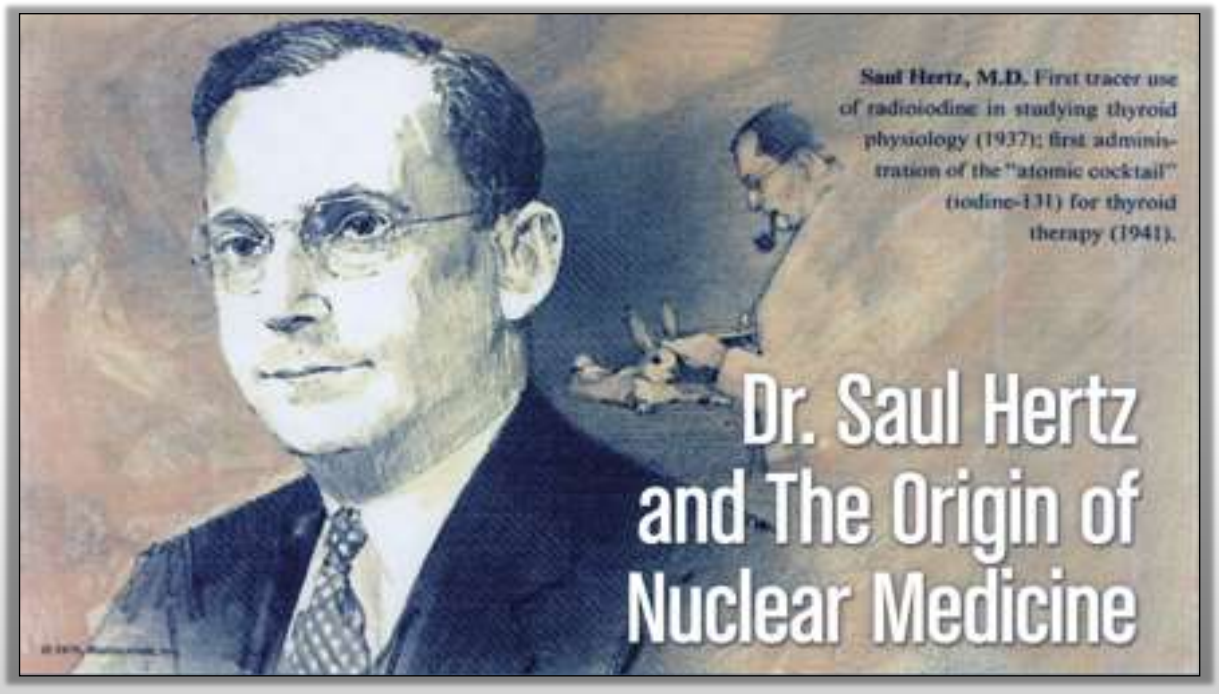
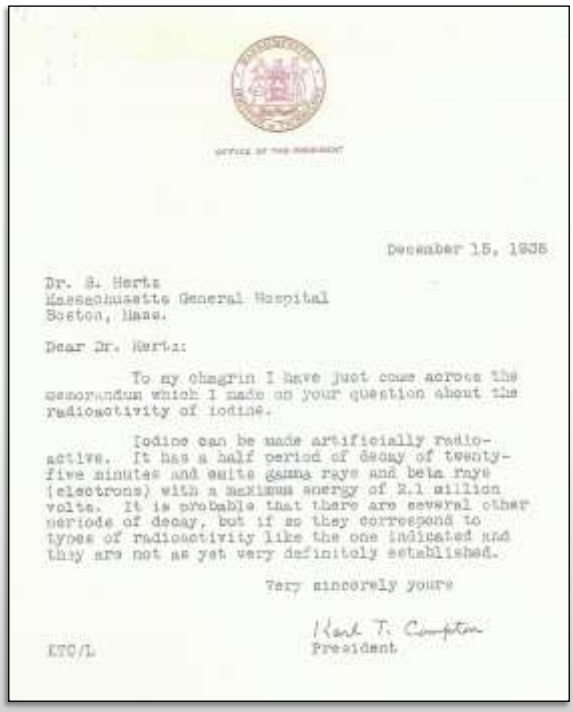
131 Iodine Therapy: A Brief History

Lewis Braverman, M.D.
Boston University School of Medicine



Letter to Dr. Saul Hertz from Karl T. Compton, Ph.D., President MIT (1930-1948).



