their tutors, went on an educational trip to Paris. It is no exaggeration to state that on that journey von Knebel arranged the most important meeting in Goethe's life; he introduced Goethe (then 25) to the seventeen-year-old Duke, who formed an immediate friendship with the famous poet, a friendship which was to last to the end of his long life.

Goethe had arrived in Weimar with little or no understanding of Nature. He had grown up in the free imperial city of Frankfurt, studied and briefly practised law, became a bestselling author, and was very much a young and privileged city gentleman.

Figure 2 *The Stone of Good Fortune with the garden cottage in the background*

"*Born and reared in a large city, I acquired my first schooling in the study of ancient and modern languages, to which rhetorical and poetical exercises were soon added. My further education I likewise owe to rather large cities; hence it followed that my intellectual activity was directed towards the manners of polite society, and to the pleasant activity which at that time was called 'polite literature'.*

On the other hand I had no understanding of external Nature in the strict sense of the term, nor the slightest knowledge of her so called three kingdoms. . ."[4]

His interest in the plant world was awakened in Weimar, where he came into close contact with the local forests and meadows while out hunting with the young Duke, and, once he became a government minister, with questions of forest maintenance, land drainage, and food production. His study of Nature included a growing interest in medicinal herbs and roots growing in the wild, as well as the cultivation of fruit trees and food crops, always taking practical needs as his starting point.

"*During these past days I have tried hard to concentrate my thoughts on the clods of soil and clay, and am now more convinced than ever that a person who has spent his life at the card table cannot become a farmer. One has to be born and bred very close to the Earth to gain something from her.*"[5]

"*I now intend to continue, and establish what use Nature makes of the soil, and what Man makes his own.*"[6]

He soon met a local herb gatherer, who grew medicinal as well as rare native plants in his apothecary garden, and was encouraged by him to consider how healing qualities might be expressed by a plant's outer form. Goethe mentions in particular the "*salutary root*" of gentian[7] as a source of inspiration for his botanic studies.

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4 *The Author relates the History of his Botanical Studies*, in *Goethe's Botanical Writings* (1952) translated by Bertha Mueller, University of Hawaii Press, p.150.

5 Letter to Charlotte von Stein, Meiningen, 12 April 1782. Quotations from Goethe's letters have been translated from http://www.zeno.org/Literatur/M/Goethe,+Johann+Wolfgang/Briefe/. All translations of letters are my own.

6 Letter to von Knebel, 17 April 1782. Karl Ludwig von Knebel (1744-1834) was the tutor of Duke Karl August's younger brother Prince Frederick Constantin. Goethe was introduced to Karl August (at the time also still a prince as he had not yet reached his eighteenth birthday) in Frankfurt in the summer of 1775 in a far-reaching meeting arranged by von Knebel. They immediately became friends, and Karl August spontaneously invited Goethe to visit Weimar where he was soon to become Duke. Goethe arrived in Weimar in November 1775, just a month after Karl August's investiture in October. Goethe and von Knebel also became lifelong friends.

7 The root of various species of gentian is a well-known traditional cure for digestive and other ailments.

Then, as now, a serious study of botany would have been impossible without an equally serious study of the taxonomic system of Linnaeus.

The Taxonomy of Linnaeus

Figure 3 *Illustration in Linnaeus'* Systema Natura*, showing the different arrangements of stamens used by Linnaeus to position plants in his taxonomic system*

Carl Linnaeus (1707-1778) was a Swedish botanist, zoologist, taxonomist, and physician who formalised the modern system of naming organisms. From an early age his deep interest in plants was encouraged by his father, an amateur botanist, and curate in the small village of Rashålt in the South of Sweden. He had little by way of a formal education, preferring to go out in the countryside to look for plants. His father intended him to follow in his footsteps as a curate, but the intervention of the village doctor, also a botanist, enabled Carl to study botany. After an expedition to Lapland in search of new plant species, he went to Holland where he was persuaded to publish a first edition of his taxonomic system, the 'Systema Naturae' in 1735. It consisted of just 12 pages. The tenth edition was published in 1758, and featured 7700 plant species.

Linnaeus had become convinced that all organisms reproduce sexually. As a result, he expected each plant to possess male and female sexual organs (stamens and pistils), or 'husbands and wives', as he also put it. On this basis, he designed a simple system of distinctive characteristics to classify each plant. The number and position of the stamens, or husbands, together with the number and position of the pistils, or wives, determined the species. Linnaeus worked out his system in great detail, so that all plant forms, both existing and newly discovered, could be identified with very little contradiction.

This 'sexual system' as Linnaeus called it, became extremely popular throughout Europe. Rousseau used the system for his botany lessons, and Erasmus Darwin, grandfather of Charles, used the system for his poem 'The Botanic Garden' (1789), which caused an uproar among contemporaries for its explicit passages.

He turned down an offer to visit South Africa and South America to search for unknown plants, preferring instead to work on identifying specimens sent from all over the world in his herbarium. He published several more groundbreaking books, helped establish the Royal Swedish Academy of Science, became rector of Uppsala University, reconstructed and enlarged the Botanic Garden according to his taxonomic system, and had numerous honours bestowed upon him, including that of chief physician to the Swedish king.

During the eighteenth century the interest of botanists, indeed of all natural scientists, was focused almost exclusively on a systematic ordering of Nature by means of a unified nomenclature. By the time Goethe had moved to Weimar, Linnaeus had brought the efforts to establish a useful classification of the entire plant kingdom to a provisional conclusion.

Linnaeus and his next successors now saw the application and implementation of this system as the main task of scientific botany. Other botanists, including Goethe, considered the system artificial, because only a small number of a plant's individual external characteristics were used to distinguish it from others.

Indeed, Linnaeus himself had already emphasized the need for a natural system in which the grouping of plants is carried out according to the totality of their characteristics, i.e. the groups, or 'families', of the system correspond as closely as possible to the natural grouping of plants. He came some way in achieving this in his book '*Genera Plantarum*', which he considered his crowning taxonomic

achievement. In contrast to his earlier attempt at generic definition, '*Genera Plantarum*', first published in 1737, with a fifth edition published in 1754, presented a system based on what Linnaeus called the 'natural characters' of genera - morphological descriptions of all the parts of flower and fruit. His new system was able to accommodate the growing number of new plant species arriving in Europe in large numbers from overseas colonies.

Goethe's Dissatisfaction with the Taxonomic System of Linnaeus

Although he studied all of Linnaeus' publications, and always carried at least one with him on his official and unofficial journeys, Goethe used the system as a means to an end. He was less interested in the 'what' than in the 'why'.[8]

"After Shakespeare and Spinoza the greatest influence on me came from Linnaeus and admittedly through the conflict he brought about in me. Because I tried to absorb his sharp, ingenious separation, his apt, suitable, but often arbitrary laws, a dichotomy arose within me: that, what he sought to keep separate with force, must, following my innermost needs, strive for correction."[9]

In one of his morphological fragments, he wrote: "*Natural system: a contradictory expression. Nature has no system. She has, she is life, and proceeds from an unknown center to an unknowable boundary perimeter.*"

The confusing variety of organic forms, of which Goethe became fully aware in Italy, reinforced his belief in the inadequacy and arbitrariness of the taxonomy of Linnaeus. Goethe sought to explain this variety by the forces driving an inexhaustible metamorphic potential, guided and limited only by environmental conditions, and based on a fundamental structure common to all plants (which he later referred to as the "*primeval plant*"). His key to the variety of plant life would have to be a living one.

As he wrote in the *Italian Journey*: "*How delightful, how glorious a living thing is! How exactly matched to its condition, how true, how intensely alive*! *How useful my bits of Nature study have been, and how happy I am to continue it! But since it can be communicated, I do not want to provoke the friends with mere proclamations.*"[10]

He was however, against comparing life in one kingdom of Nature with life in another, because it prevented a correct understanding of the true relationships between them: "*Great harm is done to the proper understanding of the physiology of the three kingdoms by a facetious avoidance* (of their true nature). *For example, Linnaeus calls flower petals 'curtains of the nuptial bed', a parable that would do honour to a poet. But really!*"[11]

There were other reasons as well, which may be summarized as follows:

- His difficulty in memorizing a specialized terminology to which he had no relationship. He was known for his phenomenal memory, but only of matters to which he had a personal relationship.

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8 "*Reflect on what, still more on why*". Faust, Part Two, Act Two, Homunculus to Wagner.

9 Quoted in file:///C:/Users/Owner.DESKTOP-0EP3EQB/Downloads/HahnAndreM2018.pdf. p.57

10 *Italian Journey*, *Volume One*, Venice, 9 October 1786.

11 *Metamorphosis of Plants – second essay*, in *Goethe's Botanical Writings* (1952) translated by Bertha Mueller, University of Hawaii Press, p.79.

- Linnaeus believed in the unchanging constancy of species. They did not change their form through the generations, and remained just as God had created them. Goethe had observed for himself the wide range of forms in well-defined species.
- Professional botanists worked in herbariums; Goethe worked in Nature, where the environment played an important role in plant development. He saw the possibility of new species arising well before Darwin.

Goethe's Botanical Journey in his own Words

Goethe wrote a first description of his botanical studies in 1817 ("*History of my Botanical Studies*"). In 1831 he expanded it into its present form "*The Author relates the History of his Botanical Studies*", and included it in his botanical writings. The following six paragraphs are short extracts from a lengthy essay. The first three describe his discomfort with the system of Linnaeus, followed by the reasons for his discomfort, and ending with his discovery of the primeval plant.

