

EQUIVOQUES ON THE RADIOACTIVE APPLICATIONS AND ABOUT OTHER HISTORIES

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ABSTRACT

On the first two decades of the twenty century, researchers, professors, physicians and politicians from Brazil were interested in the establishment of the basis of the applications of the new European discoveries in the radiation field into the medical and industrial areas. The present article provides information about the strategies of diffusion of the radioactive potential and the mineral ores found in the Brazilian territory, such as the systematic study of the Prof. Nelson Senna and its compilation of the Th, U and Ra ores from the Minas Gerais state; also, about the political efforts in the creation of the thermal water stances on the south of Minas Gerais; about the official and non official diffusion of the goodness found in the sea water baths close to the Th and Ra concentrated beaches, as Guarapari on the Espírito Santo state; and, finally, about the ingestion of the radioactive water, recognized at that time by the sanitary authorities and by the medicine, and commercialized in all national territory. This Brazilian product, which was similar to the United States one, namely Radithor, was divulged lauder as a panacea of all males, including the cure of cancer. The article points out the absurd published in many of the major journals at that time and also the goodness from the incorporation of the new discoveries which culminate as example on the foundation of the Radium institute in Belo Horizonte, and about the visit of the Mne Curie at Brazil, including her quickly tourist trip to the radioactive water region (“Circuito das Águas”) in Minas Gerais. The article also addresses the indiscriminate use of X-ray in the treatment of various moles such as skin irritations (“frieira”) and diabetes. Herein, equivoques is addressed which errors were also the basis for the development of the Brazilian present scientific knowledge.

1. MEDICATIONS AND TONIC: THE RADIOACTIVE WATER

The applied approaches for selecting the documentation were quite simple: all and any reference to the progresses of the medicine and related doctors, that involves activities with ionizing radiation, radioisotopes or chemical elements as uranium or thorium, adding documents related to the construction of the Radium Institute of Minas Gerais. However, the abundance of pharmaceutical announcements is enormous and it is evidence of its importance as literature source for information on medicine and diseases for the newspapers readers.

In the announcements of pharmaceutical medications, the patient is hardly mentioned. He is the healthy subject because he made use of such or that product. The symptoms, the pains and uncomfortable are described with wealth of details, as well as the list of benefits attributed to the ointment, syrup, tonic, purgative, tablets, powders, fortificants, depurative, creosoted, elixir, tablet, preparation, vitamin, drops, laxative, draggers, balm or ointment.

Starting from the beginning of last century, some people understood that it is possible to do fortune with the production of popular pharmaceuticals or patented medications, without scientific knowledge.

One of the most dangerous began to be sold in 1925. Well-known as Radithor, it was invented by William J. Bailey, a north-American questionable dealer that had already been condemned by the production of a fraudulent cure for the impotence. Bailey decided to take advantage of the fascination of the people for the radioactivity, that in the decade of 1920 it was a new phenomenon of little understood. He obtained some success with the "radioactive" device that he alleged to be capable to cure every type of metabolic disturbance. With Radithor, he discovered the true vein of gold. As the label proclaimed, Radithor consisted of a radioactive water contains tiny amounts of radium. Much less true, the propaganda disclosed by Bailey Radium Company guaranteed that Radithor was "inoffensive in all the aspects". In its advertising pamphlets the medication was divulged as "The new weapon of the medical science".

In terms of commercial enterprise, the results were impressive. Radithor didn't delay to sell about 100 thousand glasses a year. Bailey sent boxes of the medicine for friends and colleagues, and also prescribed it even to its race's horses, acquired with the new fortune. When doubts appeared on the safety of the radium, he alleged that took the medicine and it was in excellent health conditions. However, nor everybody shared of the trust of Bailey in its product.

In 1930, five years after the release of the product, US Food and Drugs Administration (FDA), organ regulator of the section of food and medications in the USA, noticed on the dangers of radioactive mixtures and, in 1931, a special procurator visited the house of Eben M. Byers, a millionaire manager that took more than 1,000 glasses of Radithor in four years. Byers was seriously radiation sick, and the procurator's discoveries provoked the immediate suspension of the sales of the product [1].

