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Nils Rosén von Rosenstein – The Father of Paediatrics

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If you know from where you are coming
there is practically no limit
Svante Foerster (1966)

One of the pioneers in *medical sciences*, in the modern sense of the word, was a young doctor in Uppsala, Nils Rosén – or Nils Rosén von Rosenstein (1706-1773) as he was later called as a nobleman. Already in the 1730's he devoted himself in successful empirical research, a strong interest in medical education and many important clinical experiences.

This made him one of the foremost physicians of his time, *Nordens Store Arkiater*, also called *The Hippocrates of the Modern Times*. He has also, by right been acknowledged as *The Father of the Swedish Medical Training*.

Today his name is especially well known by specialists in children´s diseases. Paediatricians all over the world honour Nils Rosén von Rosenstein as the *Father of Paediatrics* (Wallgren 1964).

The leading question is *why* a scientifically learned academician as Nils Rosén in the eighteenth century started with research works concerning children and their needs and their possibilities to survive. At this time, physicians as well as laymen seemed to have thought that it was just as inevitable that 50 per cent of all the living born children died without reaching an adult age, as that we all finally have to die.

The challenging question is: *Can we here an now* within our work *learn something for the future* by this very pioneer in medical sciences concerning the medical problems in our own country as well as in the developing countries.

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GENERAL INTRODUCTION

Background

Nils Rosén lived and worked in a time when Sweden was a poor country with a low average life span and a child mortality rate exceeding fifty per cent (see Statistiska centralbyrån 1983).

The medical tuition in Sweden at the time was almost non-existent. In his autobiographies, Rosén's student and later his colleague, Carl Linnaeus (named Carl von Linné when later raised to the nobility), gives evidence of that (Linné 1957).

It is true that the current of ideas, like *iatromekanik and iatrokemi* (now biochemistry) etc., started to become popular within the medical sciences. But most physicians still treated their patients with blood-letting and other forms of "emptying" therapies like *koppning*, application of leeches, treatment with emetics, inducing diarrhoea and so on. Therapies emanated from the theory that illnesses were caused by "sick fluids" within the human body necessary to draw of, usually late in the course of the disease when the symptoms of the illness culminated. Such physicians who looked upon disorders in this way, could hardly imagine that a disease could be contagious. Many of Rosén's colleagues did not understand that it was possible to prevent illnesses, and the idea of applying therapy early in the course of the disease was rejected.

Family and childhood

Nils Rosén was born on February 11, 1706 (new style) at the vicarage of Sexdrega in *Västergötland*, as the second of nine siblings. At that time his father Erik Esbjörnsson Rosenius, a clergyman of peasant stock, was an army chaplain in the military forces of Charles XII and stationed at the regiment of *Älfsborg*. The family lived in a very small dwelling in Blidsberg until 1710. Nils' mother, Anna Wekander, was a daughter of a clergyman since several generations, born and grown up at the vicarage of Sexdrega. Due to his marriage to Anna, it was possible for Erik Rosenius to be appointed as vicar of Sexdrega parish in 1709.

The couple gave birth to nine children, two girls and seven boys.
All nine children survived until adult ages and from this family emanated all together four families belonging to the nobility.

School education

Nils Rosén and his siblings received a solid, fundamental education at the private, boarding school of their parents in Sexdrega, together with several other boys from various parts of the country. Thereafter Nils spent only two years at the gymnasium in Gothenburg before he started his studies first in theology and philosophy and thereafter mathematics and medicine in Lund and Stockholm. There he was requested by professor Olof Rudbeck (junior) from Uppsala to apply for an appointment as *adjunct* (*professor*) at the medical faculty of the university.

NILS ROSÉN VON ROSENSTEIN
(1706 – 1773)

Oljemålning av Magnus Hallman
(1745 – 1769)

Ägare: Uppsala universitet, deponerad i Rosénsalen på Akademiska barnsjukhuset, Uppsala

Medical studies abroad and doctorate

Rosén moved to Uppsala where he satisfactorily defended his thesis *De usu metodi mechanice in medicina* ("The use of mechanical methods in medicine") and so he was appointed adjunct at the age of 22, in 1728. Thereafter it was possible for Nils Rosén to travel to the European continent, visiting universities and clinics and to get practical medical training and to acquire a doctor's degree. He came in contact with the majority of the most prominent medical researchers, teachers and clinicians in the world at the time. Wherever he came, the young student was welcomed for his amiability, his gift for languages and because he brought with him unexpected knowledge in various subjects, which he shared.