"*Thus with the rest of my contemporaries I had become aware of Linnaeus, of his farsightedness and compelling authority. I had devoted myself to him and to his theory with complete trust. Nevertheless I gradually became aware that somethings on the path which he had marked out, and I had taken were holding me back if not actually leading me astray. . . Imagine that such a man (i.e. a poet) is now expected to commit to memory a ready-made terminology, a certain number of words and bywords with which to classify any given form, and by a happy choice to give it a characteristic name. A procedure of that kind always seemed to me to result in a kind of mosaic in which one piece is placed next to another, creating finally the semblance of a picture from thousands of pieces. The demands of this process were in this sense repugnant to me.*"

"*I recognised the necessity of this procedure, which had as its goal the definition of certain external plant appearances, according to general agreement, and the elimination of illustrations that are uncertain and difficult to draw* [accurately]. *Nevertheless when I attempted an accurate application of the nomenclature I found a major difficulty in the variability of organs. When on the self-same stem I discovered first round, then notched, and finally almost pinnate leaves, which later contracted, were simplified, turned into scales, and at last disappeared entirely, I lost the courage to drive in a stake or to draw a boundary line.*"

"*The problem of designating the genera with certainty and of arranging the species under them seemed insoluble to me. Of course I read the prescribed method, but how could I hope to find a suitable classification when even during Linnaeus' lifetime genera had been shattered and separated, and classes themselves dissolved? The conclusion to be derived from all this seemed to be that even this highly astute man of genius had been able to subjugate Nature only in a general way. My admiration for him was not in the least reduced through this. Nevertheless, a very special conflict was bound to arise. The reader can imagine my embarrassing situation; a self-taught beginner torturing himself and fighting his way through.*"

"The variability of plant forms, whose specific course I had long been following, now awoke in me more and more the notion: the plant forms round about us were not originally predetermined and established, instead we find allotted to them, along with a stubborn generic and specific tenacity, a happy mobility and flexibility, enabling them to adapt themselves to the many conditions all over the world, to be influenced by them, and to be formed and transformed in accordance with them.

"*Here variations in soil come into consideration; richly nourished by valley moisture, stunted by the aridity of heights, entirely protected against frost and heat, or inescapably exposed to both, the genus can be modified to the species, the species to the variety and the latter in turn to other varieties, ad infinitum. At the same time the plant is restricted to its own realm, even when it attaches itself in a neighbourly fashion to a hard stone, or to more animated life here and there. But even most distantly related ones have a marked affinity, and permit easy comparison*."

"*As they* (the variety of plant forms) *could now be gathered within a single concept* (*Begriff*), *it gradually became clear to me that the notion* (*Anschauung*) *could be enlivened in a higher way: a challenge that I had in mind at the time as the sensual form of a super-sensible primeval plant. I kept track of all the forms* (*Gestalten*) *as they appeared to me in their modifications, and so at the final goal of my journey, in Sicily, the* <u>*original identity*</u> *of all the parts of the plant manifested itself to me completely. I now sought to pursue it everywhere and to become aware of it again*."[12]

People who Helped along the Way

Goethe was not alone in expressing his dissatisfaction with the rigidity of Linnaeus' classification system. Several French botanists, notably Antoine de Jussieu and his brother, were also looking for an alternative, as were two of Goethe's fellow botanists in Weimar: Dr Batsch and Councillor Büttner.

He also came into contact with an interesting family of local woodsmen living near Jena, from whom he received practical help in identifying plant specimens. For several generations, the Dietrichs in the village of Ziegenhain had exercised the privilege of collecting the demonstration material for the botanical lectures at the University of Jena, and providing the students with specimens of the plants to be discussed in the lectures.

One young son in particular was active in this field, and over the years he had acquired a very comprehensive knowledge of the flora of Jena. He was eventually able to designate all the local plants not only with their German, but also with their Latin names according to the Linnean system. Goethe was impressed, and in

August Johann Georg Karl Batsch (1761-1802) rejected the system of Linnaeus; he began to classify plants on the basis of their external form and shape, and to make them generally understandable by means of a clear, precise description of the whole plant. He had studied medicine and philosophy at the University of Jena, and taught natural science there from 1786. Goethe had been instrumental in arranging the appointment. He was a recognised authority on mushrooms, discovering 200 new species.

Goethe relates that he first met Batsch during a severe winter on the skating lake, an activity introduced to Weimar by Goethe himself, which he considered "*a gathering place of good society*". Batsch in turn introduced Goethe to the writing of de Jussieu and other French botanists seeking to classify plants into larger 'family groups'. "*While indulging in active out of door sport*" Goethe "*discoursed openly and at length with him regarding advanced views of botany.*"*

Batsch later began to arrange the plants in the ducal garden according to de Jussieu's classification by natural families, analogous to the botanic garden in Uppsala redesigned by Linnaeus according to his system. He also founded the scientific society in Jena which arranged regular meetings and lectures, after one of which Goethe and Schiller finally managed to break the ice of their hitherto frosty relationship.

* From *The Author relates the History of his Botanical Studies*, in *Goethe's Botanical Writings* (1952) translated by Bertha Mueller, University of Hawaii Press, p.155.

12 *The Author relates the History of his Botanical Studies*, in *Goethe's Botanical Writings* (1952) translated by Bertha Mueller, University of Hawaii Press, p.149-165. Goethe's emphasis in the original German.

1785 took the young man with him on his first visit to the spa at Karlsbad[13], where he 'took the waters', meaning that along with all the other spa guests, he was expected to drink seven beakers of the spring water daily. "*But the grandson Friedrich Gottlieb Dietrich had an even greater influence on my instruction. As a well-built young man, with an amiable demeanor, he strode ahead to master the plant world with fresh youthful strength and delight. Blessed with a providential memory, he remembered all the strange names, and instantly recalled them when needed. His presence appealed to me, his open-minded character shone forth, and so I was persuaded to take him with me on a trip to Karlsbad.*

Always on foot in upland areas, he brought together everything blooming with zealous intuition, and handed me the yield where possible on the spot into the coach, calling out with joyful conviction in the manner of a herald, the Linnaean names, genus and species, occasionally with incorrect intonation. This gave me a new relationship with the glories of Nature, in which my eye enjoyed its wonders and at the same time scientific designations of the individual, as it were from a distant study room, penetrated my ear.
In Karlsbad itself, the hale and hearty youth was in the hills at sunrise, bringing back abundant specimens to the well even before I had emptied my beaker. All the guests participated, especially those who were particularly committed to this beautiful science. They saw their knowledge stimulated in the most graceful way when a stylish country boy, in a short waistcoat, walked along, showing off large bundles of herbs and flowers, identifying all of them by name, whether of Greek, Latin, or barbaric origin; a phenomenon that aroused much interest in the men, probably also in the women."

A physician interested in botany soon joined these early morning lessons. He wrote down all that Dietrich said, *"and many other things besides. From this practise I could derive only benefit. Through repetition the names were engraved in my*

Christian Wilhelm Büttner (1716-1801) was professor of natural history in Göttingen. He retired to Weimar where he traded his huge private library and natural history collection for a lifelong pension and free accommodation in the ducal palace. He was an eccentric bibliophile, and used most of his annual pension to buy more books for the library he had bequeathed. He kept these in his private quarters in the palace, gradually filling each room to overflowing. Goethe, who considered the Büttner library the best in Jena, and greatly valued its resources, relates that when it was once pointed out to Büttner that his library already possessed an important book, he replied: '*A good book cannot be had often enough*'.

Apart from the immense amount of information stored in Büttner's library, Goethe considered the man himself a talking library, who loved nothing better than to discuss botany. "*In these discussions he did not deny, indeed, he passionately avowed that he had never accepted the system of his contemporary Linnaeus, the distinguished man whose fame had spread throughout the world; that in quiet opposition he had endeavoured to arrange the plants according to families, advancing from the simplest, almost invisible rudimentary manifestations, to the most complex and devious.*"*

Büttner later played a minor but crucial role in Goethe's study of optics. It was his prism set which Goethe had borrowed, and never found the time to use, so that Büttner, who liked to know where everything was, eventually asked for it back. Goethe felt obliged, but decided to take at least a quick look. He put the prism to his eye, did not see the spectrum he expected to see, and the rest is history.

* From *The Author relates the History of his Botanical Studies*, in *Goethe's Botanical Writings* (1952) translated by Bertha Mueller, University of Hawaii Press, p.156.

13 Today Karlovy Vary in the Czech Republic.

memory, and I gained greater skill in analysis - without conspicuous success however, for separation and counting did not lie in my nature."[14]

Goethe noted that young Dietrich's subsequent career "*was in harmony with these beginnings*". He went to Jena where he gained a doctorate, and wrote several well received books, including '*Flora of Weimar*' and '*Lexicon of Gardening and Botany*'.

Goethe was also inspired by the botanical work of Rousseau. The philosopher Jean-Jacques Rousseau (1712-1778) had strong interests in education and botany, and made use of both in the seventh 'promenade' of his 'Rêveries du promenade solitaire'. This consists of eight letters, written between 1771 and 1773, and were intended as a course in elementary botany written for Marguerite Madeleine, the daughter of a cousin, Madeleine-Catherine Delessert, who had asked for advice on teaching her daughter botany. It was an opportunity for him to put into practice the educational ideas first described in 'Émile', and to combine the classification system of Linnaeus with his own observations in Nature, closely following the seasons. Goethe read them in the summer of 1782, and immediately wrote to Karl August:

"*In Rousseau's works there are the most charming letters about botany, in which he presents this science to a lady in the most comprehensible and delicate way. It is truly an excellent example of how to teach, and a supplement to Emile. I am therefore taking the occasion to recommend again the beautiful realm of flowers to my beautiful friends.*"[15]

Grand Thoughts in Switzerland

Although he used the Linnean taxonomic system all his life, his search for the primeval plant was closely related to his plans for finding an alternate approach to the science of botany, an approach which today would be called 'holistic'. He first wrote about this while in Switzerland in 1779 on a grand tour which he had undertaken with Karl August, effectively still his protégé, even though on 28 August, his thirtieth birthday, he had received a unique birthday present. He was promoted by the young Duke to full Privy Councillor, the highest rank in the Duchy's hierarchy. Goethe was overjoyed; two days after the official ceremony on 5 September he wrote to Charlotte von Stein*: "I am amazed that at 30 years old, I enter, as if in a dream, the highest honour it is possible to achieve in Germany*".

