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Ingold, Nikolaus

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"LIGHT SHOWERS" AS VITALITY BOOSTERS: SUNLAMPS AND THE HYGIENIC LIFESTYLE IN AN INDUSTRIALIZED ENVIRONMENT

NIKOLAUS INGOLD

SUMMARY: During the first half of the twentieth century the Austrian physician Arnold Lorand published several editions of his advisory book "Old age deferred, The causes of old age and its postponement by hygienic and therapeutic measures". Therein, Lorand faced the challenges of a modern life style for human health in terms of endocrinology and outlined a hygienic lifestyle that was thought to maintain the human organism in good shape and prevent "premature old age". Lorand recommended, among other things, the application of two devices for the irradiation of the human organism with short- or long-wave light rays. With this advice, Lorand addressed two main audiences: everybody who feared about his or her vitality as well as those concerned with their personal performance in different areas of life. Lorand's book *Old Age Deferred* represents an example of permanent negotiations between physicians, patients, producers and salesmen of sun lamps about the purpose of such medical devices. This historical case example can be used to explain the development of some irradiation devices to articles of daily use.

KEYWORDS: Arnold Lorand, Light Therapy, Sunlamp, Hygiene, Industrialization, Endocrinology, Rejuvenation.

PRECEPTOR: Prof. Philipp Sarasin ■ INSTITUTION: University of Zurich

Introduction

Around the middle of the twentieth century, a booming market for ultraviolet lamps existed in both North America and Europe. Companies like Philips, General Electric or Westinghouse produced these so-called "sunlamps" and promoted them for regular use in individual households.[1]

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[1] Michael R. Albert and Kristen G. Ostheimer, "The Evolution Of Current Medical And Popular Attitudes Toward Ultraviolet Light Exposure, Part 2," *Journal of the American Academy of Dermatology* 48 (2003), pp. 909-918;

The advertisements were illustrated with photographs of healthy and sporty women, men or children or the whole family together in front of such irradiation devices. Claims like "Boosts vitality and strengthens health – a treat for the whole family" or "Stay well, stay young" were widespread among the captions of these photographs.[2] Such captions indicate that the producers and sellers of these instruments saw a special benefit in the promotion of their products: Exposure to ultraviolet rays was not reduced to a leisure tanning procedure but presented as a form of preventive medicine and, therefore, sunlamps were seen as general means for improving individual and population health. Today, such a view seems utterly overstretched if not outright dangerous. Ultraviolet radiation is now recognized as the most important carcinogenic agent related to the development of skin cancer, and medical doctors advise on reducing personal exposure to ultraviolet light.[3] In fact, the association of skin cancer with sunlight exposure is not a new observation; but the relationship was difficult to understand and mainstream scientists did not recognize the aetiology of cancer through ultraviolet light before the 1930s or 1940s.[4] During these decades, however, medical doctors increasingly mentioned the risks of ultraviolet radiation in popular writings, the scientific knowledge had little impact on popular attitudes towards ultraviolet light exposure.

To explain the early twentieth century popularity of ultraviolet light applications and the ensuing usage of sunlamp baths as articles for daily use, some cultural historians have emphasized the groundbreaking discovery of the role exerted by short-wave light rays in the synthesis of vitamin-D.[5] One of the more prominent scientific figures of this historical discourse was Dr. Kurt Huldschinsky (1883-1941), a German physiologist who managed to heal rickets – a long-time health burden of the Industrial

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esp. p. 915. I thank Ariane Knuesel for comments on an earlier version of the current article as well as Kerry Sun and Frank W. Stahnisch for their editorial hands and suggestions regarding the final English version of this article.

[2] The original quotes are in German: "Spendet Lebensfreude und staerkt die Gesundheit – Eine Wohltat fuer die ganze Familie", "Gesundbleiben, Jungbleiben". See: Quarzlampenvertrieb Zurich, "Die Hoehensonne," *Volksgesundheit* 45 (1952): p. 41; Quarzlampen-Gesellschaft m.b.H., "Gesundbleiben Jungbleiben," *Die Gartenlaube* (April 13, 1933), p. 15.

[3] Michael R. Albert and Kristen G. Ostheimer, "The Evolution Of Current Medical And Popular Attitudes Toward Ultraviolet Light Exposure, Part 1," *Journal of the American Academy of Dermatology* 47 (2002), pp. 930-937.

[4] Albert and Ostheimer, *The Evolution Of Current Medical And Popular Attitudes Toward Ultraviolet Light Exposure*, p. 1096.

[5] Albert and Ostheimer, *The Evolution*, Part 2, p. 909.

Figure 1: Advertisements for sunlamps were illustrated with photographs of healthy, sporty women, men and children in front of such medical devices. Source: Heraeus Noblelight GmbH, Hanau, Germany.

Age and dreadful childhood disease caused by a lack of vitamin-D – in a Berlin children's home in 1919 with the sunlamp "*Kuenstliche Hoehensonne*" (engl. "artificial sunlight").[6] After this success, several projects were started in which paediatricians systematically irradiated babies with short-wave light rays for the prevention of rickets.[7] For this reason, the discovery of the role that ultraviolet rays play in vitamin-D synthesis to a certain extent explains why children had been irradiated for health care purposes. Some physicians exploited Huldschinsky's healing success to advise regular use of sunlamps not only to the groups at-risk for

[6] Kurt Huldschinsky, "Heilung von Rachitis durch kuenstliche Hoehensonne," *Deutsche medizinische Wochenschrift* 45 (1919), pp. 712-713.

[7] See, for example, Philipp Zoelch, "Ueber neuere Behandlungsverfahren der englischen Krankheit im Dienste der allgemeinen Rachitisbekaempfung, I. Mitteilung: Ueber Erfahrungen mit der Quarzlampe bei Rachitis," *Muenchener medizinische Wochenschrift* 76 (1929), pp. 1420-1423.

rickets, but for adults as well.[8] It was not obvious why the successful healing of a childhood disease should have also boosted the irradiation of healthy adults.