OFFICE OF THE PRESIDENT

December 15, 1936

Dr. S. Hertz
Massachusetts General Hospital
Boston, Mass.

Dear Dr. Hertz:

To my chagrin I have just come across the memorandum which I made on your question about the radioactivity of iodine.

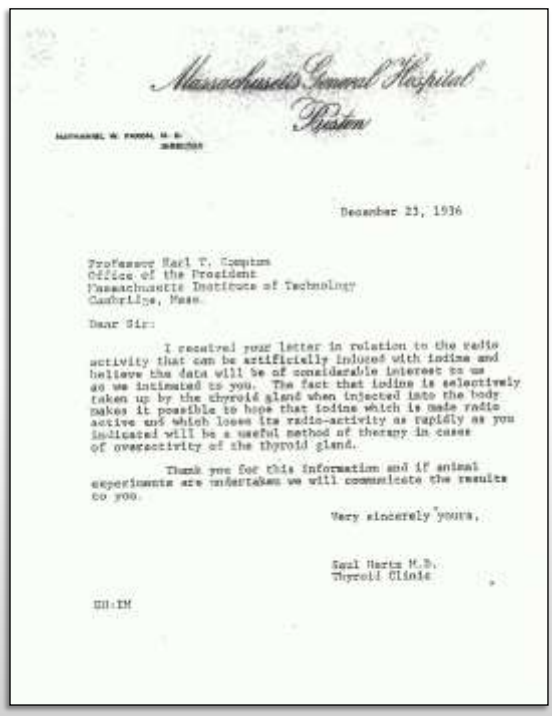
Iodine can be made artificially radioactive. It has a half period of decay of twenty-five minutes and emits gamma rays and beta rays (electrons) with a maximum energy of 2.1 million volts. It is probable that there are several other periods of decay, but if so they correspond to types of radioactivity like the one indicated and they are not as yet very definitely established.

Very sincerely yours

Karl T. Compton
President

KTC/L

Letter to Karl T. Compton from Dr. Saul Hertz.



Massachusetts General Hospital
Boston

December 21, 1936

Professor Karl T. Compton
Office of the President
Massachusetts Institute of Technology
Cambridge, Mass.

Dear Sir:

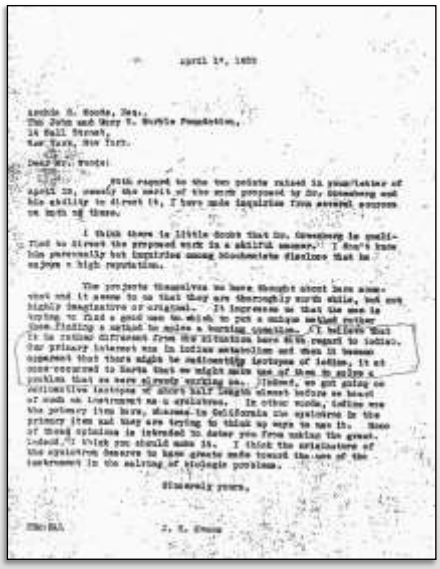
I received your letter in relation to the radio activity that can be artificially induced with iodine and believe the data will be of considerable interest to us as we intimated to you. The fact that iodine is selectively taken up by the thyroid gland when injected into the body makes it possible to hope that iodine which is made radio active and which loses its radio-activity as rapidly as you indicated will be a useful method of therapy in cases of overactivity of the thyroid gland.

Thank you for this information and if animal experiments are undertaken we will communicate the results to you.

Very sincerely yours,

Saul Hertz M.D.
Thyroid Clinic

SH:EM



April 1st, 1939

Archie R. Brooks, Esq.,
The John and Mary T. Markle Foundation,
14 Wall Street,
New York, New York.

Dear Mr. Brooks:

With regard to the two points raised in your letter of April 1st, namely the merit of the work proposed by Dr. Greenberg and his ability to direct it, I have made inquiries from several sources on both of these.

I think there is little doubt that Dr. Greenberg is qualified to direct the proposed work in a skilful manner. I don't know him personally but inquiries among biochemists disclose that he enjoys a high reputation.

