

## **Radiation Exposure is Unequal**

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### **Doesn't Radiation Discriminate?**

The Japanese Reggae musician, Rankin Taxi, has a song he has been singing for over twenty years: "*You Can't See It, You Can't Smell It, Either.*"

Radiation is strong  
Radiation is powerful  
It does not discriminate  
And you can't beat it

Yes. Nobody can beat radiation. Nobody can escape its harms -- so Rankin Taxi sings, and he is right.

The Japanese government and TEPCO (The Tokyo Electric Power Company) constructed nuclear power plants in Fukushima and Niigata Prefectures, 220 kilometers away from the Tokyo metropolis. There are several reasons one can think of as to why they built them so far away. One of them could be that in case of accident, the metropolitan area would be safe from radiation damage. Imposing all the risks onto these Prefectures instead, they calculated to protect Tokyo. However, the explosion of March 2011 revealed how their assumption was optimistic. The fall-out of radioactive substances affected far beyond Fukushima Prefecture, to the entire Kanto region, and reached even the Chubu region. The accident at the nuclear reactors easily surpassed the distance of 220 kms. The relative measurement of farness and nearness has quickly faded. People have learned that the crux is not distance, but wind direction and speed, temperature and topography; on top of that, how variable the direction of the wind is, and how far the fast winds at high altitudes can travel. Rankin Taxi's song was right: radiation did not discriminate; the residents of Fukushima Prefecture and Tokyo metropolis were equally bathed in radiation.

This ominous observation was thus materialized. Thereafter, however, we have been facing another reality. That is, while nobody is free from radioactive fall-out, in this post-nuclear disaster society a different situation has arisen, wherein indiscrimination has begun to collapse. Radiation exposure *is* unequal. In this society it is not possible that everyone is equally exposed to radiation. In principle the efforts to shield against radiation would envision an environment where everyone was equally protected, but this cannot be realized easily in this world.

### **The Dilution Myth**

Those who advocate accepting and enduring the radiation damage emphasize "sharing the pain." This position takes

for granted the idea that the spreading radioactive substances are diluted in space; in other words, that when a substance of a certain quantity is thrown into a bigger space, its density will be weakened. This idea has long been adopted by the electric companies to support the claim that the radioactive substances that leak from nuclear power plants are eventually diluted in the big expanse of the atmosphere and ocean, becoming harmless.

Based upon this notion, the idea of incinerating the polluted debris left by the earthquake and tsunami is being conducted at the moment (2012). The Ministry of the Environment responsible for the project claims that there is little concentration of radioactive substances detected in the atmosphere according to their monitoring of the incineration. Exemplifying the low density of radioactivity in the vast space, they insist on the safety of the project.

This method of estimation is fundamentally false. The idea that danger can be avoided by dilution might be applied to those substances whose half-lives are short. But what about problematic substances such as cesium and strontium, whose half-lives are long? The half-life of cesium 134 is two years and considered to be relatively short, however, its complete disappearance takes twenty years, ten times longer than the half-life. As for cesium 137, its half-life is thirty long years. Even after these years, its radioactivity will diminish only by half. The radioactive substances released from the vents of incinerators have been once diluted and their temperatures lowered. But the same state of dilution and low temperature will not be kept constant for tens of years. The particles move around, fall to the ground and are washed away by rain. In some places they are washed away and dispersed, while in others they accumulate and concentrate. Already in some side ditches in the Kanto region, highly radioactive sludge has been discovered whose density measures more than several hundred times higher than the density of the ground washed by water.

The idea that a state of dilution is sustained is totally wrong. Radioactive substances follow the paths of wind and water, accumulating in certain spots. Should they accumulate in the mouth of a river for only a short period of time, there will be countermeasures to deal with. But unfortunately the case is not so simple. Also, should the hotspots be few and exceptional, we could be more at ease. But that is not the case. The singular points are created constantly and anywhere. It is just difficult to thoroughly map the distribution and dynamic since they are always in flux. For instance, houses on the ground can be mapped in detail, but underground waterways cannot. Water leaking from side ditches into the ground is not visible from the surface of the earth.

The method of dividing the total volume of released radioactive substances by the volume of the space or the

square meter of the ground surface is fundamentally flawed. The distribution and dynamic of the released nuclides cannot be extrapolated so easily. In the total process of actual contamination, if radioactive gas or dust is ever spread evenly in a vast space, it is only for an instant.