In Switzerland, no doubt encouraged by his new status, Goethe wrote to his friend Lavater: "*Unfortunately I already feel my thirty years as a creature of the Earth.* [But] *grand thoughts, completely alien to the youth, fill my soul, and occupy my thoughts in new realms*."[16] The "*youth*" was his young friend Tobler who was studying theology, and who Goethe, now all of thirty years old and a Privy Councillor at that, considered a hopeless romantic.[17]

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14 *The Author relates the History of his Botanical Studies*, in *Goethe's Botanical Writings* (1952), University of Hawaii Press, p.150. My translation.

15 Letter to Karl August, Weimar, 16 June 1782.

16 Letter to Lavater, Geneva, 2 Nov 1779. Johann Kaspar Lavater (1741 – 1801) was a Swiss theologian whom Goethe had first met in the summer of 1774 on a journey down the Rhine.

17 Georg Christoph Tobler (1757-1812). Three years later they were evidently still friends. In 1782 Tobler stayed with Goethe in Weimar for more than a week. Lengthy conversations about Nature and God took place, after which Tobler, inspired by his own grand thoughts, dictated the orphic hymn '*Nature*', which was written down by Goethe's secretary Philipp Seidel, and was occasionally attributed to Goethe himself.

These thoughts had been stirred by his journey four weeks earlier through the Birs gorge between Basel and Moutier (Münster), where he had been deeply moved by the grandeur of the limestone cliffs, and where he had described his first detailed geognostic observation in a letter to Charlotte von Stein on 3 October 1779.

He had already explained, in an earlier letter to Lavater, what he meant by the "*new realms*". He had in mind a complete rewriting of the '*Systema Naturae* ' of Linnaeus, a project he referred to as his "*bite on the new* '*Systema Naturae*'".[18] Linnaeus had completed the final edition of his 'Systema Naturae' in 1768, after more than thirty years of work, but it was Goethe's intention to tackle the ordering of Nature in a completely different way.

Geologic Interests Intervene

Unfortunately, his travels through Switzerland had also reawakened in him his lifelong interest in geology, and his grand plans for reordering the system of Linnaeus were put on hold until 1784, when he had brought his early geological work to an interim conclusion with the writing of two essays on granite. He had intended these as an introduction to a longer work modelled on Buffon's 'Epochs of Nature'.[19] In these essays he expressed his conviction that granite forms the "*highest and the deepest*" rocks, that it is the solid "*foundation of our Earth*". Incomplete as they are, these essays bring to a conclusion his early geological work.

In 1784 he also discovered the intermaxillary bone[20] in a human skull; and began (but did not complete) the Rosicrucian poem "*The Secrets*" (*Die Geheimnisse*). 1784 was in many ways Goethe's most productive year. From this year onward his letters show an increasing interest in the botanical work he had put off for so long.

He had in the meantime also started working with Herder[21] on the latter's '*Outlines of a Philosophy of the History of Mankind*', beginning with a geologic, botanic, and

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18 Letter to Lavater, Geneva, 28 October 1779.

19 Count de Buffon (1707 – 1788) was a natural philosopher, mathematician, and *encyclopaedist*. His works influenced several generations of natural historians, in Goethe's younger days he was considered the father of natural history. He was a keen promoter of the Enlightenment programme of empirical study, and taught that 'in natural phenomena nothing is well defined but what is accurately described; and in order to describe accurately, one must have seen, seen again, examined, and compared the thing one wants to describe, and all this without prejudice, without preconceived ideas.' Goethe had studied Buffon's work while a student in Leipzig, and had read the most recent edition of 'Epochs' while in Switzerland. After returning from Switzerland he wrote to Charlotte von Stein that he was considering writing his own "*Novel about the universe*" (*Roman über das Weltall*).

20 Now known as the 'premaxilla', a pair of cranial bones located at the front of the upper jaw, and bearing the incisors in animals that have these teeth.

21 Johann Gottfried Herder (1744-1803) was a German philosopher, theologian, poet, and literary critic. He first met Goethe in Strasbourg in 1770. In 1776, less than a year after his arrival in Weimar, Goethe persuaded Karl August to appoint Herder as general superintendent and consistory councillor. Together with Goethe he began to develop the foundations of a world view, which enabled him to understand how a work of art, in its historical context, was bound to assume the individual form that it did, rather than another. Herder's method achieves its results by recognizing contradictions and by resorting to a higher unity. In the unfinished '*Outlines of a Philosophy of the History of Mankind*' (*Ideen zur Philosophie der Geschichte der Menschheit* (1784-91)) Herder showed that in the development ('evolution') of life, including human life, on Earth, forces were active, working in harmony for a common good. Too often, however, the freedom given to humanity works against Nature, because his sense of the measure of things and his powers of reason are immature. Despite these shortcomings, one must trust that growing insight and goodwill will lead people to act according to the truth that they recognize and, through the conflict of nations, will reach the equilibrium of a

zoologic history of the Earth. The first volume appeared in the spring of 1784, the result of an intensive collaboration between the two friends, as they tried to show that the laws underlying Nature, history, and art are very similar.

"*Herder is writing a philosophy of history, as you can imagine, from the very beginning. We read the first chapters together the day before yesterday; they are delightful. Life's been rather constrained lately, but still very agreeable. World- and natural history is really racing past us.*"[22]

Although he did not use the term "*primeval rock*" (*Urgestein*) until some years later, at least in writing, another primeval substance almost was certainly discussed with Herder. The very first verse of Genesis describes God's spirit hovering over the 'face of the deep' ('water' in Luther's translation). This was no ordinary water because it already existed before God had begun his Work.[23] For Goethe and Herder it was 'primeval water' (*Urgewässer*) from which all rocks (even granite), and all life had proceeded. As he began his search for the "*primeval plant*" (it would be another three years before he named it in writing) Goethe had in mind something that had already existed before the third day of creation.

In a conversation with his friend Johann Falk[24] Goethe later recalled (in 1809):

"*In the first volume of 'Herder's Ideas on the Philosophy of the History of Mankind' there are many of my ideas, especially in the beginning. These topics were discussed by us together at the time. It should be added that I felt more inclined to a sensory contemplation of Nature than Herder, who always wanted to reach the goal quickly, and grasped the idea, where I was hardly able to complete the observation; although it was precisely through this mutual excitement that we encouraged each other.*"[25]

Four years later Goethe reviewed the effect of his collaboration with Herder on the development of his own his world conception in another conversation recorded by Falk:

"*Every sun, every planet carries within itself a higher intention, a higher mission, by means of which its development must come about just as regularly and according to the same laws as the development of a rose bush through leaf, stem, and crown. You may call this an idea or a monad as you like, I have nothing against either; enough that this intention is invisible and present earlier than the visible development from it in Nature. The larvae of the middle states, which this idea makes in the transitions, must not mislead us. It is always just the same metamorphosis or transformability of Nature that produces a flower, a rose from the leaf, a caterpillar from the egg and a butterfly from the caterpillar.*"[26]

Charlotte von Stein wrote about their collaboration: '*Herder's latest book makes it likely that we were first plants and animals. . . Goethe is deep in thought about these*

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society living in harmony with itself. Goethe applied these ideas to his studies of Nature, in that he saw plants and animals striving (evolving) to ever greater perfection.

22 Letter to von Knebel, Weimar, 8 December 1783.

23 Genesis, Chapter 1.

24 Johann Daniel Falk (1768-1826) was a German author and philanthropist, and a close friend of Goethe in Weimar.

25 http://www.zeno.org/Literatur/M/Goethe,+Johann+Wolfgang/Gespr%C3%A4che/%5BZu+den+Gespr%C3%A4chen%5D/1809

26 http://www.zeno.org/Literatur/M/Goethe,+Johann+Wolfgang/Gespr%C3%A4che/%5BZu+den+Gespr%C3%A4chen%5D/1813

matters, and everything that has gone through his imagination becomes most interesting."[27]

Botanical Observations and Reflections

In 1783 Goethe was still an extremely busy man. He attributed his phenomenal energy and ability to take on diverse subjects, besides his work as a privy councillor, director of mining and public highways, and the considerable time he spent in bringing order into the Duchy's finances, to a robust and improving constitution.

"*In the midst of my day-to-day affairs I am still involved with so many passions, hobbies, inventions, ideas, fancies, and plans, that my life sometimes gets stressed. Meanwhile, my constitution has taken on an improved stability, and I still have my old essence that gets me through everything.*"[28]

In another letter to Jacobi he wrote about his wide range of scientific investigations. He had borrowed a microscope to study fertilization and germination processes in plants, as well as germinating seed embryos. In his study of individual topics he was always less concerned with knowledge of the details, than with understanding just exactly what makes a plant a plant, the 'being' of a plant.

"*My osteological endeavors, whereby I also assigned the notorious intermaxillary bone to humans, has been sent on to Camper.*[29] *Wish me luck in this new career. I will soon make brief comments on the Kassel elephant skull*[30]*, and everything that will follow after it. In my parlour 'Arbor Dianae*[31] *and other metallic vegetation is germinating. A microscope has been set up to observe and control the experiments of von Gleichen-Rußwurm*[32] *at the start of spring. I wouldn't want to, and can't tell you the directions I'm going in all the kingdoms of Nature. It doesn't bear thinking about, the silent chaos separating itself more and more beautifully, and purifying itself in the process of becoming.*"[33]

Figure 4 *Diana's Tree, showing crystal growth after 2 hours.* https://commons.wikimedia.org/w/index.php?curid=6446060

27 Letter from Charlotte von Stein to von Knebel, 1 May 1784.

28 Letter to his friend Friedrich Heinrich Jacobi, whom he had known since before his move to Weimar, 12 November 1783.

29 Petrus Camper (1722-1789) was a Dutch anatomist and anthropologist.

30 The so-called Goethe Elephant (c.1771–1780) was an Indian elephant in the menagerie of Landgrave Frederick II in Kassel. The animal, which was very popular with the public, died in 1780 in an accident. Goethe used the skull as part of his intermaxillary bone studies. The skeleton is still on exhibit in the Natural History Museum in Kassel.