In 1730 at Harderwijk in Holland he published and defended his thesis *De historiis morborum rite consignandis* ("On writing of case reports") under the professor de Gorter.

Academic teacher at the medical faculty in Uppsala

On his arrival back home, in spring 1731 Nils Rosén had to take over professor Olof Rudbeck´s teaching in medicine and botany. (The professor however, kept the salary for himself). Rosén also had to take over the responsibility for professor Lars Roberg's lessons in anatomy and clinical medicine. In addition to this, he had to fulfil his own obligations as a medical adjunct.

During the 1730ies Nils Rosén built up, virtually on his own, a new and solid medical training of a modern model in Uppsala, where the fundaments were anatomy, physiology, pathology and clinical chemistry. Nils Rosén was one of the first doctors who trained *bedside teaching* to his students. He also published a very important text-book on anatomy (Rosén 1736 and 1738) and many medical articles and books. He presided at forty-six (doctors') theses.

Nils Rosén's new model of medical education, worthy of imitation, was soon distributed all over the country. It came to the University of Lund through his brother Eberhard Rosén (who later became a nobleman named Rosenblad) and to Stockholm, where several of Rosén's former students started medical education at the *Serafimerlasarettet* in 1752.

During the following two decades this model of medical education was consolidated, when Nils Rosén as a professor of anatomy and medicine and Carl Linnaeus as a professor of medicine and botany were responsible for the medical teaching in Uppsala, which attracted large audiences. From that time, the Swedish medical students were no longer forced to go abroad for theirs training in clinical medicine.
In principle, Rosén's model of a Swedish world-famous medical education has remained until the beginning of the 21st century, and Nils Rosén von Rosenstein has, rightly, been named *The Father of the Swedish Medical Education*.

Physician-in-order to the king

Nils Rosén soon proved to be a more competent doctor than anyone else. He became a physician-in-order to two kings, first (1735) to Fredrik I and thereafter to

Adolf Fredrik and the future Gustav III. He was unanimously elected to be a doctor for the pregnant crown princess Lovisa Ulrika – a starting point for a life long friendship. It was said that he saved the life of her first born, the above named Gustav, who was seriously injured during the course of a difficult delivery (1746). Nils Rosén was present at all the four royal children's births and served the royal family as their paediatrician and family doctor for many years. Queen Lovisa Ulrika was also convinced that doctor Rosén saved the life of her husband, when he, Fredrik I, suffered from severe and prolonged headaches and other symptoms of illness (1761). Rosén had prescribed his royal patient some time of absence from his ordinary royal duties and ordered an outward journey in order to take the waters at the spa of Loka. Thereby the king with his family received the opportunity of peace and quietness with several agreeable applications for the treatment, strengthening promenades, horticulture and healthy and suitable food and drink. Altogether, it is very likely that the prescriptions prevented for example stroke or a myocardial infarction.

The rosy stone of Loka

Thus, the king Adolf Fredrik recovered. Queen Lovisa Ulrika was happy and decided to raise a memorial stone of rosy (pinkish) granite (in German *Rosenstein*) for honouring the competent and skilful doctor Rosén, and also to commemorate the fact that the king once more was well. The idea of the planned memorial stone was the basis for the name *Rosén von Rosenstein* that Rosén selected when he finally was raised to the nobility the following year (1762, the same year as his colleague Linnaeus received his aristocratic name Carl von Linné). Twice earlier (in 1748 and 1756) Rosén had declined the nobility, first of all because he had no son who could inherit the name. When he accepted, he also accepted as his devise the Queens words *sine spinis*, meaning (a rose) without thorns.

The fact that the idea of the queen's memorial stone is to be found on Rosén's richly coloured coat of arms, decorated with roses, demonstrates that Lovisa Ulrika personally had been an active part in the design of the picture on the coat of arms. (How a memorial stone made of rosy granite was raised near the mineral spring in Loka sixty-four years later, is another story).