The promoters of incineration would refute this idea: "in the first place, filters at the plants can catch 99% of the substances, thus the released volume is very small." This too is false. The vague argument as to whether the total volume is big or small tacitly takes for granted the volume of the entire space. Saying that the total volume is small means only 'small' vis-à-vis the entire space to which the substances are released. And if 'small' is to be insisted upon, it is imperative to prove the limits of accumulation and condensation. To say it differently, it is necessary to point out to what extent the state of dispersion and dilution can be kept. Since radioactive substances exist in the nano-level, the spatial volume that assumes the denominator of their densities is compressed into extremely micro dimensions. Therefore, in order for us to be able to assert the *smallness*, it is necessary to present the limit of the condensation of the spatial volume, or else, to what extent the atmosphere and soil that surround us can *exclude* the radioactive substances.

After contaminated debris is incinerated, a band of radioactive contamination is created which is then gradually concentrated. Such places as reservoirs, rivers and coasts will be affected inexorably. The primary industries which rely on soil and water will suffer enormous consequences. Certainly, workers at incineration facilities and sewage disposal plants will be forced to face tremendous hazards, except that they are entitled to the "Occupational Safety and Health Act on the Regulation of those Engaged in Ionization and Radiation work" as well as "hazard pay." Meanwhile, those who are in the primary industries do not receive any support, even after a high degree of soil pollution has been revealed. That is to say, for the same degree of danger, guarantees and security are not offered equally. The pains of radiation exposure are never shared impartially. Specific types of people in the same region are subjected to corporeal, psychological and economical hardships.

"To share the pain" is but a myth made to sound like an ideal. By advocating the myth, the Ministry of the Environment is able to turn a blind eye to the unfair state of things, instigated by this very government.

Where did these false notions--dilution of radioactive substances and "share the pain"--come from? This is not simply born out of ignorance about radioactivity. In the background exists an aspiration of various people for an equality-based society. When equality is absent in the society where it was supposed to be, in order to imaginarily recover it, the people have come to leap at the

notion of *equality* (by dilution) in the whole. To put it more nastily, the Japanese nationals do not know a way of making social bonds other than by sharing superficial equality. It is for this reason that *the good people* have stopped thinking while facing the reality of radioactive condensation, and instead cling to the myth of dilution.

### **The Dilution Myth of Food**

There is another type of dilution myth.

In April 2012, in a community in Aichi Prefecture, Chubu Region, a food product with radiation levels higher than regulation was discovered. Dried Shiitake mushrooms containing 1400 Bq per kilo was used for making an Udon noodle dish. The public health center of the city announced that the amount of cesium that children had taken in was no more than 5.5 Bq per person. When I asked for clarification of the grounds of that estimation, they answered: the total sum of 1400 Bq was divided by the quantity of one child's intake (estimated 3.9 grams) --  $1400 \times 0.0039 = 5.5$ . This calculation was totally wrong, because the distribution of cesium--including in dried mushrooms--is not even, and does not dilute evenly.

Imagine that we have two sample pieces of dried mushroom from which 1400 Bq/kg has been detected. We cut the two pieces into half: A, A', B and B'. Then we shuffle them, and the consequence is not that all have the same amount 1400 Bq/kg. For the distribution of cesium differs in all of them.

The dried mushroom used in Aichi Prefecture was a blend of pieces from varied regions. In one package, those from Oita Prefecture (in Kyushu) and those from Iwate Prefecture (near Fukushima) were mixed. As we can assume, the package contained pieces from both non-radiated and irradiated zones. Some pieces would have zero becquerels, while others would have more than 1400 Bq/kg.

If we make a graph to measure the radiation density of each of the mushroom pieces, there won't be any number '1400 bq/kg' on the graph. The bar graph will be divided into either 0 Bq/kg or more than 2000 Bq/kg, drawing the shape of the letter M. In reality, it is impossible to measure the density of radiation per piece of mushroom; and it is impossible to verify the number. The least we can do is to reckon that the distribution of cesium would be divided into two poles.