31 'Diana's Tree' was considered a precursor to the Philosopher's Stone with a growth pattern resembling coral. It is an amalgam of crystallized silver, obtained from mercury in a solution of silver nitrate; in alchemy 'Diana' represented silver. The tree-like form led alchemists to theorize the existence of life in the kingdom of minerals.

32 Wilhelm Friedrich von Gleichen-Rußwurm (1717–1783, chief equerry (stablemaster) for the Margrave of Bavaria was a botanist who had studied fertilization processes under the microscope using dyes. He published his findings in 1764 and 1781; reports which Goethe studied with great interest.

33 Letter to Jacobi, 12 January 1785.

"*Here is some Soulavie.*[34] *I haven't been able to read it myself yet. You'll do me a favor if you make notes of some topics we could talk about.*
I would be happy to send you some short botanical articles, if only they were already written. I have thought through the matter of seeds, as far as my experiences go; if only you could get me the 'Joseph ab Aromatariis' from Büttner's library. I would also like to have the Linnaean dissertation 'de seminibus muscorum', and whatever has recently become available about this matter.
I much prefer to use my free moments for these reflections. The consistency of Nature is a welcome consolation for the inconsistency of people."[35]

Towards the end of 1784 his geologic interests are gradually being replaced by botanical ones, although his osteological research is still of some importance, as he explains to his longstanding friend Johann Merck.

"*In other sciences, for example in botany, I have made very interesting discoveries and found new relationships, which correct and clarify some matters, but I also don't really know where it will lead.*
I'm quite curious to hear what Sömmering said when you showed him the bones. I do not yet believe that he will give in. I believe professional scholars are quite capable of disowning their five senses. It is rare for them to be concerned with the living concept of the thing, but only about what has been said about it. I am eagerly awaiting Camper's answer."[36]

And to Charlotte von Stein he writes a week later:

"*We came back from a long walk that would have been much more enjoyable if my dear one had been with us. We botanized, and Fritz was very happy, he sends you greetings. Tonight we want to stay at home, I still need the peace and quiet.*
Adieu. This note will welcome you instead of your friend."[37]

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34 Jean-Louis Giraud Soulavie (1751-1813) was a French clergyman, geologist, and writer. He was among the first to recognize environmental constraints in the distribution of plant species, and had already noted the effect of altitude on plant growth in 1784. He drew transverse plant distribution maps more than 20 years before the work of Alexander von Humboldt in the Andes.

35 Letter to Karl Ludwig von Knebel, 2 April 1785.

36 Letter to Johann Heinrich Merck, Weimar, 8 April 1785. Merck (1741-1791) was a German writer and critic, and co-founder in 1772 of the periodical "*Frankfurter Gelehrte Anzeigen*", in which some of Goethe's earliest pieces were published. They became friends, and wrote each other often about a variety of subjects. Merck was especially interested in fossils. Several failed business ventures and misguided speculation, as well as the death of all five of his daughters, led him to take his life in June 1791.

37 Letter to Charlotte von Stein, 17 April 1785. Gottlob Friedrich Konstantin von Stein (Fritz, 1772-1844) was Charlotte's youngest son who had been living with Goethe as his mentor since 1783. Goethe was by then living in a big townhouse, the house on the '*Frauenplan*'.

In fact, nearly all the letters in which he writes about his botanical studies are directed to Charlotte von Stein. He frequently mentions discovering new ideas and insights, but appears unable or unwilling able to explain what they are.

Figure 5 *Common Liverwort* Marchantia polymorpha

"*Herewith I send you the prettiest and best piece of moss from the most beautiful specimens* (I saw today). *When Albertingen went to Karlsruhe, I found just such a piece and gave it to her as an adornment on her black hat. I have been unable to find it again since. Now it suddenly appears. Probably the caps are a kind of fertilization that takes place this month; I have not been here in the autumn for several years now.*"[38]
"*I will bring back good edible mushrooms, dried; you can see in which class of vegetation I live here now.*
I have Linnaeus' botanical philosophy with me, and in this solitude I hope to finally be able to read it properly. I have only ever nibbled at it.
I am having some good botanical ideas again, and have made a vow not to touch a stone this time.
In my good warm parlour I miss only your presence; everything else is so calm and agreeable."[39]

"*I continue reading Linnaeus, because I have to, I have no other book. It is the best way of reading a book properly, especially since I do not easily finish a book. But this one is excellent not so much for reading, but for recapitulation, and is now doing me an excellent service, since I have thought about most of the topics myself.*"[40]

"*There is little else to say. Apart from my usual affairs, I am also diligent in other matters. In botany I have made good progress*."[41] But he gives no indication of what this "*good progress*" might be.

"*Botany and microscope now make up the main opposition* (? *Hauptfeinde*) *I have to contend with. On the other hand, I also live in a solitude and seclusion from the world that makes me mute like a fish. . . .*
If you would like some infusion microbes, I could let you have several million. Farewell, and write soon."[42]

For unknown reasons he takes up algebra for a few months before his departure to Karlsbad, but is more likely to be working much harder at learning to read in the book of Nature. "*Algebra has been started. It is still making a grim face, but I think there will also speak to me a spirit from these ciphers, and once I have heard it, we*

38 What Goethe had found was probably a liverwort, which are effectively all leaf, with only tiny rhizoids, and cup-like reproductive structures.

39 Letter to Charlotte von Stein, Ilmenau, 8 November 1785.

40 Letter to Charlotte von Stein, Ilmenau, 9 November 1785.

41 Letter to von Knebel 18 November 1785.

42 Letter to Friedrich Heinrich Jacobi, Weimar, 14 April 1786.

will be able to help ourselves through. Some botanical insights have also been added, and so it goes on."[43]

In an essay written towards the end of his life Goethe explained: "*Considering my inclinations and circumstances, I had to appropriate to myself very early the right to investigate and to conceive Nature in her simplest, most conspicuous creations, also without the aid of mathematics. I was accused of being an opponent, and enemy of mathematics in general, although nobody can appreciate it more highly than I, as it accomplishes exactly those things which I was prevented from realizing*."[44]

"*I cannot convey to you how readable the book of Nature is becoming for me. My long wrestling with the details has helped me, and all at once things are falling into place. My quiet joy is inexpressible. However many new details I find, nothing is unexpected. It all fits together because I have no system, and want nothing but the truth for its own sake.*
I think with joy how this will now increase. Just keep me dear, so that I don't miss out on the usual happiness from your side."[45]

Again, no hint of what he has read the book of Nature, even though it was the source of his joy. He still has no system, and therefore no words to describe what he is beginning to intuit, but in his mind things are beginning "*to fall into place*".

Before his departure to Karlsbad in July 1786 for his second stay at the spa, which he would use as the springboard for his escape to Italy later that summer, he wrote to Charlotte von Stein. This letter leaves little doubt that he was strengthening his intuitions, beginning to perceive something in a super-sensible world, something fundamental within the teeming life of the world of plants:

"*Most of all I am pleased with the being of plants* (*Pflanzenwesen*) *which is pursuing me; and that is right, for this is how something can become one's own. It all imposes itself upon me, I no longer think about it, it all comes to me, and the immense realm simplifies itself in my soul. I will soon be able to deal with the most difficult tasks*."

"*If I could only share with someone the vision and the joy, but it is not possible. And it is not a dream, not a fantasy; it is an awareness of the essential form with which Nature only ever plays, and playfully produces the diversity of life. Had I time in the brevity of life, I would dare to extend it to all the kingdoms of Nature – to her entire realm*."

"*Now farewell most beloved, the only one who may lay bare my soul and devote herself to it; I rejoice in your love and rely on it for all future times. I will bring you a gift to Karlsbad that will make you happy. I was very lucky to find it. Farewell.*"[46]

Goethe is overjoyed with his (prophetic) vision, and is beginning to find words to describe it. With the expression "*essential form*" (*wesentlicher Form*) he is quite clear that he had made a major breakthrough, and that he had discovered some constant, creative essence in the diversity of plant life. He now needed to develop the details by eliminating everything subject to change, both in a single species, and in the immense variety of plants growing in different environments.

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43 Letter to Charlotte von Stein, Jena, 21 May 1786.

44 "*Mathematics and its Abuse*", essay published in Goethe's 'Natural Scientific Writings'.

45 Letter to Charlotte von Stein, Ilmenau, 15 June 1786.

46 Letter to Charlotte von Stein, Weimar, 10 July 1786.

If he could take hold of this essence as an idea, he would be able to establish his new system on it. Whereas that of Linnaeus depended on the outer characteristics of a plant, identifiable and countable, such as the number of stamens or petals, the system he had in mind would be based on something more subtle, a plant's "*essential being*", its 'inner' form; an invisible morphological form from which all others can be derived by modification and metamorphosis. But he is still some way away from all this.

By this time he already knew that he would leave for Italy after his holiday in Karlsbad, where Charlotte von Stein was waiting for him. Two days after his letter to her, he wrote to Jacobi:

"*You are in England and will be very much enjoying the good* (life)*; When you come back I will be displaced to another side of the world. Don't write to me until you have a letter from me again indicating the place of my stay.*
I am calm and working hard. In the plant kingdom I am gradually become more and more at home, and as I have climbed, so to speak, over the wall, I am coming from new sides and in strange ways to insight."[47]

At the end of July he departed for Karlsbad, from where he will make his escape to Italy.

