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Carl Peter Thunberg (1743-1828)

Translated from the Japanese language text by Katsumi Abe and Richard Reyment.

The Founder of Japanese Botanical Research

Notwithstanding the fact that our book in Japanese (Reyment and Abe) is devoted primarily to pioneers inthe geological sciences, we deemed it relevant to include Carl Peter Thunberg, not only for the important reasonthat much of Palaeobotany today relies on results of Thunberg, but also for the fact that he played an important part in the early development ofscientific research in Japan. Thunberg is generally regarded as the founder of Japanese Botany. He is just as well--known as the founder of botanical research in southern Africa, Indonesia and Sri Lanka.

Linné, Thunberg s teacher at Uppsala University, relied almost entirely on specimens sent to him from abroad by colleagues and his graduates. Thunberg was the most widely travelled of all of these, although many of them did visit distant lands, for example, Sparrman and Solander and one made two visits to Sierra Leone. We know a great deal about Thunberg's life-history, since he published a four-volume work on his travels, issued in several languages. He donated his huge collections to Uppsala University, where they form today an important part of the natural history record. For example, the entire material for his *Flora Japonica* is intact.

After his return to Sweden, Thunberg hardly left Uppsala, and then only to travel to the meetings of the Royal Swedish Academy of Sciences in Stockholm, 70 km distant. He bequeathed his entire library to a college of the university which, in turn, handed over the material to Uppsala University, including 36 bound thick volumes of correspondence with 1400 persons, many of them important figures in Natural History. This is in marked contrast to what happened with Linné's collections and library. Thunberg was, at the time of death, working on an autobiography, the documentation for which is preserved in a bound volume in the Uppsala University library.

Carl Peter Thunberg was born in the city of Jönköping in the province of Småland on November 11th, 1743 (Linné was also from this province). The inhabitants of this part of Sweden are noted for frugality. His father was Johan Thunberg, a bookkeeper employed as an overseer by an iron-foundry. His mother was Margaretha Starkman. Johan Thunberg died young in 1751, leaving his wife penniless and with two small boys to look after. The mother was a resolute woman, who managed to feed and clothe her small household , until she had the good fortune to wed a shopkeeper in moderately comfortable circumstances, one Gabriel Forsberg. Thunberg's mother was well aware of the need for schooling, and her boys received as good an education as she was able to manage.

Thunberg was soon recognized by the teaching staff at his school to have ability above the ordinary and he was selected for special coaching and rapid advancement through the school system.

It was agreed that he should be sent to Uppsala to matriculate, which he did with excellence. The next nine years of his life were spent in passing through the university programme.. According to the rules of the time,

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he was first required to study Theology, Law and then Philosophy. This preliminary phase was terminated in 1767 with a small thesis. Although Thunberg was unhappy about the time devoted to acquiring proficiency in Latin, there is no doubt that he was greatly served by his fluency, not only for writing his taxonomic works, but also for contact with colleagues in other countries and lecturing at European universities. Carl von Linné was a mediocre latinist (Linnés strange version of Latin has served as a subject for research at Stockholm University), as was also Berzelius, whereas Thunberg and Sparrman were skilled. The next stage was to take up medicine. After two years of medical studies, Thunberg passed his first examinations, then the two obligatory research examinations for which theses were required, the Licentiate in 1770 and the Doctorate of Medicine (with a thesis on sciatica) in the same year, but not officially conferred until very much later.

As was the custom in those days, it was time for Thunberg to take a look at the outside world. He was, thanks to von Linné, awarded a small grant in 1770 (Thunberg records that this was the smallest of all the available university bursaries) to visit Holland and France.
The sum of money may have been small, but it sufficed to keep Thunberg housed and fed for a whole year. Nobody but a thrifty native of Småland could have survived on the meagre pittance, all the more remarkable because of the fact that he had to share the bursary with another person. And so he left his home country, little knowing that he would not see it again for another nine years.

Acting on advice from Linné, while in Amsterdam, he visited the Burmans, a family of competent botanists, a most fortunate turn of events. Holland was a major centre of scientific activity in those days. Linné had been obliged to take his doctorate there, since there was no possibility for obtaining this degree in Sweden at the time.) The Burmans, father and son, were most impressed when Thunberg determined all the species in a collection the son had bought in Uppsala in1760 when studying under Linné - without having to consult a single book. Nicolas Burman, the father, was a man of considerable public influence and he could see that somebody with Thunberg's ability could be usefully placed in Dutch service. Linné was consulted and Burman recommended his pupil for employment in the Dutch East India Company, a commercial organization of immense wealth andinfluence.