The example where products from two origins are mixed together is convenient, but all in all, the problem is the same even when all products are from the same region. Each sample will show different numbers. This is because radioactive substances are micro substances that exist on the nano-level and are gathered into *density* at the same time as being surrounded by *sparseness*. We are in the process of learning how to approach such a knotty phenomenon, meanwhile what we are doing for now is just to make a projection of its status at a distance by employing

macro samples. We hardly understand what kind of *density* and *sparseness* are formed within the nano-domain.

Therefore, please do not state that there is 1.4 Bq radioactivity per 1 gram from the calculation of 1400 Bq/kg total. Today's testing of radiation density is far less reliable than we are made to believe. It is like describing a deck of cards that has 26 red and 26 black as "50% red." In the real situation, when we distribute the cards to school children, each will get either red or black: no one will receive one that is 50% red. For the child who gets red, the calculation method based upon dilution has no meaning at all.

The ideal of education certainly has to be based upon equality, but radioactive substances are never distributed equally according to the ideal. Even if we distribute all food products by stirring them in a mixer, we won't be able to achieve an equal density for all. Today's technology cannot control the distribution of cesium. In order to achieve a true equality in terms of all children's meals, there is no other way but to realize the state of *zero becquels*.

Wise readers, by now all of you have realized that no one can tell how many becquels are contained in the food products you are eating now. The sample testing of food products can only be partial. It is for this precise reason that many homemakers are buying food from the southern island of Kyushu. Their judgment is based upon the origin of products instead of the numerical values from testing, only because they *know* that the sample testing is impossible and ineffective.

What the testing can clarify is only whether or not *there are radioactive substances*. It is only by the testing of the totality that we confirm that the food is safe. Partial sample testing cannot tell anything.

The Ministry of Health, Labor and Welfare sets up a regulatory standard of 100 Bq/kg, just for convenience, but the vegetables that pass this standard contains varied densities of radiation, maybe from 1 Bq/kg to 300 Bq/kg (or in fact much more). In one cardboard box, that there is a vegetable which contains 90 Bq/kg does not mean that this number is the maximal one among those in the same box; there could be ones with higher radiation. Among the vegetables in a market, there are many exceptions.

Some vegetable distributors might call what I have been saying a 'harmful rumor [*fuhyo higai*]' – the common parlance to accuse those who honestly express their worries about the current situation. But it is necessary to acknowledge the fact that numbers on sample testing can easily be manipulated. If you pick up multiple samples from one vegetable field, different numbers will come up. One can choose a number convenient for your purpose and record it. Even in a polluted field which contains 45 red cards, there are at least 7 black cards; you can continue to draw

cards until a black one comes up. When the degree of pollution is smaller, such operations will become easier. Farmers know everything about soil. They could tell from which point to get samples and which point not to, in order to pass the test. (This does not mean, however, all farmers are doing this.) This is why consumers are cautious and avoiding the vegetables from Chiba, Ibaraki and Gunma Prefectures. This saying would be deemed a harmful rumor, which is however based upon a solid scientific question.

Careful consumers who have scientific knowledge don't buy vegetables from Tohoku and Kanto Regions; they don't eat out. But the society does not sufficiently support such protective measures. Why not? Now the issue at stake is that of general economy -- that which grounds the society.

### **The Protective Measures and Homemakers**

The radioactive substances spreading from the Fukushima Daiichi Power Plant have reached Tohoku and Kanto, and part of the Chubu region. The residents living in those regions are affected by radiation in three processes: external exposure by being bathed in radioactive substances accumulated on the soil; internal exposure by inhaling the substances as dust and gas; internal exposure by intake of the substances in water and food. Outside the polluted zones, a secondary spread is being effected by circulation. In this case carriers of radioactive substances are: debris from the earthquake, recycled construction materials, agricultural materials, food products and medical supplies. The most dangerous in the non-polluted zones is internal exposure by intake of food products.

The protective measures taken by the government are totally insufficient. While it sets a permissible dose as one milli-sievert per person, it cannot do anything for recognizing, differentiating and controlling the three different types of exposures: external, inhalation internal and intake internal.

While the government's protective measures are ineffective, the people have come to be active: they have created their own monitoring centers and share the information across the nation via the internet. The leading agents for this movement are homemakers. Why so?