In Italy at last

Forced by convention to remain in Karlsbad to celebrate his thirty-fifth birthday, Goethe was finally able to sneak away to Italy a few days later. He wanted to reach Rome as soon as possible, and he was in a hurry. He nevertheless found time to make notes of the changing landscape as he travelled South. In following Goethe's 'botanic trail', across the Alps and South into Italy, it will be necessary to switch back and forth between his actual letters and what he wrote in the *Italian Journey*,[48] which begins as follows:

"*At three in the morning I stole myself away from Karlsbad, because otherwise I would not have been allowed to leave. The company, which celebrated my birthday in a very friendly way, probably acquired thereby the right to detain me; only it was no longer possible to delay. Just packing a valise and a knapsack, I threw myself into a post chaise, and arrived at half past eight in Zwota, on a beautiful, quiet, foggy morning. The upper clouds streaky and woolly, the lower ones heavy. It seemed like a good omen. After such a bad summer, I hoped to enjoy a good autumn. At twelve in Eger, in hot sunshine; and now I remembered that this place has the same latitude as my hometown, and I was happy to have lunch again under the fiftieth degree* (*of Latitude*) *under clear skies.*"[49]

Some idea of his desperation to travel to Italy can be felt by the following entry in the journal which he was writing for Charlotte von Stein as he travelled South. On 11 September, as his coach was approaching Trento in North Italy, he noted: "*It is*

47 Letter to Jacobi, Weimar, 12 July 1786.

48 The I*talian Journey* is Goethe's description of his travels in Italy between 1786 and 1788. It was published in two volumes, and largely based on his diaries, interspersed with detailed reports, both real and fictitious letters, explanations, afterthoughts, and illustrations. Composed between 1815 and 1817, it was first published in 1817. My translations are from https://www.gutenberg.org/cache/epub/2404/pg2404.html and https://www.gutenberg.org/cache/epub/2405/pg2405.html

49 *Italian Journey*, *Volume One*, From Karlsbad to the Brenner Pass, 3 September 1786.

as if I was born and brought up here, and am now returning from a whaling expedition in Greenland."

Ten years had passed since Goethe had established his cottage garden on the banks of the Ilm, ten years spent in hours of careful and conscientious observation and discussions with experts. He had established a strong relationship with Nature, and saw a great deal more than the beginner he rather disingenuously described himself as:

"*Concerning plants, I still consider myself very much a beginner. As far as Munich, I really thought I saw only the usual ones. Of course, my hasty journey by day and by night was not favorable for more detailed observations. I have Linnaeus with me, and memorized his terminology, but where should I find the time and peace of mind time to analyze the details, which, if I know myself correctly, will never be my strength anyway? I therefore focused my attention on the general, and when I saw the first gentians at Lake Walchen, it occurred to me that I always discovered new plants in the vicinity of water.*
What made me even more attentive was the influence altitude seemed to have on the growth of plants. I not only discovered new plants in the mountains, but changes in the growth of familiar ones. Whereas in the foothills branches and stems were thicker and stronger, the nodes closer together, and the leaves wider; at higher altitudes branches and stems became more delicate, the nodes moved further apart, so that there was a greater distance from node to node. and the leaves were more lance shaped. I noticed this on a willow and a gentian, and convinced myself that these were not different species. At Lake Walchen I also noticed longer and slimmer rushes than in the lowlands."[50]

When he reached the coast he noticed how the salty soil, and especially the salty air, brought about more changes in the vegetation. On 8 October he saw sea holly (*Eryngium maritimum*) growing on the coast near Venice. He mistook it for a simple coltsfoot, armed with sharp spikes. He noticed that the maritime plants had characteristics in common with both aquatic and mountain plants. "*They are bursting with juices like aquatic plants, they are firm and tough like mountain plants; if their leaf ends have a tendency to spike, as thistles do, they are tremendously pointed and strong. I found such a plant, it seemed to me our innocent coltsfoot, but here armed with sharp weapons, and the leaf like leather, as also the seed pods, the stems, all thick and fat.*"[51]

He realised more and more strongly that what he was searching for could not be expressed by such outer characteristics, which vary and change from plant to plant, with altitude, and even on the stem of a single plant. What was the underlying form from which the outer forms appeared?

50 *Italian Journey*, *Volume One*, On the Brenner Pass, 8 September 1786.

51 *Italian Journey*, *Volume One*, Venice, 8 October 1786.

In Padua he visited and wrote about numerous monuments and works of art and architecture. He was after all on an art trip, with the main intention on improving his drawing skills. But in Padua he also spent time in the botanic garden. He started to think about his "*grand thoughts*" again, and there was a hint of a kind of primeval plant arising in a vision of his plan to improve on Linnaeus, but his thoughts are still "*tangled*" and unclear. He was beginning to imagine that a single plant form, if it could be found, would be the basis of his "*grand thought*", which he does from time to time also refer to as an 'idea'.

Figure 6 *Fan Palm,* Chamaerops humilis. *The tree Goethe saw was more than 100 years old.*

"*During winter many plants can remain outdoors if they are placed next to or near walls. A covering roof is constructed towards the end of October and the enclosed space is heated for a few months. It is a delightful and instructive experience to walk about surrounded by vegetation that is alien to us. With familiar plants as with everyday objects long known to us, we no longer think anything at all, and what is seeing without thinking? Here amidst the new diversity which confronts me, the idea that all plant forms* (*Pflanzengestalten*) *can perhaps be derived from a single one, becomes more and more alive. This alone would make it possible to truly determine genera and species, which, as I think, has so far been happening very arbitrarily. On this point I am stuck in my botanical philosophy, and I do not yet see how to unravel my thoughts. The depth and breadth of this business seems to me to be completely unpredictable.*"[52]

"*A fan palm attracted my attention; fortunately the simple, lance shaped first leaves were still near the ground; the succession of separation increased until finally the fan quality was discernible in complete development. From a spatulate sheath, a branchlet with blossoms finally emerged, looking like an old offspring, strange and surprising, and unrelated to the preceding growth.*" [53]

The tree Goethe saw is still there today, and a plaque explaining his excitement at the growth sequence of the leaves commemorates his visit. See Figure 7.

52 *Italian Journey*, *Volume One*, Padua, 27 September 1786.

53 *The Author relates the History of his Botanical Studies*, in *Goethe's Botanical Writings* (1952) translated by Bertha Mueller, University of Hawaii Press, p.161.

He spent some days in Venice where he worked on the second version of *Iphigenia*, which had to be with his publisher as soon as possible. But even though he was restless for Rome, he still found time to look carefully at everything he saw.

"*I have seen them work with the most beautiful oak wood from Istria, and made my silent observations about the growth of this worthy tree. I cannot repeat often enough how my knowledge of the natural things which man ultimately needs as materials and uses for his benefit, a knowledge acquired with great difficulty, helps my understanding of the procedures used by artists and craftsmen. In the same way my knowledge of rock formations and the stones quarried from them, is of great advantage in my understanding of art.*"[54]

Figure 7 *Plaque in the Padua Botanical garden*

Rome

In Rome he found lodgings with the German artist colony, among them Johann Heinrich Tischbein[55] (1751-1829) and Angelica Kauffman (1741-1807). Back in a bustling city and wandering among the overgrown ruins of classical antiquity, there was little time for botanizing. Nevertheless, he recorded his impressions. Were his contemplations of Nature bringing him closer to what he is looking for? He didn't say. He had no words to describe it, and had to rely entirely on his intuition.

"*As late as the time of year is, my little bit of botany continues to delight me in this country, where a happier, less interrupted vegetation is at home. I have already noted some quite interesting general remarks, which will also be pleasing to you in future. Here, where the most precious has been brought together from the ends of the world, the stone kingdom has its throne. You can imagine how a friend of granite looks at the obelisks and columns.*"[56]

Figure 8 *Goethe in the Roman Campagna by Tischbein (1787)*
Städel Museum, Frankfurt

Spring arrives early in Rome, and he breathed deeply into his soul

54 *Italian Journey*, *Volume One*, Venice, 5 October 1786.

55 Johann Heinrich Wilhelm Tischbein (1751-1829) was a German artist living in Rome on a grant from Duke Ernst II of Gotha, (the Duchy bordering Weimar) arranged for him by Goethe, who was a friend of Duke Ernst. He introduced Goethe to the Roman art circles, and accompanied him to Naples even, rather unwillingly, hiking up Vesuvius with him, but did not accompany him to Sicily.

56 Letter to von Knebel, Rome, 17 November 1786.

the atmosphere of his first Mediterranean spring.

"*The weather continues to be beautiful beyond expression. A hazy fragrance floats in the air, known only from paintings and drawings by Claude*[57]*, a natural phenomenon not easily seen as beautifully as here. Flowers are springing from the soil that I do not yet know, and new blossoms on the trees; the almonds are in bloom and make a delicate appearance among the dark green oaks. The sky is like a light blue silk, illumined by the sun. How will it be once I get to Naples! Nearly everything here is already green.*
My botanical fancies are confirmed by all of this, and I am on my way to discovering new and interesting conditions; how Nature, apparently insignificant, yet truly prodigious, develops the greatest diversity from the simplest [forms].
Vesuvius is throwing out stones and ashes, and at night you can see the summit glowing. May active Nature give us a lava flow! Now I can hardly wait until I have also made these impressive experiences my own."[58]

Naples and Sicily

He had been five months in Italy, but felt that Nature had not manifested herself to him as he had expected. Nor had he found the inspiration he had hoped for from the ruins of the archaeological sites he had visited. He therefore hoped that in the landscapes further South the forces of Nature would reveal themselves to him unhindered by the ruins of monuments and the memories of a bygone empire, as perfect expressions of the ideas giving them form and substance.

He arrived in Naples on 25 February; his first impression was: *"A Mediterranean Paris; that is Naples"*. There was again a great deal of art to see, several social visits to absolve, and of course Vesuvius to ascend.

"*Naples, 13 March 1787. I have now made a thorough study of the Vesuvian products. Everything appears different when one sees the connections. Actually, I should spend the rest of my life making observations; I would make one or the other discovery that would increase human knowledge. Please inform Herder that my botanical understanding is making good progress. It is always the same principle, but it would require a lifetime to carry it out. Perhaps I am still able to describe the main outlines."*[59]

A note in his diary dated 24 March 1787, says simply "*Urpflanze*", the first time he mentioned it in writing, and the result of an "*epiphany moment*" he experienced while in a state of peace and contentment.

