

The Father of Light Therapy: Niels Ryberg Finsen

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For the attention of: Mark Hetherington and John O'Neill

The report: Heroes of Science and Technology

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1. Introduction

This report has been requested by Mark Hetherington and John O'Neill. The report has been compiled to analyse the work done by Niels Ryberg Finsen as a hero in the field of science and technology. The report details his achievements and how his disease played a very great role for his whole development. It also details how he got the tag `father of light therapy` and his contribution to the treatment of lupus vulgaris with concentrated light radiation rewarding him with the NOBEL Prize.

This report is to be submitted on 25th May 2009.

2. Procedure

The information shown in this report was gathered from various websites and books.

I set myself an appropriate timescale before starting on writing the project which is as follows:

- Identify topic and hero by 30th September
- Produce a brief outline plan by 28th October
- Outline Summary by 25th November
- Final report by 25th May
- Presentation by 1st June

3. Who is Niels Ryberg Finsen?



Niels Ryberg Finsen, Danish physician, was born on December 15, 1860, at Thorshavn in the Faroe Islands. He established in Copenhagen an institute of light therapy and wrote several books on his work. He received the 1903 Nobel Prize in Physiology or Medicine for his method of treating disease, especially lupus vulgaris, with ultraviolet light.

4. The Father of Light Therapy

Finsen's studies in connection with this disease constitute the most well-known and the most fruitful part of his work and are responsible for the important role played by phototherapy in medical art today. His first steps in the field of phototherapy however, were directed towards general biological problems related to the effects of light on the organism. This led him to consider a number of specific problems concerning the effects of light on the skin in certain diseases. At first his research was not concerned with lupus but with another disease, smallpox. This first project in the field of therapeutics was certainly far removed from the principles that Finsen followed later in the treatment of lupus and other diseases, but it prepared the way none the less for his major research in this latter field.



The picture above shows a patient under phototherapy.

In 1893 Finsen recommended the use of red light in the treatment of smallpox. This treatment, by protecting the skin against harmful light rays, was believed to facilitate the healing of the skin lesions and prevent the appearance of scars which are often the sequel to this disease. A firm basis for this practice was lacking however. The situation was far more favourable when Finsen began his research on the subject.

Finsen's decision to follow this line of research was influenced by the phenomenon that light has the property of preventing the development of bacteria and even of killing micro-organisms. This phenomenon had already been observed in 1877 by Downes and Blunt and had been confirmed and studied by a number of scientists such as Duclaux, Roux, Buchner and others, on bacterial cultures, before Finsen applied it to living tissue containing bacteria. In this case also the active rays are the high-refraction rays of the spectrum.

5. What is Lupus?

Lupus vulgaris is, a form of tuberculosis, with localised lesions on the skin, especially that of the face, such as the nose, eyelids, lips and cheeks. The skin is gradually eroded; the face sometimes becomes dreadfully disfigured, and finally transforms patients into objects of repulsion. The chronic and progressive nature of this disease is particularly marked: it may remain active for ten years, twenty years, or even longer and, until now, it has proved resistant to all treatment. Even when patients had sufficient courage to persevere with these forms of treatment their hopes were dashed more often than not; rarely was a permanent improvement possible in this disease.



The picture above shows a typical patient suffering from Lupus Vulgaris.

The treatment of lupus by Finsen's method is carried out in the following way. Sunlight, or more frequently the light from a powerful electric-arc lamp (both forms containing a high proportion of active rays) is concentrated by means of lenses of appropriate composition into a beam from which the heat rays have been as far as possible eliminated. This beam is projected on a small area of affected skin, which has been drained of blood by pressure. The beam of light is applied continuously for one hour. Immediately afterwards the treated area becomes red and a little inflamed. During the next few days, this irritation of the skin increases and then soon after begins to decrease. It is at this point that healing commences and scar tissue begins to form, which eventually produces a surface almost exactly like normal skin. Every part of the diseased area is treated consecutively, repeating the process twice on the same area if this proves necessary. This treatment has no unpleasant effects but it is expensive, requires constant supervision and considerable time. The results obtained, however, greatly outweigh these disadvantages. This method has proved of use in the treatment of a number of other skin diseases, but it has been particularly successful in the treatment of lupus vulgaris. None of the methods previously used for the treatment of this disease has produced results which can in any way be compared to those obtained with phototherapy.

Thus it was that Finsen's method was hailed as a benefit to humanity when his treatment of lupus gave results which can arguably be described as brilliant.

6. The impact of Niels Ryberg Finsen's work on society

Finsen began to treat his first case of lupus in November 1895. Although the method had not yet been developed and although the case itself was of considerable severity, having proved resistant to all the current forms of treatment most energetically applied, the results were satisfactory. News of this success soon spread: patients suffering from lupus left their hiding places and hurried from far and near to seek a cure or some relief from their suffering. They were rarely disappointed.

The new method soon obtained recognition from the medical world and became current practice. It also gained considerable support from

philanthropists outside medical circles. The very next year, in 1896, the Finsen Institute of Phototherapy was founded in Copenhagen with funds obtained largely from generous private donations contributed. This Institute, devoted to research on the biological effects of light and the practical medical application of the results obtained, has since gradually been greatly developed and improved. It is now housed in its own recently equipped building, which includes a clinical section for the treatment of patients and an experimental research laboratory. It has a large staff including 8 doctors, 53 nurses, 3 assistants, other employees and numerous domestics.

7. Conclusion

This method represents an immense step forward and the work of Professor Finsen has led to developments in a field of medicine which can never be forgotten in the history of medicine. For this reason he deserves the eternal gratitude of suffering humanity.

An illness, from which he has long suffered, unfortunately prevents Professor Finsen from being here today.

8. Evaluation

This assignment was one of the most demanding tasks I have ever done. I am pleased with my project. If I had the chance to start the project again I would probably choose my websites more carefully. There is an awful lot of information about lupus and so much of it was of no relevance to me. It took too much time to look at each piece of information and decide upon its relevance.

I also feel that I could have researched Niels Ryberg Finsen a lot better by using fewer web sites to gather my information. I also had to read "Meddelelser fra Finsens Medicinske Lysinstitut. Volume V.", which took up a lot of time before I could even get started as there were a lot of medical terms used in it.

I have learned a lot of skills by researching my Hero names, report writing and oral presentation.

9. Sign and Date

Signature

Date

10. Bibliography/References

Books:

- Meddelelser fra Finsens Medicinske Lysinstitut. Volume V.
- Lupus Vulgaris. Scrofulide Tuberculoses

Websites:

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