Thunberg studied for almost a year in Paris. During this period, the Burmans were making arrangements for his future employment. The Dutch are not noted for being particularly philanthropic or idealistic when it comes to money and it had first to be decided if Thunberg would be a good investment for the Dutch East India Company. His native thriftiness appealed to the Dutch mentality and it was finally agreed that he could be relied on to "make money"for the company. to us today,.

When Thunberg returned to Amsterdam he learned that he was to be offered employment by the Dutch East India Company for service in Japan. A great deal of the income of the Dutch derived from horticulture and it was expected that Thunberg would be able to send back valuable plants. There was no difficulty in finding sponsors and three of them were honoured by their names being given to new genera of plants, namely, Pollia, Hovenia and Deutzia. These plants have become common garden components and, in particular, the latter one is popular all over Europe. There were, however, a few bridges remained to cross.

The Japanese were, not without just cause, highly suspicious of all foreigners. Their arrangement was that only Chinese and Dutch traders were to be allowed into their country under rigid control. Thunberg was not Dutch, of course, so he had to be camouflaged as one in order to deceive the Japanese authorities. Holland was a major centre of scientific learning and if a foreign language were to be acquired by a Japanese, it was most likely to be Dutch. Therefore, in order to avoid unpleasant surprises, dangerous for business, it was decided that Thunberg would have to become proficient in Dutch and in order to achieve this end, he would have to spend some time in one of the Dutch colonies. Language instruction could be combined with useful work for the Company. South Africa was chosen as the most suitable place and so, early in1772, he set sail for the Cape of Good Hope as Ship's Surgeon on the East India windjammer, Schoonzicht.

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It is of interest to note that the captain of the vessel was Swedish, just one of the many Swedes in Dutch service. As was usual at the time, the seamen and soldiers were recruited by very dubious means. One popular method was for the company recruiters to get men drunk and then drag them onto the ship. Once at sea, there was little that could be done and the men just had to make the best of matters. Many ofthe "shanghaied" crew were in poor health and Thunberg had his work cut out to keep as many as possible alive. Nonetheless, 115 of the crew of the Schoonzicht died during the voyage. In addition the officers and mess-helpers almost died from lead-poisoning owing to carelessness on the part of the cook, who mistook white lead for flour. Thunberg identified the poisonous material and could save the lives of his companions.. Finally, after three months at sea, Table Mountain hove in sight. By sheer coincidence, another o fLinné's students, Anders Sparrman, arrived in Cape Town by a Swedish East India vessel at about the same time.

Sparrman was Thunberg's opposite. Spontaneous, volatile, generous, and something of a spendthrift. Sparrman was very pleased to meet his student comrade, but Thunberg was much less delighted. He wanted no competition in his research on the natural history of South Africa. Nevertheless, they did collaborate on a few minor projects, but Thunberg was quick to rid himself of his brilliant colleague, who was not only a gifted geographer, but also a good draughtsmanand a great stylist in his scientific writing, which Thunberg was not to the same degree. Thanks to Sparrman's excellent map of the South African coastline, it was finally understood that the southernmost tip of Africa was located at Cape Agulhas and not at the Cape of Good Hope, as had long been thought.

Thunberg's travels in South Africa took place over a period of three years, during which he can be justly claimed to have carried out pioneering research on that vast area and to have established the basis of its Botany and an essential part of its Zoology. He was now very fluent in Dutch (Dutch is very easily acquired by Swedes and most normally gifted people can manage well after 4-5 months; a Dutch newspaper can be read and understood without any special study of the language). It is a matter for speculation as to what form of Dutch Thunberg actually acquired while in South Africa, since the derivative, Afrikaans, was already firmly established as the dominating mode of speech (Afrikaans differs from the original language mainly with respect to simplifications in the conjugation of the verbs and the use of the tenses, an evolution that has also profoundly influenced South African English).

In all, Thunberg undertook three major expeditions into the hinterland of the colony and covering about 5000 km. Once again, he was led to observe in his diary that as far as he could ascertain, no scientist had ever undertaken so much travel under such difficult field conditions and with so little money. Transport was assured by a covered wagon drawn by oxen. He had very little equipment, just boxes and needles for mounting insects, small bags for seeds, and tobacco to give to the Hottentots. It did not take long for the makeshift wagon to fall apart thus leaving Carl Peter in a sad and unenviable state. Fortunately, a regional administrator took pity on our naturalist and gave him a new wagon and ten fine oxen to drag it. Today, few researchers of natural history would last long under the rough conditions met by Thunberg on a daily basis. He was small, wiry and unusually strong for his size, for which he thanked his having taken part in the instruction in fencing while at university in Uppsala.