According to the *Italian Journey*, he wrote to Charlotte von Stein on the following day:

"*Naples, 25 March 1787 . . After this pleasant adventure, I walked by the sea and was contented and at peace. Then an epiphany moment* (*gute Erleuchtung*) *about botanical matters came to me. Please tell Herder that I will soon be able to produce the primeval plant, although I am afraid that no one will want to recognize the rest*

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57 Claude Lorrain (c.1600–1682) was a French painter. He spent most of his life in Italy, and was one of the earliest artists to concentrate on landscape painting.

58 *Italian Journey, Volume One*, Rome, 19 February 1787. Possibly based on the draft of a letter to Herder. The last paragraph could only have been written in Naples.

59 *Italian Journey*, *Volume One*, from a letter to Charlotte von Stein.

of the plant world in it. My famous doctrine of the cotyledons is so refined that it will be difficult to take it any further."[60]

But what was his "*famous teaching of the cotyledons*"?[61] Was he referring back to his studies of germinating seeds under the microscope? And how does this relate to a primeval plant? Here is a first hint of the revelation to come.

He decided after much soul searching to continue further South to Sicily, where he hoped to experience the remnants of a Greek culture untouched by the influence of Rome, and the landscape in which it had taken root. He visited Segesta, Agrigento, and other Greek archaeological sites on the island. Even there, the ruins of the Greek temples had not been able to give him that vision of eternal truth "*noble simplicity and quiet greatness*" (*edle Einfalt und stille Grösse*) which he had come to expect from Schliemann. He expressed his disappointment, but he did find something much more important, which he described as an "*indestructible treasure*" in letters to Philip Seidel and Karl August after his return to Naples in May.

"*My travels through Sicily have been a most pleasant experience, and will remain an indestructible treasure for the rest of my life. I'll tell you more on my return. In particular, it is simply not possible to form an idea of the fertility of the countryside if one has not seen it. From Palermo to Girgenti and from there on to Messina I made the journey on horseback, and arrived here on a French ship after a four-and-a-half-day journey.*"[62]

And in the same vein to Karl August two weeks later: "What I have seen in Sicily *will remain an indestructible treasure for the rest of my life*." Unfortunately he gives no hint of what it might be.

Inspired by Homer while in Naples he had started drafting the outline of a new drama, *Nausikaa*[63], work he intended to continue in Sicily, where he bought a copy of the 'Odyssey'. He embarked for Palermo on 29 March, finally arriving, after a severe storm, five days later. He was seasick during the crossing, and unable to enjoy the wine offered him by the captain. Goethe noted that his

Figure 9 *The Greek temple at Segesta*
http://www.bestofsicily.com/segesta.htm

60 *Italian Journey, Volume One*, from a letter to Charlotte von Stein.

61 A cotyledon is an embryonic leaf in seed-bearing plants, one or more of which are the first leaves to appear from a germinating seed, most clearly visible in a germinating bean.

62 Letter to Philip Seidel, Naples, 15 May 1787.

63 *Nausikaa* is the daughter of Alcinous, king of Phaeacia, the island on whose shore the shipwrecked Odysseus was cast on the third day of his near death experience battling the wrath of Poseidon, and where he relives his past adventures in a kind of panoramic vision. A close reading of this chapter of the Odyssey reveals that the gardens are an Imagination of the life sphere of the Earth, but that unlike the wild gardens of Calypso, from where Odysseus had made good his escape, those of Alcinous are cultivated. The drama was never completed, but the surviving fragment contains beautiful verse, evocative of the Greek islands and classical antiquity. It has often been commented that Goethe discovered classical Greece in Sicily.

travelling companion Kniep[64] was happy to oblige. While he stayed below deck, "*in the belly of the whale*" he made good progress with the plan of his drama. On 2 April he stepped ashore, "*completely recovered*", and "*experiencing the greatest pleasure*". After two weeks in Palermo he began to prepare for his horseback tour of the island.

"*Palermo, Monday 16 April 1787. Since we are now threatened by our imminent departure from this paradise, I hoped to find a perfect balm in the public garden, to read today's allotted chapter in the 'Odyssey', and to continue to think through the plan of the 'Nausikaa' on a walk to the valley at the foot of the Rosalienberg, and to try to extract a note of drama from the subject matter. This was all achieved, if not with much luck, but with great pleasure. I sketched out the plan and could not resist to draft and compose some sections that particularly attracted me.*"[65]

A calendar note from 17 April 1787 written in Palermo, simply recorded "*Looked for primeval plant*".

His next mention of a primeval plant was in a letter from Rome dated 8 June, again to Charlotte von Stein. To find out what happened on 17 April we must therefore stay with the *Italian Journey*. On his day he had planned to continue working on *Nausikaa* in Palermo's botanic garden. Goethe described the day as follows.

"*It is a real misfortune when one is pursued and tempted by many spirits! This morning I went to the public garden with the quiet, firm intention to continue my poetic dreams. But before I even realized it, I was caught by another gremlin* (*Gespenst*)*, which has been creeping up on me these past days. The multitude of plants, which I am otherwise only used to seeing in tubs and pots, and for most of the year only behind glass, are thriving here fresh and joyfully under the open sky, and by completely fulfilling their intentions, they reveal themselves to us more clearly. In the presence of so many new and familiar forms, that old fancy* (*Grille*) *came to mind again, whether I could not discover the primeval plant among this throng. There must be one! How else would I know that this or that entity is a plant if they were not all formed according to a pattern* (*Müster*)*?*

64 Christoph Heinrich Kniep (1755–1825), was a German painter. He was introduced to Goethe in Naples by their mutual friend Tischbein, but remained in Naples when Goethe and Tischbein returned to Rome.

65 *Italian Journey*, *Volume One*.

I tried to investigate how the many different forms differed from each other. And I always found them more similar than different, and if I wanted to apply my botanical terminology, that was fine, but it was of little use. It made me restless, without it helping me. My good poetic intention was disturbed, the garden of Alcinous had disappeared, a world garden had opened up before me. Why are we moderns so distracted, why attracted to demands that we can neither achieve nor fulfill!'[66]

Figure 10 *Botanic garden in Palermo*
https://going-for-awalk.blogspot.com/2016/07/a-bit-of-refeshment-in-palermo.html

He appears to lament the fact that he had been unable to carry on with his *Nausikaa* drama, an "*unfulfilled demand*" on his poetic genius. But there had been another "*unfulfilled demand*", one on his botanic grand plan. He had searched the gardens of Italy hoping to find a living specimen of the primeval plant, and finally realised that he was looking for something that couldn't exist as a real physical plant. Thirty years later, when he wrote the account, this hope appeared to him merely as a "*gremlin*", an "*old fancy*", which he should never have entertained. He used the word "*Grille*", literally a cricket, or as we might say in English, 'a bee in his bonnet'. In 1817 Goethe had long ago realised that he had been searching for something which could not take on a concrete form.

A later Reflection

In August 1816, in the draft of a letter to Nees von Esenbeck[67], Goethe looks back with some amusement at his hopes of finding the primeval plant as an actual real plant:
"*In the diaries of my Italian journey, which are now being printed, you will notice, not without a smile, the strange ways in which I was pursuing vegetative transformation; I was looking for the primeval plant at that time, unconscious that I was looking for the idea, the concept whereby we would be able to develop* (*ausbilden*) *it*."

66 *Italian Journey*, *Volume One,* Palermo, 17 April,1787.

67 Christian Gottfried Daniel Nees von Esenbeck (1776-1858) was an all-round natural philosopher. He trained and practiced as a physician, but nurtured lifelong interest in botany and zoology. Together with his younger brother Theodor Friedrich, he was director of the newly established botanic garden in Bonn from 1819 to 1830, a responsibility which he considered a 'refreshing pastime'. He had long been enthusiastic about Goethe's metamorphosis studies, and visited him in Weimar in 1819, In 1823 he named a plant *Goethea semperflorens* (a mallow from Brazil) in Goethe's honour.

Back in Rome

After his tour around the island of Sicily Goethe arrived back in Naples on 14 May. There was no storm this time, but the danger had been equally great. The ship had become becalmed on the coast of Capri, and was in danger of stranding on the rocks. Somehow disaster was averted. He visited several more archaeological sites on the mainland, including the three Greek temples at Paestum. Then he travelled back to Rome where he arrived on 1 June.

Figure 11 *Goethea semperflorens* https://www.klassik-stiftung.de/digital/fotothek/digitalisat/100-2018-1231/

A week later he wrote a long letter to Charlotte von Stein, telling her about his last days in Naples, and the feast of Corpus Christi he had experienced in Rome. He was expecting to return to Germany before the autumn, something he wasn't looking forward to[68], and once again "*lays bare his soul*" to her. Towards the end of the letter he recovers his equanimity, and writes:

"Tell Herder that I am very close to the secret of plant reproduction and organization, and that it is the simplest thing imaginable. Under this sky it is possible to make the most beautiful observations. Tell him that I have clearly and undoubtedly discovered the main point where the essence is to be found, that I have an overview of everything else, and that only a few details need to be determined. The primeval plant will be the most unusual (*wunderlich*) *creature of the world, for which Nature herself should envy me. With this model* (*Modell*) *and the key to it, one will be able to invent an infinite variety of plants, which must be consistent, that is: which, even if they do not exist, could still exist, and are not fantastic or poetic shadows, but have an inner truth and necessity. The same law* (*Gesetz*) *can be applied to all other living things.*"[69]

A Displaced Letter

From this letter it sounds as if he might have found the primeval plant, or something close to it, after all. Perhaps this is why he included, thirty years later, this paragraph in the *Italian Journey* in a letter addressed to Herder, as a not entirely unrelated insert. The letter includes reminiscences about Nature as he had experienced it in Sicily, how closely he had felt that Homer's atmospheric descriptions of Greece had matched his own experiences in Sicily. The letter appears only in the *Italian Journey*:

"*To Herder, Naples, 17 May 1787. . . . Furthermore, I must confide in you that I am very close to the secret of plant reproduction and organization, and that it is the simplest thing imaginable. Under this sky it is possible to make the most beautiful observations. I have discovered quite clearly and undoubtedly the main point, where the essence is to be found. I can also see everything else as a whole, and only a few*

68 In the event he received permission from Karl August to stay in Italy another year.

69 Letter to Charlotte von Stein, Rome, 8 June 1787.

details need to be determined. The primeval plant will be the most unusual creature of the world, for which Nature herself should envy me. With this model and the key to it, one will be able to invent an infinite variety of plants, which must be consistent, that is: which, even if they do not exist, could still exist, and are not fantastic or poetic shadows, but have an inner truth and necessity. The same law can be applied to all other living things."[70]

Backtracking somewhat, but continuing to follow Goethe's 'botanic trail' from where we left off (in the botanic garden on 17 April), we therefore find ourselves on 17 May back in Naples. The paragraph in question is essentially the same as the paragraph in Charlotte von Stein's letter of 8 June. The minor changes arose from the fact that Goethe was now (supposedly) addressing Herder directly. Goethe might of course have been in possession of a draft copy of the letter to Herder (now lost), or there might have been a simple mix up. But why should Charlotte von Stein be asked to tell Herder about his discovery when it had all been explained to him three weeks earlier in his own letter?

