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HISTORY OF MEDICINE

How Pseudoscience Generated US Material and Device Regulations

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Abstract

The images in the American Medical Association's Historic Health Fraud and Alternative Medicine Collection include quack devices from the early 20th century, which gave rise to regulatory and professional oversight.

Quackery

Use and even surgical implantation of regulated devices is common in 21st century health care. This is—perhaps ironically—one good outcome of unregulated, pseudoscience-based “medical” devices having been around for so long. The Industrial Revolution of the early to mid-19th century and applications of scientific method to medicine in the early 1900s, combined with the absence of regulations, led to the proliferation of contraptions and so-called miracle cure production, **advertising**, and use. Despite court-ordered injunctions against their use, many quack devices had devoted adherents.¹ Evidence—or its lack—doesn't always carry the weight it should, and this is still the case today.^{2,3}

Responses to Pseudoscientific Devices

At least we now have regulatory oversight. The US Food and Drug Administration (FDA) was established by Congress in 1906.⁴ Also in response to dubious “health” intervention promotions, the American Medical Association (AMA) took a 2-pronged approach.

Public outreach. In 1906, the AMA began publishing regularly about quackery and health fraud in the *Journal of the American Medical Association (JAMA)*. *JAMA* articles' successes in public education led the AMA to establish a department devoted to combatting health fraud in 1913.⁵ An AMA director of the Department of Investigation traveled the United States to instruct radio, television, and in-person audiences about how to identify quackery and avoid its risks.

Curricular standardization. In 1908, the AMA's Council on Education worked with the Carnegie Foundation to standardize and certify what students learn in medical schools. One product of this joint effort was publication of the **Flexner Report** in 1910,⁶ which, among other things, sought—though imperfectly and unjustly⁷—to help members of the public distinguish well from poorly trained physicians.

Device Advertising

In the early 20th century, devices to which the AMA responded fell into roughly 6 categories. Three categories were based on then-new scientific concepts: radiation, radio and magnetic waves, and electricity. Three other categories were based on popular pseudoscience: phrenology, chromotherapy, and orgone therapy. The images shown and briefly described in the rest of this article represent only a tiny fraction of materials the AMA has collected and archived.

Radiation. Discovered by Pierre and Marie Curie in 1898,⁸ radium became well known as an all-purpose restorative tonic and was thought by some to treat a wide range of conditions. As early as 1923, a *JAMA* article warned of skin cancer risks,⁹ but after learning that radium's radiation inhibited growth of cancer, physicians used radium-based interstitial irradiation to treat patients with cancer from 1930 to 1950.¹⁰ Early adopters (not necessarily limited to cancer patients) likely suffered radium's iatrogenic toxicity from doses that were neither carefully regulated nor expertly monitored. Figures 1 to 3 are advertisements for devices that facilitated radioactivity consumption.

Figure 1. Rador Toilet Requisites pamphlet, Radium and Beauty Rador Company, circa 1918

Degnen's Radio-Active Solar Pad

This Company guarantees Degnen's Radio-Active Solar Pad to contain a definite quantity of actual Radium.



**RADIOGRAPH OF SECTION CUT FROM
DEGNEEN'S RADIO-ACTIVE SOLAR PAD**

This Radiograph was taken by placing a key, upon an ordinary photographic plate in utter darkness and a section cut from our Radio-Active Solar Pad was placed upon it. After a number of hours the plate was developed, showing the Radiograph here produced.

This Radiograph differs from photographs in that it was taken in absolute darkness, whereas a photograph is taken by exposure to light. Neither a radiograph nor a photograph can be taken without light. Therefore, the necessary light to reproduce the radiograph was supplied by the pad itself. This light is easily discernible by the human eye by taking pad in a dark closet after having exposed the pad for a few minutes to sunlight or daylight.

What the Doctors Say About Degnen's Radio-Active Solar Pad

Extracts from letter, written in answer to a request for an investigation of our Company by an Association of Physicians in Chicago. This report is certainly very gratifying to us.

Dr. T. E. C. _____
Chicago, Illinois.

My dear C. _____:

Your letter of December 12th, requesting me to make some inquiries for you in regard to the Radium Appliance Company of this city, and the appliances now on the market manufactured by them, came duly to hand. After careful investigation, I can report about as follows:

The Company is a closed California corporation with no stock for sale, five men comprising the same, all residents of this City and most of them identified with business interests here. They all seem to be men of good standing.