The works of care or house-work or reproductive work existed as communal division of labor, but in the capitalist production of value became shadow work and as such were imposed upon mostly women. In this sense they embody the status of women being exploited, oppressed and discriminated against. And at the same time, these works are what support the entire domain of productive works. They are crucial for sustaining social (re)production. In the post-Fukushima situation, the conflicting duality of these works -- exploitation/discrimination and potency -- has been revealed, more than ever, in their complexity. There are four attributes of the duality that homemakers have to

live.

**Their Intelligence:**

The practices of the protective measures in concrete are works that belong to house-work such as cooking, cleaning, washing and childcare. Homemakers know the actuality of these works by their everyday practice.

Every single day, they are tirelessly (or rather tiredly) cooking for nourishment of their family members. They know the sheer fact that an accumulation of micro substances could make a human live or die. Radioactive substances are invisible, and the invisibility is not anything new to them. Bacteria, virus, food additives, agricultural chemicals, allergens, genetically modified products, ultraviolet rays, etc. -- there are so many invisible things in life circumstances. If they give up dealing with the invisibles, they can by no means take care of the health of their infants. And they never overlook the substances (produced by the male centered society) and never give up the project to avoid their harms.-

It is homemakers who are working on protective measures in the non-polluted zones, because they know they can deal with them by expanding their everyday works for nourishment and hygiene. And it is again homemakers who determine to evacuate from the polluted zones, only because they practically know the limit of possible protective measures. The primary element that drives their protective measures is intelligence that they create themselves from the domain they have no other choice but to confront every day.

**Their Responsibility:**

Homemakers are, whether they like it or not, often charged with responsibility for the health of their family members. Rather they are imposed the responsibility. When a family member becomes ill or requires care, it is they who shoulder the trouble. When I say "homemakers" here, it is not limited to married women with children. For instance, a female university student in Tokyo worries about her future: when her parents become ill, her brothers will abandon the task of taking care of them and she alone will have to do it. Only wealthy families can hire professionals, and in most cases care and nursing are imposed upon women in the household. In some cases, they become caretakers of the household even without being a spouse; in any case, many of them lose their opportunity to get jobs or get married. Or more precisely, when they get married, they often face the duty to take care of their parents-in-law; and furthermore, unless their husbands are retired, they become the caretakers of both their own parents and their parents-in-law. What distinguishes daughters and sons is the difference of self-recognition: whether or not one day they are expected to carry on such tasks as real possibility. So it is homemakers and female

(or rarely male in Japan) reproductive workers who are appointed to the reserved, unpaid work making up for the coming situation. That is to say, the society does not give permission for them to refuse the appointed duty always, already reserved for them.

When the specialists for the medical care for radiation exposure, or ICRP (The International Commission on Radiation Protection) or WHO (World Health Organization) estimate that the health hazard by radiation is 'small,' as they usually do, they do not expect they take care of the 'small' number of the victims with their own responsibility. It is predetermined that some members of families work *gratis* round-the-clock, taking care of the consequence. It never happens that the specialists are pressed with care of the victims, be their number big or small. With no sorrow or self-reproach, they love to use the term "risks," only because they know someone else would take care of the consequences of the risks.

Reproductive workers or homemakers are those who undertake everything when something happens to their family members. They are like shock absorbers for crises. They are forced to work *gratis* with their sense of responsibility even though they are not responsible at all. In terms of radiation, it is homemakers who are liquidating the horrendous consequences of 'small'. And it is this charge that drives them to the protection measures at the moment.

Discrimination against Them:

Homemakers are accustomed to discrimination. This is different from their acceptance of discrimination. They just know discrimination by experience. For homemakers, being looked down on or underestimated is an everyday affair. For them being belittled by their family members is hurtful but not surprising. For experienced homemakers it is within their expectation for living this world.

After Fukushima, it is advertising industries that have embodied discriminatory consciousness against homemakers the most. As consumers, of course they had been familiar with advertisement. Advertising agencies had been releasing information on health and beautification such as cosmetic, detox and anti-aging, which homemakers have been using on their side. In other words, by fabricating the images of "beautiful women" or "fashionable moms," advertising agencies had been imposing a consumerism accompanied by the disciplinization of their bodies. Suddenly then, the agencies began to advocate: "accept radiation bravely." This was an extreme case of betrayal and the moment when the discriminatory nature of advertising industries was revealed brazenly. According to their advice, women are supposed to be cautious about ultraviolet rays, but accept radioactivity. I have never seen such overt discrimination.