Clearly, Goethe considered his discovery very important, but did not want to reveal his reasons at this stage of his *Italian Journey*. In order to discover what Goethe did discover in the Palermo Botanical garden, we have to follow the trail further.

An Unusual Report

The second volume of the *Italian Journey* begins with his return to Rome in June. Between the entries of July and August a "*Report*" is inserted, which is introduced as follows: "*In order to prepare properly for what I now intend to introduce, I think it necessary to refer to some passages from the previous volume, which there, in the course of events, may have escaped attention, and thereby to recommend the matter so important to me again to the friends of natural science*."[71]

The report is made up of (amongst other matters) the paragraph headed Palermo 17 April (from the *Italian Journey*) quoted above, and the paragraph headed Naples 17 May (from the letter purportedly sent to Herder, also in the *Italian Journey*.). To this paragraph Goethe added the following:

"*But to prepare for future understanding this much should be said here: It had dawned on me that in the organ of the plant, which we usually refer to as a leaf, the true Proteus*[72] *was hidden, which is able to hide and reveal itself in all manner of configurations. Forwards and backwards, the plant is always just leaf, so inseparably united with the future germ that one must not think of one without the other. To grasp such a concept, to endure it, to find it in Nature, is a task that puts us in a painfully sweet condition.*"[73]

Although this paragraph could only have been written with hindsight, i.e. in 1817, it does indicate the end of Goethe's search. At the same time it characterized the

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70 *Italian Journey*, *Volume One*.

71 *Italian Journey*, *Volume Two.*

72 In Greek mythology, Proteus is the son of Poseidon. Homer refers to him as the 'old man of the sea'. Possessed of the gift of prophecy, he knew all things; past, present, and future - but disliked telling others what he knew. Those who wished to consult him had to surprise him and hold him fast. He would try to escape by assuming all sorts of shapes, but eventually relent, and give the wished-for answer before plunging back into the sea. From his power of assuming whatever shape he pleases, Proteus came to be regarded as a symbol of the original matter from which the world was created.

73 *Italian Journey*, *Volume Two*.

principal objective of his next task. His insight of the leaf as a basic organ, which in the course of its development follows a sequence of forms taking on different functions, was pursued after his return from Italy, and became the basis of his major botanical work *The Metamorphosis of Plants*.

"All is Leaf"

While still in Rome he immediately set to work on the details of the "*true Proteus*". Little information can be gleaned from his letters, but an undated note was found among his scientific papers after his death, and included in the Weimar edition of his collected works. The note was sewn together with other notes into a booklet, and likely to have been written soon after his return to Rome. On it Goethe had written:

"*Hypothesis*
Everything is Leaf, and through this simplicity the greatest diversity becomes possible.
The Leaf has vessels that intertwining in themselves again produce a Leaf [...].
The point where the vessels meet and begin to form a Leaf is the node.
This node does not just produce the next Leaf but /one/more.
A Leaf that only sucks in moisture underground we call root; a Leaf that is extended by the moisture etc. onion, bulb.
A Leaf that immediately stretches a stalk. Stem."[74]

His initial enthusiasm with his discovery enabled him to write that every organ of a plant is leaf, even the root. He had found the key to his proposed reordering of the plant world, and had already decided on a name for his grand work, as he explained in a letter to von Knebel in August.

"*If you like to be and live in Rome as an artist; you would wish as a lover of Nature to go further South. From what I have seen of plants and fish in Naples and Sicily, if I were a year younger, I would be very tempted to make a trip to India, not to discover anything new, but to look at* (what has already been) *discovered in my own way. I have found everything here as I often predicted, more open and developed. Some of what I only suspected and searched for with the microscope at home, I see here by naked eye as an undoubted certainty. I hope that you will one day also enjoy my 'Harmonia Plantarum', which will illuminate the Linnaean system in the most beautiful way, resolve all disputes about plant forms, and even explain all abnormalities.*

74 Quoted in Uwe Pörksen (1988*) „Alles ist Blatt"* , p. 335. Open Access, file:///C:/Users/Owner.DESKTOP-0EP3EQB/Downloads/10.1515_9783110692716-010.pdf

Here it is quite common that from a certain variety of filled carnation flowers (Dianthus) *another filled, complete flower appears. I found one from which four others had grown out of the main flower. NB. perfectly, with stems and everything so that one could have broken off each one separately. I have carefully drawn them, even their parts in the smallest detail.*
Tell Batsch, he should write to me: How is he doing? What is he studying? What work has he done? Can I be of any assistance to him? He is an interesting person with an interesting life, and I wouldn't want to lose sight of him completely. And as we won't be going to India, we will probably find ourselves occasionally in Büttner's Library."[75]

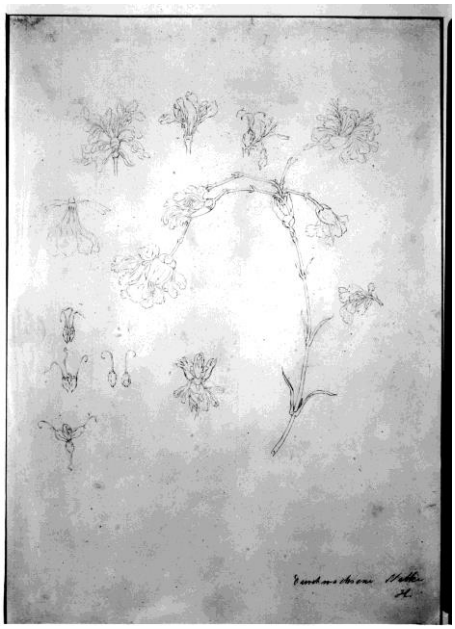

Figure 12 *Goethe's drawing of the perfoliate carnation he saw in Italy* https://www.youpedia.de/de/lexikonartikel/goethe-und-die-botanik

His discovery of a perfoliate (proliferous) carnation was an important stimulus to his thinking at the time in his chain of thought at the time. The same plant is mentioned again in his next letter to von Knebel a month later.

"*I have been doing botany at every opportunity. It might sound like a pretentious exaggeration when I tell you how far I believe I've progressed. But enough; I am getting more and more confident that the general formula I have found is applicable to all plants. I can already explain the most stubborn forms, for example Passiflora and Arum, and put them in parallel with each other.*
It will take time to fully develop the idea. This country is little short of a studio (in which to formulate the details). *What I only suspected in the North I find here openly displayed. It is unfortunate that I am so far removed from all the books that belong to this studio! The 'Genera Plantarum' and an old edition at that, is all that's available in my Robinson Crusoe Museum.*
This summer I discovered a carnation from which four different, full-bodied flowers had grown out, and from these others would have grown again if the plant had had enough drive. It is a highly unusual phenomenon, and gives certainty to my hypothesis.[76] *The phenomenon is quite different from what Hill describes, who has published a treatise on such plants.*"[77]

Numerous entries in Volume Two of the *Italian Journey* testify to his ongoing pursuit of botany. He collected specimens, sowed seeds to observe their germination, spoke to eminent botanists. In "*The Author relates the History of his Botanical Studies*" he went into greater detail: "*I must mention several others of the many seeds that I observed in this way, for, as a memorial to me, they continued to grow for some time in old Rome. Pine kernels expanded very remarkably; they arose*

75 Letter to von Knebel, Rome, 18 August 1787.

76 i.e. Goethe's hypothesis of leaf metamorphosis as expressed in *Metamorphosis of Plants*, where it is described in §105.

77 Letter to von Knebel, Frascati, 3 October 1787.

as if enclosed in an eggshell, but soon threw off this cap and exhibited the beginnings of their future destiny in a wreath of green needles."[78]

He also grew prickly pears (*Cactus opuntia*) from seed and "*saw with pleasure that it made its appearance as an innocent dicotyledon with two tender leaves, and only developed the irregularity during its future growth*."[79]

Figure 13 *Cactus opuntia, common throughout Southern Italy*
https://www.gardendesign.com/succulents/prickly-pear.html

"*The laws of plant organization of which I became aware in Sicily have occupied me between everything else, as inclinations which take over our inner life tend to do, while at the same time demonstrating our abilities as adequate. I visited the botanic garden, which, if you like, had little appeal in its antiquated state. It nevertheless had favorable influence on me, because much of what I found there appeared new and unexpected. I have therefore taken the opportunity to collect some of the rarer plants, and to continue my reflections on them, as well as to observe the ones I raised from seeds and pips in a nurturing way.*"[80]

One person in particular played an important role in assisting Goethe with his botanical work, not because he was a botanist, but because he helped Goethe formulate his ideas, and find the right words to express them. This was "*Professor*" Karl Morris.

