

Fukushima: Is the CNRS a purveyor of ignorance?*

Or

Fukushima: the CNRS does not tell the truth and indoctrinates the masses*

On January 7 2013, CNRS (the French National Center for Scientific Research) gave access to a « [scientific multimedia site](#) » on nuclear energy intended for the general public.

As a CNRS researcher trained in economics, based in Japan, where I have been developing since the last two years research on the forms and limits of human protection in the context of the Fukushima disaster, I am anxious to dissociate myself from what is said in this « animation » aiming at the mass indoctrination and at keeping quiet about the situation in Fukushima.

The reasons of my dissociation are given here. I concentrate my arguments against the «animation» on the following seven points:

- The questionable estimates of the numbers of victims from radiation exposure
- The absence of less a accommodating picture on Chernobyl's morbidity provided by Ukrainian authorities
- The ignorance of radiation effects through transgenerational genomic instability and the bystander effect
- An implicit concession to the “radiophobia” approach
- The silence on the WHO-IAEA 1959 agreement
- A questionable interpretation of the origin of the Fukushima nuclear disaster
- The silences on the Fukushima disaster.

** About 55.000 readers accessed and over 400 comments were made after a shorter [French version](#) of that article that was published on 16 January 2013. Up to now no official answer or public statement was made by any representative of the CNRS or of the CNRS website dealing with nuclear energy, to respond or contradict the present analysis.*

Questionable estimates of the numbers of victims from radiation exposure

In the « scientific » report of the CNRS, assertions without any arguments in support and taking the appearance of unquestionably obvious facts are legion. For example it is claimed that «nuclear power is a political investment on the very long run which requires decisions over several decades, hard to call into question even after a major nuclear accident like the one in Fukushima ». We also learn that the report of the WHO and of IAEA on the Chernobyl catastrophe, published in 2005, under the aegis of the United Nations, estimates the number of deaths of immediate victims after the accident to less than 50 to 2 200 the number of excess deaths brought about by the exposure to radiation of 200 000 « liquidators » among

the most exposed. Such assertions are not false in themselves, but in front of it we could at least expect a minimal critical distance from a scientific organization such as CNRS.

Must it be repeated that those estimates have been put into question by the [Union of Concerned Scientists](#) (which announces 25.000 fatalities) or by a study published in the [Annals of the New York Academy of Sciences](#) (1) (announcing between 211 000 and 245 000, 15 years after the catastrophe), among other studies such as the 2006 [Torch report](#) (2) estimating that the worldwide collective dose of 600,000 person Sieverts will result in 30,000 to 60,000 excess cancer deaths, that is 7.5 to 15 times the figure release by IAEA statement in 2005 ?

According to a predictive study made by [Cardis](#) et alii (3) published in the International Journal of Cancer in 2006, by 2065 about 16,000 (95% Confidence Interval CI 3,400-72,000) cases of thyroid cancer in Europe due to exposure to iodine-131 from Chernobyl and 25,000 (95% CI 11,000-59,000) cases of other cancers may be expected due to radiation from the accident. Moreover, this study used a DDREF (dose and dose rate effectiveness factor) of 1.5.

The DDREF is, according to IAEA « the ratio between the risk or radiation detriment per unit effective dose for high doses and/or dose rates and that for low doses and dose rates. It is used in the estimation of risk coefficients for low doses and dose rates from observations and epidemiological findings at high doses and dose rates. » If, for example, the DDREF is two, then it means the risk per unit dose at low doses or low dose rates (or both) is half compared to the risk given by a linear extrapolation from the high dose region. Thus it is the assumption of the International Commission on Radiological Protection (ICRP) that, for cancer, the initial dose response would have half the slope of the direct linear extrapolation of the Japanese bomb survivor data.

But in fact this is contested as there is no specific evidence to support it. According to recent scientific works in the light of what we know today DDREF should be 1.0 or possibly less: according to Keith Baverstock « the epidemiological evidence is now overwhelming that there is no sparing at low dose rates. » In their recently made accessible Agenda for Research on Chernobyl Health (Arch Project) [Technical Report](#) (pages 112 and following) (4) the authors Andrei V Karotki and Keith Baverstock explained very instructively in the Addendum to the report that « the ICRP has adopted a dose and dose-rate effectiveness factor (DDREF) equal to 2, in effect assuming that at low doses (<100mGy) and low dose-rates the risk per unit dose will be half that at high doses and dose-rates » but that « there is no evidence to support this in terms of cancer induction and the curvilinear dose response data upon which it is based are not confirmed if later, more sophisticated, methods of measuring chromosomal aberrations are used. In this case the response is much more linear, suggesting a DDREF of unity. » The authors even point out that a DDREF inferior to 1 is fully supported by evidences from different radiation worker studies (Cardis, Vrijheid et al. 2007) (5) and from the analysis of the Techa River data (Krestinina, Preston et al. 2005 ; Eidemuller, Ostroumova et al. 2008; Eidemuller, Ostroumova et al. 2010; Krestinina, Preston et al. 2010) (6) (7) (8) (9).

Recently health effects due to radiation exposure have been established epidemiologically in the case of Chernobyl, a [study](#) by Zablotska et alii (2012) (10) of leukaemia in cleanup

workers from exposure to whole body radiation providing evidence of increased risk of leukemia associated with chronic protracted exposure to low doses of ionizing radiation.

