The neurological problems of children prior to 1800 were overshadowed, to a large extent, by the social and hygienic problems that resulted in the high infant and child mortality rates. From the beginnings of recorded medical history, it is also probable that handicapped children were perceived similar to the mentally ill and retarded. Demonical possession, witchcraft, spiritualism, and beliefs in all types of superstitions, permeated the attitudes toward the severely afflicted child. Children born with congenital defects were perceived as monsters, those with seizures were possessed, and those with other forms of mental or physical illness had been taken by the devil or were suffering at the hands of the gods. Much of what is believed about the treatment of such children, however, is conjectural, as very little recorded history is available. For example, Leo Kanner, in his study of the history of mental retardation (1964), observed that Heinrich Laehr's _Die Literatur der Psychiatrie, Neurologie und Psychologie von 1459 bis 1799_ contained no references to children with mental deficiency.

There has, however, been recognition and concern for children suffering with neurologic disease dating from Galen's _Advice for an Epileptic Boy_ (Ternkin, 1934). The outlines of this history have been traced in the Introduction on the history of child neurology. With the social, intellectual, and industrial changes that began in the sixteenth century, medicine changed dramatically. With this, an interest developed in childhood neurologic disorders. Representative of these beginnings were: Thomas Sydenham and his description of chorea; Nicolaas Tulp and his brief but accurate illustration of meningomyelocele; Michael Underwood's first clinical description of poliomyelitis; and Robert Whytt's description of tuberculous meningitis and hydrocephalus. (Please see the list at the end of the Introduction for references.)

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### THOMAS SYDENHAM

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**THOMAS SYDENHAM** (1624–1689) (figure 1) was born in the town of Winford Eagle, Dorset. The Sydenham family, who were able to trace their roots back to the time of King John, had been politically active for many years. During the Civil War, they sided with the Parliamentarians and both of Sydenham’s brothers were officers in the Roundhead army. William, the elder brother, who rose to be a colonel and later governor of Weymouth and the Isle of Wight, was also a member of Parliament, while two other brothers and Sydenham’s mother were killed during those troubled years (Dewhurst, 1966).

Not much is known about Thomas Sydenham’s childhood. He started his university studies in 1642 at the age of eighteen as a commoner of Magdalen Hall, Oxford, but left two months later to become a soldier in the Parliamentary army. He returned to his studies in Oxford after the town fell to the Parliamentary army. Although he graduated with a degree of M.B. (Bachelor of Medicine) in 1648, he did not establish a practice of medicine until 1661, thirteen years later. He might have continued his medical studies intermittently during those years, possibly spending some of that time at Montpellier under the Protestant physician, Charles Barbeysac. Unfortunately, information on this presumed sojourn is based solely on the statement of M. Desault, an eighteenth-century French surgeon, who claimed that one of his friends met Sydenham in Montpellier (Dewhurst, 1966). His fragmentary formal studies of medicine were probably the outcome of his involvement with the Puritan cause and his brother’s career. Following the Restoration, his brother lost political power. He subsequently died, and from then on, Sydenham devoted all his time to medicine, treating patients, teaching, and writing. In 1661 he established himself as a physician in London, later moving to Pall Mall, a prestigious area that had become populated after the Restoration. In 1663 he became a Licentiate of the College of Physicians. His practice was interrupted in 1665 when the Great Plague struck the city and Sydenham, along with other physicians, moved to the country. In 1677 he took the degree of

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Doctor of Medicine in Cambridge. He continued his clinical work and writing although he was considerably limited by gout, renal calculus, and hematuria, from which he had suffered since 1654. Sydenham died at his home in Pall Mall on the 29th of December, 1689, and was buried in the Church of St. James, Westminster. He had three sons, one of whom, William, had qualified in medicine in Scotland and previously had joined his father in practice.