In the same period in Brazil, similar medication appeared - Radium L. Pagliani. Started at 1920, the National Department of Health (DNS) was responsible for a series of services and campaigns for addressing the control of diseases, as the yellow fever and the malaria. It was also responsible for the inspection of the merchandise medications and for the patent of the same ones. Thus, the "Radioactive Water" was patented in August of 1926 and its proprietor published announcements in the main newspapers alerting against water's falsifications.

RADIUM "L. Pagliani"

Tube (fiala) do cientista Prof. Médico L. Pagliani para o preparo, em casa da água radioactiva. O primeiro que apareceu no Brasil (agosto de 1926), ÚNICO que tem operado de facto curas assombrosas em doenças consideradas incuráveis.
Approvado pelo Departamento Nacional de Saúde Pública e licenciado sob o número 938.
O produto foi especialmente analysado pelo "INSTITUTO OSWALDO CRUZ" (Manguinhos) sendo a analyse assignada pelos eminentes e provecos professores médicos Carlos Chagas e José Carneiro Felipe.
As grandes experiências científicas do professor médico L. Pagliani foram feitas em Paris sob a direção de M.m.e. Curie a celebre cientista descobridora do RADIUM. Esse portentoso corpo científico tem operado prodigiosamente a cura de innumeras doenças como sejam: diabetes, urcemia, gotta, cálculos reanes, fígado, debilidades, exgotamentos funcçionaes, rheumatismo, menopausa das senhoras, arteriosclerose, etc.
Cuidado com imitação de productos similares.
O representante em Bello Horizonte, Joaquim Severiano de Carvalho, encarrega-se de mandar vir sem despesas de correio. Rua S. Paulo 302.
Tube typo III – de 300 unidades Mache guarnecido de estojo de prata finíssimo constatada (825) e 200\$000 e do typo IV de 500 U.M.B 340\$000.

Other pharmaceuticals makers, as the advertiser of the Tonic "Nervino Sore't ", increased to the end of the list of benefits, the number and the date of approval of the medication for the Management of Public Health Institute [2]. The "Elixir Nogueira" makes the same, one of those that keeping announce, the neoplasia cure - "Cure of tumors (of the size of oranges) with blood Elixir Nogueira's depurative. The Pomade Zanic affirmed to be a registered mark and it exhibited the number of the license granted by the National Department of Public Health. Its advertiser divulged its use indications:

"...for cancers, tumors, ulcerate, burns, hemorrhoids, eczemas, carnations, panaricio, furuncles, fragile bony, chronic wounded and wrinkles..."

2. THE INSTITUTE OF THE RADIUM, 1920.

In June of 1920, Borges da Costa communicates the foundation of the Institute of Cancer and Radium. Institution that counted with the support of the Governor of the State, Artur Bernardes that created the Institute for the law no. 792 of September 18, 1920. The construction was made in a land donated by the City hall that was in the back of the Municipal Park, limited with the lands of the School of Medicine, where the Club of Hygienic Sports had been working. The law no. 5458 of December 7, 1920 determined the organization of the Institute as autonomous Foundation that would receive subsidy and government donations. In January of 1921 the construction had began.

Their inauguration was in 1922 on September 7. The blessing of the new building happened in the beginning of January, 1923 [3]. The goals of the Radium Institute were summarized in: the study of the treatment of cancer and pre-cancerous lesions, the study of the radium and radioactive substances, the diffusion of advices and practical knowledge for the public and the study of experimental surgery. Its structure had Curietherapy laboratories, Roentegentherapy, surgery's rooms, infirmary and a laboratory of chemical researches [4]. The Institute had capacity to shelter a hundred of internal patients, with about 160 beds. In an article published in the Newspaper Paíz, August, 1922, the following matter can be read:

No Instituto do Radium podem ser abrigados 100 doentes internos, localizados em magníficos e espaçosos quartos, servidos de água quente e fria, sala de refeições, de recreio e de operações, todas ellas amplas e bem-ventiladas e revestidas de porcelana, completam as instalações do magnífico instituto que custa ao Estado mais de 800 contos de réis [5].