Therefore, previously mentioned Cardis' estimates should be multiplied by 1.5. This means that the upper 95% CI is about 90,000 incident cases of cancer excluding the thyroid cancers, and about 108,000 for the incident cases of thyroid cancers. Always by the year 2065, about 16,000 deaths from these cancers may occur (95% CI ranging from 6,700 to 38,000) according to Cardis study (3), which means that the upper 95% CI is about 57,000 deaths.

In such context, the information and knowledge selection made by the CNRS is particularly surprising for an international scientific organization where freedom of researchers is supposed to be a crucial dimension of « scientific progress ». Especially since the WHO's report mentioned and used as a reference by CNRS was actually preceded by a draft version of the UN's Chernobyl Forum in 2005 suggesting up to 4,000 deaths could be linked to the incident (this figure being based on the 600,000 people exposed to high levels of radiation such as liquidators, evacuees and residents of the strict control zones) and the full report suggesting another 5,000 of the 6.8 million people exposed to lower levels in other contaminated areas would also die for a total of about 9000 deaths among the most exposed persons in Belarus, the Russian Federation and Ukraine – even though this figure did not appear in the 50 pages executive summary. Actually those estimates were once again based on a previous Cardis et alii's [work](#) ... dated back from 1996 (11)!

In an [interview](#) dated from April 2006 for the scientific journal Nature, Melissa Fleming, a press officer for the IAEA, explained why the 4,000 figure was actually given prominence in the WHO report: « It was to counter the much higher estimates which had previously been seen » and « it was a bold action to put out a new figure that was much less than conventional wisdom. »

A less accommodating picture on Chernobyl's morbidity provided by a Ukrainian report

On the morbidity side, in Ukraine alone, a recent [governmental report](#) of the Ministry of Ukraine of Emergencies, dated from 2011 and titled «*Twenty-five Years after Chornobyl Accident: Safety for the Future*» (12) provides a much less accommodating picture of the post-Chernobyl situation than the one proposed on the CNRS website. This report shows among other things that « as of 01.01.2010 in the organs of Labour and Social Welfare of Ukraine were registered 2,254,471 citizens affected by the Chernobyl disaster, including 260,807 the Chernobyl clean-up workers (...) Children-victims of the Chernobyl disaster are registered as 498 409 persons. »

« According to the annual clinical examination of affected troops 314,192 clean-up workers of the Chernobyl accident are registered in SRU, among them 207,486 – liquidators of 1986–1987. Epidemiological studies after the accident revealed in clean-up workers growing rate and radiation risks of stochastic and non-stochastic effects of irradiation – leukemia, some forms of solid cancers, non-tumour diseases. Descriptive analysis of long-term monitoring of tumors in affected populations shows the excess of national rates of this pathology only in the clean-up workers of 1986–1987 participation. Among all the forms the largest increase was in cases of thyroid cancer – 5.6 times. Incidence of breast cancer in female liquidators of

1986–1987 exceeded the expected level by 1.5 times. » (p.111).

« Preliminary analysis of the incidence among the male clean-up workers (20 years and over) showed the change of structure with increasing number of individuals with CLL (chronic lymphoid leukemia) compared to similar indices in Ukraine as a whole: the incidence of CLL among the male population of Ukraine was 42%, and among the liquidators, about 60 %; acute myeloid leukemia and chronic myeloid leukemia in the population of Ukraine were 12 % and 13 %, and among liquidators – 6 % and 17 % respectively. » (p.112).

In terms of *non-tumor morbidity of clean-up workers* « From 1988 to 2008 among clean-up workers the proportion of healthy people decreased from 67.6 % to 5.4 %, chronic non-cancer pathology respectively increased from 12.8 % to 83.3 %. » (p.113).

« Mortality of clean-up workers from non-tumor diseases for the period 1988–2008 increased from 2.2 ‰ to 12.0 ‰. » (p.117).

« A risk-analysis revealed a highly significant dose-related effect of the Chernobyl clean-up workers of 1986–1987 mortality from non-tumor diseases and cardiovascular diseases. » (p.119).

According to the same report, « Attracts attention a sharp rise in registration of certain classes of disease in 2009 compared to 1992 in suffered children with respect to child population as a whole, namely: endocrine diseases – 11.61 times, diseases of the musculoskeletal system – 5.34 times, the digestive system – 5,00 times, mental and behavioural disorders – 3.83 times, cardiovascular diseases – 3.75 times, urogenital system – 3.60 times. (...) In the dynamics of post-accident period, the weight of healthy children decreased from 24.1 % in 1992 to 5.8 % in 2008, and the number of children with chronic diseases increased from 21.1 % in 1992 to 78.2 % in 2008. (...) In SRU are 13,136 children born to the Chernobyl clean-up workers of 1986–1987, among them in 1,190 (90.6 per 1000) recorded inborn birth defects (IBD). » (p.110-111).

If the data contained in this official report are to be considered as not trust worthy enough by the French scientists who managed to communicate about the Chernobyl catastrophe on the CNRS website on nuclear energy, then they should at least bring the evidences showing how this report is wrong. What would be the response of the French government to another foreign government dismissing one of their reports essentially as fiction? Would not the responsible action for a country as heavily dependent on nuclear energy as France be to mount an investigation of this evidence in cooperation with Ukraine? In fact, there is some evidence in the scientific literature of unexpected changes in health status among exposed children and these need to be further investigated not ignored. In other words CNRS should be drawing attention of the French authorities to the need for further investigation, and not just getting out of its scientific responsibility by only reproducing in a biased way the available data. The pool of “common knowledge” about radiation effects might be much larger that the closed universe the CNRS website designers subjectively selected and drawn upon.