M. L. Degnen, the President, is a mineralogist and chemist. He has been experimenting for a number of years with radium in particular. The process by which these radium appliances are made is entirely his own.

You remember that Mrs. B. _____ secured a pad thru Dr. E. S. B. _____ soon after her operation, and she is still using it and gets great relief from its use. This Company's pads at a lower price appear to be a great improvement on mine, both in materials, construction, and, so far as I can tell, of as high or higher radium content. Mr. Degnen showed me the entire process by which they are built up step by step, as the various coats of minerals are applied, the actual radium salts by the Degnen process being dispersed thru the alkali mineral earths forming the base. His technique and methods are his own, of course, but they appear to be sound and rational. The ionization of the mass is uniform and the face of the pad shows the characteristic emanations by exposure in a darkened room.

I believe, Doctor, they are exactly as represented and a most valuable adjunct in the treatment of disease, and I give them my hearty endorsement. It is true that the company is a commercial one and manufactures these appliances to make money. Dr. C. in his letter explains this and hopes that the physicians may become enough interested to control the entire output which can be done after the doctors find what greater benefits can be derived from their use by themselves.

The atomic energy of matter as displayed in radium fairly amazes one. If this energy can be harnessed and applied to any part of the human body at will and is constantly acting, curative force, it is surely worth our time to investigate it even if a layman points out the way. This Company is receiving many letters from people wearing these pads for their ills, some of which I have read; all show their genuineness, and many of the reports in these letters are truly flattering.

In regard to Dr. C., I know him personally and you will see by the enclosed clipping from the Tribune how he stands in the East. He is also well acquainted with the New York, Pennsylvania and New Jersey men, and the letters, that I have seen show me that they value his professional opinion very highly; also he is the Medical man in the Radium Appliance Company and is endeavoring to keep the manufacture and sale of their appliances in the medical profession, as he believes radium is one of the greatest assets that a physician can have, and from his own personal experience and those of his friends who have tried radium, he is convinced of its efficacy. I have seen letters of inquiry

from Drs. A. and B. of Chicago, and also men from the East, who are writing for information, and many have used the pads and are ordering them for their patients.

As a physician, it strikes me that these appliances are worthy of further unbiased clinical observation and study.

Fraternally yours,
(Signed) M. A. B., M. D.
W. Pa.

Dr. Wm. H. C.,
Penna.

My Dear Doctor:

Replying to your letter of the 24th, regarding the Radio-Active Pad, I am only too glad to be able to fully corroborate anything that Dr. C. may have said. He is a conscientious and truthful gentleman, and if I may be pardoned for diverging, an ethical physician as well. Were I to write you the things that some of my Pad wearers have told me occurred to them after wearing them a short time or longer time, I fear you would class me as a member of the Ananias family. However, to be brief, I have so far as I can observe, been cured of a malignant gastric ulcer.

My patients and friends whom I have prescribed the Pads for, one and all, assure me that they have been much improved by their use, and many tell me that nothing would induce them to part with them could they not replace them.

Some few had so slow a response that they have been discouraged in the start, but have been more enthusiastic later than some who have had immediate relief.

I wore mine 30 days, and discarded it as being N. G. The following week, being desperate, and without faith, something impelled me to again wear it, and from that time we have been inseparable. I'm 70, Class of 1872, and am in active practice.

With best wishes, I am,
Fraternally yours,
(Signed) J. A. B., M. D.

**INTERESTING EXTRACTS FROM
HEALTH MAGAZINE**

"A man is as old as his arteries." It is a well known fact that the primal cause of old age is the hardening of the walls of the arteries. Many of the world's foremost thinkers have realized this fact and have sought through years of patient study to cope with man's most relentless enemy—time.

Some months ago the writer of this article had his attention called to a Radio-Active Appliance, which had only been on the market for a short time, and which, from the statements of those who had used it, seemed a veritable fountain of youth and a panacea for nearly every malady.

Needless to say I was interested and, with a view of determining to my own satisfaction, investigated personally many of the cases under treatment. I found that several of those who were using the appliance were well advanced in years and that nearly every case brought under my observation, the results were, to say the least, remarkable.

