Editor's note: Permission to create this transcript was granted by Maria Gilardin, TUC Radio. I am grateful to Maria for making available the draft text she worked with to fashion her continuity.

Shut Down Nuclear Power Plants
The Life and Work of Dr. John Gofman

by Maria Gilardin

TUC Radio Podcast Part One of Two

Feeds: radio4all.net and podcast.tucradio.org

22 May 2012

Broadcast quality mp3 of the 30 minute program is here:
http://tucradio.org/JohnGofmanONE.mp3 (20.1 MB)

> TUC aka *Time of Useful Consciousness* is an aeronautical term. The time between the onset of oxygen deficiency and the loss of consciousness, the brief moments in which a pilot may save the plane.

Shut down nuclear power plants. How many nuclear power plant accidents does it take to come to that conclusion. Even after Fukushima there is very little movement in that direction. Why is that? Are we mistaken or uninformed about the dangers of nuclear radiation? Do we believe again – and over again this time – that there are safe doses of radiation? That radiation from power plants will not stay dangerous – depending on the element – from days to hundreds, thousands and even hundreds of thousands of years? That in these long time periods radioactive particles will not eventually move from the source of the accident to every corner of the earth?

The story of an extraordinary man illustrates both the science and the politics of nuclear power. Dr. John Gofman, from 1970 on, called for the closure of nuclear power plants. The obituaries for him in 2007 quoted him as saying,

> Licensing a nuclear power plant is in my view, licensing random premeditated murder. First of all, when you license a plant, you know what you're doing—so it's premeditated. You can't say, 'I didn't know.' Second, the evidence on radiation-producing cancer is beyond doubt. [As of 1980] I've worked fifteen years on it, and so have many others. It is not a question any more: radiation produces cancer, and the evidence is good all the way down to the lowest doses.
>
> The only way you could license nuclear power plants and not have murder is if you guarantee perfect containment. But they admit that they're not going to contain it perfectly. They allow workers to get irradiated, and they have an allowable dose for the population. So in essence I can figure out from their allowable amounts how many they

> are willing to kill per year.[1]

These provocative words came from a scientist who, in the 1940s helped in major ways to usher in the atomic age. His credentials are impeccable. John Gofman studied under Glenn Seaborg at UC Berkeley and, in 1943, earned a Ph.D. in nuclear physical chemistry for his work on and co-discovery of Uranium 232 and 233.[2] Plutonium is the most dangerous substance in nuclear power and weapons. And Gofman, in a lab on the UC Berkeley campus, produced the first 1.2 milligrams of plutonium for J. Robert Oppenheimer and the Los Alamos weapons lab.

He remembered that moment with KPFA radio news producer Aileen Alfandary in 1979.

> I remember when J. Robert Oppenheimer came back from Los Alamos and came to see me and said he absolutely needed a miligram of plutonium in a hurry. At that time the total world stock was about a tenth of a miligram—yet a year later we were going to have *grams* of it—and asked if we would prepare it. And we agreed to do it. So we bombarded a ton uranium nitrate on the Berkeley Cyclotron night and day for two months and then we set up a little chemical factory in Gilman Hall in the chemistry department on the campus. And we worked night and day around the clock to separate that plutonium out of that ton of uranium and deliver it to Dr. Oppenheimer and Dr. Kennedy: one point two miligrams of plutonium. So it was the world's largest factor of increase in plutonium production at that moment. The world's first miligram. I don't know whether I'm proud of that or sad about it now.[3]

In spite – or because – of this lab work, Gofman has done more in his life time to warn people of the dangers of plutonium and radiation than most other scientists.

One reason why Gofman is considered one of the greatest scientists of the 20th century by independent colleagues and by the Right Livelihood Committee, that gave him the 1992 award,[4] is that his work bridged two of the most consequential disciplines for the understanding of the risks of radiation: nuclear physics and medicine.

By 1944 Gofman decided that he was no longer needed in the nuclear bomb project that was by then the domain of engineers. He finished Med School in 1946 and by 1947 had become assistant and later full Professor of Molecular and Cell Biology at UC Berkeley. He remained in that position doing research from 1948 to about 1973 and made a number of major discoveries working with cholesterol, lipoproteins, coronary heart disease, arteriosclerosis, and above all, cancer.[5]

Gofman was so widely acclaimed as scientist in both fields, nuclear chemistry and medicine, that he was asked to be part of two major projects at the Lawrence Livermore National Lab, set up fifty miles east of the University of California at Berkeley under the aegis of the University's Lawrence Radiation Lab, of which Gofman was a member.