If the United Nations are the only relevant source accredited to the CNRS scientific controllers, why don't they refer to an even more radiorevisionist report published by the UNSCEAR (United Nations Scientific Committee on the Effects of Atomic Radiation, 2011) (13) showing that the Chernobyl catastrophe only made « less than 50 fatal casualties » due to radiation exposure, 15 from fatal thyroid cancer and 47 among the emergency teams, even considering that 19 of them died in 1987-2004 of « various causes not necessarily associated with radiation exposure » ? It is true that, from the point of view of the CNRS to use estimates of a death toll showing a « few » more fatalities due to radiation nuisances can contribute to create the deplorable travesty of a « scientific independence » the researchers are often referring to in spite of their constant cohabitation with their « partners »: CEA (Commissariat à l'Énergie Atomique), ANDRA (Agence nationale pour la gestion des déchets radioactifs), IRSN (Institut de Radioprotection et de Sécurité Nucléaire), EDF, AREVA.

We should mention that the day after a previous version of the present article was published on the website of RUE89, the originators or authors of the CNRS website on nuclear energy decided to alter their own phrasing and very shyly added the following paragraph:

« However, those figures are the object of strong controversies into the international scientific community and today, more than twenty years after, it is therefore very difficult to get a reliable estimate of the number of victims of this catastrophe. »

But still no alternative figures, even though those existing, were mentioned in that addendum.

Ignored radiation effects: transgenerational genomic instability and the bystander effect

Another important issue which is not addressed on the website animation of the CNRS is that of transgenerational genomic instability and the bystander effect as detected in 1996 by Dubrova et alii (14). However, according to Keith Bavertsock (Department of Environmental Science, University of Eastern Finland, Kuopio) « there are strong reasons to believe that this is a very serious but so far under-recognised health problem. »

Genomic instability describes the delayed radiation effects in the irradiated cell and its progeny, whereas the bystander effect describes the response of non-irradiated cells to the targeting of a neighbouring cell by radiation. Both effects are thought to be important, in terms of dose effect, at low doses.

According to David J. Brenner from the Center for Radiological Research, Columbia University Medical Center, and Rainer K. Sachs from the Department of Mathematics, University of California, Berkeley (2006) (15):

« Our understanding of the effect of inter-cellular interactions is still in its infancy, but those multi-cellular effects which have been investigated at low doses, such as bystander responses, often show an increased mutagenic or oncogenic risk per surviving cell, compared with what would be estimated using LNT (linear no-threshold). For example, there is evidence that some bystander effects saturate at quite low doses, in which case the first hit to any cell in a communicating population of cells could be more dangerous to the

population than subsequent hits to other cells in that population—implying that LNT would underestimate risks at very low doses » (p.254).

In a recently published paper untitled « *What mechanisms/processes underlie radiation-induced genomic instability?* », (16) Andrei V. Karotki (formerly of the Radiation Group, International Agency for Research on Cancer, France) and Keith Baverstock explain that:

« Radiation-induced genomic instability is a modification of the cell genome found in the progeny of irradiated somatic and germ cells but that is not confined on the initial radiation-induced damage and may occur de novo many generations after irradiation. Genomic instability in the germ line does not follow Mendelian segregation and may have unpredictable outcomes in every succeeding generation. This phenomenon, for which there is extensive experimental data and some evidence in human populations exposed to ionising radiation, is not taken into account in health risk assessments. It poses an unknown morbidity/mortality burden. » (p.3351).

Thus, according to the two scientists while radiation can act to cause health damage through the mediation of specific mutational damage there is a second process in which the organizational, rather than the material, properties of the living cell respond to the deposition of energy from ionizing radiation: « That the damage that characterises GI appears late and is sometimes different in character to that directly inflicted by radiation is an indication that the cause of GI lies not in the material but in the efficient cause, i.e., it is a result of the “process” underlying molecular change rather than the molecular change itself. » (p.3356).

The authors go on :

« At the time of the discovery of the structure of DNA in 1953, there was deep concern about the population genetic consequences of radioactive fallout from atmospheric weapons testing, particularly in terms of the recessive disease. The concept, therefore, that radiation effects could be understood in terms of material changes to the coding sequence of DNA (mutations) had considerable traction and indeed single locus hereditary effects can be explained in that way. The extension of these ideas to somatic disease, particularly cancer, was therefore a natural progression. (...) However, the focus on material causation to explain radiation effects allowed little incentive to explore the role of process, i.e., efficient causation. » (p.3357).

And they conclude that:

« The still dominant metaphor for the cell is the machine. A consequence has been an almost complete failure to realise that radiation effects could also result from damage to processes taking place in the cell as well as to DNA or other material components of the cell. » (p.3357).

