



Review article

Origins of the binocular head mirror: The mystery of Dr. Clar, clarified



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ABSTRACT

Background: The origin of Dr. Clar's forehead mirror remains a mystery. The aim of this study is to track the roots of this eponym anew to find a definitive answer.

Methods: Historical, notably by the analysis of the reports of medical meetings and the content of instrument trade catalogs of the corresponding epoch.

Results: Konrad or Conrad Clar (1844–1904) was an Austrian balneologist and geologist particularly interested in laryngological examination. He notably invented a lighting apparatus in 1874, his famous forehead mirror in 1886, and a handgrip for laryngological instruments in 1901.

Conclusions: Konrad Clar is the man behind the eponymous Dr. Clar's mirror. This study allowed to definitively confirm this statement.

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1. Introduction

References to Dr. Clar's mirror are regularly found in collections of old medical instruments. While often-cited and emblematic, the origins of the name and the person behind the mirror remain unclear. For this reason, it is necessary to look back again into this somewhat mysterious and complicated history [1–3]. A recent historical note investigated whether the name of this time-honored mirror was related to a physician and suggested other clues for the naming of this medical instrument [4].

The aim of this study is to re-trace the roots of Dr. Clar's mirror. Still available today, Clar's mirror, "Clar's reflector", "Clar's photophor", "Clar's headlamp", or "Clar's parabolic electric

forehead lamp", is an electrical double-perforated, concave forehead mirror. It is characterized by the presence of a reflecting lamp fixed on the top of the mirror associated with two eccentric crafted holes in the mirror proper at eye level, allowing the observer to view through it. A second modified model with lateral apertures appeared later (Fig. 1).

Dr. Clar's mirror was not only used in otorhinolaryngology but also in other specialties, notably urology. Originally, the mirror relied upon a light source from an incandescent lamp, which was only available on the market after 1878. Thus its invention could not have occurred before this date. This observation suggests that the first evidence of the corresponding Dr. Clar in medical history must belong to the second part of the 19th century. Furthermore, the first decade of the 20th century, many international otorhinolaryngology trade catalogs mention Clar's mirror, thus demonstrating that it was invented before this time. This study

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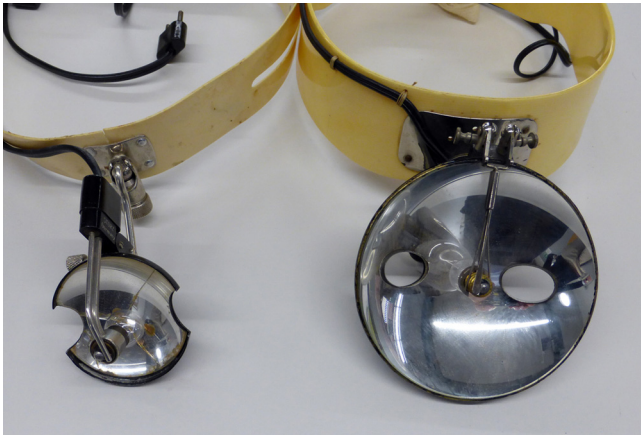


Fig. 1. Clar's original mirror, begin 20th century, and Clar's modified, courtesy of IRHMSP, Lausanne.

will, such as, be limited between 1870 and 1910. Another concern is that “Dr. Clar” is usually considered to have left no written documents and no peer-reviewed publications. A basic research was again conducted, notably with the systematic compilation of original medical trade catalogs and reports of meetings.

2. A certain Dr. Clar interested in laryngology lived in the second part of the 19th century in Austria

The history of a Dr. Clar begins in the mid 1870s in Austria. In 1874 a “Dr. Clar at Gleichenberg” published a first paper entitled: “A new lightning apparatus for laryngoscopic examination” [5]. This Dr. Clar was confronted with a lack of gas light, and the insufficient power of focusing the petrol light useful for laryngological examination with a “forehead reflector”. These limitations may have inspired him to invent a new lighting system producing a concentrated and focalized light. No drawing accompanied his publication.

