THE BARTHOLIN FAMILY

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DURING a review of the aetiology of inflammation and cysts of Bartholin's glands, interest was aroused in the discoverer of these glands. This led to a search of the literature and the tracing out of the history of a remarkable family of Danes, who flourished in the 17th and 18th centuries.

The first of the line of medical interest was Caspar Bartholinus who lived from 1585 to 1629. He was born at Malmo in Sweden and was extremely precocious. He could read at the age of 3 and by the time he was 13 he was composing Greek and Latin verse and delivering public orations in those tongues. He studied at Copenhagen, Rostock and Wittenberg. Underwood (1950) states that by the age of 26 he had refused chairs of philosophy, anatomy and Greek, but Singer (1925) says he was professor of philosophy at Basel, of anatomy at Naples and of Greek at Montpellier. Whichever of these versions is accepted it seems that Caspar Primus would have been a notable man in any age. Singer's version of the activities of Caspar Bartholinus shows that he travelled widely and visited Germany, the Netherlands, Britain and France, as well as Switzerland and Italy.

When he was in Italy he studied under Fabricius ab Aquapendente (1533–1619) who was professor of anatomy at the University of Padua, which played an important part in the Renaissance of Medicine. Fabricius was one of the successors of the anatomist Andreas Vesalius (1514–1564), who has been described as the founder of modern anatomy. Other pupils of Fabricius were William Harvey (1578–1657) and Olaus Wormius (1588–1654). One is tempted to suggest that Caspar Bartholinus must have met William Harvey before the latter's discovery of the circulation of the blood. He might have met him in Padua or in Britain, but there is no evidence to support such a speculation.

Olaus Wormius was a contemporary of Bartholinus, and he practised in London before finally settling in Copenhagen. It was he who described the bones which may occur within the sutures of the skull, and it was Caspar Bartholin who suggested they should be called Wormian bones. The uncharitable may feel that this was very much a family affair since Bartholinus and Wormius were brothers-in-law, Bartholin having married Anna Fincke and Worms having married her sister. There may even be more to it than this, because in the National Medical Library at Washington is a book by the son of Bartholin which carried the portraits of Fuirenius, Olaus Wormius, Thomas Fincke, Caspar Bartholin, Sim. Paulli and Joh. Rhodius. The book is a history of anatomy at Copenhagen and one wonders if the Thos. Fincke mentioned was the father of the wives of Bartholin and Worms.

In 1610, at the age of 25, Caspar Bartholinus took his degree of Doctor of Medicine. Three years later he became professor of medicine at Copenhagen, and he held this chair till 1624. In that year he suffered a serious illness, the nature of which is not known, and vowed that if he recovered he would devote himself to divinity. He did recover and with apparently characteristic brilliance he became canon of Roskilde and professor of theology at Copenhagen. This chair he held until his death in 1629 at Soro in Zeeland.

There are at least nine papers published by Caspar Bartholin, mentioned in the Surgeon-General's catalogue. During his lifetime they were published in Wittenberg, Copenhagen and Frankfurt and after his death one was published

in Paris and one in Cambridge. The subjects of his papers were anatomy, medicine, surgery, astrology, philosophy and metaphysics.

Caspar Bartholinus had four children of whom Thomas, the second son, is of the most medical interest. The other sons were Jacob (d. 1653) an orientalist, Erasmus (1625–1698) a physicist, and Albert a biographer. Thomas was born in 1616 at Copenhagen and died at Haagestaed in 1680. He travelled for nine years to foreign universities but the main influence upon him was Dutch. He was a contemporary, at Amsterdam, of Regnio de Graaf, who first discovered the Graafian follicle of the ovary.

He was a supporter of William Harvey and among his papers are several references to the circulation of the blood. Extracts from these read "observationibus tertiam ad sanguinis circulationem reformata", "ad circulationem Harveianam", and "Gulielmi Harvei de venis lactis sententia expensa ab eodem Th. Bartholino". One of his books was published in England and its title was *Bartholinus anatomy: made from the precepts of his father, and from the observations of all modern anatomists, together with his own. In four books and four manuals answering the said books . . . Also two epistles of the circulation of the blood. Published by Nich. Culpepper and Abdiah Cole, London. J. Streater 1668.*

Perhaps his interest in the circulation was stimulated by his father, who had first learned of the valves in veins from Fabricius, who was also Harvey's teacher.