The Agenda for Research on Chernobyl Health [Technical Report](#) (4) also warns us that « As far as cancer is concerned a rather simplistic picture of radiation as an initiator has dominated thinking on radiation carcinogenesis, largely based on the survivors of the atomic

bombings in Japan, and has to be replaced by a more complex picture where radiation may not only initiate but also promote cancer. For example, post-mortem examination of the tissues of trauma victims provides evidence of latent pre-cancerous lesions in many tissues of adults. In addition a proportion of the population will be carrying developing cancers which may take several years to become evident. Were the latent lesions to progress to full scale tumours or the developing tumours be accelerated, the age specific tumour incidence rates would be increased. Enderling (2009) (17) has proposed that the latent lesions are surrounded by very slowly dividing cells that constrain their further development and that disturbance of these lesions (by radiation) could provoke their proliferation in tumours. Thus, there are ways in which radiation could act to increase cancer incidence quite independently of its ability to initiate cancer. » (p.113).

Here again, our conclusion is that the neglect from CNRS on its website of such latest scientific advances, even though rather complex to explain but always transmittable to a large public, is also worth to mention here.

Asserting truth with certainty when we know there are doubts, and asserting doubts with scepticism when there are established truths, those are two parts of the ignorance production mechanism the CNRS seems to participate to on his website.

Radiophobia and psychosocial effects: between underplay and overplay

Another questionable point in the CNRS site is the following idea flirting with «radiophobia» even though the use of this notion is avoided by the CNRS:

« Other serious consequences, particularly psychosocial, exist for the human populations: distress can lead to suicide and evacuated populations who loose everything they have overnight and the fear of contamination (in Chernobyl, a large number of women aborted because of the fear to give birth to malformed children). »

We notice an attention given to the so-called « psychosocial consequences » as large as the attention given to the assessing of the number of deaths by cancer induced by radiation. Again, such biased perspective has been and is still used in favour of the non evacuation of the population, relativizing the seriousness of the physiological sanitary effects of radiations, while as it was mentioned before according to the Ukrainian governmental report among the 13,136 children born to the Chernobyl clean-up workers of 1986–1987, almost 10% recorded inborn birth defects, showing that mother's fear of contamination and the fear to give birth to malformed children are actually well-founded and are not only resulting from a general psychological state of «radiophobia».

We can also argue that psychological effects of a nuclear accident exist in the sense that being affected physically by radiations produces a degradation of the psychological strength (for example by producing a depressed state of mind) not in the sense of the consequence of an anxiety due to an overestimation of the risk by the population, but as a consequence of being in a contamination situation.

Since 1958, WHO has been trying to use psychological and social studies in order to shape

the mind of the populations, especially children, so that they accept without problem the industrial reality which is imposed to us. A study group worrying about the population acceptance of nuclear energy was formed including Dr M. Tubiana, who has always been convinced of the absence of any health effects of low dose radiations, Dr A.M. Brues, according to whom in the field of radiation effects “many victims were victims because they needed to”, Pr A.H. Leighton a former leader of U.S. Strategic Bombing Survey in charge of studying the feelings and the reactions of survivors from atomic bombings, or Lord R. Calder author of a book untitled *Living with the atom*. In a WHO publication dated from 1958 (18) the experts wrote:

« In general, it is possible to act upon today’s adults only in a fragmentary way (...) History demonstrated that we can obtain a lot by acting on the intellect, but we cannot get a modification of deep attitudes. It is only with the human being at the step of childhood and by using methods of education very different from the one characterizing most of the civilizations that we will be able to obtain a modification at the scale of a nation. » And the team concludes: « Now it seems that we already know enough about the human development and about the human psychology to be able to start to educate children how to live by adapting themselves with their own insecurity. » (p.44).

Among the “positive measures aiming at increasing the trust of the public” we find the following rather striking recommendation from the same mental health specialists:

“By using propaganda to restore the trust of the public one takes the risk to fail. We rather need to consider the issue in the perspective of a conditioning process. Thus during the WWII the case of refugees demonstrated that human beings acquire reflexes then automatically activated by symbols previously charged with a terrifying meaning; for example the view of a military uniform would arouse sometimes an irrational fear, even in a friendly environment. We have been able to modify such mechanisms by cautiously and gradually familiarizing the refugee with the dreaded objects and by developing inside him an actual as well as an intellectual understanding of the meaning of such objects. Such lessons can be applied to the setting up of nuclear plants.” (p. 47-48).

On the other side, in spite of such declarations from WHO’s experts clearly showing how “scientific” expertise can just be transformed into a public relation and communication activity for the nuclear industry, the impact of psychosociological effects after Chernobyl should not be underplayed because of the confusion created by its instrumentalization by the nuclear industry and by international organizations. In 1990, a WHO/EURO report (19) by a *Working Group on Psychological Effects of Nuclear Accidents* identified six « dimensions » of such effects in Chernobyl and it seems pretty clear that similar effects are arising in Japan: the sociopsychological dimension of the perception of risk involved in radiation, and the part information policy plays; the sociocultural dimension of the displacement and consequent social disruption of communities; the general pathogenic factor relating to physiological stress reactions and to changes in lifestyle, such as dietary habits and the consumption of alcohol; the medical sociological dimension concerning changes in the illness behaviour of the population and in the diagnostic behaviour of the doctors; the socioeconomic dimension relating to the large-scale effects of the accident, such as the closure of nuclear plants and the reversion to other sources of energy; and the radiopathological dimension and its

nonstochastic and stochastic effects.

It is a well known fact that the industry tries to distance itself from its responsibility concerning the psychosocial aspects of nuclear activities, even though at the same time it tends to influence the perception of such effects by the population as being as much or even more detrimental for health, but the two are intimately connected and if the industry was making any type of other good, like cheese, there would be no psychosocial effects from an accident at one of their factories. Moreover because of such distancing, the industry contributes to create the fear of people.