Gofman said in an interview for the book *Nuclear Witnesses: Insiders Speak Out*:

> Ernest Lawrence called me in one day. We were good personal friends. "I'm worried about the guys out at Livermore," he said. "I think they may do some things to harm themselves. You're the only person who knows the chemistry and the medicine and the lab structure. Could you do me a favor and go out there a day or two a week and just roam around and see what the hell they're doing, and see that they do it safely? If you don't like anything they're doing, [just] tell them that your word is my word, that either they change, or they can leave the lab."[6]

Gofman ended up heading the Lawrence Livermore Lab Medical Department with 1,500 people until 1957, gaining insight and knowledge about the effects of nuclear radiation. Then he chose to return to UC Berkeley to teach and do research on heart disease and trace elements in biology. But in 1962 something happened which altered the course of things for him. Gofman said in *Nuclear Witnesses*,

> In 1962 I got a call from John Foster, who was...then the director of the Lawrence Livermore Lab.
>
> He said, "I'd like to have you come out.... We had a very interesting approach from the Atomic Energy Commission. They're on the hot seat because of this 1960s series of [bomb] tests which clobbered the Utah milkshed with radio-iodine. And they've been getting a lot of flak. They think that maybe if we had a biology group working with the weaponeers at Livermore, such things could be averted in some way—like you'd advise us not to do this or...do this differently."[7]

The milkshed that is so brutally casually mentioned by the Lab director is the area of Utah where humans and dairy cattle were hit with radioactive fallout from the 1961-62 series of atomic bomb tests.

Gofman needed convincing to accept that job because he did not trust the Atomic Energy Commission, the so-called AEC. He expected to be censured by them. John Foster explained to him:

> "They're willing to set up ... a biology and medicine lab at Livermore, with a very adequate budget, starting at three ... million dollars a year. You know, we've got the best computer facilities in the country.... you'd have support."[8]

Gofman remembered that moment in his conversation at KPFA.

> I was asked in 1963 by the Atomic Energy Commission to set up a biology and medicine department at the University of California's Livermore Lab. And I finally agreed to do it—to cut down my teaching duties in Berkeley where I was a professor—to do this job because I thought it was important. The only point was that before taking that assignment

> I told Glenn Seaborg, who was then chairman of the commission, I said really, I don't care where the chips fall as far the Atomic Energy Commission is concerned. And we're going to state what the biological effects are honestly as we find it out. And he said, "Jack, all we want is the truth." Well, to my sorrow six years later I learned that the Atomic Energy Commission *never* wanted the truth if it were unfavorable.[9]

But back in 1963 John Foster promised. "[T]he AEC can't fight the University of California, the Regents, and this lab" he said. "And I can tell you one thing, if they try to prevent you from telling the truth about what you find about radiation, we'll back you and the Regents will back you, and they'll just have to eat it."[10]

So Gofman cut his teaching down to 10 percent, and took two posts at Livermore. One as head of a new bio-medical division, the exact mission of which was to calculate and do the experimentation needed to evaluate the health effects of radiation and radionuclide releases from weapons testing, nuclear war, radioactivity in medicine, nuclear power, etc.—all of the atomic energy programs.[11] And Gofman was given the three million dollar budget to start.

From 1963 to 1965 Gofman served as that division's first director. To gauge the dramatic downfall of Gofman, his being censored, de-funded, and eventually forced to resign from the Lab, it is necessary to know that during this time at Lawrence Livermore Lab he held one of the nine prestigious positions of Associate Director sitting along the notorious Edward Teller in weekly meetings on all programs of the Lawrence Livermore Lab.

In 1979 Gofman gave an overview over that period of his life to KPFA news director Aileen Alfandary:

> **JWG:** And I would say, as an organization, the Atomic Energy Commission has probably been one of the worst in this regard in attempting to color any opposition as un-american, or kooky, or trying to undermine the national defense.
>
> **AA:** Of course if it was to continue the research and development and production of atomic weapons and the use of nuclear power for producing electricity—
>
> **JWG:** The research and development of atomic weapons is one thing. Nobody asked the Atomic Energy Commission to become God, a super-politician, and decider of the social and political fate of the world. They were way out of their element in entering into the socio-political sphere. They didn't know what they were doing and they were just amateurs at that.
>
> The job of making bombs, they did, I think, reasonably well. The job of the peaceful uses of the atom, what they did was a hard promotional sell, hiding all the problems.
>
> **AA:** Did they know about the problems?

