

'TOO CHEAP TO METER?'
ANATOMY OF A CLICHÉ

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It has become an axiom of the nuclear power controversy that the early advocates of fission energy once promised the ultimate free lunch — electricity “too cheap to meter.”

Recurrent press accounts have cited the prediction as an example of nuclear boosterism. Even a member of the Nuclear Regulatory Commission, Peter Bradford, picked up the refrain in a speech.

The phrase has been repeated so often that one might expect to find that it was once a literal goal of national nuclear power policy. Since energy from the atom is not, in reality, too cheap to meter, the unmistakable subliminal message is that consumers have been led down a garden path.

The only hitch is that there doesn't appear to be any real evidence that knowledgeable nuclear advocates ever made such a claim about fission energy. The documentation that has been used to support the allegation that they did is so obscure as to be virtually meaningless. The facts indicate, instead, that the real goal of the nuclear energy program was to generate electricity competitive with fossil fuels.

To begin with, the controversy over what was claimed for nuclear energy in its infant years is a relatively new phenomenon. A June 23, 1975, article in *The Washington Post*, by staff writer Peter Milius, resurrected the “too cheap to meter” phrase. Milius attributed it to a *government official* — Lewis L. Strauss, chairman of the Atomic Energy Commission, 1953-1958 — and he incongruously used it as an example of poor forecasting by the *nuclear industry*.

NRC Librarian Margaret Conyngham remembered receiving at about that time a few inquiries seeking the original source of the quote. “It was one of those things that people thought had been said, but that they couldn't put a finger on,” she said. Conyngham was unable to come up with anything.

Richard Hewlitt, the official historian at the Department of Energy and its predecessor agencies, also remembered being asked for the primary source of the quotation many times. He, too, was unable to find it, despite spending “hours and hours” searching through “hundreds and hundreds” of documents. The fact that it was not well preserved by historians itself casts doubt on the idea that national nuclear power policy ever had pursued such a goal. (By contrast, would one expect to have difficulty finding documentation of President Kennedy's goal of reaching the moon at the National Aeronautics and Space Administration library?)

In August 1978, an employee newsletter at the NRC (*REGNEWS*) renewed the search. Editor Virginia Grimager, since retired, printed an article in the August issue asking readers to help find the source. “It took about three months before we tracked it down,” Grimager recalls. “If I hadn't personally known some people I probably wouldn't have found it



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at all,” she said.

One of the numerous leads that Grimager followed was *The Washington Post* story by Milius more than three years earlier. “As with many other writers, Mr. Milius was unable to supply the time and place,” Grimager reported. A “chance contact” eventually led her to Dr. George Weil, a former assistant deputy director of the AEC and a veteran critic of nuclear technology.

The source of the remote, but by then often-cited, quotation at last had been found. Grimager learned from Weil that the speaker was indeed Strauss. The exact quotation: “It is not too much to expect that our children will enjoy electrical energy in their homes too cheap to meter.” The time and place, Weil said, was a Sept. 16, 1954, Founder's Day Dinner of the National Association of Science Writers (NASW) in New York. Grimager duly reported the information provided by Weil in *REGNEWS*.

(A subsequent check finds that *The New York Times* of Sept. 17, 1954, reported the speech. "ABUNDANT POWER FROM THE ATOM SEEN: It Will Be Too Cheap for Our Children to Meter, Strauss Tells Science Writers," said the multi-decked headline, which interestingly ran next to an article about the Iranian government forming spying trials for officers accused of Communist treason.)

NRC Commissioner Bradford used the quotation in an Aug. 2, 1979, speech. Bradford said that "for a time in the 1950s it was claimed that 'nuclear power would be too cheap to meter.'" He implied that this "delusion" had been a basic tenet of nuclear power development.

John Conway, president of the American Nuclear Energy Council, queried Bradford about use of the refrain on August 16. He asked the commissioner for the specific quotation and the identity of the person or persons who made the allegation in the 1950s.

Bradford, who was preparing to depart on a vacation, initially replied that he'd seen the quote numerous times, but that the only quick reference he had was *The Washington Post* article by Milius. (Bradford apparently was unaware of the research conducted by the NRC house organ, *REGNEWS*). Shortly thereafter Bradford wrote again to Conway, this time citing Strauss' 25-year-old NASW address.

Replied Conway, "To the best of my knowledge, Admiral Strauss was the only person of any authority to suggest that possibility back in the 1950s and, when he did, he was criticized by his peers within the AEC, as well as by other knowledgeable individuals in the industry and by members of the [now defunct] Joint Committee on Atomic Energy."