If we admit the principle according to which one has to take responsibility for actions with adverse effects on others, and if we admit that radiation can not only modify the DNA but that it can also modify the state of mind, then the industry should take its responsibility for such modifications. However, the industry knows about the existence of those psychosocial effects and it is the reason why they want to convince the population that radiation is safe, but actually they failed to do so and are responsible for such failure.

In a recently published book untitled *Scepticism: Hero and Villain* (Eds: R. Calne and W. O'Reiley, 2012) (20), D. Williams and K. Baverstock remind us (*Chapter 3 : Scepticism and Radiation*, p. 43) : « One eminent psychologist when asked how people could be made to be more comfortable with radiation replied that it would be necessary to make them comfortable with the concept of nuclear war. »

Here again, in order to initiate a proper independent debate about the Chernobyl health impact, scientific institutions such as CNRS should consider to review more exhaustively than before the scientific work which has been produced, including the work dealing with the psychosocial dimensions of nuclear disasters. One consequence of such higher interest given to those effects of the nuclear catastrophe would be to help drawing the line with the pathological effects, to get rid of the confusion introduced by notion like «radiophobia», and to contribute to establish more clearly the responsibility of the industry through all the dimensions of their nuisances.

The silence on the WHO-IAEA 1959 agreement: a lack of independence from CNRS?

The CNRS website's treatment of the Chernobyl catastrophe as well as of the Fukushima disaster could have been the right opportunity, namely but not only in the debate on the numbers of victims of radionuclides releases, to remind its readers of the ambiguity of the relations between the World Health Organisation (WHO) and the International Atomic Energy Agency (IAEA) which both signed an agreement «WHA 12-40» on 28th May 1959.

In this agreement one should note in particular that IAEA and WHO recognize that they may find it necessary to apply certain limitations for the safeguarding of confidential information furnished to them. The Secretariat of the IAEA and the Secretariat of the WHO shall keep each other fully informed concerning all projected activities and all programmes of work which may be of interest to both parties.

It is also recognized by the WHO that the IAEA has the primary responsibility for encouraging, assisting and co-ordinating research on, and development and practical application of atomic energy for peaceful uses throughout the world without prejudice to the right of the WHO to concern itself with promoting, developing, assisting, and co-ordinating international health work, including research, in all its aspects.

Whenever either organization proposes to initiate a programme or activity on a subject in which the other organization has or may have a substantial interest, the first party shall consult the other with a view to adjusting the matter by mutual agreement.

The bilateral cooperation agreement between WHO and IAEA contains very specific clauses which, considering the hierarchical differences between the two organizations, namely that WHO responds in front of the Economic and Social Council while IAEA responds to the Security Council, prevent WHO to publish independently anything related to the sanitary impact of environmental radioactive pollutions. One consequence is that WHO never really developed any expertise on its own in that field and put itself literally in a position of institutional incapacity. According to the *Convention on the Assistance in case of Nuclear accident or Emergency Radiological Situation* prepared by the IAEA on 26 september 1986, crisis management is placed under the executive control of IAEA itself. There is no mention of the notion of "health" in that convention. The secrecy atmosphere in which the soviet authorities covered the Chernobyl accident was one motivation for elaborating this convention. The other reason was the confusion created by the first soviet estimates of the sanitary effects of the catastrophe presented at the IAEA conference in august 1986, when Valery Legassov, then in charge of the nuclear safety of USSR, announced that Chernobyl's accident would cause 40.000 fatal cancers, against the 4.000 cases acknowledged by the nuclear industry. In September 1986 the soviet delegation declared to have made a mistake by a factor 10 in its estimate of the dosimetry!

Since the WHO-IAEA agreement was signed, WHO has shown no autonomy of action towards achieving its stated objectives in the field of radiation protection. On the contrary it has shown its capacity for misinforming the public about the sanitary consequences of radioactive contamination caused by the civil and military nuclear industries. WHO waited five years before visiting those territories that had been heavily contaminated by the accident at Chernobyl. They gave no instructions for evacuation or for the provision of clean food to the affected populations. WHO has kept hidden the health consequences of this catastrophe, especially by not publishing the proceedings of the 1995 and 2001 conferences. As we saw before, the WHO's estimate of the number of deaths caused by the Chernobyl catastrophe at less than fifty and its attribution of the health problems of populations of Belarus, Ukraine and Russia to fear of radiation (radiophobia), as well as its non-recognition of the validity of the work published in 2009 by the Academy of Sciences of New York which estimates the number of deaths caused by Chernobyl to be nearly one million, are among the main collateral effects of the agreement WHO passed with IAEA, the same attitude being developed in the context of the Fukushima disaster. On 11-12 September 2011, during the first international experts conference organized in Fukushima, Margaret Chan the Director-General of WHO declared in a video message: « The accident of Fukushima was an industrial disaster affecting the trust into nuclear energy at a global level, but it was not a humanitarian and sanitary disaster. »

If the real motivations of CNRS for not mentioning at all this agreement between WHO and IAEA on its website are still unknown, such silence can be interpreted as another sign of a lack of independence - independence to those with a vested interest - from the French scientific organization.