The Demand for Sunlamps

The traditional explanation of the growing demand for sunlamps, as rooted with the spectacular healing successes and the newly-discovered scientific facts regarding the relation of light to life, is too narrowly construed. Certainly, the consideration of such successes and knowledge gains is relevant for the understanding of attitudes toward ultraviolet exposure in the past. For a more thorough explanation of the daily use of sunlamps by the general public, however, the broader historical circumstances need to be taken into account as well. I shall argue in this article that irradiation devices were seen as contributing to a new and adaptive lifestyle in an industrialized and urbanized environment. In the following, I first describe how modern daily life also became problematized in medical terms during the first half of the twentieth century. To this end, I make use of some recent observations by the historian of Germany Michael Hau, who regards the process of medicalization as a "socially negotiated product of subjective social experiences" as well as attempts by certain actors "to explain these experiences in medical terms".[9]

The Austrian medical researcher Arnold Lorand is a typical example of Hau's assertion. Lorand worked as a physician in the well-known and popular Spa of Carlsbad, a health resort in the province of western Bohemia (in the modern day Czech Republic), during the first three or four decades of the twentieth century. In a book review, he was introduced as a "distinguished physician" who "had extended experience dealing with people who, through excess and unhygienic living generally, have been driven to the baths for cures or relief".[10] Lorand was concerned with the medical problem of rejuvenation: In 1909, he published the first German edition of the advisory book *Das Altern* which was later translated

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[8] See: Hugo Bach, *Anleitung und Indikationen für Bestrahlungen mit der Quarzlampe "Kuenstliche Hoehensonne", Mit Beruecksichtigung der leuchtenden Waermestrahlen*, 20.-21. vermehrte Auflage, Unter Mitwirkung von Ferdinand Rohr (Leipzig: Curt Kabitzsch 1929), p. 62.

[9] Michael Hau, *The Cult of Health and Beauty in Germany, A Social History, 1890-1930* (Chicago and London: The University of Chicago Press 2003), p. 3.

[10] Anonymous, "The new books on our shelf," *Peabody Journal of Education* 5 (1927), p. 52.

and published in English as: *Old Age Deferred.*[11] Therein, Lorand dealt with "premature old age", a disease which he argued was caused by "certain faulty habits"[12] in everyday life, yet could be healed or even prevented with specific hygienic measures such as light irradiation. The book was repeatedly revised and further translated into twelve other languages. In the year 1932, the seventh German edition was published and the book reached a circulation of seventeen thousand exemplars.[13] The success depended largely on the preferences of the lay public.[14]

In the preface to the first edition, Lorand had accordingly stressed that he wanted to inform broader social circles about a new rational lifestyle ("*rationelle Lebensweise*") for the modern world and expressively apologized for omitting certain details about contemporary medical developments.[15] For that reason, he omitted describing his own experimental findings in the book but emphasized the general benefit of the medical and scientific facts in therapeutic programs as well as public health applications. This rhetorical disconnect between the medical discourse of the time was probably the reason why Lorand continued to be an outsider in the scientific community, exemplified by the fact that Eugen Steinach (1861-1944) of Vienna, one of the most important contemporary researchers of hormonal rejuvenation, completely ignored Lorand's earlier work.[16]

The diagnosis of "premature old age" was based on the observation that many people showed signs of aging like "corpulence, gray hair, wrinkles in the face, falling out of the hair and loss of teeth, etc."[17] already at the age of 40 or 45 long before their "natural" aging. According to Lorand, the disease was not just a cosmetic affair. Symptoms like gray

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[11] Arnold Lorand, *Das Altern, seine Ursachen und seine Behandlung durch hygienische und therapeutische Massnahmen, Ein Handbuch für eine rationelle Lebensweise* (Leipzig: W. Klinkhardt, 1909). English title: Arnold Lorand, *Old age deferred,The causes of old and its postponement by hygienic and therapeutic measures*, 5th ed., trans., with additions, by the author from the third German edition (Philadelphia: F. A. Davis, 1916).

[12] Lorand, *Old Age Deferred*, 5th ed., p. xvii.

[13] See: Arnold Lorand, *Das Altern, seine Ursachen und seine Behandlung, Eine Anleitung fuer eine rationelle Lebensweise, 7. den neuesten Forschungen entsprechend umgearbeitete Auflage*, 16 to 17 thousand (Leipzig: Johann Ambrosius Barth, 1932), p. IV.

[14] Heiko Stoff, *Ewige Jugend, Konzepte der Verjuengung vom spaeten 19. Jahrhundert bis ins Dritte Reich* (Koeln: Boehlau 2004), p. 272.

[15] Lorand, *Das Altern*, p. V.

[16] Stoff, *Ewige Jugend*, p. 272.

[17] Lorand, *Old Age Deferred*, 5th ed., p. 1.

hair and wrinkles in the face, for example, made more hidden health problems evident:

> The mental faculties are also altered; the memory weakens, and the mind is often depressed. Neurasthenia or hysteria become frequent in such persons, while impotence in men and menstrual disorders in women develop.[18]

Thus, "premature old age" diminished the performance of the human being under the conditions of modern life in the Industrial Age. Referring back to Hau's account, Lorand's diagnosis can be interpreted as a possibility to express and describe a lack of social status or fears of failing in ordinary work situations or impotence in intimate relationships. Those conditions were explained in medical terms that strongly borrowed their terminology from the physiologists' work on rejuvenation and regeneration: In accordance to the ideal of health and beauty at the time,[19] also social failure was linked to the aged body, while youthfulness meant vitality, high performance and economic success. Lorand's book then was a proposal on how to deal with the requirements and exertions of modern life. The author gave further advice about how the body should be maintained and kept healthy under the conditions caused by the processes of industrialization and urbanization. Adherence to Lorand's hygienic rules thus promised prevention of failure on the one hand or recovery on the other.

I will now describe how Lorand connected his views about the challenges of modernity with the construction and prevention of the two irradiation devices. I will first look at his perception of the causes of health and disease and the problematization of modern life. Subsequently, I will describe Lorand's argumentation for the use of the two devices in terms of improved hygienic means. I then connect his application of the devices with their broader usage, and in the conclusion of this article I will outline an altered perspective on the history of sunlamps.

The Legend of Thomas Parr

In his writing, Lorand often used the famous story of Thomas Parr (1483-1635) – also known as Old Tom Parr – to illustrate the natural possibility of living to a long, almost biblical age. According to this legend, Parr died at the age of hundred and fifty-two years in 1635, one year after King

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[18] *Ibid*., p. 1.
[19] See: Stoff, *Ewige Jugend*, p. 13.