The projects themselves we have thought about here somewhat and it seems to us that they are thoroughly worth while, but not highly imaginative or original. It impresses us that the one is trying to find a good use to which to put a unique method rather than finding a method to solve a burning question. It believe that it is rather different from the situation here with regard to iodine. Our primary interest was in iodine metabolism and when it became apparent that there might be radioactive isotopes of iodine, it at once occurred to Hertz that we might make use of them to solve a problem that we were already working on. Indeed, we got going on radioactive isotopes of short half lives almost before we knew of such an instrument as a cyclotron. In other words, iodine was the primary item here, whereas in California the cyclotron is the primary item and they are trying to think up ways to use it. Some of these opinions is intended to deter you from making the grant. Indeed, I think you should make it. I think the architecture of the cyclotron deserves to have grants made toward the use of the instrument in the solving of biologic problems.

Sincerely yours,

JHM:BA J. H. Means

"…I believe that it is rather different for the situation here with regard to iodine. Our primary interest was in iodine metabolism and when it became apparent that there might be radioactive isotopes of iodine, it at once-occurred to Hertz that we might make use of them to solve a problem that we were already working on…"

-J.H. Means, 1939

Dr. Saul Hertz and an Early Patient.

February 10, 1943

To Whom It May Concern
United States Navy

Dear Sir:

Dr. Saul Hertz has been a professional collaborator and personal friend of our for over six years. Dr. Hertz is an exceptionally able endocrinologist. His success and excellent reputation in this field will undoubtedly be brought to your attention by physicians, whose opinion in a professional judgment of this type must necessarily carry more weight with you than the opinion of a physicist. Dr. Hertz is the originator of new techniques in endocrinology, especially in the treatment of disabling thyroid disturbances through the use of artificially radioactive isotopes. Within the last year it has been definitely established that these new techniques have definite advantages over older methods of therapy, and indeed are successful in some cases where older methods failed completely. It is evident that if the benefits of these new methods are to be made available to members of the armed forces the new treatment should be supervised by the men who originated it, and is best aware of the applicability to individual cases.

With this thought in mind, it would seem to me to be highly desirable to the Navy to have Dr. Hertz within the Naval Medical Corps and specifically assigned to the treatment of stubborn endocrinological cases among naval officers and ratings.

The application of these new techniques involves the active collaboration with physicists who prepare the new medicines activated by atomic disintegration through the use of the cyclotron. These facilities are all available at the Massachusetts Institute of Technology and our staff is skilled through six years of experience in making the preparation required for these new thyroid treatments. The United States Navy and Dr. Hertz could rely on our continued cooperation in this work if Dr. Hertz were assigned to endocrinological duties as a Naval Officer.

Sincerely yours,

Robley D. Evans
Associate Professor of Physics

RDE:kg

- "Dr. Saul Hertz has been a professional collaborator and personal friend of our[s] for over six years. Dr. Hertz is an exceptionally able endocrinologist."
- "Dr. Hertz is the originator of new techniques in endocrinology, especially in the treatment of disabling thyroid disturbances through the use of artificially radioactive isotopes."
- "With this thought in mind, it would seem highly desirable to the Navy to have Dr. Hertz within the Naval Medical Corps and specifically assigned to the treatment of stubborn endocrinological cases among naval officers and ratings."