Once back in Cape Town, Carl Peter busied himself with preparing his plants for transport to Holland as soon as possible. He reasoned that if his employers could see the fine, money-making material he had collected for them, they would be a little quicker about paying him some of what they owed him. He had been obliged to borrow money for his fieldwork and had therefore creditors who also were interested. Good collections also went to Linné and others in Sweden. In order to keep alive, he was obliged to open a medical practice in Cape Town.

The second expedition had, likewise, to be financed by borrowing money from people in Cape Town. A year had past, and his employers had not done anything about paying their true and trusted servant for his work. This time he had the company of an English collector, sent out from Kew Gardens, London. Francis Masson

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was more in the nature of a technician than a scientist and was not regarded as a competitor by Thunberg. As always, our scientist recorded all he saw in his diary, plants, animals, and people. He devoted some interest to a Dutch farmer's wife who weighed 165 kg. On his return from this extended tour, he was gratified to find a letter from the company in which gratitude was expressed for his fine work on its behalf, plus, his salary. He could now pay all his debts.

There is no doubt that Thunberg made the most of his stay in South Africa. Fortunately for Japanese botany, he turned down an offer to collect in Madagascar. A Swedish soldier in Dutch service, Franz Oldenburg, went in his place and, died of a tropical illness while there. Oldenburg was a good amateur botanist and was responsible for supplying Sir Joseph Banks in London with more than one thousand plants from the Cape of Good Hope area. In March of 1775, the Company decided it was time for Thunberg to go to Japan. The journey went by wayof Java, a Dutch colony, where our scientist spent one month. Althoughby nature a retiring person, he seems to have entered into the Europeansocial life in Batavia with atypical energy. An important matter was to have a smart uniform tailored for the forthcoming stay in Japan. He also bought up a supply of narwhal tusks which he knew, on the information of his shipmates, could be sold at a great profit in Japan, where they were highly regarded as an aphrodisiac. On August 13th, 1775, the triple-decker Stavenisse anchored at the harbour entrance of Nagasaki, after a stormy seven weeks crossing from Batavia via Macao. The sister ship was so badly damaged by the storms that she had to remain in Macao for urgent repairs. Religious materials, such as prayer-books and bibles, were collected and handed over to the authorities in sealed boxes, not to be returned until the ship left Nagasaki. This seemingly over-zealous behaviour was not without justification. Previous trading partners, Spaniards and Portuguese, had not respected the treaties agreed upon with the Japanese authorities and had byvarious underhand methods attempted to spread Christianity, denigrate traditional Japanese religious beliefs and customs, and hence undermine political stability. Missionaries were tolerated in the beginning of European contact, but their activities had to be restrained more and more as Japanese suspicion of their real motivation grew. Finally, RomanCatholic Europeans were deemed to be no longer acceptable and the few remaining Portuguese were expelled in 1638. This left non- Catholic countries, such as England and Holland, as candidates, both of which placed business well ahead of religious fervour (strangely enough, it was not generally realized that many Dutch were Roman Catholics). The Dutch were the winners, since the English attempts at trading ended in failure.

The traders were housed on a small, artificially constructed, well-guarded island called Deshima. They were not permitted to have their families with them. The activities of the crew were controlled strictly by inspectors and guards so that nobody could sneak into Nagasaki for purposes of highly lucrative, illegaltrading. Smuggling was a serious concern of the authorities and severely punished. The Chinese (the only other foreigners permitted to trade) were executed, the Dutch were treated less harshly, being subjected to heavy fines for breaking the rules. Thunberg soon established friendly relationships with the interpreters and was always ready to help with medical advice and treatment. One of his successes was the introduction of a mercury compound for treating syphilis. The Japanese were less interested in keeping him under surveillance than they were the Dutch traders. It was soon realized that he was an intellectualand not interested in smuggling or other illegal dealings, although he did make serious attempts at learningJapanese, which was not officially permitted. Today, Thunberg s importance for Japanese biologists is everywhere in evidence around the islet of Deshima.