"Unfortunately, the hope expressed by one person . . . in 1954 is being used today to make it appear that this was a goal universally accepted by advocates of nuclear power. In truth, the goal in the 1950's was to demonstrate nuclear power would be competitive to coal — a goal which has been successfully accomplished," Conway asserted.

Even this rebuttal by Conway may have conceded too much, however, for Strauss' remarks to the science writers a quarter-of-a-century ago may not have been relevant to present-day nuclear technology. A re-examination of Strauss' prepared text for that September evening address shows that the comment was, at minimum, ambiguous.

Strauss began with a tribute to science writing throughout the ages and then went on to discuss the AEC's policy with regard to classified information and nuclear weapons research. About mid-way through his speech, Strauss turned to the AEC's interest in the peaceful aspects of nuclear energy. He revealed that the head of the AEC's Reactor Development Division would tell a conference in Brussels the next day that the United States expected to have "industrial atomic electric power" within "5 to 15 years, depending upon the vigor of the development effort."

The AEC chairman then launched into a lengthy paean to science filled with glowing predictions about the future. Said Strauss:

"Transmutation of the elements, — unlimited power, ability to investigate the working of living cells by tracer atoms, the secret of photosynthesis about to be uncovered, — these and a host of other results all in 15 short years. It is not too much to expect that our children will enjoy in their homes electrical energy too cheap to meter, — will know of great periodic regional famines in the world only as matters of history, — will travel effortlessly over the seas and under them and through the air with a minimum of danger and at great speeds, — and will experience a lifespan far longer than ours, as disease yields and man comes to understand what causes him to age. This is the forecast for an age of peace."

That paragraph in his speech was, to put it mildly, optimistic. But what did Strauss have in mind when he spoke of electricity too cheap to meter? And was it meant as a literal claim about the future cost of energy from fission reactors, which Strauss clearly was predicting would be a reality within five to 15 years?

The next-day report by *The New York Times* implied that this is what Strauss intended. *The Times* story gave that impression by connecting the ideas from the two disparate paragraphs. Said *The Times*:

"Rear Admiral Lewis L. Strauss, chairman of the Atomic Energy Commission, predicted here last night that industry would have electrical power from atomic furnaces in five to fifteen years." (Actually, unless he departed from his written text, Strauss said a member of the AEC staff would make the claim.)

"Our children will enjoy in their homes electrical energy too cheap to meter," he declared.

There is strong doubt, however, that Strauss ever meant for such a connection to be made. Presumably knowledgeable people believe, instead, that he was referring to *fusion* energy — not *fission* — when he spoke of electricity "too cheap to meter." (In 1954, when Strauss addressed the science writers, thermonuclear fusion was still clothed in secrecy. Conyngham, the NRC librarian, suggested that this could explain why Strauss did not elaborate on the concept in his speech.)

"I would say my father was referring to fusion energy," said Lewis H. Strauss, the admiral's son. "I know this because I became my father's eyes and ears as I travelled around the country for him," said the younger Strauss, a physicist who resides in Washington, D.C.

Kenneth D. Nichols, who served as general manager of the AEC under Strauss, also is convinced that the admiral was referring to *fusion* energy. To back up the conviction, Nichols pointed to Strauss' book, *"Man and Decisions,"* published in 1962, twelve years before his death. In the book, Strauss mentioned his support for an AEC project, codenamed "Sherwood," which was aimed at harnessing fusion energy. He described how a fusion reactor would utilize "virtually unlimited and easily obtained" fuel that would have an "extremely low" cost compared to uranium fuel.

Still another supporter of this interpretation is Richard Pfau, assistant professor of history at Dickinson College, who is currently at work on a biography

of Strauss (during which he claims to have culled through half-a-million documents). "I would say the quote absolutely referred to fusion," he said. Pfau also believes that when Strauss spoke of *children* enjoying meterless electricity, he did not mean it in the narrow, specific, sense, but in the way a man thinks of generations yet unborn, i.e. children's children's children.

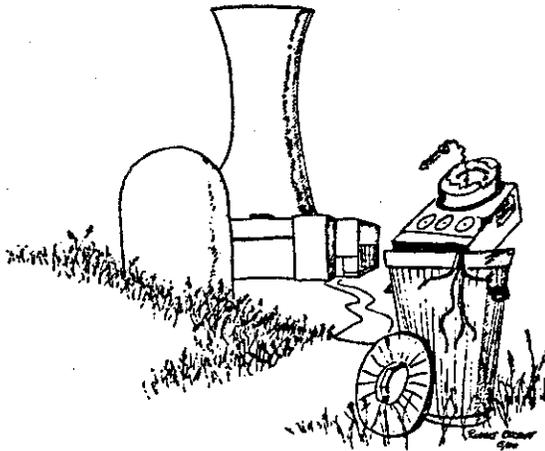
Whatever Strauss had in mind, there is widespread agreement that meterless electricity never was predicted by others who served on the AEC or on the JCAE.