Charles I. (1600-1649) of England had invited him to live at his court. Until his move to London, Parr had lived a quite frugal country life as a farmer. He worked hard outdoors on the fields, stayed on a milk diet, went to bed early in the evening and got up early in the morning.[20] To prove Parr's youthfulness, the anecdote recounted that at the old age of 102 he had been accused of having committed a sexual offense on a young woman. The doctor was found guilty and consequently punished.[21] After Parr's death, the court's physician – the famous London physiologist William Harvey (1578-1657) – conducted an autopsy. On the dissection table, Harvey discovered that every organ in the old man's body was in a perfect condition and as the cause of death, he remarkably diagnosed "over-eating".[22] Focusing on these autopsy results, Lorand formulated the point of the story as follows:

> [...] the rich food [which Parr] received in the Royal household did not prove beneficial to him, and though his 152 years of frugal life were unable to kill him, nine months of an opposite style of living succeeded in doing so.[23]

I am not interested in the credibility of Parr's old age.[24] Instead, I want to emphasize two aspects of the story which tell us more about Lorand's own views on the causes of health and disease and his problematization of modern life. My first concern is with Lorand's good news to his contemporaries; he marked Parr's frugal lifestyle as the key to a long life. This means, in other words, that each human being has its individual form of physical well-being and is responsible for it, based on the assumption that the general physical condition of the body is influenced by the way each individual behaves within the different ways of life. Lorand identified nutrition, work and sleep, consumption of fresh air and sunlight, emotions and sexual activity as fields in which human beings could influence their health by proper habits and prevent "premature old age".[25] In all of these areas, it would be important to find the right measure and

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[20] Lorand, *Das Altern*, p. 39.
[21] Lorand, *Old Age Deferred*, 5th ed., p. 48.
[22] *Ibid*., p. 49.
[23] *Ibid*., p. 50.
[24] The declaration of Parr's age is controversial. Some authors argue that he was not older than seventy years. Paul Lueth, *Geschichte der Geriatrie, Dreitausend Jahre Physiologie, Pathologie und Therapie des alten Menschen* (Stuttgart: Enke, 1965), pp. 153-154.
[25] See: the table of contents in: Lorand, *Das Altern*, 7th ed., pp. V-VI.

equilibrium. In the field of sexuality, for example, Lorand warned against both excess as well as abstinence.[26] This view regarding the causes of diseases and health stood in a line with a long tradition of advice that European hygienists had given for the improvement of healthy living during the 19th century.[27] But in contrast to those hygienists of the nineteenth century, Lorand used the new science of endocrinology as a resource for his own argumentation to explain the association of the general human behaviour and a healthy life style. I will come back to this point further below.

The second aspect of the legend of Thomas Parr, which I want to emphasize here, concerns the two lifestyles Lorand had brought face to face: He contrasted the country life to the way of living in the city and at court, by emphasizing their different results on health and illness. Whereas the countryside was the location for a healthy and balanced life style, the city was the place of decadence (as demonstrated in the pathological case of "over-eating") and death. This juxtaposition can further be read as a sceptical statement towards modern civilization as a whole and the contrast between the urban/rural health divide, in particular, that became justified by recent medical argumentation. The country life then stands for "nature" while the city life means "culture", and this opposition translated into the bad news that Lorand had for his readership. In the culturally shaped city, the unfriendly conditions of the industrialized environment resulted in the widespread problem of "faulty habits". Fresh air and sunlight were limited due to the living conditions which the urban environment provided; people worked and slept in small locales, the consumption of fresh air was obstructed by closed windows and curtains, further dimming the daylight.[28] Moreover, machine vapours and industrial air pollution absorbed healthy rays from the spectrum of the natural sun light.[29]

As a means to remain healthy under these conditions, Lorand recommended for his readers to literally flee the city whenever they could:

> After the day's work is finished we should always get out into the air, preferably in a park or wood […]. We should follow the example of those

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[26] Lorand, *Old Age Deferred*, 5th ed., pp. 389-399; Lorand, *Das Altern*, 7th ed., p. 34.

[27] For a study of the related hygienic discourses in the 19th century see: Philipp Sarasin, *Reizbare Maschinen, Eine Geschichte des Koerpers 1765-1914* (Frankfurt am Main: Suhrkamp, 2001).

[28] Lorand, *Das Altern*, p. 128.

[29] *Ibid*., p. 127.

> English people who leave town on Saturday and remain in the country until Monday, behind them the cares of business.[30]

It is a further anecdote that Lorand proposed using the car for the travels away from the city.[31] Yet, this fact clearly brings out that he was not opposed to the processes of modernization, despite his glorification of the rural ways of living. Instead, Lorand proposed the use of modern achievements as a way to mitigate the negative effects of urbanization and industrialization. And among such technological products were the irradiation devices. In the various editions of his work *Das Altern*, Lorand strongly promoted two of them: the electric light bath and the quartlamp ("*Kuenstliche Hoehensonne*").

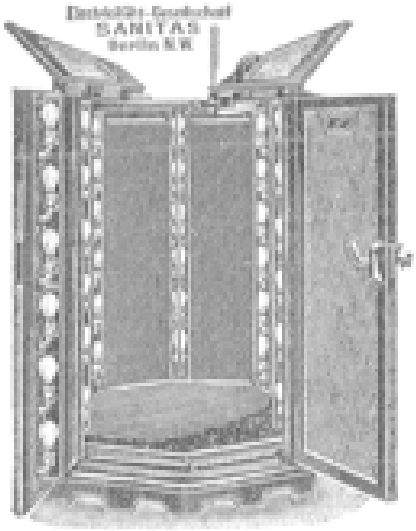

Figure 2: The electric light bath was a wooden box in which fifty or sixty incandescent light bulbs were strung up. Source: Max Walser, *Zwei moderne Heilfaktoren: Elektrische Lichtbehandlung und Vibrationsmassage, deren Erfolge in Krankheiten, Gemeinverstaendlich dargestellt*, 2nd ed. (Leipzig: Edmund Demme, 1902), p. 60.

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[30] Lorand, *Old Age Deferred*, 5th ed. (n. 11), pp. 265-266.
[31] *Ibid*., p. 266.