A questionable interpretation of the origin of the Fukushima nuclear disaster

Another groundless allegation made by the CNRS is about the supposed origin of the Fukushima accident. According to the CNRS 's site makers:

« Safety is of course a question of cost which remains proportioned in the limit of the reasonable: certainly, in Fukushima, if the sea wall had been higher, the catastrophe would have been avoided. But no one imagined a wave 15 meters high. »

And:

« Concerning the Fukushima catastrophe which could have been avoided if for example the sea wall had been higher, it puts back the absolute priority of the safety of installations even in front of highly unlikely situations. »

Those two allegations are in full contradiction with the reality of the facts.

Several evidences can be brought which fully contradict the monolithical interpretation made by the CNRS of the accident, an interpretation that is actually well accepted among the nuclear organizations in France. First, based on official informations and facts we established clearly in our book (Ribault, 2012, pp. 36-37) (21) that the consequences of a 15 meters high wave had been considered long before the catastrophe and even modeled by governmental experts from the Nuclear Safety Agency in reports dating back in 2008 and 2010, even though none of their conclusions had been taken into account by the operator. Moreover this voluntary ignorance, based on a very precise knowledge of the consequences of an invading high wave, was far from being only motivated by «cost» reasons, as argued on the CNRS website, but mainly because of anticipated adverse effects of security improvement works in terms of trust from the local inhabitants in regard to the operator. Actually TEPCO managers considered that building breakwaters would have given rise to the suspicion by the residents already alerted by the disclosure of the falsification of previous security controls in 2002.

Second, according to the Fukushima Nuclear Accident Independent Investigation Commission of the National Diet of Japan (p.17) (22): « The damage to Unit 1 was caused not only by the tsunami but also by the earthquake, a conclusion made after considering the facts that: 1) the largest tremor hit after the automatic shutdown (SCRAM); 2) JNES confirmed the possibility of a small-scale LOCA (loss of coolant accident); 3) the Unit 1 operators were concerned about leakage of coolant from the valve, and 4) the safety relief valve (SR) was not operating. Additionally, there were two causes for the loss of external power, both earthquake-related: there was no diversity or independence in the earthquake-resistant external power systems, and the Shin-Fukushima transformer station was not earthquake resistant. » This means that focusing on the tsunami as the only cause of the catastrophe is considered as a mistake by the Commission stating that « it is impossible to limit the direct cause of the accident to the tsunami without substantive evidence. » The

Commission believes that this is « an attempt to avoid responsibility by putting all the blame on the unexpected (the tsunami) » as they wrote in their midterm report, and « not on the more foreseeable earthquake. »

This point is very important because since earthquakes occur relatively frequently and many nuclear power plants around the world (especially in Japan but not only) were constructed near seismic fault lines, the nuclear industry has a great interest in diverting attention away from the earthquake as possible because of the nuclear meltdowns and placing the blame on the much less frequent and more exotic «massive tsunami» (see [IPPNW report 2012](#)) (23). A comprehensive [German study](#) (24) confirms that the structural damage, which led to the nuclear catastrophe at Fukushima Dai-ichi, was caused by the earthquake and not by the ensuing tsunami, and atmospheric data collected by NILU (Norwegian Institute for Air Research) also proved that radioactive emissions were first measured right after the earthquake had caused substantial damage to the reactors and before the tsunami struck the plant.

As we can see, the so called «non-imposition of values» (which was wrongly translated from the concept of *Wertfreiheit* as «axiological neutrality») used by Max Weber in its 1917 conference entitled «Science and vocation», a concept to which many CNRS researchers seem to pay respect to if we consider a recent symposium organized in Paris on December 7th about the relation between social and human sciences and nuclear, such «non-imposition of values» did not actually succeed in imposing itself on the CNRS website dedicated to tell the story and evolution of nuclear energy, rather making this site, as Weber himself would argue, a tool to «mass indoctrination».

The silences of the CNRS on the Fukushima disaster

What the site of the CNRS should have established concerning the Fukushima disaster, and that its academic underlings have chosen not to tell, I would like to tell it today, after almost two years of research on the site.

- The disaster of Fukushima is a Cesium 137 release in the atmosphere 500 times more important than in Hiroshima, according to [Anzai Ikuro](#), an atomic nuclear physicist from Ritsumeikan University in Kyoto, who has been «believing in nuclear energy before discovering its dangers.» It is also, according to Norwegian Institute of Air Research, the largest release of rare gas Xenon 133 ever known excluding nuclear tests: more than two times the release of that gas in Chernobyl. It is today, according to TEPCO, an activity of 10 millions Becquerels per hour released from the Fukushima Daiichi source. In January 2012, atmospheric emissions of radioactive cesium were even measured at [60 MBq](#) per hour or about 1,440 MBq each day. No comment was made by TEPCO regarding continued iodine-131 emissions: in [June of 2011](#), MEXT scientists still found iodine-131 concentrations of more than 200 Bq/kg in numerous municipalities of Fukushima prefecture, with maximum ranges found in Namie and Iitate of 1,300 and 1,100 Bq/kg, respectively. As iodine-131 has a half-life of 8 days, measurements this high, 90 days after the initial fallout on March 15th, suggest additional contamination of the area with iodine-131 at a later time. Similarly, the WHO [report](#) from may 2012 found vegetable samples containing 2,200 Bq/kg of