Thomas Bartholin first described the thoracic duct in man, though it had been earlier described in animals by Pecquet (1622–1674), and he gave the first full description of the whole lymphatic system in man. Also credited to him are Bartholin's *anus, i.e. the aditus ad aqueductus cerebri*, and Bartholin's duct, which is the longer and larger of the sublingual ducts, though it is probable that his son described the latter.

He became professor of mathematics at Copenhagen in 1646 and two years later moved to the chair of anatomy. He retired from this post in 1661 and went to live the life of a landed gentleman at Hagestaed House, not far from Copenhagen. Unfortunately, fire broke out at his house and destroyed many manuscripts and the library. He therefore returned to Copenhagen where he became the university librarian and physician to King Christian V, a somewhat odd mixture of occupations in our eyes. He died in 1680.

There are 38 publications listed against his name in the Surgeon-General's Catalogue. Papers about him deal with his activities as a poet, nobleman and landed proprietor. He must have been a most remarkable man.

Thomas Bartholin had five sons and one daughter, the latter, Margaret, being a poetess. The eldest son was Caspar Bartholinus or Caspar Secundus (1655–1738). He was born in Copenhagen and like his father and grandfather he travelled much abroad. His main centres of education were probably Paris, where he came under the influence of Duverney, and Amsterdam where he was a pupil of Ruysch and Swammerdam.

Jan Swammerdam (1637–1680) was an interesting man who probably had some influence on Caspar Secundus. He had been intended for the Church, but took up medicine instead. His father then withdrew all his support and Swammerdam had some financial difficulty. Later he turned to entomology. He developed a technique for injection of blood vessels, which showed them up prominently. When he became an entomologist he gave the secret of his method to Ruysch, who ultimately became professor of anatomy and botany at Amsterdam. Ruysch wrote on the mechanics of childbirth.

Swammerdam obtained his doctorate of medicine at the University of Leyden with a thesis on respiration. He was the first to show that the unaerated lung of a stillborn infant sank in water, an observation still of importance today. In 1701, thirty or more years after this thesis was written, Caspar Secundus wrote a paper called "De respiratione animalium".

In 1672 Swammerdam published a work on the human uterus and this was the year in which de Graaf discovered the ovarian follicle. At this time Caspar Secundus was 17 years old. Only 5 years later he published his paper which described the vestibulovaginal glands for the first time. It seems likely that Caspar's interest in the anatomy of the female genitalia was a direct result of coming under the influence of Ruysch, Swammerdam and de Graaf.

Joseph Guichard Duverney (1648–1730) was professor of anatomy at Paris, and there is no doubt that Caspar Secundus was taught by him. As Duverney had described the vestibulo-vaginal glands in cattle, it may be that this prompted Bartholin to look for them in woman. Bartholin's paper describing these glands was entitled "*De ovarii mulierum et generationis historia, epistola anatomica, antea Romae edita; cui jam accessit alia ejusdem argumenti*". It was published in 1678 in Amsterdam.

Until the time of Caspar Secundus and Swammerdam it was thought that the ovaries secreted a seminal fluid which was increased in amount by sexual stimulation. Swammerdam maintained that the discharge did not come from the ovaries and Bartholin showed that it came from the uterus and vagina.

Later in life Caspar Secundus busied himself in politics and public administration in Copenhagen. He died there in 1738.

The Renaissance of Learning is a hard period to define, because there was no revolutionary change in habits of thought, but only a slow evolution of a new method and approach to learning of all kinds. An oversimplified view, but one with a grain of truth, is that there was a change of emphasis from the deductive method to that of induction, empiricism and pragmatism. In the van of this new approach were the universities of Salerno, Montpellier, Bologna and Padua and from the last three of these Caspar Primus was one of the men who carried the new learning northwards from the Mediterranean.

Thomas Bartholin and Caspar Secundus restricted their educational journeyings to Northern Europe, thus showing that the Renaissance had established itself there, in medicine at least, shortly after the time of Caspar Primus.

This brief study also shows that even three centuries ago discoveries were rarely made by one man working in isolation, and that any man depends for his inspiration on the climate of thought in which he finds himself. Thus, Caspar Secundus, whose father and grandfather had been anatomists of repute, found in both Amsterdam and Paris that attention was being directed to the problems of the female genitalia, and in particular to the problem of the origin of female semen. With his interest drawn to this area of anatomy he used the teachings of Duverney, Ruysch, Swammerdam and de Graaf and applied the empirical new approach which was a product of the Renaissance. This new approach had been learned by his grandfather, who had helped to bring its methods northwards from its native Italy.

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