It seems that the authorities ignored his academic interests for practical reasons, since the Swede was in a position to impart much new scientific knowledge to his hosts. Thunberg moralizes on several occasions in his memoirs over the low moral standards of the people with which he had to associate on a daily basis, first in South Africa, then in Japan. The traders had no intellectual interests and the only way in which they could fill their spare time was by gambling, drinking alcohol and utilizing prostitutes, supplied at a cost by authorized brothel-masters in Nagasaki. Thunberg refused to indulge in any of these diversions. Notwithstanding this expression of puritanical virtue, an inordinate fascination withthe subject of illicit sexual relationships with women is manifested in his published diary, not only in Japan, but also inSouth Africa and Java. He prudely

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parades his being above such animalistic pleasures enjoyed by the Dutch, but like many ministers of religion, cannot free himself from dwelling on the subject. Thunberg was disgusted with the attempts the Dutch made to smuggle goods past the guards into Nagasaki. Even the head ofthe enterprise, Feith, the only member of the group allowed to move freely in Nagasaki, indulged in this. He was unmasked by a watchful guard who found that the seemingly very fat man was actually concealing goods beneath a wide gown. When forced to remove the garment, he was seen to be a very thin man indeed. He was punished by being denied the right to leave the compound for several weeks. By the time Thunberg arrived in Japan, it seems that the official attitude to Christianity had takena turn for the worst. He described the Japanese New Year Celebration in which trampling upon artifacts of the Christian religion formed a diverting and obligatory exercise. Thunberg's day was filled with attempts at obtaining plant material with the help of the interpreters and in medical consultations. After six months in Deshima, the time had arrived for the annual official visit to the Shogun in Edo (today's Tokyo). The symbolic power lay with the Emperor, who resided in Kyoto. The worldly power was with the Shogun, in Edo.

The delegation consisted of 200 people, but only three of these were Europeans, the head of the Dutch traders, acting as the Dutch ambassador, his assistant, and the medical advisor, to wit, Thunberg. The main party consisted of servants, bearers, Japanese public servants and the interpreters, all provided with gifts for the shogunate, and all of which was at the expense of the Dutch traders. Obviously, the commercial enterprise was highly lucrative to permit such expenditure. It was during the long journey of several months to and from Edo that Thunberg was able to collect most of his plants. At first the Japanese were annoyed at his leaving the group at every possible opportunity to botanize, but they soon realized he was not trying to do anything harmful, and was allowed to gather material within reason. He was surprised over the honourable treatment the group received en route for Edo, for he had already become aware of the low esteem inwhich the Japanese held Europeans. A predecessor, the German Engelbert Kaempfer, had recorded in print the low status accorded to foreigners by the Japanese. He was therefore agreeably astounded by the cries of children by the roadside, thinking this was a form of cheering. He was less happy when the interpreters told him the children were calling out insults.

The standard of the roads struck him as something extraordinary, and far better than anything in Europe. Moreover, travellers kept to one side of the road, not like a flock of sheep as in Europe. Hedges planted along the roads made them pleasant to behold, thus easing the tedium of the voyage. He was, however, rather unhappy with the effectiveness of the Japanese farmers, who carefully removed all weeds - this meant the collections of plants could not include this important constituent. He recorded the strange custom of the Japanese of bathing everyday. To a European, this was very exotic behaviour indeed and not a practice that appealed to Thunberg at all - he could not see the need for it and, like other westerners, firmly believed it was dangerous to the health. The passage over Hakone was a godsend for Thunberg. This was difficult terrain for the caravan to negotiate and he profited from this by running off into the vegetation to collect as much as he could. The guards, who were charged with keeping Europeans from coming into contact with the local population, were given much trouble by Thunberg's scientific diligence.

Thunberg's stay in Edo yielded good results, particularly his contacts with medical people, one or two of whom could speak fairly good Dutch. For many years he maintained correspondence with them, and some of the interpreters, sending them scientific literature inexchange for seeds which enriched the herbarium in Uppsala. Finally, three weeks after arrival, the Europeans were received by the shogun on May 18th, with Carl Peter suitably attired in his ornamental official dress. Thunberg records various aspects of the reception, some of them not very pleasant, since the foreigners were regarded as disturbingly ugly, though highly entertaining, ethnographical curiosities. The ladies of the court were permitted to observe the spectacle from behind a screen and many were the shocked cries of mock horror at what they saw before them.