Karl Philipp Moritz

Karl Philipp Moritz (1756-1793) was a German novelist, art historian and aesthetician. He grew up in a poor Quietist family, was apprenticed to a hatmaker at the age of twelve. After extended travel and several attempts at finding a career he could embrace, he joined the Moravian Brotherhood, and began to study theology. Some years later he taught at a military orphanage in Potsdam, ended an unhappy relationship, gave up a secure income, and took to the road again. He had read '*The Sorrows of Young Werther'*, and became a passionate Goethe admirer. For two years he travelled through England, and wrote a book about his experiences. In 1786 found himself in Rome where he met Goethe, who took him under his wing, but whom he in return advised on artistic theory. In spite of a lack of formal education, or perhaps because of it, they became close friends. Goethe often referred to him as Professor Moritz, even as 'God'.[81]

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78 *The Author relates the History of his Botanical Studies*, in *Goethe's Botanical Writings* (1952) translated by Bertha Mueller, University of Hawaii Press, p.163.

79 Ibid. p.162.

80 *Italian Journey*, *Volume Two*, April 1788, towards the end of his second stay in Rome.

81 After his return to Germany Goethe invited him to Weimar, where he became friends with Schiller and Herder. Karl August helped him become a member of the Berlin Academy of Science. After his return to Berlin in 1789, he became professor of archaeology and aesthetics at the Academy of Arts, as well as a member of the Prussian Academy of Sciences. Alexander von Humboldt was among his well-known students. Apart from an autobiographical novel and two fictional novels, he also wrote a

Goethe was introduced to Moritz by Tischbein soon after his arrival in Rome in the autumn of 1786. He accompanied the other German expatriates on their archaeological excursions and social outings. When Moritz fell from his horse and broke his arm on such an outing, it was Goethe who arranged for round the clock care by drawing up a schedule, which included his own name, from the German community, until the break had healed after seven weeks.

Figure 14 *Karl Philipp Moritz* https://alchetron.com/Karl-Philipp-Moritz

"*I have just come back from Moritz whose bandage has been removed from his broken arm. He is doing well. What I have learned from this patient during these 40 days, as confessor and confidant, as minister of finance and private secretary etc., should also benefit you, I hope, in future.*"[82]

During these confidential conversations Goethe discovered that Moritz' destiny had been very similar to his own; he too had left a beloved without saying goodbye. Even though Goethe hadn't forfeited his position in the Duchy, he nevertheless felt sufficiently moved to tell all this to Charlotte, leaving her to work out that he in fact had done exactly the same – a confession without an apology.

"*Moritz is held up to me like a mirror. Think of my situation when he told me his story in the midst of his pain, and confessed that he had left behind a beloved; more than an average relationship of the spirit, heartfelt sharing etc., a relationship torn asunder, leaving without saying goodbye, forfeiting his position! He handed me a letter from her for me to open first, which he did not dare to read in his feverish state. I had to write to her, give her the news of his accident. Just think how I must have felt.*"[83] Did he consider how she might have felt?

In return for these counselling sessions, Moritz was able to assist Goethe in beginning to formulate the results of his botanical studies in Italy. It is not known whether these were merely brief notes, or formed an outline of the "*Metamorphosis of Plants*".

"*The 'God' gives me most pleasant company. Moritz has really been put in order. This was the only thing missing, as it were, in his work, which always tended to fall apart, but which now forms the keystone his thoughts. It will be very good. He encouraged me to penetrate further into natural things, especially in botany, where I came across an εν και παν*[84] *that amazes me; how far this will develop I cannot yet foresee myself.*"[85]

"*I am having some productive hours with Moritz and have started to explain my plant system to him, and to write down in his presence how far we have come each time. Only in this way am I able to put some of my thoughts on paper. Just how*

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number of theoretical essays on aesthetics, one of which 'On the Formative Imitation of Beauty' ('*Über die bildende Nachahmung des Schönen*') Goethe excerpted in the *Italian Journey*.

82 Letter to Charlotte von Stein, Rome, 6 January 1786.

83 Letter to Charlotte von Stein, Rome, 20 January 1786.

84 *En kai pan*: *One and All*. Goethe might have had Spinoza in mind here, i.e. a concept of the whole of Nature as a single individual, whose parts vary in infinite ways, without any change to the whole.

85 *Italian Journey*, *Volume Two*, Rome, 6 September 1787. Possibly from a letter to his publisher.

comprehensible even the most abstract of this type of representation (*Vorstellungart*) *becomes when presented with the right method and finds a prepared soul, I see in my new student. He takes great pleasure in the work, and always comes up with his own conclusions. But in any case, it is difficult to write down, and impossible to comprehend by merely reading it, no matter how precise and accurately everything were to be written down.*"[86]

The Metamorphosis of Plants

After his return from Italy Goethe no longer used the term 'primeval plant', except when writing the account of his travels in "*Italian Journey*" thirty years later. He no longer needed it as a concept to work with. From then on the leaf - a "*transcendent concept*" as he once explained[87] - was for him the "*true Proteus*", as indeed it is.

The greenness of a leaf, its chlorophyll, is the alchemist, the Proteus, which transforms sunlight, air, and water into simple sugars, releasing the oxygen without which life on Earth would not be possible. Dissolved minerals drawn up through the roots combine with these sugars, thereby creating the various substances which make up the plant.[88]

Based on this concept he was able complete his essay "*The Metamorphosis of Plants*". Here he proposes that the different stages of growth of annual flowering plants, as well as the diversity of their forms, obey a "*secret law*" (*geheimes Gesetz*). provided that all the parts of an individual plant, and all plant species and genera, are regarded as metamorphoses, (i.e. transformations, modifications) of a single organ, namely the leaf. There is no mention of a primeval plant in the essay, nor in the poem he later wrote in an effort to make his ideas on metamorphosis more accessible to the general public.

In the poem he described the "*secret law*" as follows:
"Like unto each the form, yet none alike;
And so the chorus hints at a secret law,
A sacred mystery."

In the famous conversation with Schiller on a summer evening in 1796, when their friendship began, there is no mention of a "*primeval plant*". In his 1817 report on the meeting, he explained to Schiller his discovery of a "*symbolic plant*".[89]

Figure 15 *Perfoliate rose. Watercolour commissioned by Goethe intended for the "second part" to 'Metamorphosis of Plants'.* https://blog.klassik-stiftung.de/mit-botanik-gibst-du-dich-ab/

86 *Italian Journey*, *Volume Two*, Frascati, 28 September 1787. Possibly from a letter to Herder.

87 Quoted in Uwe Pörksen (1988*) „Alles ist Blatt"*, p. 336. Open Access, file:///C:/Users/Owner.DESKTOP-0EP3EQB/Downloads/10.1515_9783110692716-010.pdf]

88 But the 'form' of the various plant organs is created in the growing tip of the shoots, the meristem, where unspecialised cells (stem cells) that have the potential to become any type of specialised cell are found. Stem cells are also found in the tips of roots, and between the xylem and the phloem.

89 *A Propitious Encounter*, (*Glückliches Ereignis*), in in *Goethe's Botanical Writings* (1952) translated by Bertha Mueller, University of Hawaii Press, p.205.

A New Task beckons

There can be no doubt that Goethe planned to continue with his botanical studies after he had completed and published the essay *Metamorphosis of Plants* in 1790.

"*You will have received my Faust and the botanical essay. With the first I've now completed the equally laborious and genial work of the* (new) *edition of my writings, with the second I start a new career, in which I will not proceed without some hardship. My mind drives me more than ever to natural science, and I am surprised that in prosaic Germany, snatches of poetry still float above my head. . .*
Should I have some spare time somewhere, I'll write a second part[90] *to the 'Metamorphosis of Plants', and an attempt about the bodily form of animals: I would like to publish both next Easter.*"[91]

"*You can easily imagine that in the meantime I have not neglected to continue my studies and my work in all those matters which you know I love, and I may flatter myself that I have made progress in some of them. You will have seen from the way in which I approached my botanical essay that I intend to continue my contemplation of all the kingdoms of Nature, and apply all the tricks given to my mind to explore the general laws by which living beings organize themselves. Only time can tell what I will achieve.*"[92]

But life intervened. Between March and May 1791 Goethe's good intentions were redirected to another scientific project, the only one he completed to his satisfaction. In Italy he had become fascinated by the effect of the pigments used by artists in their paintings. They were never able to explain why they chose this or that particular shade to conjure forth a desired effect. He decided that as soon as an opportunity presented itself back in Weimar he would research this question. He was aware of the theories of Newton, and had already borrowed a set of glass prisms from Councillor Büttner. By May 1791 at the latest he had started a serious study of prismatic phenomena, with exciting preliminary results, about which he wrote to Karl August. Before he left for Silesia to join the Duke on a military campaign that summer, he wrote to him as follows:

"*I have also written a theory of the colour blue these days, and will let it be printed in some journal.*"[93]

"*I can still report with vivid joy that since yesterday I have reduced the phenomena of colours, such as are shown through a prism, in the rainbow, in magnifying glasses etc., to the simplest principle. I was above all encouraged by a contradiction of Herder which struck out this spark.*"[94]

What had happened? Unsurprisingly, he had not found the time to begin his work with the prisms, and the borrowed box was left unopened for several months.

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90 Goethe had intended to write a fully illustrated sequel to the *Metamorphosis of Plants*, and had begun to arrange for the watercolours to be prepared. In the end only four were completed. Goethe's wish was finally brought to fruition in 2009 with the publication of "*The Metamorphosis of Plants*" by Gordon L. Miller (The MIT Press), which contains a photograph of every plant species mentioned in Goethe's *Metamorphosis of Plants.*

91 Letter to von Knebel, 9 July 1790.

92 Letter to Jacobi, Weimar, 20 March 1791.

93 Letter to Karl August, 17 May 1791.

94 Note to Karl August, 18 May 1791.

Eventually Büttner sent his servant to fetch them back. Before he was willing to let them go Goethe took a prism from the box and hurriedly put it to his eye, expecting to see a spectrum as described by Newton. He didn't, and so Büttner didn't get his prisms back, the second part of the *Metamorphosis of Plants* didn't get written, and Goethe began (and completed) his most successful scientific research project.