-Robley D. Evans, 1943

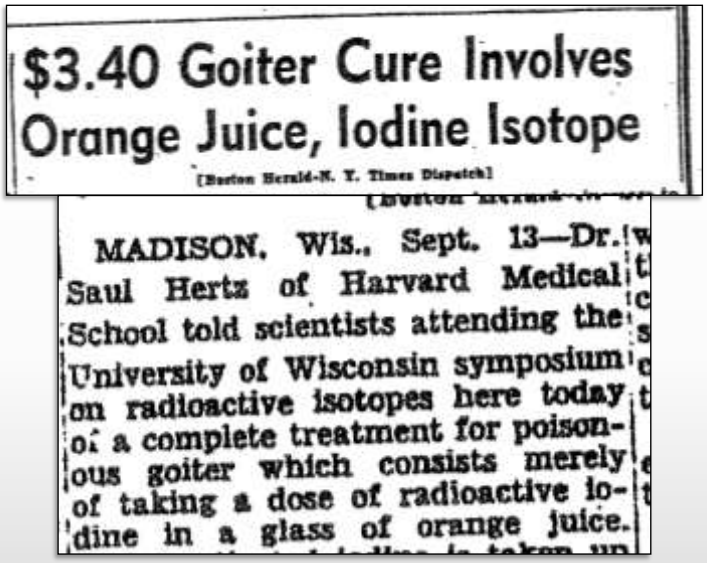
THE JEWISH ADVOCATE

THURSDAY, MAY 23, 1946

Local Researchist Discovers Cure for Goitre Through A-Bomb By-Product

DR. SAUL HERTZ

The Jewish Advocate, May 23, 1946



$3.40 Goiter Cure Involves Orange Juice, Iodine Isotope

[Boston Herald-N. Y. Times Dispatch]

MADISON, Wis., Sept. 13—Dr. Saul Hertz of Harvard Medical School told scientists attending the University of Wisconsin symposium on radioactive isotopes here today of a complete treatment for poisonous goiter which consists merely of taking a dose of radioactive iodine in a glass of orange juice.

Boston Sunday Herald, September 14, 1947

PAGE FOUR THE HARVARD CRIMSON TUESDAY, MAY 24, 1949

HATFIELD'S COLOR SHOP Art Supplies

Hertz to Use Nuclear Fission in Cure for Cancer

DR. SAUL HERTZ, instructor in Medicine at the Medical School, who has announced the establishment of the Radioactive Isotope Research Institute. The foundation will apply the products of atomic fusion to the treatment of malignant growths.

The Harvard Crimson, May 24, 1949

Treatment of Thyroid Carcinoma with Radioactive Iodine I 131

Freedberg, AS, Ureles, AL, Lesses, MF, Gargill, SL
Am J Med. 1951; 11: 44-54.

- My father-in-law, Dr. Samuel Gargill, followed up on this suggestion and published one of the earliest reports on the use of radioactive iodine in the treatment of thyroid cancer.

- "During the late 1930's and early 1940's patients were treated with either 131 I (half life=8 days; 90% of energy beta emission), 130 I (half life 12.5 hours 100% beta emission), or a combination of the two."
- "The first therapeutic dose intended to treat hyperthyroidism was administered to Mrs. ED on March 31, 1941, and contained a mixture of 131 I (10%) and 130 I (90%)."
- "Of the eight patients treated with RAI between 1940 and 1941, five received divided doses estimated at 1.5-6.2 mCi (average 3.9 mCi)."

Daniels GH. Radioactive Iodine: A Slice of History. *Thyroid*. 2013; 23: 253-258.

then joined Boston's Beth Israel Hospital. He was there but a short time, when he received a phone call from Morris Fishbein, editor of JAMA. "Saul," he said, "I have a paper here from MGH by Earl Chapman and Robley Evans from the Massachusetts Institute of Technology (MIT), and they are saying they have propriety over RAI… and your name isn't even on the paper! What is going on here?" Fishbein requested that my father submit an article updating his original series of 29 patients. Consequently, both articles were published side by side in JAMA's May 1946 issue (2,3).

Hertz BE. Response to: "Radioactive Iodine: A Slice of History". *Thyroid*. 2014; 24: 177-178.

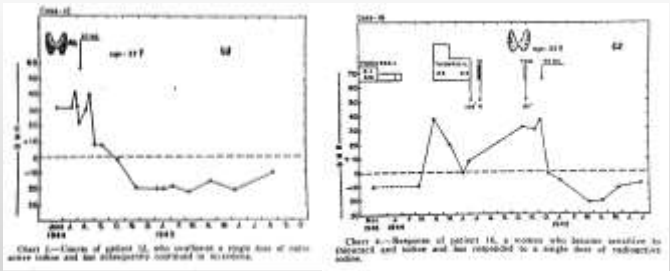
The First Two Manuscripts Describing the Use of Radioactive Iodine in Treating Hyperthyroidism

RADIOACTIVE IODINE IN THE STUDY OF THYROID PHYSIOLOGY USE OF 131 I IN HYPERTHYROIDISM

Hertz S, Roberts A. *J Am Med Assoc.* 1946; 131: 81-86.

THE TREATMENT OF HYPERTHYROIDISM WITH RADIOACTIVE IODINE

Chapman EM, Evans RD. *J Am Med Assoc.* 1946; 131: 86-91.