This invention of Dr. Clar from Gleichenberg was then a new apparatus producing light eccentrically to improve its focalization on the forehead mirror. In this article, no mention of a modification of the used mirror is related. The historical records suggests that Dr. Clar might be Konrad or Conrad Clar (1844–1904), the Austrian balneologist (physician specialized in therapeutic use of thermal baths) and geologist. Gleichenberg was the place where he spent his summertime as balneologist, as mentioned in his 1904 obituary [6]. Born in 1844, Konrad Clar first studied geology, then medicine which he finished in 1869. He received his Privat Docent in balneology in 1870 in Graz and from that date, worked in this city in the winter and in Gleichenberg in the summer. In 1875, as indexed in the history of the Viennese Society of Physicians [7], a “K. Clar” presented a lightning apparatus for laryngoscopic examination: the same lamp as described in 1874. These first original documents lead one to suppose that Dr. Konrad Clar was a physician somehow interested in improving the instrumentation used in laryngoscopic examination.

Though the combination of training in both geology and medicine may appear peculiar nowadays, it was not uncommon in the first half of the 18th century in Austria. Under the Habsburg monarchy, university education underwent multiple reforms. In the late 1700s, the government spearheaded significant overhauls of the previously Jesuit-led universities. As a result of these reforms, education of natural history, of which geology was part, was displaced to the medical faculty and to the philosophical faculty, where it was taught in less depth. The school of mines also offered instruction in the earth sciences, but it did not lead to any formal university degree. Because the teaching of geology at the medical

school was at a higher level, it was the pathway of choice for the student interested in the field [8]. Konrad Clar's academic pathway is thus a product of the educational system of the time in Austria. Physicians trained in both geology and medicine often found a natural synthesis in balneology or spa medicine. Balneology was also a lucrative summer activity that allowed the physician-researcher to fund unremunerated research during the winter months. Clar spent his summers as a bath physician in Gleichenberg and his winters practicing medicine and teaching climate therapy and bacteriology in Vienna. While at the same time he dedicated himself to clinical work, Clar also had a productive output in geology, producing the first geologic map of the Graz region, describing the Palaeozoic successions with remarkable accuracy [9].

3. A Dr. Clar's mirror is invented

One of the first references to a “Clar's reflector” is found in 1889 in the urological medical literature. It is described as a concave, binocular reflector, “perforated in two places” [10]. This system corresponds to what is currently known as Clar's mirror. In 1890, the Viennese otologist Viktor Urbantschitch, in the 3rd edition of his textbook on ear diseases, mentioned the forehead concave mirror developed “by Dr. Clar in Vienna” with the instrument maker Reiner [11]. It was an “electrically lighted perforated mirror, which allows a binocular inspection” reason why he used it with pleasure. In the 2nd edition published in 1884, Viktor Urbantschitch did not refer to Clar's mirror. In 1892, a description of the “Clar's photophor” was found in the French *Revue générale des sciences pures (General Review of pure sciences)*. The forehead mirror was described as follows: “This device is composed of a forehead mirror greatly concave fixed to the head of the observer by a band or by a metallic spring, and pierced with two holes for the passage of the visual rays. A small Edison lamp of eight volts is fixed to a metallic rod, itself linked by hinge to the superior border of the mirror” [12]. No instrument maker was mentioned. The text is completed with an illustration showing the electrical forehead mirror in place which did not give a good view of the two holes.

The mention of Reiner's firm alone is confusing, because at least two firms of the name Reiner were active in Vienna at the end of the 19th century. The first was Heinrich Reiner's firm, as later precisely cited by Dr. Clar, founded in 1840, and particularly involved in the production of medical and surgical instruments. It published various instrument trade catalogs, notably a general one in 1894, and another specific for otorhinolaryngology instruments in 1908. The second firm was Carl Reiner, founded at the turn of the 1860's, and particularly engaged in the manufacture of mirrors. This factory began, in 1912, to also produce medical and surgical instruments. In the 1894 Heinrich Reiner's catalog, “Dr. C. Clar” is associated with the “binocular forehead reflector for electrical light” [13]. The 1908 Heinrich Reiner's catalog [14] is completely explicit in crediting “Dr. (later Prof.) Conrad Clar” for the invention of this device, with two annexed illustrations (Fig. 2). It is specified that it was first made 22 years before in 1886. The two illustrations were already in the 1894 Heinrich Reiner's catalog, but with a different light generator and less explanation about “Dr. C. Clar”. In 1888, Konrad Clar moved to Vienna to continue his practice as balneologist at the University and continued to remain active during the summer at Gleichenberg. He was promoted “extraordinary professor” at Vienna University in 1899. Konrad Clar is definitively the inventor of the Clar's mirror in 1886.

4. Origins of Dr. Clar's lighting apparatus

In 1894, Dr. Clar again demonstrated his spheric lighting system at a meeting of the Viennese Society of Physicians [15]. There, he explained that he had developed his lamp around 20 years before

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