

**THE FIRST NOBEL PRIZE FOR MEDICINE
TO THE NORDIC COUNTRIES (NIELS RYBERG FINSEN, 1903)**

Alfred Nobel (1833-96), who could trace his ancestry on the distaff side to the great 17th century anatomist, Olof Rudbeck, Professor of Medicine at Uppsala, spent many years in Paris. It was here that, disdaining lawyers, he drew up his will without legal assistance on November 27th, 1895. Nobel had amassed his fortune — at that time amounting to 31 million Swedish crowns, by 1981 well administered to 362 million — as a result of his inventions primarily of explosives, dynamite being the best known. He was of a philosophical turn of mind, a lover of peace. It is a moot point whether the donation should be regarded as an expression of penitence or of the desire to create a monument.

The first Distribution of the Nobel Prize was held in 1901, when Emil von Behring won the Prize for Medicine and Wilhelm Conrad Röntgen took the Physics Prize. In the following year the Medicine Prize went to the Englishman Ronald Ross « for his work on malaria ». Next time round a Scandinavian was rewarded in the medical sector — the Dane Niels Ryberg Finsen.

Altogether nine medicine prizes have been won by Nordic scientists through the years, four going to Denmark and five to Sweden.

Niels Ryberg Finsen was born on December 15th, 1860 in Thorshavn on the Faeroe Islands. His father came from an old Icelandic family, and in October 1876 Niels Ryberg arrived in Reykjavik on Iceland where he lodged with his paternal grandmother, and had many other relatives in the town. He attended school and took his university entrance examination in 1882. Already as a young student (1883) he noticed symptoms of a chronic heart and liver ailment (*morbus Pick*) which he would fight for the rest of his life, and which meant that he was always cold. After his examination he went to Copenhagen to study medicine. He obtained his M.B. and Ch.B. in 1890, and that same year became prosector in anatomy at Copenhagen University, a post which he resigned, however, in 1893 in order to devote himself exclusively to scientific work.

Finsen's own pathological symptoms attracted his interest to the field in which he would make his great contribution to science: the biological question of the importance of light for human life and health and for the cure of disease.

The young student's room faced north, and never caught the sun. But he began to take walks in the sunshine and noticed the beneficial effect. A seemingly trivial observation of a cat which lay sunning itself on a flat roof below his window, and moved to follow the solar heat, prompted his assumption that the sunlight profited the cat. Indeed he became envious of the cat which could lie in the sun in this way!

The scientists in the Nordic countries, which hardly see the sun for much

of the year, then evinced little interest in the effect of sunlight on the body, while of course many people knew by practical experience that sunbathing appeared beneficial.

The Swedish ophthalmologist Erik Johan Widmark (1850-1909), Professor in Ophthalmiatrics at the Karolinska Institute from 1891, made a contribution of crucial significance in this sphere. On the basis of his own experiments Widmark could now state that so-called eczema (erythema) solare, which was previously regarded as a form of eczema caloricum due to solar heat, is caused by the ultraviolet rays — from both solar radiation and electrical arc light.

Already far back in time attempts had been made, despite the lack of scientific grounds, to attain better healing of skin eruptions in smallpox by protecting the patient from harmful light rays. Finsen found an item by the Englishman C. Black (1867) to the effect that smallpox passes more easily and leaves no scars if the patient can lie in a dark room. As a result of Widmark's investigations Finsen became interested in the possibility of a less drastic protection of the smallpox patient's skin by means of red glass, red curtains at the windows etc. to exclude the ultraviolet rays. But « the red room principle » involved a « negative » mode of therapy. He would soon present a positive.

In an article « Lyset som Incitament » (Light as Stimulus) in 1895 in *Hospitalstidende* Finsen for the first time proposed the use of general light radiation — in a natural or artificial light bath. In this thesis *Om Anvendelse i Medicinen af Koncentrerede Kemiske Lysstraaler* (On the Use in Medicine of Concentrated Chemical Light Rays) he describes the method which would create his fame.

It could be confirmed that it is the ultraviolet rays which in sunshine produce life and movement in nature. Already then a great deal was known about the effect of light on micro-organisms, and scientists were aware of the lakes' « self purification » from bacteria by agency of the sunlight as a disinfectant. Since living tissues are highly permeable to sunlight, the effects of the sunlight is there much greater. Finsen says : « Thus we now see that from a theoretical viewpoint there is no obstacle to, on the contrary there is every indication in favour of a use of the light in local, external, bacterial skin diseases. » He himself had for a year been pursuing investigations of how to use light as a drug, and of its ability to penetrate the tissues.