Figure 3: The “*Kuenstliche Hoehensonne*” was the prototype of those sunlamps which were sold for daily use at home. Source: Hugo Bach, *Anleitung und Indikationen fuer Bestrahlungen mit der Quarzlampe “Kuenstliche Hoehensonne”*, 14th and 15th eds. (Leipzig: Kabitzsch, 1925), p. 66.

The electric light bath produced heat and was also used as a sweat bath in bathhouses, sanatoriums and villas.[32] It consisted of a wooden cabinet in which fifty or sixty incandescent light bulbs were strung up. For irradiation, patients stood or sat in the wooden box.[33] In contrast, the “*Kuenstliche Hoehensonne*” emitted a cone-shaped beam of short-wave rays which permitted the irradiation not of the whole patient but of a large part of the torso. Its most important technical component was a so-called “quart-burner”. This component was a tube of quartz glass, in which mercury vapour emitted short-wave rays if an electric potential was introduced.[34] The “*Kuenstliche Hoehensonne*” was the prototype of those

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[32] John Harvey Kellogg, *Light Therapeutics, A Practical Manual of Phototherapy for the Student and the Practitioner*, 2nd ed. (Battle Creek: The Modern Medicine Pub. Co., 1927), pp. 5-6.

[33] For a detailed description of the electric light bath see: John Harvey Kellogg, Anwendung von Waerme nach einer neuen Methode (Aus dem Englischen uebersetzt),” in: *Fortschritte der Hydrotherapie, Festschrift zum vierzigjaehrigen Doctorjubilaeum des Prof. Dr. W. Winternitz*, hrsg. v. Alois Strasser und B. Buxbaum (Wien and Leipzig: Urban & Schwarzenberg, 1897), pp. 130-131.

[34] Hugo Bach wrote the standard reference for the “*Kuenstliche Hoehensonne*.” See: Hugo Bach, *Anleitung und Indikationen für Bestrahlungen mit der Quarzlampe “Kuenstliche Hoehensonne”* (Leipzig and Wuerzburg: Curt Kabitzsch,

sunlamps which became widespread articles of daily use in modern bathrooms, living or sleeping rooms.

"Faulty habits", Endocrinology and the New Irradiation Devices

To understand why the electric light bath and the quartlamp should have had an effect at all on the social formation of the concept of "premature old age", I will now look at how Lorand associated "faulty habits" of modern life with this new disease. As was mentioned before, Lorand used endocrinology to explain the impact of the behaviour in several areas of modern life on the physical well-being of the body. According to him, the whole human organism was subjected to the functioning of the endocrine glands (principally the thyroid gland, the hypophysis, the adrenal glands, the generative glands, and the pancreas); they were seen to affect the exterior of the body as well as the mental faculties and the character of a person; and they further exerted a strong impact on the physiological living processes and patterns like metabolism or the sensible and motor faculties of the nervous system. For example, glands like the generative glands and the hypophysis controlled the development of the secondary sexual characteristics, regulated adipose tissue, and influenced body size, intelligence and memory.[35] In this instance, "faulty habits" were dangerous to the physical well-being because they were thought to have an impact on the shape of the extremely important endocrine glands: Inadequate and hence "faulty habits" were seen as causes that introduced or produced poisonous substances in the human organism, and these substances could harm the endocrine glands in return.[36] As a consequence of such an "autointoxication"[37] of the individual body, the performance of the endocrine glands decreased – Lorand called this situation a physiological "degeneration"[38] which would lead to the premature aging of the organism.

The functions of the thyroid gland are a particularly good example to illustrate his view: Lorand recognized "faulty habits" as harmful social influences on this physiological gland during several stages of life, such as

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1915). Quartz glass was used for the construction of the burner because other types of glass did not let ultraviolet radiation pass through.

[35] See: Lorand, *Das Altern*, 7th ed., pp. 5-24.

[36] *Ibid*., pp. 25-26, 28 and p. 34.

[37] Lorand, *Old Age Deferred*, 5th ed., p. 127; Lorand, Das Altern, 7th ed., p. 37.

[38] Lorand, *Das Altern*, p. 2.

emotional arousal, sexual excess and frequent pregnancies or infectious diseases as well as intoxication through wrong nutrition, alcohol, tobacco or pharmaceuticals could all lead to a severe "degeneration" of the gland.[39] Those toxins could harm the thyroid gland either in a direct way – as in the case of infectious diseases – or in an indirect way through physical or mental exhaustion. As to the issue of nutrition, for example, Lorand quoted a number of medical studies which had found that the thyroid gland destroyed toxins that are formed in the intestines particularly through decomposition of animal food.[40] Therefore, eating large quantities of meat and fish might cause over-functioning of the thyroid gland. Over the course of time then, according to Lorand, such an overstimulation would lead to exhaustion and reduced activity of the gland.[41]

From the perspective of the contemporary cutting-edge discipline of endocrinology, a markedly reduced performance of an endocrine gland caused far-reaching consequences for the whole human organism. In the case of the thyroid gland, for example, its "degeneration" became fatal as this gland exerted a great impact on the physiological activity of the somatic cells, which were seen as the fundamental units of biological action in modern cell theories.[42] According to Lorand, the thyroid gland produced many substances that played important roles in the essential metabolic processes of the somatic cells. These substances were then further transported by the blood. "Degeneration" of the thyroid gland, accordingly, changed the composition of the blood which in return disturbed the metabolic processes of the somatic cells. Dysfunction of the gland thus reduced the physiological activity of these cells, and the vitality of the whole organism diminished.[43] Such a loss of vitality, however, proved to be a threat on the ideal of physical health and beauty of the time.

