

CARL LINNAEUS: A TRIBUTE ON THE TERCENTENARY OF HIS BIRTH

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All biologists should be familiar with the name of Carl Linnaeus as he named very many plants and animals. He is credited with them in the abbreviated form "Linn." or even "L.", for example the yam *Dioscorea alata* L.

The year 2007 has been notable in biological circles for the commemoration of the tercentenary of Linnaeus's birth in 1707. The Linnean Society of London and the corresponding societies in Sweden, Japan and USA have held lectures, parties and excursions in his honour. So who was this man? And why should a Swedish man be honoured by West Africans? Simply because he was a revolutionary—not with weapons but with his pen and magnifying-glass. Yes, he turned the biological world upside-down yet out of chaos came order. Indeed *Order out of chaos: Linnaean plant names and their types* is the name of a reference tome published this year (Jarvis 2007).

Carl's father, the Reverend Nils Ingemarsson Linnaeus, was a minister in the Lutheran Church who lived in southern Sweden in a simple turf-roofed house with his bride Christina. Their first son Carl (or Carolus) enjoyed the freedom of the neighbouring meadows bordering the lake. He soon became familiar with the insects visiting the numerous wild flowers; the noisy frogs and slippery fish. "His toys were flowers," somebody said about him, and he cultivated his own patch of garden. As he grew up he wondered whether he might follow medicine as a career since cures were mostly plant-based. His studies, with the help of the local doctor Johan Rothman, included Greek, Hebrew and no doubt Latin, the language of science which he was to use so fluently throughout his life.

By the time Carl entered Lund University in 1727 he was already very knowledgeable and recognized as being exceptionally talented, but before long he transferred to Uppsala University which would be more suitable for his medical ambitions. However, Uppsala was still recovering from a disastrous fire in 1702 that had destroyed three-quarters of the city. Sadly, the flames had also destroyed the monumental work and dried plant collection of Olof Rudbeck Senior and Junior, leading scientists of the day. The younger Rudbeck also lost heart in his botanical studies when his life's work was lost before his eyes, so his lectureship at Uppsala was taken up by Lars Roberg, who was not of the same calibre.

It was a casual meeting with the Dean of Uppsala Cathedral that helped the depressed Linnaeus beyond all measure. One day in the botanical garden he met this elderly Cathedral



Fig. 1: Portrait of Carl Linnaeus as he appeared in Thornton's *Temple of Flora* (1807)

Dean, Olof Celsius, who was a keen amateur botanist. Recognising young Linnaeus's knowledge and aptitudes, Celsius befriended Linnaeus. By this time Linnaeus had used up his funds to such an extent that he was thin and dishevelled so when the Dean offered to house and feed this promising student the tide had turned in his favour. Eventually, after various attempts to apply for work, Celsius persuaded Rudbeck to appoint Linnaeus as a junior lecturer, in 1730. Moreover, Rudbeck helped to increase his salary and to accommodate him too. Soon Linnaeus was the sensation of the town and he attracted large audiences to his lectures. His lectures were accompanied by field studies which became very popular.

The Lapland journey

Linnaeus's field work developed into exploration when in 1732 he undertook an extensive journey in the northern territories of Sweden known as Lapland. Under the auspices of the Swedish Royal Society of Science he set out to investigate 'the three kingdoms of Nature'. Linnaeus rode his horse and carried an assortment of equipment that included a sword and a fowling piece (shot gun). Bearing in mind that he was venturing into wild country, sparsely populated by reindeer-herding Lapps at the top of the world where winters are long and severe, this was to be no sinecure. There he was seeing strange plants and animals. These he sketched and wrote about in his diary which ended up as published papers and a book entitled *Flora Lapponica* (1737). All this was formative for the young naturalist who was still in his twenties. But how to earn a living was a real problem. Various teaching and coaching posts were hardly adequate. Yet it was during this period that Carl fell in love and became engaged to Sara Elizabeth Moraea, the young daughter of a physician in the town of Falun.

To Holland and England

Before they married, however, Carl had to spend three years in Holland tutoring a friend's son as he had promised to do so. In April 1735 he and Claes left for Hamburg and Amsterdam - a difficult sea voyage in those days arriving in Amsterdam in early June where he found a sophisticated society of learned men. At Harderwijk University he was rapidly awarded a medical degree. As Linnaeus travelled from town to town he met physicians and naturalists of the day, including those who collected shells, rocks and stuffed animals for their private museums they called 'cabinets of curiosities'. Many of these notables were later honoured by Linnaeus when he named plants and animals after them, such as *Boerhaavia* after Dr Herman Boerhaave. Linnaeus had already formed in his fertile mind a new naming system and classification for the 'three kingdoms of nature' - in those days there was no distinction between botany and zoology, or geology for that matter. Here was a chance to publish his slim *Systema Naturae* at others' expense. One of the great landowners in Holland was George Clifford, of English extraction, who had a large house at Hartekamp near Haarlem with a spectacular garden and zoo. At that time Holland was

In Bibl. Univ. Upsal. 1784. J. W. Smith.

CAROLI LINNÆI

S. R. REG. MEDIC. SVEDICÆ ARCHIATRI; MEDIC. & BOTAN.
PROFESS. UPSAL; EQUITIS AUR. DE STELLA POLARI;
NEC NON ACAD. IMPER. MONSPEL. BEROL. TOLOS.
UPSAL. STOCKH. SOC. & PARIS. CORESP.