People who have been suffering for years from rheumatism, gout and other ailments were either cured or well on the way to recovery.

These results were brought about by the patients wearing an appliance in the form of a pad charged with highly Radio-Active mineral elements, having the property of storing up and holding in suspension the life giving energy and rays from the sun. When applied to the body, the Pad immediately begins to discharge this energy into the system, sending the life-giving current through the blood and nervous system, causing a healthy circulation, overcoming sluggishness, throwing off impurities and restoring the issues and nerves to a normal condition.

While it has been long known that many complicated diseases that baffled medical science have yielded readily to the treatment of Radium and its emanations, yet the chief obstacle to Radium treatment has been the prohibitive high cost and the rarity of the element. The curative powers of Radium emanations have been demonstrated by many of the great physicians of London, Paris and New York. They however, have only been able to supply this treatment for a short time on account of the extremely small quantity of Radium at their disposal, which could only be centralized upon a very small portion of the anatomy, and that only at short intervals.

The Radio-Active Solar Pad seems to have overcome these difficulties and supplies a means of giving a constant flow of Radio-Active energy to any part of the body.

All that is required to keep the activity of the pad up to its full capacity is to place it in the sunlight or ordinary daylight when sunlight is not available. In this manner the rays of light and energy are absorbed and are then in turn distributed throughout the system by placing the pad in contact with the body.

E. B.

Radium Appliance Company,
346 Broadway Bldg.
Los Angeles, California.

Gentlemen: In my general practice, I have had occasion to prescribe my Radio-Active Appliances, particularly the Pad, and the results have been most gratifying. I also wish to thank you for the great benefit I have derived from the same in using it on myself. You are at liberty to refer to me at any time.

Most sincerely yours,
DR. A. R. H.

This is not a copy of our Money-Back Guarantee

The Manufacturers of

"Degnen's Radio-Active Pads"

Guarantee this appliance to be thoroughly tested as to workmanship and materials and to contain a sufficient quantity of natural radium elements to insure its radio-activity at full strength for one year.

Radium Appliance Company
Los Angeles, Calif.

This Guarantee attaches to Pad No. _____

Radium Appliance Co.,
Los Angeles, Calif.
Gentlemen:

In my haste to send your last "order" I failed to state that the change for the better that has come to me already, while wearing your Pad, is marvelous, indeed, when my advanced years are considered. Born Dec. 13th, 1869. In my 3 years of Army service I contracted chronic Entritis, and a Hemorrhoidal Tumor formed just above lower Anal Sphincter,—both pathological conditions giving me no end of discomfort all these 58 years,—yet the change for the better in my condition is so great that I feel like a new man.

Am complimented by all my friends on my greatly improved condition, and I tell them I feel even better than I appear.

Hope to prevail on my chronically ailing friends to follow my example, and "Buy a Pad."

Had you an office in Chicago or N. Y. City, 'twould save much time in obtaining them.

You are at liberty to publish any portion.

E. F., M. D.

to have overcome these difficulties and supplies a means of giving a constant flow of Radio-Active energy to any part of the body.

All that is required to keep the activity of the pad up to its full capacity is to place it in the sunlight or ordinary daylight when sunlight is not available. In this manner the rays of light and energy are absorbed and are then in turn distributed throughout the system by placing the pad in contact with the body.

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Most sincerely yours,
DR. A. R. H.