JWG: Oh, they knew the problems very well and they have lied through their teeth from day one about the problems in every sphere.

AA: Some examples.

JWG: They lied concerning the problems of reactor safety. Lied right up to the time they disappeared. And as you are probably—

AA: They disappeared?

JWG: The Atomic Energy Commission disappeared by governmental order and was split into the Energy Research and Development Agency (ERDA) and the Nuclear Regulatory Commission (NEC).

They actually withheld reports, suppressed them, concerning the magnitude of the consequences of an accident. They withdrew funds from those who found radiation was more dangerous than others had thought—

AA: Like yourself.

JWG: Like myself.

Looking back at Gofman's stay at Lawrence Livermore Lab it becomes clear that the story of suppression of evidence, blackmail, co-optation, is a long and sordid one. And it involves government agencies, the utility industry, the manufacturers of weapons and power plants – down to the universities, their Regents and individual scientists – even including the clerks in the xerox department at Lawrence Livermore Lab who tried to prevent the copying of Gofman's papers. Given all this and the refusal of the media to report on it, it may not be so surprising that there still is no appropriate reaction to nuclear accidents and nuclear power.

The pressure began within weeks of Gofman becoming Director of the Bio-Medical Research Division at Lawrence Livermore Lab in 1963. He was ordered by the AEC to come to Washington to suppress research by Dr. Harold Knapp. He had made some calculations of the true dose that the people of Utah got from the radio-iodine from the bomb tests in 1962. Harold Knapp said that the doses were something like one hundred times higher than publicly announced.

To their credit, Gofman and the handful of other scientists assembled looked at Knapp's evidence, found it sound and recommended publication. Gofman said (in *Nuclear Witnesses*), The AEC guy "was very disappointed. But since the committee wasn't going to do anything...to help the AEC try to suppress scientific truth, Knapp did publish. And the sky didn't fall [in]. Unfortunately, in this society it takes a hell of a lot more than revealing some awful things for the sky to fall."[12]

And Gofman added, "it taught me something that was very, very different from what Glenn

Seaborg had told me. (By now my former professor was chairman of the [AEC].) ... I told him, 'You know, Glenn, you ought to think twice about my being...head of this thing. Because I don't really give a damn about the AEC programs, and if our research shows that certain things are hazardous, we're going to say so... And here within a matter of a few weeks one of his chief men at the AEC is asking us to help suppress the truth."[13]

By 1965 the bio-medical division got known in the lab as 'the enemy within' because they opposed things like Project Plowshares and the use of nuclear bombs to dig a new and better Panama Canal. But it was still fairly good-natured. Gofman began his work on cancer, chromosomes, and radiation essential for the proof of radiation damage. Things went quietly until 1969.

That year a man by the name of Dr. Ernest Sternglass, who had been studying infant mortality, published some papers saying that something on the order of four hundred thousand children might have died from the world-wide radioactive fallout from the bomb testing. And *Esquire* published an article saying "The Death of all Children" based on Sternglass' work. The AEC was desperately worried about this because they were just then trying to get the antiballistic missile treaty through Congress, and they thought if Sternglass' work was accepted, it might kill the ABM in the Senate. So they sent Sternglass' paper to all the labs. Gofman said he got it, looked at it quickly, and wasn't sure what to make of it. But Arthur Tamplin, one of his colleagues, was an expert on this. And Gofman asked him to do the assessment.

Arthur Tamplin concluded that only 4,000, not 400,000, children had been killed by fallout. The AEC, instead of being pleased with Tamplin, was "disturbed" because any kind of number did show that children died and they wanted that number removed. Gofman told the AEC representative to go to hell and Tamplin published his paper with the 4,000 number. And again, the sky did not fall in for the AEC. That was April 1969.

Then the sky did fall in for Gofman and his colleague Arthur Tamplin when they decided to give a paper in October of '69 that repudiated the AEC's claim that there is a safe threshold of radiation.[14]

The AEC maintained that there was a "safe threshold" of radiation below which no health effects could be detected. And we hear that argument to this day, including Fukushima. The so-called safe threshold provided the justification for exposing American servicemen to atomic bomb tests, for permitting workers in nuclear plants to receive a yearly dose of radiation, and for operating nuclear power plants which release radioactivity to the environment and expose the general population even during normal operation.

But in the 1960s evidence began to come in from around the world—from the atomic bomb survivors, and from people in Britain who had received medical radiation—with estimates of the numbers of cancers occurring per unit of radiation.