In 1666, when forced out of London by the plague, Sydenham completed the first edition of *Methodus curandi febrium, propriciis observationibus superstructa* (Method of Treating Fevers, Based on His Own Observations), which he dedicated to Robert Boyle, his friend and mentor in Oxford, who introduced him to epidemic diseases. The book, based on his observations of the London epidemics, consisted of four sections: continued fevers, the symptoms of continued fevers, intermittent fevers, and smallpox. It was probably written in English and later translated into Latin. A second edition was published in 1668 with the addition of a chapter on the plague. His second major book, *Observationes medicae circa morborum acutorum historiaem et curationem*, appeared in 1676 and was an expanded revision of his work on fevers (Payne, 1900, 115–37). A Continental edition was published within the same year in Strassburg. The book became a major textbook of medicine, both in England and Europe. His third book, *Dissertatio Epistolaris* (1682) dealt with the treatment of confluent smallpox and hysteria. A further edition of this book was published in Geneva one year later. Sydenham's final book, *Tractatus de podagra et hydrope* dealt with gout. It was published in 1683. Other works included *Schedula monitoria* (1685) and *Processus integri* (1692) (Payne, 1900, 138–57).

Two schools of medicine existed at the time of Sydenham: the School of Hippocrates and the School of the Chemists. The latter was based on tradition and authority; the former on observation. Though Sydenham accepted parts of the Hippocratic doctrine of the humors, according to which diseases were thought to result from disturbance of the four imaginary humors, his main guide and methods of diagnosis were his medical observations.

This simple recognition of the priority of direct observation and its paramount supremacy to everything else, was the proclamation of what is now an old truth, of what was then a new one and of what is always a great one (Latham, 1848).

He attempted to study diseases by recording observations without any preconceived hypotheses (Dewhurst, 1966). In a letter to his friend and pupil, John Mapletoft, Sydenham says:

*The more I observed the facts of this science with an attentive eye, and the more I studied them with due and proper diligence, the more I became confirmed in the opinion which I have held to up to the present hour, that the art of medicine was to be properly learned only from its practice and its exercise.* (Sydenham, "Epistle Dedicatory to the Third Edition of His Book Medical Observations," in Latham, 1848, 4)

Sydenham followed these methods in his practice and teaching of medicine. He probably did not read widely on medicine, nor did he quote from or refer to previous writings. When one of his pupils, Richard Blackmore, asked what authors he should read, he was directed to Don Quixote: "... A very good book. I read it still."

Sydenham should be counted among the first medical epidemiologists using the Hippocratic method of observing the maladies of each season and year as a model for the London epidemics between 1661–1675. His theory of epidemic constitutions maintains that contagious diseases are influenced by cosmic or atmospheric influences that may change their types, as well as by environmental and seasonal influences. A specific influence — telluric or climatic — becomes dominant and impresses peculiar features on the clinical manifestations of diseases prevalent at that
time (Rolleston, 1920; Crookshank, 1920; Greenwood, 1919). On the other hand, he objected to basic research because he thought that pathological data would confuse the physician whose only concern should be with curing diseases (Wolfe, 1961). Sydenham's unorthodox ways of practicing and teaching medicine and his critical and uncompromising attitude towards his colleagues provoked considerable antagonism in the medical establishment of his time. A faction of the Royal College favored withdrawing his license on the ground of irregular practice. In spite of many complaints in his writings of persecution, he retained the support of intellectuals and had loyal pupils who later held high positions in British medicine. He had a long and rich relationship with two of these students, John Locke and John Mapleton, and they spread his ideas throughout England and the Continent.

Sydenham is probably one of the greatest representatives of practical medicine in England in a period that was rich with achievements in other scientific fields such as geology, botany, microscopy, zoology, anatomy, and chemistry, because of the works of Robert Hooke, John Ray, Thomas Willis, and Robert Boyle (Latham, 1848).