The Institute of Radium had 25 centigrams of radium that were acquired in the industry Societé Française of Energie et Radiate-Chimic at Courbevoie by 276.459 francs.

In its internal regiment, the Institute of Radium of the State of Minas Gerais established the norms of its operation. Among of them, the most peculiar one meet registered in the article 36 and 37:

Artigo 36. As taxas das applicações therapeuticas de radium e raios-x, serão cobradas adiantadamente.

Artigo 37. Serão permitidas applicações de radium em domicilio, devendo para isto serem pagas tarifas especiaes, sem prejuízo, porém, do serviço interno do Instituto.

The Institute of Radium also possessed microbiological laboratories, biological chemistry and pathological anatomy. Besides the rooms for surgeries, it possessed two cabinets for application of the radium, one for x-ray for deep application with tubes and plates of radium bromate [6].

In August of 1926, the school of Medicine had the honor of attending a lecture uttered by own Mme. Curie about the radioactivity, its applications in the therapy and its effects in the health.

The international press announced the progresses of the medicine of the State. In 1923, the newspaper La Presse Médicale (20/10) published a brief history of the Institute of Radium printing a photo of the scale model of its construction.

The School of Medicine received foreigner's teachers that presented conferences on the themes of the students' interest regularly. In September 1922, Fernand Lamaitre, a teacher of the School of Medicine of Paris, uttered class about cancerous infections of the larynx. The authorities, doctors or politics that visited the city were taken to visit the Institute of Radium that almost became a tourist point. The foreign delegates that came to the commemoration of the "Centennial of the Independence of the Country" mention that "our Institute of Radium is superior to the Washington one" [7].

It was not rare that the Institute receives illustrious visitors. Santa Catarina's Governor, Dr. Hercílio Luz, visited the dependences of the Institute of Radium, besides he had access to the radiographic installations and radium foils (Diario de Minas, 04/05/1923).

In the occasion in that a group of students of the School of Medicine of Rio de Janeiro came to fraternize with local students, there is the following registration [8], dated of 10/06/1924.

(...) Ao médico que chega á Bello Horizonte, antes do mais, avassalla o desejo de conhecer o Instituto de Radium, cujo renome é um título de gloria de sua classe. Não serve, porém, somente de abrigo ao rico metal com o cortejo de seus favores para a humanidade, se não que o Instituto se destina também à prática da Roentherapia e da diagnose radiológica.

This same group of academics of the medicine obligatorily knew the School of Medicine, Hospital Santa Casa, the Hospital São Vicente, the Maternidade Hilda Brandão, the Hospital São Geraldo, the Institute of Neuro Psychiatric and the Instituto Oswaldo Cruz.

3. THE MINERALS AND THE STUDIES OF PROF. NELSON SENNA

After the discovery of the radium in France, the geological investigation began in Brazil. A report of the Daily newspaper of Minas from January 1922 brought interesting information on the location, concentration and economic value of that ore.

The Teacher Nelson Senna published his work on the ores of Minas Gerais. The selected chapters were published in series in the Daily Newspaper of Minas during the year of 1923. He described the ores found in the states:

(...) Pelas amostras de areias monazíticas extrahidas do córrego denominado Barro Preto (mun. de Theophilo Ottoni) e remettidas para a Europa pelo sr. A. Tuchband, o exame chimico accusou uma média de 4,10% de Thorium, que ao preço máximo (em 1910) de 170 marcos por cada 1% de Thorium, perfazia por cada tonelada de monazita posta em Hamburgo a quantia de 697 marcos ou ao cambio de então 418\$200 [9].