iodine-131 in month three of the catastrophe – further evidence for continued emissions of radioactive iodine after the initial explosions, most probably due to spontaneous fission or recriticality in one or several of the reactors. The disaster of Fukushima it is again the ongoing need to cool reactors 1-3 with approximately [535,200](#) liters of waters per day – some of which evaporates as radioactively contaminated vapor or is leaked into the ground as radioactively contaminated effluent. It is one third of the Fukushima prefecture contaminated at a level higher than 37 000 Becquerel's per square meter (for the Cesium 137 alone), and at least 13 prefectures touched by contamination, representing about 8% to 10% of the total Japanese territory. It is 1532 fuel rods of 300 kg and 4 meters long each, stored in the pool of the reactor n°4 on the fifth floor of a building threatening to collapse depending on the strength of the next earthquake. This situation already suggested the following [comment](#) from Mitsuhei Murata (former Japanese ambassador): « I call it the sickness of Japan : first we hide, then we postpone, and then we assume no responsibility » and aroused the following laconic comment from Prof. Hiroaki Koide, nuclear reactor specialist at the University of Kyoto: « It would be the end ». On January 4 2013 Prof. Koide explained to us in an interview with Wataru Iwata from Citizen's Radiation Measuring Station (CRMS) that « according to TEPCO there is a room for manoeuvre since if the pool of 4th reactor building collapses or even if the coolant water is all out from the pool, as long as the arrangement of the bars is not modified, then it will not exceed 170°C.» According to his calculation, the nuclear fission products placed in the coolant pool of the 4th reactor is 14 000 times (fourteen thousand) the nuclear fission products which was released by the A-bomb of Hiroshima.

- The disaster of Fukushima is 24 000 workers on the site since march 2011, among which only 3.7 % can benefit of free medical regular examinations for cancer detection proposed by TEPCO and the authorities. It is, among two millions inhabitants in the prefecture, only 100.000 nuclear refugees having migrated inside the prefecture and 60.000 outside. It is only 10% of the children of the prefecture who are left. It is one third of the 300.000 inhabitants of Fukushima city who would like to escape but who consider they cannot do so. It is the subsidies and assistance to help people to return to their homes even when they are located in areas identified as contaminated, and it is, since the end of December 2012, the abolition of the free access to public housing for the new refugees outside of the Fukushima prefecture. According to the CNRS website, in Fukushima « a 20kms zone was delimited where the government is working on de-pollution: no one knows when the few 110.000 residents will be authorized to come back », but no mention is made of the fact that large areas became uninhabitable 40 kms from the plant and even further, and without even reminding that the criteria of the definition of the «mandatory migration zone» was fixed at a 20mSv per year (actually from 20 to 50 mSv people are allowed to stay in the «habitation restricted zones» and the return is fully prohibited over 50 mSv), 20mSv per year being four times the criteria used in Chernobyl and twenty times higher than the unacceptability threshold determined by international standard.

- The disaster of Fukushima, it is the establishment of the largest sanitary survey on radiation effects ever conceived, which should allow to collect up to 2014 and during the following thirty years, the data on inhabitants of the prefecture, of which 360.000 children, the objective of the team in charge being to «calm the anxiety of the population» and «to establish a science record». Among the 80.000 children examined for the thyroid 39% present nodules of less than 20 mm and cysts of less than 5 mm thick. A first case of thyroid cancer was officially detected on a child less than 18 years old and declared on Tuesday September 11 2012.
- The disaster of Fukushima it is this inhabitant from Fukushima city who told us in an interview in November 2012 that the Warsaw ghetto and the contaminated areas in Fukushima are one and the same thing: « People from the outside know that inside is the antechamber of the death camps, they watch somewhere else and they continue to certify that nuclear energy is inescapable. »

That is the « protection » developed in Fukushima which arouses only silence on the CNRS website dedicated to nuclear energy: « Ignorance is the strength » said George Orwell.

In such a situation of the collapse of the human consciousness, of the great inversion where the disaster is denied in its negative consequences in order to be transmuted into a business opportunity inside a morbid environment to which everyone is enjoined to submit him(her)self, to take a position in favor of life became a revolutionary program.

To shorten the harmfulness of the managers of the organization of the appearances, to put into question all of the interests which govern the degradation of the whole, to deceive the deceivers, to reverse the reversers, to evacuate the evacuators: this is, according to me, what a researcher at CNRS should research in such situation. Not contenting oneself with an engagement, paltry variation of the official assignment to the nuclear cause exhibited here by the mobilization of the scientific troops of the CNRS, but in front of the de-reasoned acts of the producers of ignorance and of the de-humanization they promote, to show a real engagement.

Thierry Ribault

researcher at CNRS

Maison franco-japonaise-UMIFRE 19 CNRS-MAEE

Institut français de recherche sur le Japon

3-9-25 Ebisu, Shibuya-ku, Tokyo 150-0013, Japon

Thierry Ribault is co-author with Nadine Ribault of, [Les Sanctuaires de l'abîme – Chronique du désastre de Fukushima](#) – Editions de l'Encyclopédie des Nuisances, Paris, 2012, 144 p.

The author thanks Keith Baverstock, radiobiologist at the Department of Environmental Science, University of Eastern Finland, for his comments on a draft of this paper. The author

remains responsible for the content.