Professors in medicine in Uppsala

When professor Olof Rudbeck junior died at the age of ninety (1740), Nils Rosén was appointed professor in medicine and botany after him. The next year, when the professor Lars Roberg, eighty seven years old, retired from his professorship in anatomy and clinical medicine, Carl Linnaeus was appointed to this professorial chair – although strictly he was not qualified for it, as he would have been for the chair of Rudbeck.

Therefore, in 1742, the two young professors exchanged the subjects of their professorships with each other – with the consent of the Chancellor – so that each of them became professor of the subjects that corresponded to each person´s own

interest and scientific activity. Immediately, they started to co-operate and distribute the tasks among themselves. As an example, Rosén accepted to be responsible for rebuilding the small University Hospital, *Nosocomium academicum* (founded by Lars Roberg) while Linnaeus took upon himself the liability for care of the Botany garden at Svartbäcksgatan (now *Linnéträdgården*) (which was founded by Olof Rudbeck senior).

Now the fruit-bearing collaboration mentioned above started between the two gigantic learned masters, who acted as "pedagogical horses of a pair" at the medical faculty in Uppsala. Both of them collected big audiences when giving their medical lectures, which gave fundamentally new insights within the human body and its functions. Therefore they also set quite new and great hopes on the possibilities to prevent fatal diseases and curing and relieving therapies – instead of such blood letting etc which used to be mentioned as "a treatment more dangerous than the trouble".

Vital innovations

As above, medical doctors in general were at the time of the opinion that medical treatment (blood letting etc) was to be administered late in the course of the disease, when the symptoms reached their climax. Nils Rosén, on the contrary, carried on a scientific pioneer work by investigating new and, until then in medical circles, untested theories. Theories that dealt *partly* with the problems in preventing people becoming sick and *partly* to see whether it was possible to make the course of the disease shorter and milder when the therapy was started early.

Consequently, Nils Rosén was the first in Sweden to start using cinchona (Peruvian) bark preparations (quinine) against malaria, called *frossan*, which ravaged in Scandinavia when Nils Rosén started to work as a doctor. When Nils Rosén von Rosenstein had died, his former student, friend and colleague David von Schulzenheim mentioned in his commemoration speech (1773) that *frossan* was no longer a big problem in this country thanks to the efforts of Rosén and his students after him. The use of cinchona preparations could, however, fundamentally change the course of the disease, and was therefore considered to be "Ungodly" and against the "law of Nature". Not only theologians but also many of Rosén's colleagues blamed him for interfering in the course of the disease created by God. When hearing such orations, Rosén answered that, if God has created the disease, he must also have created the cinchona bark and the human intellect, and therefore the doctor is bound by duty to use the cinchona bark and his intellect to help his patients.

In a similar way Rosén's venture was treated, when he introduced the inoculation technique against smallpox, *variolisation*, in Sweden from England, where it originally was introduced by Lady Mary Wortley Montegu from Constantinople in the beginning of the 1720s. Nils Rosén appointed a gifted student named David Schultz (later as a nobleman von Schulzenheim) to travel to England in order to study the technique. David Schultz wrote an excellent dissertation on variolisation (Schultz 1756).

Probably in order to protect his younger colleague from trouble if something should go wrong, Nils Rosén took upon himself to be the first physician practising this technique in Sweden (1756). The result was catastrophic: One daughter and a foster-daughter died as a consequence of complications from the first variolisation in this country. Rosén however knew that the idea with the preventive variolisation was rightful, and he later wrote that it was possible to reduce the frequency of complications to only some event per thousand cases with a higher degree of care and caution (Rosén 1764).

Later in life, when Nils Rosén von Rosenstein was commissioned to take the responsibility for the variolisation of the royal "children", all went well – although they at the time (1769) were no longer children but young adults (16 to 23 years old).

Many physicians at the time could not understand the basic idea behind preventive medicine – it was not compatible with the concept of the disease most of them embraced. Nevertheless the *variolisation* paved the way for and made possible a speedy break-through of the *vaccination*, later introduced by the English doctor Edward Jenner (in two books 1798 and 1799).