Those who have been discriminated against do not trust those who discriminate. Always facing crude liars, people



know whom they can and cannot trust. During the time of varied argumentations on radiation issues after Fukushima, the discourses of the government and the specialists have been successfully invalidated, only thanks to those who have refused to trust all of them. Caregivers tend to say: "I don't know." Even though they know, or precisely because they know, they say they don't know. It is their warning that they don't trust smooth-tongued liars. Their habitus of distrust has given the weight on the arguments, played the role of shield and oriented the often confused consciousness of us all. This is one of the powers that has been leading the protective activities.

#### Their Sense of Time

Those who carry on reproduction of labor power hold a long perspective of time. While wage labor exists only by a temporary contract and only as part of short-term trades in the commodity economy, the labor of reproduction is embedded in life economy whose cycle is incomparably long. It takes more or less twenty years to bear and raise babies until they become adults. It takes almost the same length of time to take care of the aged until they die. Reproductive labor is a labor that you cannot give up when you get tired of it, that you have to continue to engage for a long period of time. To say it in an extreme way, while wage labor has lost the sense of time by living a short-term contract, while holding a timeless utopia, those who bear children are living in time and objectifying it. For instance, speaking of the relationship between radiation that they deeply fear, and time, it takes twenty years until the activity of cesium 134 ends (ten times of its half-life that is two years), but they are able to envision the length of twenty years as a concrete human time. Late radiation damage that would appear in ten or fifteen years is total nonsense to the consciousness that has forgotten time. "It is nonsense to think of an illness that might appear in such a distant future." For mothers, however, fifteen years is a future sufficiently reachable. This is because they directly engage themselves in nurturing humans by concretely assuming possible critical situations in a secured everyday life, and in time.

#### **Exploitation Embedded in the Damage Estimation**

I have been describing caregivers' intelligence, responsibility, opposition to the (male dominant) society and sense of time. Those who insist on optimistic views on the effects of artificial nuclides over human body – as very small – ridicule homemakers' protective activities while tacitly expecting their works. They would never say: "it is unnecessary." Acknowledging the need for protection, they say: "they are over cautious." At the same time, while they say: "there won't be much damages," they would never say: "there won't be any damage." For saying that is equal to saying there is no need for protection measures.

What they want to say, all in all, is that "although protection measures are necessary, we ourselves don't want to do them." Protection measures require a tremendous amount of cost and labor; they cause frictions in human relations; they force us to assume a long period of time, directly affecting our own lives. On the other hand, the social structure and economic system centered on capitalism would never care for the efforts and costs required by the protection measures, not to mention human life itself; they are operating in a totally different dynamic. They are saying that they don't want to confront such a long-term project, they don't want to carry on such troubles. Period!

Those who engage in radiation protection projects are sharing a pessimistic estimation on the hazards. The estimation for them is, however, doomed to fail, because they intend to strive toward lower numbered results that would appear in ten years. The results of their efforts will offer tremendous benefit to all. The harder they work, the more distance they will gain from their own pessimistic estimation, and move closer to the optimistic estimation of those who promote the "small damage" calculation. Homemakers are working *gratis* not only for their own rights, but also for the rights of the parasites who do nothing but ridicule them.

In this sense, "damage estimation" is no longer based upon a pure disciplinary inquiry or debate in the domain of natural science. It has become a tool for a political battle between those who engage in protection measures and those who steal a free ride on them. It is not because the voluntary protection activities of the people are useless that they are ignored and ridiculed. It is for justifying the free ride of the men in power that their activities would not be given a proper acknowledgement. By just saying: "I would not worry about radiation as such; my wife is doing something by herself," he is exempt from the trouble and can enjoy safe meals. The government insists on the optimistic estimation and keeps people's protection activities informal, only for drawing out the endless resources of the people, so that they can play dumb with the need of special budget program. The optimistic estimation of the radiation hazards has not been established previous to and independent of the feeble and pathetic protection program of the government. It is evidently motivated by a self-serving calculation for achieving the exemption from the task of protection. The small estimation is part of the process of exploitation within the entire program of the post nuclear disaster society.