John Gofman on KPFA in 1979:

JWG: What we found in essence was that the risk of cancer induction by radiation had been underestimated by official bodies by about 20-fold. We found further that the Atomic Energy Commission, in league with the utility industry, was selling the idea that there was a safe dose of radiation. And so we began to say these things were not true in print and in talks.

The first response was to try to censor our papers which we had a hell of row about at the Livermore Lab.

AA: On what grounds?

JWG: They just didn't like what we were saying.

AA: And how did they try to censor it?

JWG: Dr. Tamplin, who was my colleague in this work, submitted a paper to the Laboratory because Dr. May, the Director of the Lab, had requested that I provide him with our papers before we give them so the AEC wouldn't be surprised. And, I said that's highly reasonable, we'll be glad to provide the papers in advance.

So we provided Dr. Tamplin's paper [which] the Livermore Lab itself censored and told Dr. Tamplin if he wanted to go to the American Association for the Advancement of Science's meeting and present that paper he could not identify himself as a member of the Lab, he must pay his own expenses, he could not use any Laboratory secretaries and he would be docked for his time.

Now that's never happened in the history of the Laboratory on the basis of a scientific paper. Ordinarily they'd love to pay his expenses to give a paper.

So I told Dr. May that this was absolutely unacceptable—

AA: Dr. May was?

JWG: The Director of the Livermore Lab; he had told me he would never tolerate censorship himself. And I said that I was going to submit to the American Association [for the Advancement] of Sciences a letter to be read at that meeting instead of Dr. Tamplin's paper stating that the Lawrence Livermore Laboratory was not a scientific laboratory where research could be bought and sold for a price and that that had to known publicly.

That worried Dr. May a great deal and they backed off on the censorship of Tamplin's paper and they did allow him to go to the meeting and they did pay his expenses. But within a couple of weeks after that they removed 12 of 13 of Tamplin's people, staff people. He had a group of 13. And from there on it was a battle royal where we were

> putting out information in the form of scientific reports and publications on the radiation risk and we were sort of *persona non grata* in the laboratory.

John Gofman with KPFA Radio news producer, Aileen Alfandary, in 1979.

Gofman said in *Nuclear Witnesses*,

> I wasn't able to undo [the firing of Tamplin's people]. I wrote a letter of complaint to Glenn Seaborg, and he said, "I can't interfere with lab management." Which was BS too.
>
> Then I started hearing that there were a lot of people from the electric utility industry who were insulting us and our work. They were saying our cancer calculations from radiation were ridiculous, that they were poorly based scientifically, that there was plenty of evidence that we were wrong.[15]

At that point Gofman had not said anything about nuclear power. He later said that was stupid of him. But now he wondered, "Why is the electric utility industry attacking us?" He said in *Nuclear Witnesses*:

> ... I realized that the entire nuclear power program was based on a fraud—namely, that there was a "safe" amount of radiation, a permissible dose that wouldn't hurt anybody. I talked to Art Tamplin.... I said, "we have a couple of choices. We can back off, which I'm not interested in doing and you're not interested in doing, or we can leave the lab and I go back to my professorship and you get a job elsewhere, or we can fight them. My choice is to fight them."[16]

And they decided to fight. And in the course of that fight, they produced an amazing array of scientific documentation.[17]

Come back for the next broadcast of TUC Radio to hear what happened next. [See Part Two.]

That was part one of a radio series on the late Dr. John Gofman, Professor of Molecular and Cell Biology at UC Berkeley and director of two major studies on the effects of radiation at Lawrence Livermore National Lab. In spite – or really because his close association with the Manhattan Project and the building of the bombs he became the most prominent, knowledgable, and outspoken campaigner in the cause to shut down all nuclear power plants.

Gofman's research, expertise and legacy in print and recording are of great importance in order to understand and handle the Fukushima nuclear accident which is a cause of concern for all.

Thanks to Leslie Freeman and her book: *Nuclear Witnesses: Insiders Speak Out*, to David Ratcliffe and his very well researched and informative web site ratical.org. Thanks to Egan

O'Connor, assistant to John Gofman from 1970 to his death in 2007. And to Aileen Alfandary and the Pacifica Archives.

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TUC Radio takes its name from an aeronautical term. Time of useful consciousness is the time between the beginning of oxygen deficiency and the loss of consciousness, the brief moment in which a pilot may save the plane.

My name is Maria Gilardin. Thank you for listening. Give us a call.