Pioneer work with paediatrics

Tabellverket (the forerunner to the *Statistiska Centralbyrån, SCB*, in Stockholm) was founded in 1749. Short thereafter the harrowing numbers of child mortality of more than fifty per cent, were revealed.

In 1753, when the Gregorian calendar was introduced and Sweden got a new chronology, Nils Rosén started to publish articles in small almanacs published by the Royal Academy of Sciences. The articles dealt with children´s diseases, breast-feeding, nursing and preventive medical treatment, e. g. what then constituted fresh and new results of his empirical research work. Later, the articles were collected, re-edited and published in a book, Underrättelser om *Barn-Sjukdomar och deras Bote-Medel* (1764). It was the first veritable text-book of paediatrics. In 1771 it appeared in a new, improved and enlarged edition. The book was soon translated into many other European languages and became the Swedish text-book – all categories – that has been the most spread throughout the world. It was published in twenty-six editions and in ten different languages within the eighteen and nineteenth centuries. One of Linné's "apostles", Anders Sparrman, translated it into English during a round-the-world sailing tour with the legendary captain James Cook on board The *Resolution* (1772-1775). This book, *The diseases of Children and their Remedies*, was printed in London in 1776.

Of course there was no instant effect on the infant mortality rate or the average life span to be expected. But soon the figures of child mortality started to decrease: from more than 50 per cent at the time of Rosén to less than 0.5 per cent today.

Nils Rosén von Rosenstein – The man who prolonged the human life

Thanks to his new ideas with prophylactic and therapeutic measures, combined with

good hygiene and a rich diet, liquid therapy, active nursing and encouragement of the patient etc, Rosén created opportunities for the appearance of the basic medicine that all medical treatment is built on today. Therefore, Nils Rosén von Rosenstein can be regarded as the man who more than any other individual has contributed to the gradual lengthening of the human life span and thereby to the development of the modern welfare state.

Family life

At the age of twenty-eight, Nils Rosén married Anna Christina Hermansson (later von Hermanson), a not quite sixteen year old daughter of a famous Uppsala professor. The same year (1734) he was appointed assessor of the *Collegium Medicum* (Medical Board, corresponding to the National Swedish Social Welfare Board of today) and elected to the Royal Society of Sciences at Uppsala. Five years later he was elected a member of the recently-formed Swedish Academy of Sciences (1739).

The married young couple had a daughter (1736), named Anna Margareta Rosén, and twins (1752), Nils and Johanna Maria (the latter died in connection to the variolisation at four years of age).

The family lived in the *Oxenstiernska* house at the *Riddartorget* in Uppsala, the same house in which the first Academic Hospital in Sweden, *Nosocomium*, was located, where Nils Rosén prosecuted medical education and took care of some of his patients. In addition, he had an apartment in Stockholm (Holmgren 1926) in order to perform his duties as a physician, especially for the royal family.

Anna Margareta, the daughter, married a surgeon and medical doctor named Samuel Aurivillius, who succeeded his father-in-law as professor in anatomy and clinical medicine, when Nils Rosén retired in 1756. However, Aurivillius died already in 1767, and six years later also Anna Margareta died, leaving eight children without parents. Nils Rosén von Rosenstein then adopted his eight grandchildren in 1772. It was then possible for all of them to live and grow up at Hessle country-house, situated twenty kilometres (as the crow flies) south-west from Uppsala, that he had bought from his mother-in-law (Holmgren 1926) after leaving Uppsala university in 1757). Rosén's son Nils as well as the eight adopted grandchildren named themselves *von Rosenstein* (Segerstedt 1981).

Final phase

Nils Rosén's health was poor during the last fifteen years of his life. His renal and bladder stones caused him considerable pains and occasionally he was bedridden and suffering from a rheumatic disorder.

A year after his daughter's death, Nils Rosén von Rosenstein himself died in Uppsala. This was during a "pilgrimage", as he called it, from Hessle to Uppsala (1773).