"It was never said by me, or by any member of the JCAE in any speech that I have knowledge of," said Chet Holifield, former chairman of the joint committee. "I would have remembered this, because I was one of the most aggressive supporters of nuclear energy," Holifield asserted.

Holifield added that Strauss never predicted meterless electricity to the committee. "Even if he did say that in a speech, he never advocated that kind of a possibility before the JCAE, and he appeared there hundreds of times."

Holifield has a vague recollection of reading an article about meterless energy during the mid-1950s. He also recalls that the phrase may have been repeated by some other people who were "very uninformed." But, Holifield asserted, "It was never the position taken by the JCAE."

"No member of the committee ever had that concept of the economics of nuclear power, because we were too busy getting the research and development money and we didn't dare put ourselves in that position," he explained. "It would have been incredible to members of Congress."



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My recollection is that nobody took Strauss' statement very seriously," said James Ramey, who was an AEC staff member at the time, and who later became executive director of the JCAE and a commissioner of the AEC after that.

Ramey explained that it came at a time when only small prototype reactors had been built, such as the experimental boiling water plant at the

Argonne National Laboratory and the EBR-I experimental breeder reactor in Idaho. "Nobody took it very seriously. It was like what the solar people are saying today, because the technology wasn't there yet," Ramey said.

By 1956, when he became executive director of the JCAE, "there was a lot of derision by both the Democratic and Republican leadership about how cheap nuclear power was going to be," Ramey said. It wasn't until 1962-63, several years after the first demonstration plants went into operation, "that it began to look like, if you scaled up the technology, that you might be able to build plants competitive with coal and oil-fired plants," Ramey said.

The literature from the 1950s also suggests that the knowledgeable people were not making glib promises about the potential of nuclear energy, according to Conyngham, who said she spent considerable time delving into the subject.

"If you look back at the time, the reputable scientists were being extremely cautious about what nuclear energy would or would not be able to do," Conyngham said.

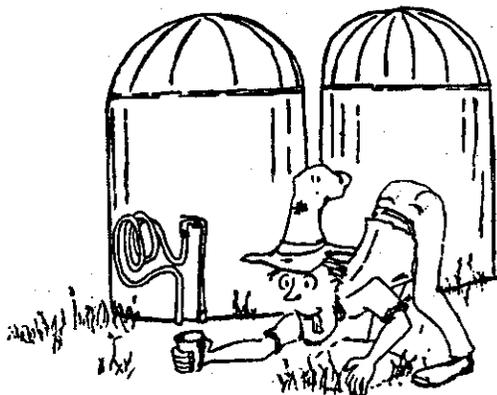
One example is the testimony of AEC Commissioner Henry DeWolf Smyth before the JCAE on June 2, 1954, just three months prior to Strauss' speech to the science writers. During hearings on the then-proposed Atomic Energy Act of 1954, the AEC's official view was as follows:

"Economic evaluations by the Commission and its contractors show that the probability of producing electricity from nuclear fuel at a cost competitive with electricity from coal, oil, or gas is good. The estimates generally indicate that if the goal of economic nuclear power is pursued with vigor, costs can be brought down — in an established nuclear power industry — until the cost of electricity from nuclear fuel is about the same as the cost of electricity from conventional fuels, and this within a decade or two. . . . At the same time it should be remembered that even the program outlined may not be sufficient to determine conclusively whether power can be produced cheaply enough from nuclear fuel to be of general use."

In sum, the real promise of fission energy was that it would become competitive with fossil fuels — a promise that has been amply kept around the world.

One final note. Even if Strauss was making a literal forecast about nuclear energy that proves incorrect, it wouldn't be the first time that this has happened. One might just as readily recall the prediction of Sir Ernest Rutherford, the renowned British physicist, who told a meeting of the British Association for the Advancement of Science in 1933:

"The energy produced by the breaking down of the atom is a very poor kind of thing. Anyone who expects a source of power from the transformation of these atoms is talking moonshine." — R.L.



"Anyone who expects a source of power from the transformation of these atoms is talking moonshine," Rutherford said in 1933.