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CFP (Cold Fusion Phenomenon) stands for

"nuclear reactions and accompanying events occurring in open (with external particle and energy supply), non-equilibrium system composed of solids with high densities of hydrogen isotopes (H and/or D) in ambient radiation" belonging to Solid-State Nuclear Physics (SSNP) or Condensed Matter Nuclear Science (CMNS).

This is the *CFRL News* (in English) No. 87 for Cold Fusion researchers published by Dr. H. Kozima, now at the Cold Fusion Research Laboratory, Shizuoka, Japan.

This issue contains the following items:

1. From the History of CF Research (1) – *DOE Report 1989* and *DOE Report 2004*

It has passed by a quarter of a century since 1989 when the cold fusion phenomenon was discovered by M. Fleischmann and his colleagues. In this period, we have had very many papers and books on the various events in this field from neutron emission to nuclear transmutations not only in deuterium but also in protium systems. These events have shown participation of nuclear reactions in the processes which resulted in their

products.

We have given a brief review of the works in this cold fusion phenomenon (CFP) [Kozima 2014d] and discussed their connection with the knowledge in nuclear physics [Kozima 2014a] at JCF14 held in Tokyo in December 2013 to bridge over the abyss between the science of the CFP and existing fields of science.

Unfortunately, we have lost communication with scientists in the existing fields almost in these long history over 25 years and have had no chance to publish papers in this field in periodicals published by scientific societies and publishers except few exceptional cases. One of these exceptional cases was the review paper by E. Storms appeared in the *Naturwissenshaften* and a critique on the paper by S. Krivit which were taken up in our review paper [Kozima 2014d].

Accordingly, we have lost communication from scientists in the outside world for a long period except several cases where they forced to respond the works obtained in the field of the CFP. Two of these fortunate cases was the investigation of the CFP by the Department of Energy, US Government who published their results as we refer to them as DOE Report 1989 [DOE 1989] and DOE Report 2004 [DOE 2004].

It is therefore, valuable to investigate their reports from our point of view established on the abundant experimental data we have at present. We have, however, to notice that the reports are written by scientists who were nominated by the DOE and asked to investigate limited materials in this field selected for their purpose – evaluation of the results obtained by chosen investigators.

We have given a brief critique on the DOE Report 1989 in the former book [Kozima 1989] and on the DOE Report 2004 in the second book [Kozima 2004]. It is our pleasure if our critiques are useful in the evaluation of two reports to promote our research works in this field. The critique given in the Sec. 1.2 of the former book is posted at CFRL website:
http://www.geocities.jp/hjrfq930/Books/bookse/bookse01/chap1.htm

For the reader's convenience, we post the Executive Summary and the Conclusions and Recommendations of the DOE Report 1989 in this website next to the News.
The critique given in the Sec. 1.8 of the second book is posted at CFRL website:
http://www.geocities.jp/hjrfq930/Books/bookse/bookse03.html
For the reader's convenience, we post the Summary and selected Reviewer's Comment of the DOE Report 2004 in this website next to the News.

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[Kozima 2014a] H. Kozima and K. Kaki, "Atomic Nucleus and Neutron — Nuclear Physics Revisited with the Viewpoint of the Cold Fusion Phenomenon," *Proc. of JCF14:* **14-5**, pp. 47 – 76 (2014) and posted at JCF website:
http://jcfrs.org/file/jcf14-proceedings.pdf.
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2. Nuclear Transmutation is taken up by the *Nikkei Ecology* – a commercial monthly journal in Japan – as one of "Promising Future Technology"

The Nikkei Ecology (in Japanese) 201407 published by Nikkei Inc. issued a Special Program including **"Make Profit by Made in Japan – 'In Front of R&D'."**

In this program, there are following themes; 1. Botanic Factory, 2. Methane Hydrate, 3. Elemental Transmutation, 4. Nuclear Fusion, 5. Celestial Solar Power Generation.

The original page of the theme 3 is posted at CFRL website;
http://www.geocities.jp/hjrfq930/News/NewsPrefaces/NikkeiEco1407.pdf

On this theme, they report the works done by Y. Iwamura et al. in Advanced Technology Research Center (Mitsubishi Heavy Industries, ltd.) by the title:

"**Elemental Transmutation – Artificial Production of Rare Metals**,
A possible application of the "modern alchemy" to transmute elements is at hand. It is possible to realize detoxification of radioactivity in 10 years and production of rare metals in 20 years."

They say that the MHI established the fundamental technique of "Elemental

Transmutation" to change an element into another by a reaction with deuterons. In their explanation of the mechanism of the transmutation, they say "Researchers assumes a possibility of the transmutation of Ce into Pr induced by absorption of 4 protons and 4 neutrons."

This mechanism, however, is only a number-juggling of atomic and mass numbers of the original and product nuclei.

In the history of the CFP research, too much attention has been paid to *d* – *d* reactions ignoring or disregarding nuclear transmutations and events in protium systems even if there is a following sentence in the pioneering paper [Fleischmann 1989] suggesting a possibility of other nuclear reactions:
"It is evident that reactions (v) and (vi) are only a small part of the overall reaction scheme and that other nuclear processes must be involved." (page 308. Reaction (v) D + D → T + H, Reaction (vi) D + D → 3He + n.)