He died surrounded by colleagues and friends and his former students (Fries 1903). He was buried in the cathedral of Uppsala, where a stony memorial with

gold lettering pays tribute to him as well as to his likewise important son, Nils von Rosenstein. (Below the memorial tablet is to be found the register of the archbishops of Sweden, amongst them a daughter's son of Nils Rosén von Rosenstein, Carl von Rosenstein, born in 1766 and archbishop from 1818 until his death 1836.)

The noble family von Rosenstein died out with the grandchildren of Nils Rosén von Rosenstein. However, on the female line there are still many gifted descendants.

THE QUESTIONS OF ISSUE

The aim of the actual research work about Nils Rosén von Rosenstein was to find answers to some questions that have not been asked up to now, nor have been satisfactorily answered in the existing literature about him.

1. *Where was Nils Rosén born*, in Blidsberg, where the family lived when the boy was born, or in Sexdrega, as is told in most of the earlier biographies, but to where the family did not move until Nils was four years of age?

2. *From where* did Nils Rosén get the idea to take his clinical interest to infants and children, in a time and in a society where learned men, also physicians, did not talk about questions dealing with any possible ways of decreasing the infant mortality?

3. *How does it come* that Nils Rosén von Rosenstein could be so enormously successful as a clinician that his name as *Nordens store arkiater* (The most prominent physician in Scandinavia) was still living more than hundred years after his death?

4. *Are there some possibilities* to discover how successful his ways of medical treatments actually were, although the so-called *numerical method* (the origin of medical statistics, Fåhraeus 1950) was not yet invented?

METHOD

The answers of this type of questions are not to be found in existing historical texts about Nils Rosén von Rosenstein. It has often been necessary to search beyond the times of Rosén, or at other places than some results of his ideas or work were thought to be found.

I have searched for information about the different people that he, as far as is known, has had any connection to. Then I have put together data about ages, places and relations in a similar way as doctors in general and paediatricians especially must do in order to make live, stern facts about the patient – with help of the imagination.

RESULTS

1. *Sigrid Buthelia*, the grandmother of Nils Rosén and clergyman's wife at the vicarage of Sexdrega, widowed early in life with six children, among them Anna Wekander, later the mother of Nils and his siblings. It was found that she did not leave the vicarage when her husband died. Instead she married his successor and went on living at the vicarage as before. When her second husband died, she once again married her husband's successor. When her daughter Anna Wekander (married Rosenius) was pregnant and was to give birth to her son Nils, it was quite natural for her to go home to her experienced mother Sigrid Buthelia at the vicarage of Sexdrega. There she could have all the help needed when she gave birth to the baby, with the after-care and with the attention of the older child.

Thus it is possible to conclude that the historical sources telling us that Nils Rosén was born in Sexdrega must be true, although his father did not move in there as a vicar until four years later.

2. *Anna Wekander*, the mother of Nils Rosén, met her coming husband, Erik Esbjörnsson Rosenius, when she only was one year of age and he was an eighteen year old boy from a peasant family in Roasjö. He came to the vicarage of Sexdrega in order to get his comprehensive school education by the vicar Olof Wekander. He stayed at the vicarage for seven years, until the age of twenty-five. Most of the time he resided indoors with his school work together with the clergyman's small children and the women, who had their place of work there. Thus, the coming clergyman Erik Rosenius not only received education in reading, writing, Latin, Greek, mathematics etc., but also in the general welfare of infants and children and caring for them during the children's illness and other diseases.

Sigrid Buthelia seems to have given her coming son in law private tuition also in midwifery, for Schulzenheim (1773) mentions that the father himself was active in the delivery when Nils was born. Sigrid Buthelia's daughter as well as her foster-son, later her son-in-law, both had been taught the art of being good parents. Therefore Anna Wekander was not alone with the responsibilities for the care of the nine children she gave life to and fostered. She, as well as the children's father, were taught by the experienced Sigrid Buthelia.

The nine children were born with about two and a half years interval between each child. The youngest was born when Nils Rosén was a twenty years old medical student. It means that he, during his whole childhood and adolescence, had been able to see and experience how infants and children were cared for in order to survive up to adult age. Later, when coming in contact with families where the infant mortality was high, he had the possibility to draw comparisons between their child-care and that of his own parents. Thus, through empirical research work, it was possible for him to determine the therapeutic effect of Sigrid Buthelia's model of child-care and her prophylactic treatment, and thereby communicate his results in his paediatric text-book.