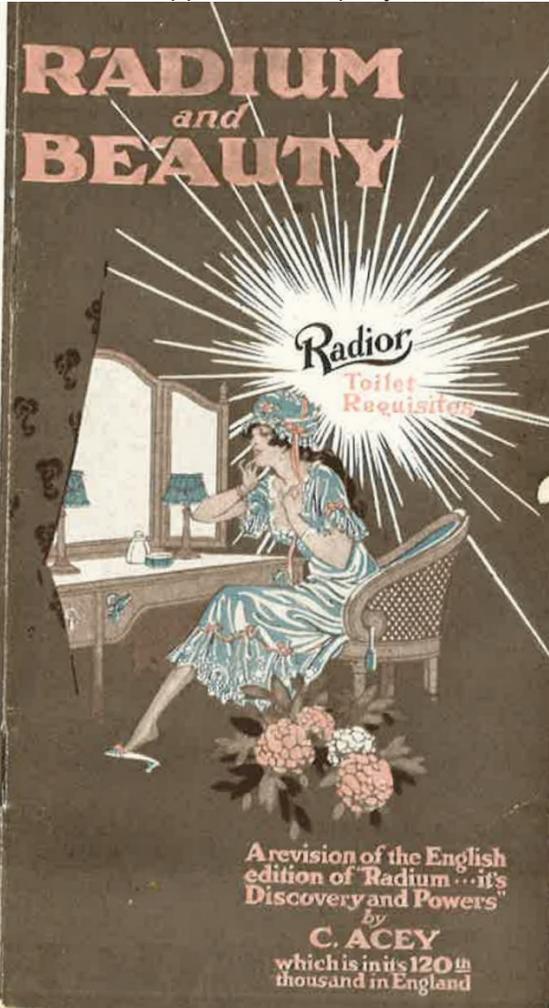
Figure 2. Radio-Active Solar Pad advertisement, Radium Appliance Company, circa 1920

DEC 14 1918 16269

**Radium Preparations are
GUARANTEED**
(under \$5000 penalty)
to be prepared from the
purest pharmaceutical
ingredients to contain a
definite quantity of Actual
Natural Radium, and to
retain their Radio-activity
for at least 20 years