SPECIES
PLANTARUM,

EXHIBENTES

PLANTAS RITE COGNITAS,

AD

GENERA RELATAS,

CUM

DIFFERENTIIS SPECIFICIS,
NOMINIBUS TRIVIALIBUS,
SYNONYMIS SELECTIS,
LOCIS NATALIBUS,

SECUNDUM

SYSTEMA SEXUALE

DIGESTAS.

TOMUS I.

Com Privilegio S. R. Medic. Suedicæ & S. R. Medic. Polonicæ ac Electoris Saxon.

HOLMIÆ,
IMPENSIS LAURENTII SALVII
1753.

Fig. 2: Title page of Linnaeus's *Species Plantarum* (1753)

the centre of trade with the Far East from where precious spices and other exotic wares were imported, making Clifford a wealthy man. The ships' captains were persuaded by Clifford to collect and bring back to Europe plants for his heated hot-house and animals for his private zoo. Linnaeus was thrilled with this encounter with the tropical world and eventually went to live with Clifford as his personal physician and guardian of his collections and library. Linnaeus even managed to get a banana plant to flower and fruit for the first time in the Netherlands. So although Linnaeus never visited the tropics he was familiar with many exotic plants. This confirmed his conviction that the current nomenclature and classification of plants was based on temperate vegetation, and a system had to be devised to cater for the world's flora, including the tropics where the majority of species occur.

In July 1736 Clifford allowed Linnaeus to visit England for a month, where he stayed with the Pastor of the Swedish church in London. The greatest naturalist and patron of the day was Sir Hans Sloane (1660-1753) whose collections eventually formed the nucleus of the British Museum. Linnaeus met not only Sloane but also Phillip Miller of Chelsea Physic Garden, Peter Collinson who had connections with America, John Martyn the Professor of Botany at Cambridge and Johann Jacob Dillenius, the Sherardian Professor of Botany at



Fig. 3: 3 Linnaeus's house with turf roof (now a museum) at Hammarby. Photo. F.N.Hepper, 1966

Oxford. These and other contacts extended Linnaeus's fame and provided him with material from British-controlled parts of the world.

Return to Sweden

Duty called him back to Holland where Linnaeus resumed his researches, which rapidly resulted in several splendid publications. Principal among these was *Hortus Cliffortianus* [Clifford's Garden] a magnificent, large format work with descriptions of many plants new to science and full-page drawings of them. But the time had come to return to his patient fiancée. First he had to find a source of income to support her; this was not easy and at first he had to treat men with venereal disease. His medical practice eventually paid off and only then did they marry on 17 June 1739. Linnaeus had hardly settled into married bliss than the Estates of the Realm requested him to investigate the mineral, botanical and zoological assets of the little-known Baltic islands of Oland and Gotland. This three-month expedition resulted in the publication of his detailed journal (Linnaeus 1745).

Thereafter Linnaeus became a full professor at the University of Uppsala where he restored the botanical garden (which is still in existence much as he left it). After two more Swedish journeys Linnaeus concentrated on his publications in Uppsala. Here he had his own town house and in nearby rural Hammarby an earth-roofed retreat where he could study and write without students interrupting him. On a personal note, in 1966 and again in 1977 I had the privilege of visiting Uppsala and Hammarby where I could see the environment in which Linnaeus lived. This was a wonderful experience I could recommend to every biologist since it makes one understand much more of Linnaeus's learning and his methods which resulted in a revolution for systematics and the naming of organisms.

Of course, Linnaeus had his critics. Nobody likes a revolution, especially when the familiar gives way to something new. Here were old plant and animal names being replaced by new ones and these arranged in an unfamiliar order. Nevertheless, Linnaeus's publications rapidly gained acceptance in the learned circles of Europe and gradually around the world. Most notable of his numerous publications was his *Species Plantarum* [Species of Plants] with short descriptions of every plant species known to Linnaeus and each given a convenient binomial name. Until then each species was known by a Latin description but when other species belonging to the same genus had to be named the descriptions became longer and longer—and too unwieldy to be memorable. So Linnaeus at one stroke cut this down to only the name of the genus and one adjectival name. For example the names of yams *Dioscorea alata* and *D. bulbifera* were similar to our personal names such as *John Smith* and *Mary Smith*. In fact, over the course of time the book *Species Plantarum* (1753) became the internationally agreed starting point for botanical names.

No wonder that the occasion of the birth of Carl Linnaeus 300 years ago deserves to be celebrated. He continued to live until he was 71 years old when on 10 January 1778 he died and on 22 January he was buried in Uppsala Cathedral after a service there.

Linnaeus's collections

Most of his collections were sold by his wife to the great British naturalist J.E. Smith who formed the Linnean Society of London and these precious collections are now housed in a bomb-proof basement in Piccadilly, London. Hence it is no surprise that the Linnean Society arranged the 2007 celebrations and published *Order out of Chaos*.

Since Linnaeus's protologues (which are brief descriptions of the plant or animal) were deliberately written as economical of space as possible in a kind of telegram style, they often fail to provide information needed for modern purposes. Hence, wherever possible, the original or authentic Linnaean material should be consulted, now at various institutions (Paris; BM(NH); Uppsala, Stockholm; especially Linnean Society at Burlington House) and on-line at www.linnean.org

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