DUMAND—Deep Underwater Muon and Neutrino Detection

Hawaii DUMAND Center
University of Hawaii
2505 Correa Rd.
Honolulu, HI 96822
808 - 948-7391

1335 Alewa Drive
Honolulu, HI 96817
Apr. 8, 1991

Dr. John R. Stanbury
41 Circuit Rd
Chestnut Hill, MA 02167

Dear Dr. Stanbury,

Mrs. Vilma Hertz has sent me a copy of Chapter V from the book I understand you will soon publish on the history of the MGH Thyroid Clinic. I have read it with great interest, since I was closely involved with the earliest history of the use of radioactive iodine in connection with thyroid physiology and therapy.

You will no doubt remember interjecting me in regard to a minor point concerning references to M.I.T. in the first paper on the use of radioiodine in rabbits. At that time I gave you a detailed description of the work at M.I.T. and of the degree of Evans' scientific participation in it – namely zero. I was unpleasantly surprised to see how completely you have ignored it.

I understood it somewhat better as I read the false and distorted picture you have given of the early work on radioiodine. I began to understand even more when I read your description of Evans: I quote "an exceptionally engaging, resolute, and brilliant colleague whose contributions to the Thyroid unit were incomparable." That literally turned my stomach. Evans may have been engaging when he wanted to be, but brilliant? The great contributions to the thyroid unit was not his, but Basil Hertz's. It was Hertz who first conceived the idea of using radioactive iodine for both research and therapy in thyroid work; it was Hertz who asked the question at Conjoint lecture – though Chapman and Evans tried their best to cast doubt on this after he died. Your conjecture that it was the outcome of a group discussion has no basis in fact. Not only did Basil tell me that the idea was his alone, but Evans in his written record so confirming to Mrs. Hertz and I have copies of his letter. There cannot be the slightest doubt on that subject.

More important, it was Hertz who conceived and carried out, with my help, all the ground-breaking work in the next seven years. The notion that you advance that it was Evans who led the "team" because he headed the laboratory in which the work was done is simply naive and absurd. He wasn't even on the "team", much less its leader. He was the owner, boss of the clubhouse.

Furthermore, that was the way he wanted it. He had every opportunity, and certainly the authority, to have taken an active part in the work; but he chose not to do so. I do not know why; but it may well be, in view of his known anti-Semitism, that he would not stomach the notion of working with two Jews.

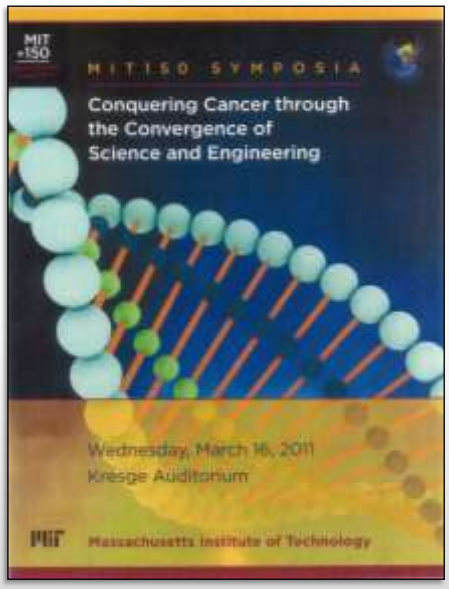
"…Finally, your verdict (on p. 77) that the credit for priorities in investigations of thyroid function and therapeutics goes to Hertz, Means, and Evans is faulty and inexact, in that implies equal credit. It omits my name entirely. Did you think I was just a glorified lab technician? I made important contributions, not only to the technology of the measurement of uptake and dosages, and for this work received an award of honor from the New England Society of Nuclear Medicine in, I think, 1976. My own allocation of credit, percentage-wise, would be Hertz 80, Roberts 15, Means and Evans 2.5 each…"

-Arthur Roberts, 1991

American track athlete Gail Devers developed Graves' disease. After 131 I treatment she came back to win Olympic Gold Medals in 1992 and 1996.

MIT Symposium 2011

- Saul Hertz (MGH/MIT) pioneered treatment of thyroid cancer using radioactive iodine treatment.



Thank You

- Jeff Garber, M.D.
- Megan Crist
- Barbara Hertz
- Saul Hertz, M.D.