The Radium Coy

RADIUM CO. Ltd.
of London
235 Fifth Ave., New York
167 Oxford Street, London



**RADIUM
and
BEAUTY**

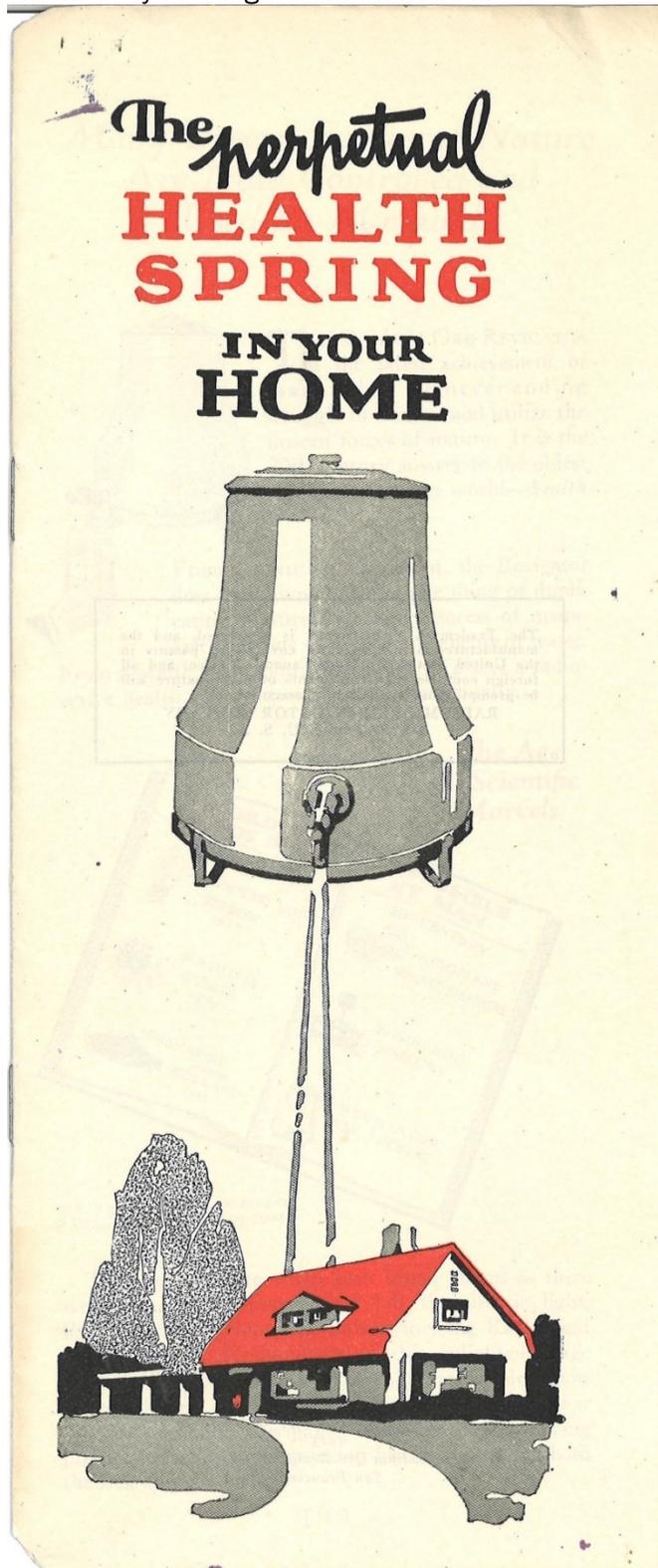
Radium
Toilet
Requisites

Arevision of the English
edition of "Radium... its
Discovery and Powers"
by
C. ACEY
which is in its 120th
thousand in England

Figure 3. R. W. Thomas' Revigator, created circa 1925



Figure 4. Revigator's brochure, circa 1925. The brochure explained how the device "worked" by infusing water with radium.



Wave-based devices. Around 1916, use of the terms *magnetic waves*, *radio waves*, and *vibrations* was popularized based on the physician Albert Abrams' work.