We have given a consistent explanation of nuclear transmutations including papers by Iwamura et al. in conjunction with other data such as excess heat production [Kozima 2014c].

In addition, the diminution of radioactivity mentioned in the title of the article is also discussed in our paper using nuclear physics of the neutron matter in CF materials [Kozima 2014b]. It should also be mentioned that there have been granted several patents on the decrease of radioactivity by the CFP (e.g. [Patterson 1997]).

References

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3. On the Dignity of Scientists (3) – STAP Cell Scandal –

In the article "2. On the Dignity of Scientists (2)" of this News No. 85, we have made reference to the STAP cell troubles as an example to learn something from it. The case, however, made unexpected development on which we have to mention a word.

The *Nature* have retracted two papers by Obokata et al. on the STAP cell as follows [Nature 2014]:
"Several critical errors have been found in our Article[+] and Letter, which led to an in-depth investigation by the RIKEN Institute. The RIKEN investigation committee has categorized some of the errors as misconduct (see Supplementary Data 1 [Riken 2014a] and Supplementary Data 2 [Riken 2014b]). Additional errors identified by the authors that are not discussed in RIKEN's report are listed below. - - - "
[+] (http://dx.doi.org/10.1038/nature12968)

On the other hand, the Japan Broadcasting Corporation (NHK) broadcasted a program on this problem [NHK 2014] on July 27. The contents of the program included several phases of the problem from scientific to organizational. They called an investigation group with six members[*] of The Molecular Biology Society of Japan (which will be referred as "NHK committee" hereafter).

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The NHK committee includes following Professors in Universities in Japan; Prof. Keiichi Nakayama (Kyushu Univ.), Prof. Tohru Nakano (Osaka Univ.), Prof. Akira Shinohara (Osaka Univ.), and Prof. Yosuke Takahama (Tokushima Univ.).

One of the defects of the papers by Obokata et al. pointed out by the NHK committee is the lack of identification of the original mouse, the STAP cells cultured, and the chimaeric mice generated by the TCR reconstructions[**]. The NHK committee concluded that "It was the point where the authors of the papers should pause to reconsider their work (when they recognized the deficit of the data)." As we see in the original paper[**] cited below that the authors did not identify the TCR reconstructions of the original mouse and the STAP cell cultured, even if they identified those of the STAP cell cultivated and the chimaeric mice generated.

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"TCR-β chain gene rearrangement analysis (「Obokata 2014a」 p. 27)
Genomic DNA was extracted from STAP cells and tail tips from chimaeric mice generated with STAP cells derived from CD45+ cells. PCR was performed with 50 ng

DNA using the following primers (Dβ2: 5′-GCACCTGTGGGGAAGAAACT-3′ and Jβ2.6: 5′-TGAGAGCTGTCTCCTACTATCGATT-3′) that amplify the regions of the (D)J recombination. The PCR products were subjected to gel electrophoresis in Tris-acetate-EDTA buffer with 1.6% agarose and visualized by staining with ethidium bromide. PCR bands from STAP cells were subjected to sequencing analysis and identified as rearranged genomic fragments of the (D)J recombination."

Dr. Sasai told at the press conference on the end of January as follows:
"The T cell receptor (TCR) is, difficult to explain in everyday language, shows a finger print of the cell and it shows the STAP cell is the cell differentiated from the original." His explanation given here has meant that he has full recognition of the importance of the identification of the original and cultivated cells by TCR. We cannot help deciding that the lack of the identification in the paper shows intentional concealment of the failure.

Another fact revealed in the NHK program is that Dr. Sasai is playing the leading role in construction of the Kobe Medical Industry Development Project (Hyogo Prefecture) at the center of which is the Riken CDB (Center for Developmental Biology). He is supposed to be the Manager or Coordinator of the Project according to Mr. T. Miki of the former director of the Promotion Division of the Kobe Medical Industry Development Project, Kobe City.

It is possible to say from this situation of Riken around him that Dr. Sasai has been an important manager of the Riken CDB in the Kobe Medical Industry Development Project and participated in the STAP cell paper as a research manager in addition to or instead of a scientist.

Professor S. Tomonaga, once worked as a researcher in Riken under Dr. Yoshio Nishina before World War II, made a lecture at Riken after winning the Nobel Prize and said as follows (according Nikkei (May 14, 2014) and translated into English by H.K.):
"A new technology created by scientific investigation results in an extreme profit. Then, there appears a view in which science should be promoted very much. However, it is necessary to understand the true value of science itself in its promotion. If it is not so, the treatment spoils science and scientists also. Then, it is possible that scientists behave illegally."

Newspapers of August 5, 2014 have reported the death of Dr. Sasai: "Mentor of

disgraced STAP cell scientist commits suicide" (Asahi). Foreign newspapers also have reported the fact and also printed interpretive articles on the suicide in Japan (e.g. [WSJ 2014]).

P.S.
Nature published an obituary to Dr. Y. Sasai by A. Alvarez-Buylla on the page 34 of the Nature Vol. **513**, 4 September 2014 [Nature 2014b]. The page is posted at the following CFRL website:
http://www.geocities.jp/hjrfq930/News/NewsPrefaces/Sasai.pdf

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