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acquiringacquiring souvacquiring souvenirs in acquiring souvenirs in Kyoto and Osaka. Back in Deshima, Thunberg was his collections for transport home. The local

governorgovernor had, moreover, granted him permission to collect botanical material in thegovernor had, moreover, grante waswas put to good advantage as oftwas put to good advantage as often as it could was put to good advantage as ofte officials,officials, whose expensesofficials, whose expenses had to be met by Thunberg personally, including aofficials, wh

On December 3rd 1776 he left Japan for good on the Stavenisse after politely but resolutely declining a generous offer from the Company to continue in its service. Thunberg's very positive attitude to Japan, which he considered superior to the Western world in many respects, has not been easily accepted by some modern science-historians, who are quick to point out the feudal nature of Japanese society and the low status of the rural population and the fact that Thunberg had lived isolated from the "true Japan". It seems that these evaluations are being made anachronistically. Thunberg could only compare what he experienced with conditions in Europe at the time and the abject poverty of most of the viciously exploited "lower classes". Sweden was no exception to the rule and conditions in France led, as we all know, to the Revolution, not to speak of the plight of the Russian peasantry and the misery of peasants in England..

AlthoughThunberg proclaimed to be in a great hurry to get back to Sweden, this does not seem to have been too serious a consideration. He arrived in Batavia in the beginning of 1777 and began immediately to explore the surroundings. He spent six months doing this. The Dutch East India Company must have been very interested in retaining his services, for while in Batavia he was offered the hand in marriage of a beautiful and very rich maiden (Thunberg lists all the material attributes of the lady, jewels, furniture, personal fortune), which he turned down (out of love for his homeland, he claims), but which he regretted later in life when short of money for his work. He then left by a ship that took himto Ceylon, where he stayed for a further six months collecting plants. Now ina real hurry to get home he took a passage to Cape Town, but felt obliged to enrich his South African collections and to pack material he had left behind two years earlier. Here he learned that he had been appointed lecturer in Botany at Uppsala. Then back to Amsterdam and home via two months in London consulting museum specimens, reaching Uppsala in1779. He claimed he turned down a prestigious professorship in Leiden, Holland, again, out of love for his dear Motherland. He seems to have been called to a high post in Russia in 1802, but once again declined to leave home. Back home again, the first task facing Carl Peter was to write a report of his activities in foreign climes. This kind of document, which was not an obligatory requirement, was meant to impress local opinion in order to obtain patronage. The King was to be made to feel all powerful and wise and the head ofthe best country in the world. Thunberg, in obsequious prose, praises God for having let him be born in Sweden and the subject of such a Christian, generous, wise, enlightened and brilliant monarch as Gustav III, whose equal could nowhere be found on this Earth nor in the annals of history. He then goes on to praise anybodywho could possibly back him in the future. Several of Linnés students had returned from overseas and there was much competition betweenthem for appointments and grants. Thunberg had, unwittingly, run foul of Linné during the latter's last years, not least because he had questioned a few of Linné's determinations. Linné became increasinglytroublesome, even paranoid, over time as his health failed. One example of this concerns his knighthood. In recognition of his services to Science, he was knighted in 1757. The next step in the consolidation ofhis new status was to have his name introduced into the annals of the organization knownas Riddarhuset (literally, College of Knights) and his coat of arms put on permanent display in the Great Hall. The House had to approve the coat of arms and, for the most part, the task was left to the official genealogist, who sent Linné a design for approval, noting that Linné wanted a flower to be in the centre. Linné's natural querulousness came into full play and one design after another was turned down. Finally, the genealogist gave up in disgust and let the manner rest. Nineteen years passed and Linné began to fear he would never be introduced before dying, for he was by then very infirm. He capitulated finally, and let the

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College design his coat of arms, which turned out to be about the same as was originally proposed.

On his taking up the lectureship in Uppsala Thunberg's particular bête noir became Linné's son, who had quite literally inherited his father's Chair,(a far from uncommon practice in Uppsala of the times), The son was person of very restricted scientific merit, who owed his prominence entirely to the name of hisfather and who resented the younger man's rapidly mounting scientific reputation. Thunberg's working day was made miserable by the attitude of Linné junior, who had devised a whole programme of petty humiliations for his second- in-charge. The Head of Department then departed on a visit to England in March 1781, and Thunberg could breathe out. The authorities had decided to ignore the complaints filed by the Head of Department and went so far as to appoint Thunberg to a personal Chair of Botany, and then to go to the extreme of granting him a half professorial salary. He began work on restoring the function of the botanical research garden, which had suffered greatly int he hands of Linné junior. This happy state ofaffairs was rapidly dissipated on the return of the Head in 1783, preceded by reports from London of his outlandish behaviour. A few months later he fell ill, never to recover fully, and died..