¹¹ Along with other individuals and companies that manufactured their own machines, Abrams told patients that, with a blood sample, one's illness could be diagnosed and cured using "wave" technology. The AMA tested Abrams' claims by sending a rooster's blood sample. The rooster was diagnosed remotely with a sinus infection and tooth decay, but other patients were diagnosed with multiple serious diseases. Abrams' quackery was exposed by *JAMA* in 1922,¹² and though Abrams died in 1924—and despite the AMA's and others' efforts—similar wave devices were advertised for remote or in-person use for many subsequent years, as shown in Figures 5 to 8.¹³

Figure 5. Drown Radio Display, created by Ruth B. Drown, circa 1940



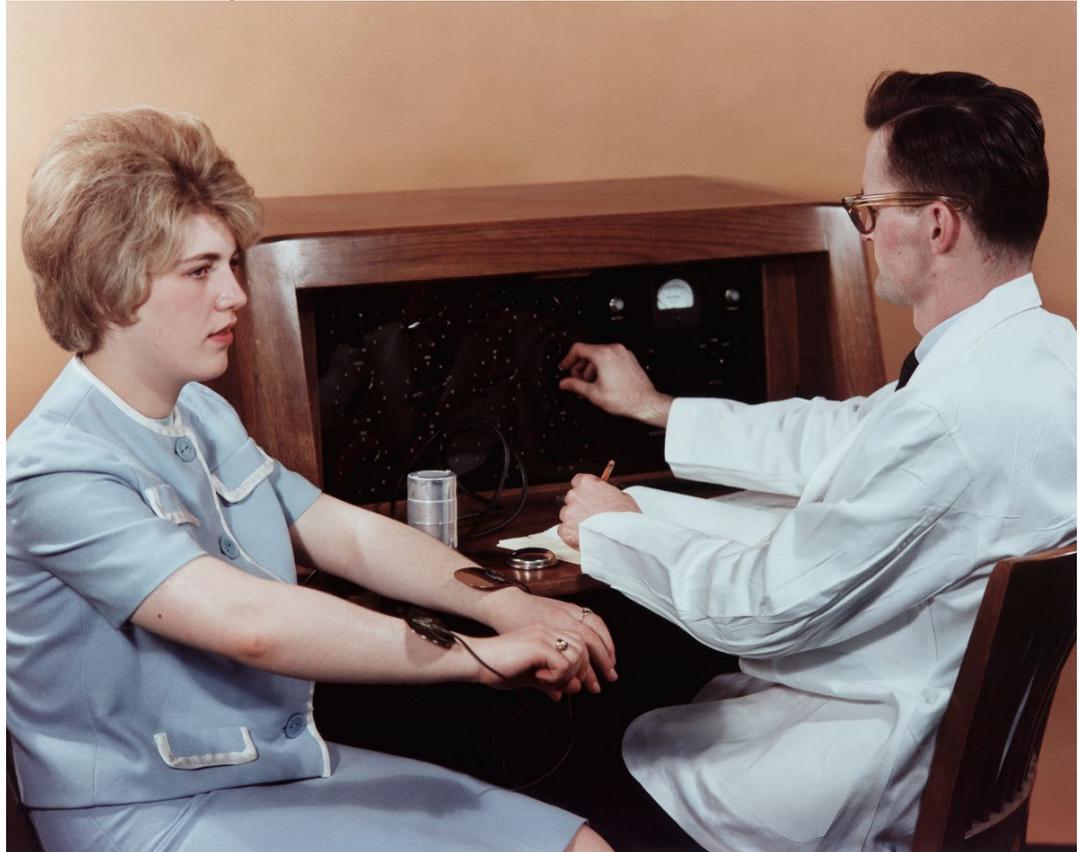
Figure 6. Albert Abrams' Oscilloclast, created circa 1910 (reenactment photo circa 1965)



