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FROM: BOCKRIS, O'M. J.
TEXAS A&M UNIVERSITY

ADDRESSED TO: KREBS, MARTHA

SUBJECT:
MEMORANDUM CIRCULATED AT THE SECOND INTERNATIONAL ULTRA
LOW ENERGY NUCLEAR REACTIONS CONFERENCE, HELD IN COLLEGE
STATION, TEXAS ON SEPTEMBER 13 AND 14
LETTER FROM J. O'M. BOCKRIS

DUE DATE: N/A

ACTION TYPE: Appropriate Action

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OTHER CONCURRENCE:

OFFICIAL SIGNATURE:

COMPLETION DATE: N/A

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1. ER-4 WILSON	Information Only	10/16/96	
2. ER-2 DECKER	Information Only	10/16/96	

Fiber Cold Fusion
No need to reply
W/ 10/31

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October 8, 1996

Dr. Martha A. Krebs
Director, Office of Energy Research
U.S. Department of Energy (ER-1) Room 7B05B
1000 Independence Avenue SW
Washington, D.C. 20585

Dear Dr. Krebs:

The enclosed is a memorandum circulated at the Second International Ultra Low Energy Nuclear Reactions Conference, held in College Station, Texas on September 13 and 14.

A list of conference attendees is also enclosed, if you should wish to contact any who signed the memorandum for verification.

Sincerely,

A handwritten signature in black ink, appearing to read "John O'M. Bockris".

J. O'M. Bockris
Distinguished Professor of Chemistry

JOMB/bvm

Enclosures

cc: D. Nagel

ULTRA-LOW ENERGY NUCLEAR REACTIONS

In 1989, claims were made by Fleischmann and Pons (University of Utah) that deuterons, introduced into palladium at high fugacity, gave rise to heat of nuclear origin.

A program of testing was immediately initiated in all D.O.E. labs. This failed. Thus, a long (hundreds of hours) period of electrolysis is necessary before nuclear phenomena are manifest. This was not known to the early researchers. Consequently, the opinion spread that Fleischmann and Pons claims were invalid.

Since 1989, more than 1000 scientific papers on this subject have been published. The following is a list of what has been firmly established.

(1) In the Palladium-deuterium system, helium and tritium can be formed. The amount of the helium is a substantial fraction of that necessary to explain the observed heat, according to the process $D + D \rightarrow He^4 + \gamma$. The tritium arises from a side reaction and the amount is less than 1% of that needed to explain the heat.

(2) Heat can be produced at densities of between 10 and 1000 watts cc^{-1} . The use of thin films is an important condition for success.

(3) A number of new nuclei are produced in the near surface region.

(4) Other phenomena (e.g., the emission of X-rays) are seen.

Work on the theory of these phenomena has begun and some papers describing it have been published in established Journals of Chemistry.

These new phenomena (commonly called cold fusion but more accurately named "ultra low energy nuclear reactions") are studied under government sponsorship abroad, particularly in Japan, Russia and Italy. Their importance is manifest and in particular:

(i) The existence of such reactions (first hinted at by J.J. Thompson in 1913; and manifest clearly in little known experiments by Enrico Fermi in 1937) leads to a modification of the current theory of nuclear reactions. Before 1989 such processes would have been regarded as impossible.

(ii) The phenomena offer important technological opportunities, e.g., the low cost production of tritium, and the the production of nuclear heat without the accompaniment of dangerous nuclear wastes.

The United States remains behind in the competition for practical technology from low temperature nuclear reactions. We recommend a government research budget of more than \$10M/yr (Japanese government support alone: \$12M/yr.)

Signed:

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