NILS ROSÉN VON ROSENSTEINS (1706-1773)

VAPENSKÖLD PÅ RIDDARHUSET I STOCKHOLM

3. *It is obvious that Nils Rosén understood* that infants and children's requirements are the same as requirements for adults and vice versa – it is only the proportion that differs. Besides the different medicaments actual at the time, Nils Rosén seems to have used, in principle, the same advice and prescriptions to adult persons and to men, as he used to give for infants and children and their wet-nurses. It is possible to read about this in his text-book *Underrättelse om Barn-Sjukdomar och deras Bote-Medel* (Rosén von Rosenstein 1764), later published in an extended edition (1771), which was translated into English, *The Diseases of Children and their Remedies (1776).*

4. *The above mentioned text-book from 1771* was translated by Anders Sparrman, one of Linné's students, when sailing round the world (1772-1775) with the legendary captain James Cook on board at The Resolution (Sparrman 1883). No doubt that Cook himself, as an Englishman, contributed actively in this translation work, and that he also absorbed the ideas and used Rosén's advices and prescriptions in order to prevent illness and try to cure tropical fevers and scurvy on board (Sjögren 2006).

The mortality rate among sailors at the time was about *fifty per cent* during year-long sea voyages. However, during James Cook's first round-the-world sailing tour (1768-1771) the mortality rate was thirty-five per cent. During the second one, in the opposite direction, only *three men* of one hundred and twenty-two died, most likely because of the methods of treatment recommended by Nils Rosén von Rosenstein. (Not even the methods of treatments of today should be able to improve this survival rate. One of the three who died suffered from an advanced lung-disease already present when he boarded. The cook fell down a hatchway and the third death happened in connection with an accident on land).

DISCUSSION

The History must be studied forwards – not from our own time and backwards, but from the time beyond what we want to study – in order to get new facts about things that are developing towards the present time (Landell 2004).

Today, Nils Rosén von Rosenstein's ideas, once revolutionary, are established as the obvious foundation of all medical activity. Therefore it may be hard for us to see and understand that what seems to be as a matter of course within the clinical reality today, once was based upon new and fresh theories in dispute, demanding courage, talents and persistent research work – in order to prove their accuracy and correctness.

Through a kind of "backwards thinking" within our time, the immense importance of Nils Rosén von Rosenstein – for the improvement of medicine and the development of a welfare state – has been dwarfed. He is often described as only a skilful popular author, who distributed knowledge at that time about facts already known.

Within the actual research work about Rosén, presented in the book *Nils Rosén von*

Rosenstein – Mannen som förlängde människolivet ("The man who prolonged the human life", Sjögren 2006), the principal character appears in his own time and with a past behind him. Therefore, it will be possible for us to think *forwards* in his life. And therefor we can understand how he was able to create new knowledge, new science, by combining the collected experiences of several generations of skilful clergymen's wives about child nursing and care, with new facts within the growing new medical science.

It is worth while to remember the methods of medical treatment that Nils Rosén von Rosenstein invented, when we in the (near?) future might be facing more and more antibiotic resistant infections, or when we are observing until now unknown diseases or possible outbreak of smallpox.

What Nils Rosén writes in his earlier works about medical examinations of the patients and medical documentation in case records, are today of immediate interest while the World Health Organisation (WHO) is now trying to produce a uniform model for medical case recording (Nilsson 2003).

Most of Nils Roséns writings in articles and books about children's diseases and their treatment are dealing with measures of present current interest when taking care of patients, adults as well as children, both in Western and in the developing countries.

He also gives us a piece of good advice: if we do not have possibilities to take away disagreeableness, we have to *supply* something pleasant.

By his early, fundamental and lasting contributions within medical science and clinical medicine for adults as well as children, the Uppsala professor Nils Rosén von Rosenstein seems to be well qualified for being appointed to t*he guardian patron of Upsala Journal of Medical Science*.

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