Figure 7. The Sonus Film O Sonic, circa 1950 (reenactment photo circa 1965). The device used song recordings to generate vibrations that were thought to be healing.

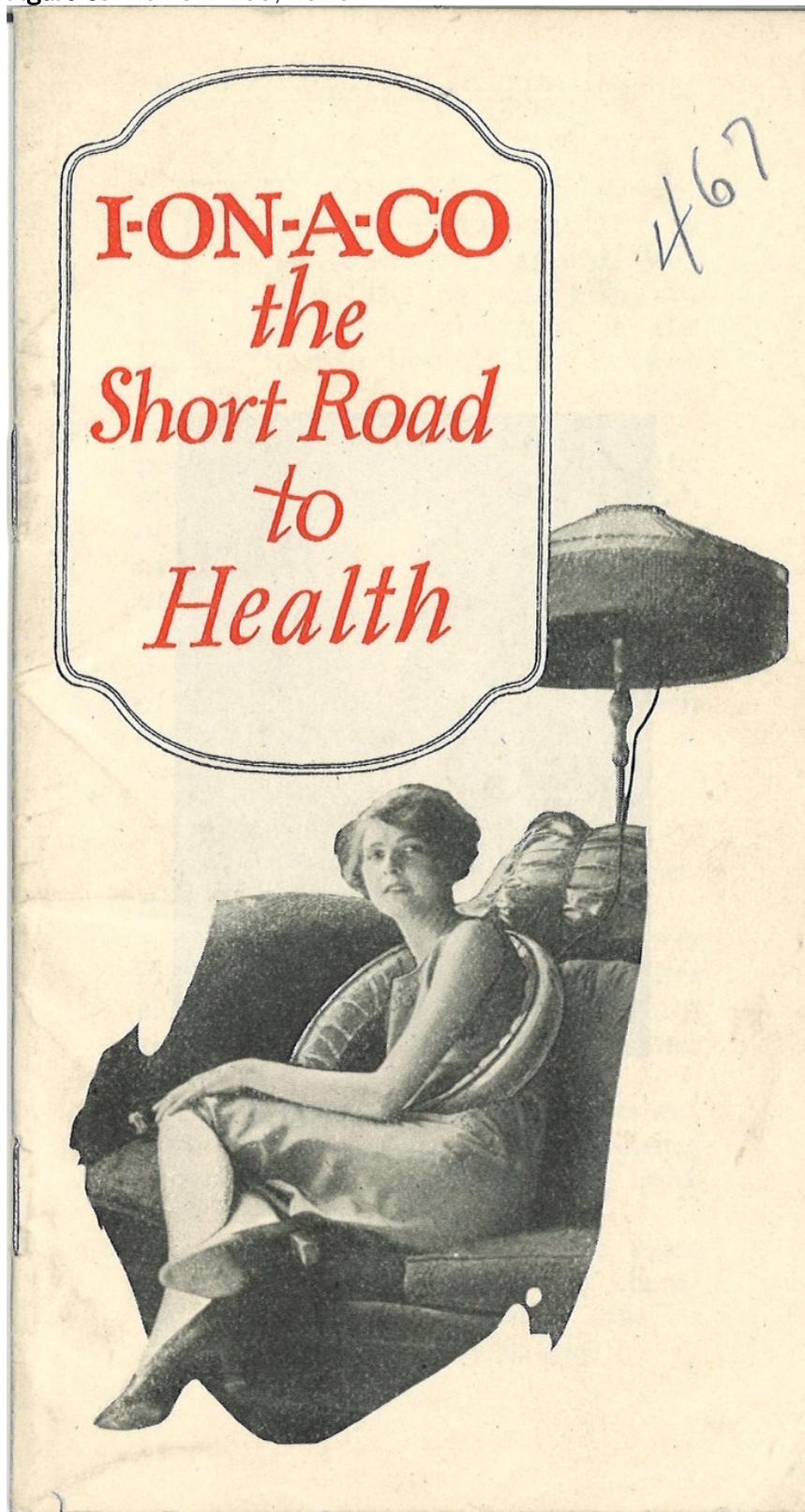


Figure 8. The Radioclast, circa 1920 (reenactment photo circa 1965). This was one of Albert Abrams' original inventions.



Electricity. Nikola Tesla's and Thomas Edison's innovative electric devices of the late 1800s seemed like magic, and their novelty was exploited to suggest that electricity could cure ailments or control disease by magnetizing iron in a patient's blood. Gaylord Wilshire's I-ON-A-CO was a metal coil, which patients wore around their necks, enlivened by an electric current (see Figure 9).

Figure 9. The I-ON-A-CO, 1925



The AMA's Arthur J. Cramp called devices like the I-ON-A-CO "magic horse collar[s]"¹³ and issued warnings to the public by placing articles in widely read publications, such as *Popular Mechanics*, and organizing conferences with the FDA.¹ The Theronoid belt—a device similar to the I-ON-A-CO with a smaller coil and a bulb added to the belt to indicate when the belt was "working"—was introduced by a former employee of Wilshire's company, Philip Ilsey (see Figure 10).¹⁴

Figure 10. The Theronoid Belt, circa 1928 (reenactment photo circa 1965)

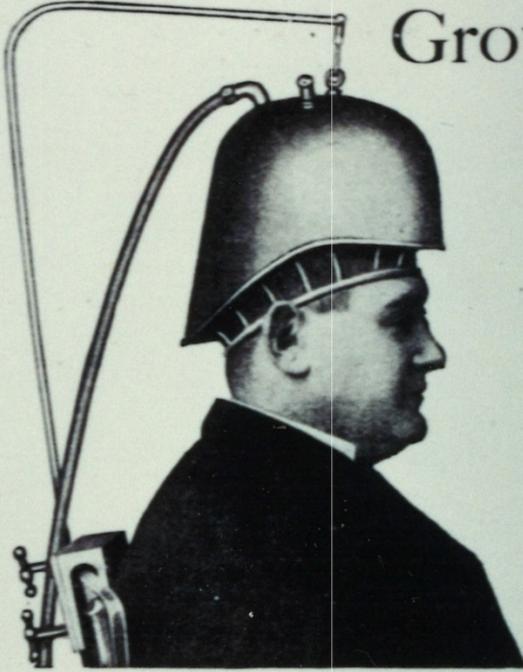


The Evans Vacuum Cap drew on a person's vanity as a cure for baldness and was sold by the Modern Vacuum Cap Company at the turn of the 20th century (see Figure 11).

Figure 11. Evans Vacuum Cap

Cosmopolitan Magazine

A Scientific Method of Growing Hair



It is a known fact that the blood conveys nourishment to all parts of the body. It is likewise known that exercise makes the blood circulate, and that where the blood does *not* circulate no nourishment is supplied.

The lack of proper circulation of blood in the scalp, due mainly to congestion produced by artificial causes, results in the starvation of the hair roots, and produces falling hair and baldness. Therefore the logical and only relief from baldness is in the restoration of the scalp to its normal condition, thus enabling the blood to resume its work or nourishing the hair roots. It was work along these logical lines that produced and perfected

THE EVANS VACUUM CAP.

The Evans Vacuum Cap provides the exercise which makes the blood circulate *in the scalp*. It gently draws the rich blood to the scalp and feeds the shrunken hair roots. This causes the hair to grow. It is the simple, common-sense principles of physical culture scientifically applied to the scalp.

Easy and Pleasant to Use.

The Evans Vacuum Cap is portable and can readily be attached to any ordinary straight back chair. Three or four minutes' use each morning and evening is all that is required. It leaves a pleasant tingling sensation for a few moments after use, indicating the presence of new life in the scalp.