The Chair was now vacant. Thunberg assures us that he had no intentionof applyingfor the professorship, and did this, only because the Rector of the university begged him to do so. After some of the academical shenanigans so typical of Uppsala, Thunberg was appointed to the Chair in 1784, a post he was to fill for 44 years. One is amazed to learn that just a few months later he was himself Rector of the university (in all Thunberg was elected Rector four times). Linné junior may have been out of the way, but a new tormenter (in Thunberg's mind) appeared in the shape of GeorgWahlenberg, a gifted but decidedly bizarre natural scientist, who not only was an important botanist, but also a skilled palaeontologist. He was appointed to a lectureship in the Botany department, but Thunberg assigned him to curating the insect and mammal collections, a task loathed by the eccentric Wahlenberg, who systematically vandalized Thunberg's collections. There was a good deal of unpleasantness, with the people in authority tending to side with the vandal and admonishing Thunberg for being a grizzler and a pedant. Wahlenberg, who died at the age of51, was freed from curatorialduties by awarding him a professorhsip, and things quietened down. Thunberg became embittered over the treatment meted out to himby the administration, coupled with the fact that he was beginningto fade as an international figure. His revenge was to take the form of the sale of his entire insect collection "in 84 cupboards", which he had donated to the UniversitywhenRector in 1785. He actually got as far as drawing up an advertisement in inaccurate French. The sale was never carried out.

It was not until1784 he got around to marrying (aged 41). During his student period inUppsala he had beenemployed part- time as a tutor in the familyof a university official. Presumably, this was to lead him in his choice of a mate when he proposed to Birgitta Charlotta Ruda (died 1813). There were no children of the union, but two related children were adopted, a boy and girl (a descendant of the former is today a well-known television actor). A third child was later adopted by Thunberg, the son of his half-brother (of his mother's remarriage). Thunberg became very attached to this third addition, Carl Peter Forsberg, and did all he could to advance him academically. Matters came to an abrupt stop when Thunberg tried to have him elected to the Royal Swedish Academy of Sciences with the help of a friend, Gustaf Johan Billberg, who, unfortunately had a sullied reputation in academic circles as a conspirator. When this failed, the aid of Sven Nilsson in Lund was enlisted, but he declined, noting that Forsberg had yet to publish an article in his own name and there were many worthier candidates. For a time, Forsberg was given an extra curatorial appointment to do the work that Wahlenberg thought to be beneath him.

In the early days of taxonomy, the concepts of priority in publication were non-existent and the idea of a "type specimen" totally unknown. Thunberg freely imparted his knowledge to others,

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including collections of identified material and descriptions in manuscript of new genera and species. The result of this was that a great number of Thunberg's new forms first appeared in print in the publications of others and hence must be attributed to those people. Thus, almost all of Thunberg's new Japanese forms appeared in a revision of Linnés Systema Vegetabilium, issued by Murray in 1784, thus predating Thunberg's own monograph..

What was Thunberg like as a man? He was universally described as a pleasant person and, notwithstanding his native carefulness with money, often willing to help a friend in need within the means at his disposal. His rather introvert nature made it difficult for him to project himself and influence opinion, as to which difficulty attests the Wahlenberg affair. During his later years, he became quite deaf and eccentric in manners and dress. This endeared him to the students who appreciated that this internationally so famous person was so free of pretentiousness. He died on August 8th, 1828, at the age of 85, still actively working on his collections. He was the author of more than 160 monographs and papers in scientific journals; in addition, he authored 294 doctoral dissertations, for the accepted procedure in those days was for the professor to write the thesis and for the student to defend it in a public disputation. It was customary for the professor to charge the doctoral candidate a fee for the service, but Thunberg claims never to have done so. Moreover, the student had to pay for the printing of the dissertation. Many of these theses were trivial products but some amounted to genuine scientific contributions. This is the case for Thunberg, who described manyof his insect species in this manner.

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Professor Tatsuro Matsumoto has been a mine of information concerning the Life and Times of

Thunberg as well as the general history of the gaijin traders. Professor Kazuyoshi Endo (Tokyo

University) has been an invaluable source of information on the religious persecution that once

flourished in Japan.