Também nos municípios de Palma, rio Pomba, Peçanha (Rio Doce) e Theophilo Ottoni (Rio Mucury) há depósitos de areias amarellas e outras "terras raras", em que se encontram corpos minerais de valor, (como sejam a monazita, a xenotima, o thorio, o baryo, o irídio, o terplo, o hólmio, etc)[10].

O Radium em Minas

Um telegramma de Londres diz que a senhora Alexander Gross, ali chegada depois de ter estado em Paris, onde visitou a sra. Curie, a esta informando da descoberta de radium no Brasil, concedeu uma entrevista à imprensa dizendo que a existência daquelle mineral em terras brasileiras foi verificada casualmente por ella, quando encontrou um engenheiro norte-americano, que lhe fez referências sobre minerais radioactivos no interior de Minas Geraes.

A sra. Gross disse que, comprehendendo a importância da informação, convenceu o referido engenheiro e sua esposa lhe acompanharam até o lugar em que existem os minerais.

A expedição teve como resultado o encontro de euxenite que, analysado no Laboratório do Rio de Janeiro, demonstrou conter dez por cento de urânio. Acrescentou a sra. Gross que várias porções desse mineral foram enviadas ao Laboratório da sra. Curie, em Paris, afim de serem ali também analysados. Verificou-se que continham seis a sete por cento de urânio.

Affirmou a entrevistada que já organizou um pequeno syndicato no Rio de Janeiro, a fim de comprar as terras que contém os minerais que produzem o radium. Informou não precisar de grandes capitães, pois os depósitos minerais encontram-se a pouca profundidade e a mão de obra é barata.

Terminou assegurando que vinte toneladas de minério barato já foram extrahidas e estão em depósito. As primeiras remessas serão brevemente feitas para Paris.

Eis o que diz o Telegramma. E é bom notar-se desde já uma particularidade: é que, na entrevista, nem se procura disfarçar a cobiça de apanhar a grande riqueza por qualquer meia pataca...

On the occurrence of the radium Nelson Senna described:

(...) ocorrências de minérios radiferos ou radiogenicos têm sido constadados em vários pontos de Minas Geraes; como por exemplo: os depósitos de euxenita encontrados pelo engenheiro Eugenio Elmo, na bacia do Pomba (perto de Tocantins de Ubá); e os de fergusonnita, no vale do Correntes (districto de São Sebastião, na Comarca do Serro), estudados "in situ" pelo engenheiro Odorico de Albuquerque[11].

Based on the notes of Senna, it is noticed that there were in Minas many foreign engineers of mines and foreign mines companies. They were the first to research and explore the new discoveries. In the case of the monazite, engineer Charles Rau, Belgian, and the Compagnie Minière Et Industrielle Fanco-Brasilienne. The extraction had been started in 1905 in the farm of the Costa Mattos, namely Mr. Colonel José Hemenegildo, in the municipal district of Além Paraíba [13] their elements associate to minerals to the rare land found in Minas Gerais was studied, for example: titanium, lithium, vanadium and zirconium.

The radioactive minerals were not only necessary for treatment of the diseases, but its industrial and also artistic applications were known:

"(...) ahí estão as "terras raras", dando metaes não menos raros extrahidos das areias monazitiferas (com applicação, por exemplo, do thorium, no fabrico de camisas incandescentes para lampeões de systema Auer, e do iridium, em pontas de pennas de ouro, etc) (...)" [11].

Soon, radioactive ores was associated with the cure of diseases. The pharmaceutical mixtures associated uranium and thorium with plants in use by the popular medicine. Various doctors were looking for patenting those mixture formulas in the exterior.

Cura da tuberculose

Diz um telegramma de Berlim que o professor Johann von Weninger partirá brevemente para Nova York, onde contractou com uma companhia norte-americana o monopólio mundial de um específico contra a tuberculose.

O professor von Weninger allega ter curado com esse remédio oitenta e seis por cento dos casos em que o applicou.

Consiste a droga em elementos de urânio, thorio e maccodure. Este último elemento é extrahido de uma planta sul-americana empregada pelos naturaes do Brasil contra a febre.