Method of Testing.

You can tell by a few minutes' use of the Evans Vacuum Cap whether it is possible for you to cultivate a growth of hair on your head, and we will send you the apparatus to make the experiment, *without expense on your part*. If the Evans Vacuum Cap gives the scalp a healthy glow, the normal condition of the scalp can be restored, and a three or four minutes' use of the Cap each day thereafter will, within a reasonable time, develop a natural and permanent growth of hair. If, however, the scalp remains white and lifeless after the Cap is removed, there would be no use to give the appliance a further trial. The hair cannot be made to grow in such cases.

The Bank Guarantee.

We will send you, by prepaid express, an Evans Vacuum Cap, and will allow you ample time to prove its virtue. All we ask of you is to deposit the price of the Cap in the Jefferson Bank of St. Louis, where it will remain during the trial period, subject to your own order. If you do not cultivate a sufficient growth of hair to convince you that the method is effective, simply notify the bank and they will return your deposit in full. We have no agents, and no one is authorized to sell, offer for sale or receive money for an Evans Vacuum Cap. All Caps are sold under the bank's guarantee, and all money is sent direct to Jefferson Bank.

A sixteen-page illustrated book will be sent you free, on request.

EVANS VACUUM CAP CO. 1043 Fullerton Building, St. Louis

When you write, please mention the *Cosmopolitan*

Phrenology. Phrenology erroneously holds that measurements of bumps on a person's skull can determine that person's traits. Developed in the late 1700s and popularized in the 1800s, phrenology had been discredited as pseudoscience by the dawn of the 20th century,¹⁵ but it was still used to promote devices through the 1930s. One such device, the Psychograph, created by Henry C. Lavery, was installed not only in malls and cinemas as entertainment, but also in physicians' offices in the early 20th century (see Figure 12).¹⁶

Figure 12. The Psychograph Phrenology Machine, early 20th century (reenactment photo circa 1990)



The AMA's efforts to professionalize medicine and to articulate to members of the public the differences between science-based medicine and pseudoscience-based quackery was one reason phrenology lost adherents, but many other quack devices remained.

Chromotherapy. Chromotherapy began with a scientifically sound kernel of truth: “light is energy, and the phenomenon of color is a product of the interaction of energy and matter.”¹⁷ Dinshah P. Ghadiali popularized these properties to promote his Spectrochrome, erroneously suggesting that illness or injury could be remedied by colors and light (see Figure 13). Violet rays, via wand, were applied to a patient’s body (see Figure 14). *JAMA* continued publishing refutations of chromotherapy until 1958,¹⁸ when the FDA facilitated a permanent injunction against Ghadiali’s institute.¹⁹

Figure 13. Spectrochrome, circa 1930s. Although it looks like there is a Star of David on it, this symbol, created by Ghadiali, actually represents chemical elements in attuned color waves.²⁰



Figure 14. Spectrochrome with wand, circa 1940 (reenactment photo circa 1990)



Orgone. Wilhelm Reich conceived of orgone as similar to chi or life force but drew on Freudian ideas about sex to suggest that traumatic experiences block energy flow in a person's body, causing ill health, and that orgasms promote wellness.²¹ Christopher Turner writes: "[I]n the ideological confusion of the postwar period ... Reich's ideas landed on fertile ground."²¹ Orgone energy, which a conical hat would trap, was thought to dissipate like heat from the top of one's head, and orgone devices were promoted as pulling orgone energy from the atmosphere and radiating it to a user. AMA investigations encouraged the FDA to bring Reich to court, resulting in a ruling that stopped the sale of Reich's machines in 1954.²¹

Figure 15. Orgon Cone Hat, circa 1950 (reenactment photo circa 1965)



Figure 16. Orgone energy box created by Wilhelm Reich, circa 1950 (reenactment photo circa 1990)



Conclusion

While the shine may have worn off some of these inventions (though some are still used), there is no shortage of new pseudoscientific devices being marketed. The internet, of course, has given rise to a whole new class of hucksters and frauds, and the rise of conspiracy theories, along with the Covid-19 pandemic, has certainly not helped. We now have a great variety of governmental and nongovernmental bodies dedicated to fighting the scourge of misinformation, although it remains to be seen how effective they will ultimately be.

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