The problem now was to remove from the sunlight the non-bactericidal, hot rays which produce burns — the ultrared (which are excluded when the light is passed through a water filter) and the red, orange and yellow (which could be eliminated *inter alia* by staining the water with methylene blue). As substitute for the sunlight which is so meagre in our countries Finsen could only accept carbon arc light.

The next problem was to concentrate the light. For this purpose he devised special apparatus for sunlight and electric arc light respectively.

The disease lupus vulgaris — which had hitherto proved therapy-resistant — was considered to have features which made it suitable for testing of the method : it is a bacterial disease, which is localised and moreover usually superficial, so that the light could exert a bactericidal effect.

The treatment continued for two hours each day, and was administered for several days or some weeks at a time. Each time a small area of the patient's skin, ranging in size from a one öre coin to a two crown piece, was irradiated. The focus of therapy was moved from place to place until all the afflicted skin had been treated.

In consequence of Finsen's brilliant results the patients came flocking. In 1896

the modest « Finsens Medicinske Lysinstitut » (Finsen's Medical Light Institute) was opened in Copenhagen. In 1900, thanks to private donations and state subsidies it could move into an imposing building on Rosenvaengets Allé. The lupus patients stayed at boarding-houses in the city supervised by doctors at the Institute. An evening school was established in accommodation at the Institute, and instruction given in reading, writing, sewing, and other handwork (which also afforded the patients opportunity to earn a little money during the long course of treatment).

Finsen was now busy in another field of medicine. The observations he made of himself and his own disease inspired him to try to found a hospital specialising in chronic heart and liver ailments.

Indeed for both theoretical and practical reasons the infectious diseases were the focus of attention at the turn of the 20th century. At the prospect of the award to the first Nobel Prizes in 1901, therefore, it was natural that achievements in this field were of prime concern to the judges. Apart from Behring and Ross, however, Robert Koch's and Finsen's names *inter alios* were discussed already then.

When the Nobel Prize for Medicine was to be awarded in 1903 the judges had some 30 candidates on which to decide. Furthermore there was special interest in tuberculosis.

The Medicine/Surgery group had proposed P. Dettweiler, N. Finsen (whose candidacy was promoted by the Professors I. Bjersum, L. Meyer, K. Faber, O. Wansch, all of Copenhagen, and J. Widmark of Stockholm), E. Köberle + R. Koch (shared prize), J. Lister and Lyder-Borthen (an ophtalmiatrist in Trondheim).

At the meeting of the Medical Nobel Committee on March 28th, 1903 it was decided to examine the work of *inter alios* C. Golgi, I.P. Pavlov, N. Finsen, G. Armauer Hansen, R. Koch and P. Ehrlich. On September 23rd the Committee resolved only to include the work of Finsen and Koch. Several members stressed Koch's greater scientific merits vis-à-vis Finsen's more practical results. The recommendation was passed by four votes of five that the Prize should go to Finsen. And on October 15th, 1903 the staff of the Karolinska Institute decided to award him the Prize.

The 1903 Distribution of the Nobel Prizes ceremonially occurred in the great hall of what was then the Royal Academy of Music in the presence of *inter alios* many members of the Swedish Royal Family, with King Oscar II presenting the Prizes.

The Nobel Prize winners this year constituted an illustrious band : from France — Henri-Antoine Becquerel and Pierre and Marie Sklodowska Curie (Physics — for the discovery of spontaneous radio-activity, and work illustrating the phenomenon of radiation in association with Becquerel's discovery respectively) : from Sweden — Svante August Arrhenius (Chemistry — for the theory of electrolytic dissociation) : from Denmark — Niels Ryberg Finsen (Medicine) : from Norway — Bjørnstjerne Bjørnsson (Literature) and from England — William Randal Cremer, M.P. and Secretary of the International Arbitration League (Peace Prize, awarded by the Nobel Committee of the Norwegian *Storting*).

Among the Prize winners M. and Mme Curie and Finsen were unable to attend.

Finsen donated 50,000 crowns of the Prize money to the Light Institute, and 60,000 crowns to the Sanatorium for Heart and Liver Diseases.

The winner of the 1903 Medicine Prize did not hold any Nobel lecture. His health steadily deteriorated and on September 23rd, 1904 his long suffering came to an end. He had been married since 1892 to Ingeborg Balslev, with whom he had two sons and two daughters.

In a memoir of Niels Ryberg Finsen Magnus Möller, the syphilidologist and later Professor, wrote :

« He died as he had lived, quietly, beautifully and with restraint, on a clear September evening, while the sun was setting behind the fading lindens of Rosen-vaenget.

He was a true servant of natural science, one of humanity's noblemen. »

The author offers to the Medical Nobel Committee of the Karolinska Institute his profound gratitude for permission to read the documents pertaining to the award of the 1901 and 1903 Nobel Prizes.

SOURCES

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