In addition to laying the foundation of modern clinical medicine by training physicians to carefully listen to the history of the disease and the patient's symptoms, Sydenham also stopped the use of many dangerous medicines and the practice of many dangerous therapies. He often did not dispense drugs at all and frequently prescribed fresh air, exercise, a moderate diet, and purges (Garrison, 1929). He introduced a "cooling treatment" for smallpox and Peruvian barks for agues. His "cooling treatment" for smallpox was different from the current common practice. He kept the patient out of bed as much as possible and allowed only a few bedclothes and liberal fluids — a treatment that probably saved the lives of many. He was, however, mistaken as to the etiology of this disease, regarding it as a natural process that everyone had to experience at least once during his lifetime and "as the most slight and safe of all other diseases."

Sydenham made several important contributions to pediatrics. He offered one of the earliest and most detailed descriptions of measles and is generally credited with being the first to describe and name scarlet fever, although some have suggested that he did great harm in his description by not recognizing that a sore throat was a major symptom and that this disorder was contagious. His description of the disease is as follows:

**SCARLET-FEVER** (Scarlatina) may appear at any season. Nevertheless, it often breaks out towards the end of summer, when it attacks whole families at once and more especially the infant part of them. The patients feel rigors and shiverings, just as they do in other fevers. The symptoms, however, are moderate. Afterwards, however, the whole skin becomes covered with small red macules, thicker than those of measles, as well as broader, redder, and less uniform. These last for two or three days, and then disappear. The cuticle peels off, and brawny scales remain, lying upon the surface like meal. They appear and disappear two or three times. (Ruhthä, 1925, 328)

Interestingly, Sydenham was probably first to recognize several neurological complications of scarlet fever, symptoms suggesting either the development of streptococcal meningitis or perhaps a toxic or hypertensive encephalopathy:

This, however, must be borne in mind. If there occur at the beginning of the eruption either epileptic fits, or coma — as they often do occur in children or young patients — a large blister must be placed at the back of the neck, and a purgative draught of syrup of pippies must be administered at once. This last must be repeated every night until they recover. The ordinary drink must be warm milk with three parts water, and animal food must be abstained from. (Ruhthä, 1925, 329)

Neurology occupied only a small part of Sydenham's writings. When asked why he wrote nothing concerning the diseases of the head, he answered that he "did not undertake to write upon diseases that he was unable to cure." Nevertheless, he wrote on a few neurological and psychiatric conditions and is known for describing what came to be known as "Sydenham chorea," which is his main contribution to child neurology. His description of this entity that he called "St. Vitus' Dance" is vivid and accurate.

Sydenham twice described chorea. The fuller account, taken from *Schedula monitoria* (1686) and translated by Pecheh, appears in G. F. Still's *The History of Paediatrics*:

*Chorea Sancti Vitii* is a sort of Convulsion which chiefly invades Boys and Girls from ten years of Age to Puberty. First it shows itself by a certain
Lameness or rather Instability of one of the Legs, which the Patient drags after him like a Fool; afterward it appears in the hand of the same side; which be that is affected with this Disease can by no means keep in the same Posture for one moment, if it be brought to the Breast or any other Part, but it will be distorted to another Position or Place by a certain Convulsion, let the Patient do what he can.

If a cup of Drink be put into his Hand be represents a thousand Gestures like Jaggers, before he brings it to his mouth; for whereas he cannot carry it to his mouth in a Right line, his hand being drawn thither and thither by the Convulsion, he turns it about for some time till at length happily reaching his Lips, he flings it suddenly into his mouth and drinks it greedily as if the poor Wretch designed only to make Sport. For as much as this Disease seems to me to proceed from some Humours ricebing in upon the nerves which provoke such preternatural Motions, I think the curative Indications are first to be directed to the lessening of those Humours by Bleeding and Purging, and then to the strengthening of the Genus Nervosum, in order to which I use this Method (Still, 1931, 276).