Lorand knew that it was sheer impossible to completely avoid harming the endocrine glands when being submitted to the physical, psychological and work strains of modern life and work conditions. However, he felt that a hygienic lifestyle could minimize the exposure to environmental noxes and production of poisonous substances in the human organism. In fact, he also proposed that "autointoxication" could be prohibited by a stimulation of the detoxifying organs. As the most important group of

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[39] *Ibid*., pp. 46-47.
[40] *Ibid*., p. 46.
[41] *Ibid*.
[42] See: Roy Porter, *The greatest benefit to mankind, A medical history of humanity*, 1st American ed. (New York and London: W. W. Norton & Company, 1997), p. 330.
[43] Lorand, *Das Altern*, 7th ed., pp. 26-27.

these detoxifying organs, he listed the thyroid gland, the liver, the intestines, the kidneys and likewise the human skin.[44] This physiological model of environmental exposure to external noxes and internal organs, which functioned against this external threat, also gave rise to the medical use and application of the electric light bath; in his view, the sun lamp was a treatment of choice for activating the skin to exert its important functions as a detoxifying organ.[45]

Lorand further informed his readership that two and a half million spiral-shaped sudorific glands were spread all over the surface of the human body in the subcutaneous tissue of the skin and that these glands were richly provided with blood-vessels. In his opinion, sudorific glands were able to extract excess fluid and solid substances from the blood and eliminate harmful agents through the excreting channels of the glands with the human sweat.[46] The activation of the sudorific glands would then further alleviate the other detoxifying organs by minimizing the external physiological strains on the body. Thus addressing his readership, Lorand pointed out that urea, uric acid, common salt, creatine, acetic acid, lactic acid, and several fatty acids were further excreted with perspiration.[47] He implicitly regarded all of these substances as harmful and quoted the long-made clinical experiences that infectious diseases often improved after perspiration as a striking proof for the detoxifying effect of sweating.[48]

The exudation of waste products by perspiration required that the openings of the sudorific glands, i.e. their pores in the skin, remained open during the course of life. Deteriorated scales of the skin, fat and dust from the air, however, always threatened to jam and close the pores, thus rendering them dysfunctional. Lorand therefore recommended daily bathing using soap and hot water.[49] He felt that it was not only important to remove substances, which trapped waste material and toxins in the human organism; but also air should have free access to the skin to improve its function and vitality. Consequently, Lorand warned against wearing thick, non-porous clothing, and advised his readers to take air baths ("*Luftbaeder*") – as he called them – twice a day.[50] The naked body needed to be exposed to the air for at least five to ten minutes to elicit a curative effect, which could be further enhanced by rubbing the surface of

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[44] *Ibid*., pp. 46-65.
[45] *Ibid*., p. 118.
[46] *Ibid*., p. 61.
[47] *Ibid*., p. 106.
[48] Lorand, *Das Altern*, p. 106.
[49] *Ibid*., p. 66.
[50] *Ibid*.

the skin with towels or shrubs while continuing with physical breathing exercises.[51]

The electric light bath was not only one of those daily practices that allowed for relaxation and recreation, but Lorand formulated his advice for its application – in the first editions of his book – in strict medical terms, even demanding the surveillance by a physician. In later editions, this demand disappeared and following to Lorand's new instructions, the electric light bath had to be "tried and given often if the results prove satisfactory".[52] He continued to recommend limiting the procedure to a duration of fifteen or twenty minutes per day, unless the bath was "well borne, when a few more minutes may be added."[53] Usually a cold shower was supposed to follow the sweat bath but for older people this treatment was not indicated. Instead, in seniors Lorand recommended that they should directly go to bed after the perspiration procedure had taken place.[54]

It is intriguing to see how Lorand adapted his argumentation for light irradiation over the course of time. Although the electric light bath, for him, remained the preferred perspiration procedure to treat "autointoxication" as a major cause of "premature old age", in later editions other light effects said to remove the symptoms of the disease gained increasing importance. In the first edition, Lorand had brought up one symptom of old age, which light could fully eradicate, namely obesity. According to him, light rays improved the metabolism in the human organism by augmenting oxidation processes which in turn influenced the fat formation in corpulent people.[55] By contrast to the detoxifying light effect, Lorand even attributed the fat-reducing capacity of light not to long-wave light but to the more effectual short-wave rays. He accordingly recommended a combination of body irradiation by electric light bulbs with an irradiation from a carbon-arc lamp. For its practical applicability, Lorand combined the electric light bath with a peephole in the front-part of a wooden box through which the rays of a carbon-arc lamp could enter the inner cabinet.[56] Carbon-arc

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[51] *Ibid*., pp. 66-67. Lorand advised people, who lived in the countryside, to develop a spot for an "air bath" in a solitary forest while people living in a city should take their "air baths" in a room at home either before dressing or after undressing.

[52] Lorand, *Old Age Deferred*, 5th ed., p. 240.

[53] *Ibid*., p. 240.

[54] *Ibid*., pp. 240-241.

[55] Lorand, *Das Altern*, pp. 118 and p. 127.

[56] *Ibid*., p. 118.

lamps, by contrast, were used for short-wave irradiation before the "*Kuenstliche Hoehensonne*" made its market appearance in 1911.

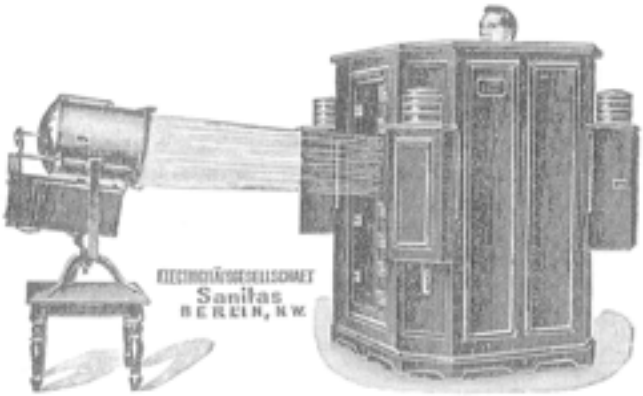

Figure 4: The electric light bath was combined with irradiation from a carbon-arc lamp. Source: Max Walser, *Zwei moderne Heilfaktoren: Elektrische Lichtbehandlung und Vibrationsmassage, deren Erfolge in Krankheiten, Gemeinverstaendlich dargestellt*, 2nd ed. (Leipzig: Edmund Demme, 1902), p. 60.