Esse extracto foi experimentado pela primeira vez com successo, no Rio de Janeiro, e é agora reconhecido pelos médicos de Berlim.

Os clínicos allemães confirmam que esse remédio tem produzido effeitos maravilhosos em poucos dias.

O dr. Guarch, Ministro Uruguayo em Berlim, que é também médico, usou essa planta brasileira com êxito contra a lepra e a diphteria.

Diz-se que a fórmula do dr. Weninger não contém nenhum elemento nocivo[12].

4. CONCLUSION: PEDRO NAVA NOVEL WRITER AND THE X-RAY

In agreement with Pedro Nava in his book 'Beira Mar' (2003:398), Belo Horizonte was already had equipments of X-ray since 1907. It was acquired by the Management of Electricity of the local City hall. That same equipment later became used by Dr. Eduardo Borges da Costa in the Hospital Santa Casa, and the Dr. Frederico Gardini and later on Major-pharmaceutical Edgard Albergaria were point out as the electricians for operating it.

It is valid to remind that on September 1, 1930, happened the inauguration of the x-ray equipment on the Hospital Santa Casa de Misericordia from Belo Horizonte, thanks to the teacher Hugo Werneck. The equipment was operated by its student Flávio Marques Lisboa that had studied in Rio de Janeiro for such purpose.

Pobre Flávio! Seria o primeiro a morrer de nossa turma. Nascido a 22 de março de 1906 tinha quarenta e três anos naquelas vésperas de Natal em que fechou os olhos exatamente no dia que acrescentava mais nove meses à sua idade – 22 de dezembro de 1949 (NAVA,2003:432).

In the same direction, the Hospital São Vicente provided soon similar equipment of X-ray. That equipment was supervised by Dr. José Ferolla that had also studied in Rio de Janeiro.

In according to Pedro Nava (2003:398), Ferolla and Marques Lisboa joined in a private clinic and the pioneers of the medical radiology can be considered in the Minas's capital.

In the decade of 1940, the doctors Jayme Furquim Werneck, Alencar de Carvalho and Marcelo Pirfo set up a vanguard service for the combat to the cancer in the Hospital Santa Casa at Belo Horizonte, a brachytherapy service, with equipments imported from Sweden for treatment of gynecological cancer. In a private clinic, the first doctors from Belo Horizonte that created service of medical radiology were Dr. João Ribeiro Viana and Dr. Virgílio Monteiro Machado.

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Equivocal on the radioactive applications and about other histories. E. M. Cuperschmid, T. Passos, R. Campos. Geography. 2007. On the first two decades of the twenty century, researchers, professors, physicians and politicians from Brazil were interested in the establishment of the basis of the applications of the new. Expand. Save. Radioactive pollution occurs when there is presence or depositions of radioactive materials in the atmosphere or environment especially where their presence is accidental and when it presents an environmental threat due to radioactive decay. Herein is a detailed explanation of the causes, effects, and solutions of radioactive pollution. Radioactive Pollution: Causes, Effects and Solutions to Nuclear Radiation. Radioactive pollution occurs when there is a presence or depositions of radioactive materials in the atmosphere or environment, especially where their presence is accidental and when it presents an environmental threat due to radioactive decay. In other words, they produced radioactivity in elements that are not naturally radioactive. One important use of artificial radioactivity is in the diagnosis and treatment of disease. In addition, the Joliot-Curies' breakthrough helped lead to the discovery of nuclear fission. Source for information on The Development of Artificial Radioactivity: Science and Its Times: Understanding the Social Significance of Scientific Discovery dictionary. PDF | The radioactivity of uranium was discovered in 1896 by Henri Becquerel who, starting from a wrong idea, progressively realized what he was | Find, read and cite all the research you need on ResearchGate. In 1902, working together in Montreal on the radioactive daughter atoms of thorium, Ernest Rutherford and Frederick Soddy showed experimentally that radioactivity is the spontaneous transformation of one element into another through the emission of radiation [19,20].