The second, shorter, and probably more frequently quoted description appeared in Sydenham's Processus integri that was published posthumously in 1693:

**ON ST. VITUS’S DANCE**

This is a kind of convulsion, which attacks boys and girls from the tenth year to the time of puberty. It first shows itself by limping or unsteadiness in one of the legs which the patient drags. The hand cannot be steady for a moment. It passes from one position to another by a convulsive movement, however much the patient may strive to the contrary. Before he can raise a cup to his lips, he makes as many gesticulations as a mountebank; since he does not move it in a straight line, but has his hand drawn aside by spasms, until by some good fortune he brings it at last to his mouth. He then gulps it off at once, so suddenly and so greedily as to look as if he were trying to amuse the lookers-on. (Latham, 1848, 2:257-59)

Sydenham's treatment of chorea, by bleeding and purging, reflects the therapeutic practices of his day. His method of containing as many as twelve ingredients in one prescription was also characteristic of his time (Levinson, 1943).

In his writings we also find a small chapter on “The Epilepsy of Children”:

This may begin so early as the first month, from over frequent alvine evacuations . . . Or it may come on during teething, between the seventh and nineteenth months, accompanied by cough, or by (what is much worse) green vomit (like that of hysteria) and diarrhea . . . At times, the fit comes on without warning. The face becomes livid, the eyes and mouth distorted, the limbs convulsed. At times, it is indicated beforehand by a contraction of the finger, or by a fixed and strange immobility of the eyeballs. In cases where they allow a trance, the infants are drowsy until a fresh attack respirates them. (Processus integri, 1686, in Latham, Vol. 2, 1848, 284–85)

Sydenham also contributed to the field of psychiatry. In his comprehensive review on hysteria, found in his Dissertatio epistolae ad Guilelum Cole, M.D., written in 1682, he recognized that it is a frequent condition that appears in both men and women and that it is a disorder of the nervous system that simulates an organic illness (Veith, 1956; Schnbeck, 1957).

Thomas Sydenham was one of the most outstanding physicians of the seventeenth century, called by some the founder of clinical medicine. Although his contribution to child neurology is only a small part of his enormous contribution to clinical medicine, it is an example of his superior diagnostic ability and the clarity and accuracy of his writings.

Yitzchak Frank

MANHASSET, NEW YORK

**REFERENCES**


NICOLAAS TULP

Nicolaas Tulp's (1593-1674) (figure 1) first name is variously spelled in English, as “Nicolas,” “Nicolas” or “Nicholas,” but his real name was Claes Pieterszoon or Nicolaus Petrus in Latin. He was born on October 11, 1593, in Amsterdam. His father was a prosperous merchant in the city and Nicolaas was the youngest of four children. He later adopted the name “Tulp,” which means tulip in Dutch, because it is said that his house was decorated with tulip flowers (Goldwyn, 1961). Tulp began his studies of medicine in 1611 at the University of Leyden, at that time the foremost school of medicine in Northern Europe. He was enrolled as a student of medicine by the rector Snellins and his inaugural dissertation was on the relationship of body and soul. After graduation he practiced medicine and married Aafje van Voegh in 1617, who died an untimely death in 1628. In 1625 he was appointed Prelector in Anatomy at the Surgeon's Guild and in 1628 he was elected judge in Amsterdam.

On January 31, 1631, Tulp demonstrated an anatomy dissection for the first time and, in the next year, Rembrandt painted Tulp dissecting the muscles of the arm. This is the famous painting known as The Anatomy Lesson of Dr. Tulp (Hecksher, 1958).

His Observations medicæ (Medical Observations), written in 1637, were first published in 1641 and reissued in many editions. The book was originally written as a practical guide for his son who had just become a doctor, and contained 228 observations. This book was based on more than twenty-five years of practice and thirteen years of professorship in anatomy and medicine and was praised by Albrecht von Haller as a “golden work.” The entire work was written in Latin because Tulp was opposed to writing medical works in the vernacular that could be read by the general public who might attempt to treat themselves with disastrous results. It has, however, been partially translated into English (Scolten, 1928).

In the very first observation of the book, entitled Calvatrix fraxia, he gives the following description: “A heavy window fell down on the son of Peter de Wit, smashing his skull on the left side. The paralysis took place on the right side. But why, priehe, is the