

P11. POSTER

On the Use of Physical Therapies: The Holo-Electron Violet Radiation Device

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INTRODUCTION

The use of physical means for therapeutic purposes is an inexhaustible area, in general technically simple and relatively cheaper than pharmacological therapy. It is therefore clearly attractive.

Violet radiation is part of the visible light spectrum, ranging from 400 to 450 nm in wavelength, located between ultraviolet A (315 to 400 nm in wavelength) and blue light proper (450 to 480 nm wavelength) (Verhoeven, 2017) (Figure 1). However, these values are not absolute, and some recommendations place the beginning of the violet light range at 380 nm (Sliney, 2016), which makes the identification and separation of radiations more difficult.

THE EQUIPMENT

The Holo-Electron device manufactured by Émile Michel, purchased, according to the proof of purchase, on 14 May 1947 by *Mademoiselle Yvonne Mollard*, for 4,802.50 French francs, was designed for the application of Violet Rays (Figure 2). From the personal collection of one of the authors (JLAG), the equipment, which is on display at the *Memórias da Saúde* Museum, Faculty of Health Sciences, University of Beira Interior, shows signs of wear and tear, but is otherwise in good condition (Figure 3).

In addition to the generator, it includes a visually appealing set of probes, in multiple shapes, with designs suited to the areas of application.

The brochure accompanying the equipment (Figure 4), is not, curiously, in ordered sequence, beginning with chapter XIV, suggesting that there should be additional texts. Interestingly, the booklet does not provide any information on the type of radiation used, other than the generic terms 'violet light' and 'high frequency,' which prevents its physical characterisation. It emphasizes the interest and efficiency in sports activities, where it promotes 'muscle re-education, stimulates vital forces, and regenerates the entire body'. The treatments, for individual and autonomous use, are adjustable via a timer button (Figure 5) that sets the option according to the therapeutic indication.

DISCUSSION

In France (the country of origin of the equipment), after the publication of Nicolas Tesla's work on high-frequency currents, there were different proposals for their use as therapeutic agents. In the 19th century, *franklinisation* (electrostatics), *galvanisation* (direct currents), *faradisation* (variable currents from magnetic and dynamoelectric sources, and later generated by induction coils), and *darsonvalisation* emerged (Brenni, 2010).

Many devices have been introduced, but, perhaps because they never obtained scientific evidence to support their use, they were successively abandoned.

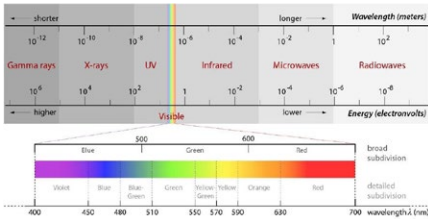


Figure 1

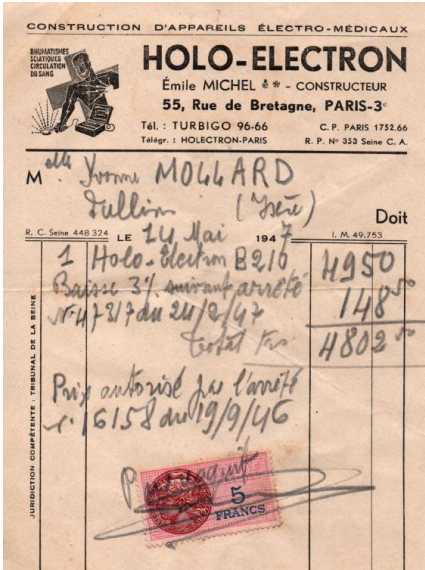


Figure 2



Figure 3



Figure 4

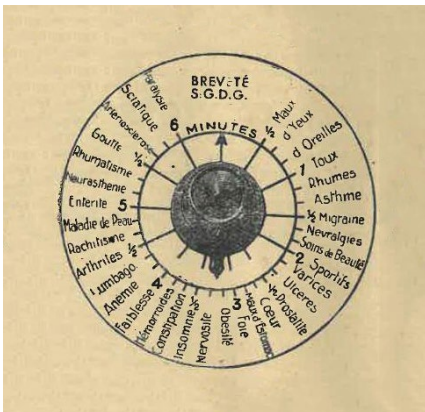


Figure 5

The use of blue light (*latu sensu*), like many other areas of therapy, is controversial. The greatest difficulties arise from energy definitions, given the variability of intensities and the too many different options in terms of wavelengths, turning difficult their clinical evaluation. From a clinical perspective, presently it appears to be useful in situations that show resistance to conventional treatments, for example in dermatology, but which carry potential, albeit unproven, risks. Violet light is currently used for teeth whitening, where its effectiveness has been scientifically documented (Kobayashi et al., 2021).

REFERENCES

- Brenni P. Les courants à haute-fréquence apprivoisés à travers la darsonnalisation et les spectacles publics (1890-1930). *Ann Hist Electr.* 2010;8(1):53-71.
- Domínguez-Valdés T, Bonnin-Arias C, Alvarez-Peregrina C, Galvez BG, Sanchez-Tena MA, Germain F, et al. Violet light effects on the circadian rest-activity rhythm and the visual system. *Clocks Sleep.* 2024;6(3):433. doi:10.3390/clockssleep6030029.
- Liebmann J, Born M, Kolb-Bachofen V. Blue-light irradiation regulates proliferation and differentiation in human skin cells. *J Invest Dermatol.* 2010;130(1):259-69. doi:10.1038/jid.2009.194.
- Sliney D. What is light? The visible spectrum and beyond. *Eye (Lond).* 2016;30:222-9. doi:10.1038/eye.2015.252.
- Verhoeven GJ. The reflection of two fields – electromagnetic radiation and its role in (aerial) imaging. *AARGnews.* 2017;(55):13-18. doi:10.5281/zenodo.3534245.