The structure of the exploitation has in fact long existed. This is an embodiment of the universal structure of capitalism and the political framework reinforced by nuclear capitalism in the postwar era. In proportion to the lowered death rate of babies, the heightened rate of education and the developed domain of reproductive labor,

the social status of homemakers has continued to decline. The work of homemakers has been unacknowledged, confined in the problematic domain of private affairs, internalized within individuality and treated informally – as the primary *modus operandi* of the primitive accumulation. Looking down on homemakers at the same time as enjoying a free ride on their work – this position has been forged into an ideology to justify the exploitation and then elevated to a national consensus shared across the political spectrum from the left to the right -- this is the completion of contemporary form of the primitive accumulation inherent in capitalism.

The spread of radioactive substances has finally put the general structure of exploitation on the foreground of the present conjuncture. It is homemakers who are striving hardest and most looked down on. The homemakers-bashing permeates society beyond the industrial class and the political spectrum. Not to mention the promoters of nuclear power, some of the self-professed anti-nukes and lefts do not acknowledge the work of homemakers rightfully. Pseudo lefts and pseudo feminists mistake criticizing the way of being of homemakers for a moral duty. This is a tacit expression of their own wish to renounce heavy responsibility of reproduction and their own fear to fully confront capitalism. The homemakers bashing is more or less used as a pretext for their own desertion of the battle against the radiation and the power. This is what we should call *bourgeois ideology* in the post-Fukushima context.

### **One Last story of Inequality**

Those who advocate accepting and enduring the radiation damages are oblivious to the inequality of their effects. That is to say, they are oblivious to the fact that this society is not equality based, rather consisting of discrimination, exploitation and partiality. They execute their power by employing convenient ideologies. For them it is useless to confront crises, but only utilize them for their interests; in this power operation they pre-determine the conclusion with their preferred underestimation. They are totally oblivious to the present exploitation and discrimination instigated by themselves; instead, they push their power operation by advocating the lack of self-management of those who are actually exploited and discriminated against.

While I was writing the current article, I asked several questions to my students studying to be social workers:

After graduating from university and getting a social worker's license and a job in the field, if your employer asks if you are willing to move to an associate office in Koriyama City in Fukushima Prefecture, not as an order but an option, would you go?

Four groups consisting of ten students each discussed this matter for twenty minutes. About half of them said they would go. Troubled by this result as I was, I added a disadvantageous condition:

Last year three workers were transferred to the same office in Koriyama. But all three quit the job within a year, for reasons we don't know – low wages or health hazards...? But it is evident that these were disposable positions and you are now asked to fill the vacancy. Would you still go?

No changes. Half of them would still go.

A certain spirit of self-sacrifice might be necessary to be a social worker. But what I would like them to understand is the importance -- not of self-sacrifice, but -- of individual rights. It is understandable that there are students who would go. But I assume that among them there are those who are just unable to say: "I would refuse to and would not go."

In order to survive the coming radioactive ages, what I hope students possess is the consciousness of human rights necessary to protect themselves. I believe that the ability to refuse dangerous work, based upon a solid awareness of human rights, is the *sine-qua-non* for the intensive engagement in the protection activities. Meanwhile, those who are uncertain about their rights and cannot assert them will be *voluntarily* bathed in radiation. This is for us a reminder of the prewar social climate. Much like the old men in power who ordered the nation to advance for the war, those men who order to accept and endure the radiation damages today won't be exposed to radiation very much or at all. The old men sitting cross-legged behind the safety zone will never see the real battlefield of radiation. Those women and young men who choose to be exploited by ignoring their rights will go over to or remain in the irradiated zones, to be bathed in an unprecedented dose of radiation.

Finally, I gave the students homework:

Research what kind of protective measures for the food stuffs of the dining hall the public health department of this university is taking. Research their ideas and practices for radiation protection. You have the right to know the actuality of this university's protection activities. Should you see uncertainties and shortcomings in their measures, attack them with your questions until you are fully convinced.

"All the nation must accept, endure and share the radiation damages equally" – so they say, but however beautiful this may sound, there is no equality here. This is a sheer fairy tale.

Bombarded by radiation, the society has exposed and also reinforced the discrimination and exploitation it had always internalized. The society will be divided and dismembered more than ever, while intensifying oppositions. In this context, what is necessary is neither false equality nor imposed homogeneity, but the consciousness of individual rights and people's science, in confrontation with the radioactive spread and the dismembered society.