In the later editions of *Das Altern*, the number of symptoms which short-wave light rays could remove was added to the book. In 1918, for example, Lorand mentioned that short-wave rays could even eliminate blushing and swollen blood vessels in the face, and he introduced the quartlamp as a means to obtain this effect.[57] In the seventh edition of *Das Altern*, which was published in 1932, Lorand further allocated an individual chapter to this lamp that was entitled as "Betterment of the Symptoms of Aging through Quartlamp Application of Ultraviolet Rays" ("*Besserung der Symptome des Alterns durch die ultravioletten Strahlen der Quarzlampe*").[58] Here, he recommended the lamp for the treatment of a whole array of aging symptoms, such as gray hair, baldness, wrinkles in the face, and obesity as well as tiredness and impotence in men, or menstrual disorders, infertility and sexual frigidity ("*geschlechtliche Kaelte*") in women.[59] Thus, the "*Kuenstliche Hoehensonne*" had not only

[57] Arnold Lorand, *Das Altern, seine Ursachen und seine Behandlung durch hygienische und therapeutische Massnahmen*, 5th ed., 11 and 12 thousand (Leipzig: W. Klinkhardt, 1918), p. 261.
[58] Lorand, *Das Altern*, 7th ed., pp. 174-178.
[59] *Ibid*., p. 177.

developed into a device that halted aging and restored youthfulness but that also possessed the power to regenerate more germane physiological body features.

Lorand's basic argument for the effectiveness of the quartlamp in all these symptoms of old age was that the short-wave light rays would increase the activity of the "degenerated" endocrine glands and stimulate blood circulation that in return enhanced the nutrition of the cells.[60] Yet he did not provide an exact explanation for the physical and physiological mode of action of the short-wave light rays. Elsewhere, he had only generally argued from his own therapeutic experience to stress the efficacy of ultraviolet irradiation for improving the function of the endocrine glands. Among other things, Lorand mentioned that irradiation that was generated by a "*Kuenstliche Hoehensonne*" brought about the same results as rejuvenating treatments on the basis of injections or potions with thyroid gland substances.[61] In *Das Altern*, he promoted the beneficial reshaping of the whole human organism by veritable means of sunlamp irradiation.[62]

The Use of Irradiation Devices and Lorand's Applications

The association of the irradiation devices and endocrinology began around 1910. Lorand recommended his electric light bath in line with the original intention of the inventor of that device. And by connecting the detoxifying effect with the challenges of modern life, he stressed the importance of the perspiration procedure in general. The "*Kuenstliche Hoehensonne*", however, had been embedded in a different social and scientific context by Lorand, which was also shared by other health reformers of the time. In the United States, for example, the first electric light bath was constructed in 1891 by John Harvey Kellogg (1852-1943), the head physician of the Sanitarium of Battle Creek in Michigan and spearhead figure of the American life reform movement.[63] This

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[60] Lorand, *Das Altern*, 7th ed., pp. 174-178.

[61] Arnold Lorand, *Haarergrauen, Haarausfall und innere Stoerungen, 2. umgearbeitete und mit neuen Kapiteln versehene Auflage* (Leipzig: Johann Ambrosius Barth, 1932), pp. 30-33, esp. p. 32.

[62] Lorand, *Das Altern*, 7th ed., p. 178.

[63] Kellogg, *Light Therapeutics*, 2nd ed., p. 5. For Kellogg's career see, for example, Albert Wirz, *Die Moral auf dem Teller: dargestellt an Leben und Werk von Max Bircher-Benner und John Harvey Kellogg, zwei Pionieren der modernen Ernaehrung in der Tradition der moralischen Physiologie* (Zurich: Chronos Verlag, 1993).

development took place one decade after Thomas Alva Edison (1847-1931) had turned the incandescent light bulb into a common light source in many households, factories and working shops.[64] By applying incandescent light to the human organism, Kellogg – like Lorand – wanted to treat the internal organs with heat by stimulating metabolic processes. He understood metabolism in the tradition of the German chemist Justus von Liebig (1803-1873) as a process in which the human organism excretes waste substances and ingests new material to rebuild and reshape the human body. Kellogg considered "autointoxication" as a general cause of many diseases in modern industrialized societies,[65] and the inventor praised the electric light bath as a superior alternative to hydrotherapeutic procedures such as conventional steam baths. Kellogg even argued that long-wave light rays could penetrate skin and tissue and, therefore, were able to directly influence internal organs. In hydrotherapy by contrast, the heat was thought to diffuse from hot water or steam via the skin to the internal organs thus rendering this a more indirect procedure.[66]

The electric light bath quickly developed into a great success: The circulation of the new perspiration procedure in Western societies started two years after the construction of the prototype when Kellogg exhibited such a device at the World's Columbian Exposition in Chicago in 1893. There, the German chemist Willibald Gebhardt (1861-1921) saw Kellogg's bath and brought the apparatus with him to Berlin after visiting the Battle Creek Sanatorium in 1897.[67] Gebhardt also published a book on light therapy[68] but the scientific community received it unfavourably as Gebhardt was not a licensed physician and thus lacked credibility in their eyes.[69] Nevertheless, the electric light bath also became popular in

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[64] Thomas P. Hughes, *Networks of Power, Electrification in Western Society, 1880–1930* (Baltimore and London: John Hopkins University Press, 1983), pp. 34-38.

[65] Kellogg, *Light Therapeutics*, 2nd ed., p. 86; Wirz, *Die Moral auf dem Teller*, p. 167.

[66] Kellogg, *Anwendung von Waerme*, pp. 126-127. For the history of hydrotherapy see: Robert Juette, *Geschichte der Alternativen Medizin: Von der Volksmedizin zu den unkonventionellen Therapien von heute* (Munich: Beck, 1996), p. 121.

[67] Max Walser, *Zwei moderne Heilfaktoren: Elektrische Lichtbehandlung und Vibrationsmassage, deren Erfolge in Krankheiten, Gemeinverstaendlich dargestellt*, 2nd ed.. (Leipzig: Edmund Demme, 1902), pp. 3-4; Kellogg, *Light Therapeutics*, 2nd ed., p. 5.

[68] Willibald Gebhardt, *Heilkraft des Lichts, Entwurf zu einer wissenschaftlichen Begruendung des Licht-Heilverfahrens (Phototherapie)* (Leipzig: Grieben, 1898).