References

1. Leslie Freeman, *Nuclear Witnesses: Insiders Speak Out* (New York: W.W. Norton & Co., 1981, 1982). All page numbers listed herein are from the 1982 paperback. p.111.

2. Ph.D. in Nuclear/Physical Chemistry from the University of California at Berkeley, 1943. Dissertation: "The discovery of Pa-232, U-232, Pa-233, and U-233. The slow and fast neutron fissionability of U-233."

3. 1979 Pacifica Radio interview with KPFA news producer Aileen Alfandary.
   See Also: From Research to Laboratory Production of Plutonium, Human Radiation Studies: Remembering The Early Years – Oral Histories: Dr. John W. Gofman, M.D., Ph.D., conducted December 20, 1994, United States Department of Energy, Office of Human Radiation Experiments, June 1995.

4. The Right Livelihood Foundation is a registered charity with its office in Stockholm Sweden. Dr. Gofman shared the 1992 Award with Alla Yaroshinskaya: he "...for his pioneering work in exposing the health effects of low-level radiation" and she "...for revealing, against official opposition and persecution, the extent of the damaging effects of the Chernobyl disaster on local people." There are two Laureate listings for Dr. Gofman: the original 1992 issue and the current declaration.

5. See: 1946: M.D. from UCSF, Discoveries in Lipoprotein Chemistry and following, "Dr. John W. Gofman - His Life, and Research on the Health Effects of Exposure to Ionizing Radiation," by David Ratcliffe *rat haus reality press*, Sep 23, 2015.

6. *Nuclear Witnesses*, *op. cit.*, p.86.

7. *Nuclear Witnesses*, *op. cit.*, pp.87-88.

8. *Ibid.*, p.88.

9. 1979 Pacifica Radio interview with KPFA news producer Aileen Alfandary.
   See Also: "Jack, all we want is the truth", 1994 DOE Oral Histories: Dr. John Gofman, *op. cit.*.

10. *Nuclear Witnesses*, *op. cit.*, pp.88-89.

11. The title of the project he was asked by the AEC to found and be the first Director of was "Implications of All Nuclear Energy Programs upon Man in the Biosphere." See *Medical Research and Radiation Politics, Oral History Transcript*, by John W.Ive Gofman (Forgotten Books, 2013), p.124. This book is a reproduction of the original oral history transcript, conducted by Sally Smith Hughes in 1980, at https://archive.org/details/medicalresearchr00gofmrich. It appears the reproduction was fashioned from the text-only version of the transcript as typographical errors are rampant in the 2013 copy including the additional "Ive" characters following Dr. Gofman's middle initial on the book's cover and title page.

12. *Nuclear Witnesses*, *op. cit.*, p.91.

13. *Ibid.*

14. John W. Gofman and Arthur R. Tamplin, Division of Medical Physics (Berkeley) and Bio-Medical Research Division Lawrence Radiation Laboratory (Livermore) University of California, "Low Dose Radiation, Chromosomes, and Cancer", The Institute of Electrical and Electronics Engineers (IEEE) Nuclear Science Symposium, San Francisco, October 29, 1969. Published February 1970 in IEEE Transactions on Nuclear Science (Volume: 17, Issue: 1), pp.1-9. Reprinted in *Environmental Effects Of Producing Electric Power*, Hearings before the Joint Committee on Atomic Energy, 91st Congress, First session, Part 1, October and November 1969, pp.640-52.

15. *Nuclear Witnesses*, *op. cit.*, pp.99-100.

16. *Ibid.*, p.100.

17. In all, Gofman and Tamplin wrote 24 technical reports, which came to be known as "The G-T Series." The complete list was published in John Gofman, *Irrevy: An Irreverent, Illustrated View of Nuclear Power: A Collection of Talks, from Blunderland to Seabrook IV*, (San Francisco: CNR, 1979), pp.243-245. These reports were submitted to two Congressional Committees: the *Environmental Effects Of Producing Electric Power*, Hearings before the Joint Committee on Atomic Energy, 91st Congress in October and November 1969; and the *Underground Uses of Nuclear Energy*, Hearings before the Subcommittee on Air and Water Pollution of the of the Committee on Public Works, U.S. Senate 91st Congress, Part 1, November 1969, and Part 2, August 1970. As was explained in the published listing of these reports, "It is no error...that the date given to an entire volume may be earlier than the dates on materials included in that volume. Congress can operate that way." Their strategy was well conceived as in this manner, the papers were given wide distribution by being published in their entirety in the Congressional Record.