References

- (1) Yablokov Alexey V., Nesterenko, Vassily B., and Nesterenko, Alexey V., 2009, *Chernobyl: Consequences of the Catastrophe for People and the Environment* Volume 1181, December, 335 Pages, Annals of the New York Academy of Sciences, New York.
- (2) Fairlie, Ian, Sumner, David, 2006, *The Other Report on Chernobyl (TORCH)*, Commissioned by Rebecca Harms, MEP, Greens/EFA in the European Parliament with the support of The Altner Combecher Foundation, Berlin, Brussels, Kiev, April.
- (3) Cardis E., Krewski D., Boniol M. et al., 2006, *Estimates of the cancer burden in Europe from radioactive fallout from the Chernobyl accident*, [International Journal of Cancer](#): 119, 1224–1235 (2006).
- (4) Euratom, 2012, *Agenda for Research on Chernobyl Health, Arch Deliverable 3, Technical Report*, Pages 175.
- (5) Cardis, E., M. Vrijheid, et al., 2007, *The 15-Country Collaborative Study of Cancer Risk among Radiation Workers in the Nuclear Industry: estimates of radiation-related cancer risks*. *Radiat Res* 167(4): 396-416.
- (6) Krestinina, L. Y., D. L. Preston, et al., 2005, *Protracted radiation exposure and cancer mortality in the Techa River Cohort*, *Radiat Res* 164(5): 602-11.
- (7) Eidemuller, M., E. Ostroumova, et al., 2008, *Analysis of solid cancer mortality in the techa river cohort using the two-step clonal expansion model*, *Radiat Res* 169(2): 138-48.
- (8) Eidemuller, M., E. Ostroumova, et al., 2010, *Comparison of mortality and incidence solid cancer risk after radiation exposure in the Techa River Cohort*, *Radiat Environ Biophys* 49(3): 477-90.
- (9) Krestinina, L., D. L. Preston, et al., 2010, *Leukemia incidence among people exposed to chronic radiation from the contaminated Techa River, 1953-2005*, *Radiat Environ Biophys* 49(2): 195-201.
- (10) Zablotska Lydia B., et alii, 2012, *Radiation and the Risk of Chronic Lymphocytic and Other Leukemias among Chornobyl Cleanup Workers*, Environmental Health Perspectives, National Institutes of Health U.S. Department of Health and Human Services, [Online](#) 8 November 2012, pages 31.
- (11) Cardis, Anspaugh, Ivanov et al., 1996, Estimated long term effects of the Chernobyl accidents pp. 241-279 in *One decade after Chernobyl. Summing Up the Consequences of the Accident, Proceedings of an International Conference Vienna 1996* STI/PUB/1001, IAEA.
- (12) Ministry of Ukraine of Emergencies, 2011, *Twenty-five Years after Chornobyl Accident: Safety for the Future*, National Report of Ukraine, Kiev.
- (13) UNSCEAR, 2011, *Sources and Effects of Ionizing Radiation*, United Nations Scientific Committee on the Effects of Atomic Radiation, UNSCEAR 2008, Report to the General Assembly with Scientific Annexes, Volume II, Scientific Annexes C, D, E, 175 pages, United Nations New York 2011.
- (14) Dubrova, Y. E., V. N. Nesterov, et al., 1996, *Human minisatellite mutation rate after the Chernobyl accident*. *Nature* 380(6576): 683-686.
- (15) Brenner David J., Sachs, Rainer K., 2006, *Estimating radiation-induced cancer risks at very low doses: rationale for using a linear no-threshold approach* *Radiat Environ Biophys* (2006) 44: 253–256, DOI 10.1007/s00411-006-0029-4.

- (16) Baverstock Keith, Karotki Andrei V., 2012, *What mechanisms/processes underlie radiation-induced genomic instability?*, Cellular and Molecular Life Sciences ISSN 1420-682X Volume 69 Number 20.
- (17) Enderling, H., L. Hlatky, et al., 2009, *Migration rules: tumours are conglomerates of selfmetastases*, British Journal of Cancer 100(12): 1917-1925.
- (18) Organisation Mondiale de la Santé, 1958, *Questions de santé mentale que pose l'utilisation de l'énergie atomique à des fins pacifiques*, Série de rapports Techniques n°151, Geneva.
- (19) World Health Organization, Regional Office for Europe, 1990, Summary Report - *Working Group on Psychological Effects of Nuclear Accident*, Kiev, USSR, 28 May - 1 June 1990.
- (20) Williams Dillwyn, Baverstock Keith, 2012, *Chapter 3 : Scepticism and Radiation*, in *Scepticism: Hero and Villain*, Eds: R. Calne and W. O'Reiley, Nova Publishers, Inc.
- (21) Ribault Nadine, Ribault Thierry, 2012, *Les sanctuaires de l'abîme – Chronique du désastre de Fukushima*, Editions de l'Encyclopédie des Nuisances, Paris, p144.
- (22) The [National Diet of Japan](#), *The Official Report of the Fukushima Nuclear Accident Independent Investigation Commission*, 2012, Tokyo.
- (23) International Physicians for the Prevention of Nuclear War, 2012, Analysis of WHO report on Fukushima catastrophe, by Dr. med. Alex Rosen, University Childrens Clinic Düsseldorf, August 3rd.
- (24) Von Henrik Paulitz, 2012, *The Fukushima Disaster - The course of events during the accident up until the reactor core meltdowns and conclusions relating to safety*, Analysis, as of March 12, IPPNW, Berlin.