[69] Lothar Gaertner, "Willibald Gebhardt, Die Heilkraft des Lichtes, Entwurf zu einer wissenschaftlichen Begruendung des Licht-Heilverfahrens, Leipzig 1898

Europe. According to Kellogg, the Austrian physiologist and hydrotherapist Wilhelm von Winternitz (1835-1917) constructed an electric light bath following the instructions of the American inventor and the health instrument company *Electricitaetsgesellschaft Sanitas* started even a serial production of the sunlamp in Germany.[70] In sanatoria and bathhouses, the electric light bath replaced the traditional steam bathes.[71] Lorand was in line with this trend when he later introduced the electric light bath in the first German edition of *Das Altern* as the best perspiration procedure to cure aging.[72]

Despite these success stories, the "*Kuenstliche Hoehensonne*" originated under completely different conditions: It was first used by physicians of the lowlands to treat tuberculosis of the joints in much the same way that the physician Auguste Rollier (1874-1954) did in a sanatorium in the Swiss mountains:[73] Rollier gradually irradiated the whole body of his patients with sun light and believed that light rays improved the general physical condition which he considered necessary for the healing of tuberculous metastases. He attributed this light effect to the short-wave rays and, to this end, cited the observation that the healing process in tuberculosis always started when pigmentation occurred, such as in the observation that short-wave light rays caused pigmentation. Hence, the pigment played a leading role in Rollier's rationalization of the health-promoting effect of short-wave rays and it was seen as the physiological localization where a transformation of energy occurred. The underlying rationale was that light was physically understood as an undulation in a "light ether", at the time, short-wave light rays possessed kinetic energy. According to Rollier, the pigment transformed this energy into other forms which improved the general physical condition.

(book review)," *Zeitschrift für diaetetische und physikalische Therapie* 2 (1898), pp. 73-74.

[70] Kellogg, *Light Therapeutics*, 2nd ed., p. 5.

[71] See, for example, Hermann Kattenbracker, *Das Lichtheilverfahren begruendet durch physiologische Thatsachen und praktische Erfahrung, Allgemeinverstaendlich dargestellt* (Berlin: Wilhelm R. Berndt, 1899), p. 115.

[72] Lorand, *Das Altern*, p. 118.

[73] Hugo Bach, *Anleitung und Indikationen für Bestrahlungen mit der Quarzlampe "Kuenstliche Hoehensonne,"* 5th augm. ed. (Leipzig and Wuerzburg: Curt Kabitzsch, 1919), p. 21. For Rollier's method in general see: Auguste Rollier, *Die Heliotherapie der Tuberkulose mit besonderer Beruecksichtigung ihrer chirurgischen Formen* (Berlin: Julius Springer, 1913).

However, Rollier was not able to give a detailed explanation for this physiological process.[74]

Because of the generally accepted fact that vapour, smoke and dust absorb the health-promoting short-wave rays in the lowlands, German doctors were looking for artificial light sources to copy Rollier's successful alpine healing method; such a lamp had to technically transfer the alpine sun to the living conditions in urban centres. In the winter of 1910/11, the German spa doctor Hugo Bach (1859-1940) tested the medical applicability of a quartlamp which had been adapted by the *Quarzlampengesellschaft Hanau*.[75] This event became the birth of the "*Kuenstliche Hoehensonne*" in the lowland country of Germany. Quartlamps had already been in medical use since the German dermatologist Ernst Kromayer (1862-1933) had introduced them for the treatment of skin tuberculosis.[76] But those earlier models were not suitable for the irradiation of a large part of the human body as it only emitted a small beam of ultraviolet light in therapeutic applications. Kromayer's observations led to the view that short-wave light rays should be directly applied to tuberculous metastases in a bundled shape as they would then acquire the potential to kill bacteria by this technique. The Icelandic medical researcher Niels Ryberg Finsen (1860-1904), for the first time, used this method on a large scale in the 1890s, and was later even awarded the 1903 Nobel Prize for it.[77]

Soon after Finsen had become a Nobel laureate, other scientists found contradicting evidence that the bactericidal light effect could not be the

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[74] Allain Rosselet, "Sur le Rôle du Pigment Épidermique et de la Chlorophylle (Travail de MM. Rollier et Rosselet) présenté par A. Rosselet Licencié ès-sciences," *Bulletin de la Société vaudoise des Sciences naturelles* 44 (1908), pp. 321-332; esp. p. 329.

[75] Hugo Bach, "Die Einwirkung des ultravioletten Quarzlampenlichtes auf den Blutdruck, mit Bemerkungen über seine therapeutische Verwendung bei Allgemeinerkrankungen," *Deutsche medizinische Wochenschrift* 37 (1911): pp. 401-404.

[76] The method is described in more detail in: Ernst Kromayer, *Die Behandlung der kosmetischen Hautleiden unter besonderer Beruecksichtigung der physikalischen Heilmethoden und der narbenlosen Operationsweisen*, 2nd. ed. (Leipzig: Georg Thieme, 1929), p. 13.

[77] Anker Aggebo, *Niels Finsen: die Lebensgeschichte eines grossen Arztes und Forschers, Uebersetzt von Maria Bachmann-Isler* (Zurich: Rascher, 1947), pp. 294-295. For Finsen's method see: Niels R. Finsen, *Ueber die Anwendung von concentrirten chemischen Lichtstrahlen in der Medicin* (Leipzig: F. C. W. Vogel, 1899).

reason for healing successes of tuberculous diseases.[78] These findings advanced further explanations of a beneficial light effect that resembled Rollier's approach, while the argument was based on the impact of short-wave light rays on the general physical condition.[79] Following to this changed conception, ultraviolet irradiations became attractive for the treatment of several diseases and medical doctors extended the number of applications of short-wave irradiation in the 1910s and 1920s turning the "*Kuenstliche Hoehensonne*" now into an all-purpose remedy.[80] Lorand was one of those physicians who advocated for Rolllier's earlier method: Probably in the 1910s, Lorand made a research trip to Rolllier's sanatorium in the Swiss mountains.[81] In difference to Rollier, however, with his problematization of modern life and the argumentation for a health-promoting light effect on human endocrinology, Lorand unhinged short-wave irradiation from the treatment of tuberculous diseases and shaped a new target group for the "*Kuenstliche Hoehensonne*".

It is striking to see that Lorand gave no instructions for the daily use of the "*Kuenstliche Hoehensonne*" in his book *Das Altern*, although he mentioned its general indications in greater detail. He may have thought that frequent ultraviolet irradiation was dangerous and other authors of similar popular writings of the 1920s and 1930s even recommended the consultation of a doctor before purchasing a sunlamp.[82] It rests unclear, when precisely the sunlamps came to be used by medical laypeople, yet at least since the late 1920s the *Quarzlampengesellschaft Hanau*, the most important German producer of sunlamps of the time, started to publicly promote the so-called "*Kleine Hoehensonne*" – an adaption of the "*Kuenstliche Hoehensonne*" for private use.[83] As far as the European market is concerned, sunlamps remained a luxury good up to the end of

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[78] See, for example, Victor Klingmueller and Ludwig Halberstaedter, "Ueber die bakterizide Wirkung des Lichtes bei der Finsenbehandlung," *Deutsche medizinische Wochenschrift* 31 (1905), pp. 539-542.

[79] See, for example Bach, *Einwirkung des ultravioletten Quarzlampenlichtes*.

[80] Bach's standard work on the "*Kuenstliche Hoehensonne*" [Bach, Anleitung] indicates this development by a constantly increasing number of indications for the device in the different editions.

[81] Arnold Lorand, *Haarausfall, Glatze, Haarergrauen, ihre Behandlung und Heilung* (Leipzig: Klinkhard, 1922), p. 129.

[82] Franz Thedering, *Sonne als Heilmittel, Gemeinverstaendliche Abhandlung*, 4. vollstaendig umgearbeitete und erweiterte Auflage (Oldenburg and Berlin: Gerhard Stalling, 1921), p. 19 and p. 39.

[83] Quarzlampen-Gesellschaft m.b.H., "Vorzeitiges Altern durch Mutterschaft?," *Die Gartenlaube* (June 28, 1928), n.pag.

World War Two.[84] Medical laypeople rather used them at the meeting places of naturopathic health care societies than in their private homes.[85]

Conclusions

Lorand's book *Das Altern* is a good example of a connection between the social problematization of modern life on the one hand and scientific knowledge about the effects of light on the human body on the other. This renders the application of irradiation devices as a hygienic means reasonable, but it stretched the issue too far if an explanation of the transformation of sunlamps into an article of daily use was attempted only in line with Lorand's argumentation. To the contrary, I regard his writing as evidence for a broader discussion about the challenges of modernity to the human organism and its general physical condition. Lorand did not stand alone with his perception of the consequences of urbanization and industrialization: the criticisms of city life, the glorification of rural dwelling and the narrative of the aged, degenerated bodies were widespread discursive patterns in the first half of the twentieth century. Especially members of the *Lebensreformbewegung* ("life reform movement") argued in a similar fashion.[86] Hans Surén (1885-1972), for instance, one of the most important German authors of the nudist branch of the movement, viewed – like Lorand – the performance in different areas of life as endangered by the modern, unhygienic lifestyle of his contemporaries. He recommended five minutes of light showers ("*Lichtduschen*") under the "*Kuenstliche Hoehensonne*" as well as perspiration procedures for the stimulation of the vital processes in human organisms.[87] Similar problematization can also be found in medical studies on the effects of light: In the 1930s for example, two physiologists of the German Kaiser-Wilhelm-Institut for Occupational Medicine diagnosed the urban population with a "chronic deficiency of ultraviolet

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[84] See, for example, Anita Severin, "Schoen und gepflegt – auch im Winter," *Die neue Gartenlaube* (November 27, 1940), pp. 730-731.

[85] Fritz Kort, "Die Frau und die Hoehensonne," *Die Freikoerperkultur* 3 (1929), pp. 299-300.

[86] For an overview of the Lebensreformbewegung see: Wolfgang R. Krabbe, *Gesellschaftsveraenderung durch Lebensreform, Strukturmerkmale einer sozialreformerischen Bewegung im Deutschland der Industrialisierungsperiode* (Goettingen: Vandenhoeck and Ruprecht, 1974).

[87] Hans Surén, *Selbstmassage: Pflege der Haut; fuer alle Leibesuebungen, fuer alle Berufe; fuer Maenner und Frauen*, 35th newly augm. ed. (Stuttgart: Dieck, 1928), p. 114 and p. 120.

light" ("*chronischer Ultraviolettmangel*"). In their opinion, the deficiency decreased the working capacity of the people and made them prone to other acute diseases.[88]

Scientific knowledge played a double role in the widespread discussions about the consequences of modernity. First, it was used to explain why some peculiarities of modern life were harmful to the human organism, while others were not. Second, scientific knowledge was used to give advice for changing behaviours into a more rational and healthy modern lifestyle. Lorand had argued in congruence with the contemporary endocrinological theories that "faulty habits" could cause "autointoxication" and thereby exhaust internal organs. To activate the skin as a detoxifying organ he recommended the practical application of the electric light bath. In contrast, however, short-wave irradiation reanimated the exhausted organs and enabled them to regain their original healthy functions. With these applications for the electric light bath and the "*Kuenstliche Hoehensonne*" in mind, Lorand approached a new user group for the irradiation devices: I have argued above that sunlamps arose out of the preoccupation with the healing of tuberculous diseases. Lorand – like other medical and health care professionals – removed the device from this context and made it attractive for everyone apprehensive of the failures in modern society. Kellogg's earlier electric light bath became promoted by Lorand as means to stimulate detoxification and regeneration of the human organism. With the connection to "premature old age" and contemporary endocrinological knowledge, Lorand gave the electric light bath a new medical relevance.

For future studies about the history of irradiation devices, these observations imply that the devices circulated widely in Western societies. New actors kept appearing who adapted the scientific argumentation to new social contexts. In recent years, the French philosopher Bruno Latour and others have shaped the concept of "*translation*" to label this view about the circulation of artefacts among society.[89] In applying this concept to my case study, the translation of such lamps like the "*Kuenstliche Hoehensonne*" to articles of daily use is therefore better understood if the enduring negotiation of the purpose of such irradiation devices is analyzed, rather than just focusing on the narrow historical perspective on some spectacular healing successes.

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[88] Gunther Lehmann und Alexander Szakáll, "Der Einfluss der Ultraviolettbestrahlung auf den Arbeitsstoffwechsel und die Arbeitsfaehigkeit des Menschen," *Arbeitsphysiologie* 5 (1932), pp. 278-341; esp. pp. 278-279.

[89] Bruno Latour, *Science in Action, How to follow scientists and engineers through society* (Milton Keneys: Open University Press, 1987), pp. 132-144.