The truth about Chernobyl vs. the ecologist syndrome

Emmanuel Grenier reports on the results of an international conference on Chernobyl recently held in Paris. Translated from the French "Fusion" magazine.

In the nuclear domain, two realities often exist side by side: that of facts, and that of symbols. Most citizens, under the influence of ecologist propaganda, have more or less unconsciously associated nuclear energy with images and symbols. Serge Prêtre cites among the strong associated symbols, the magic of the transmutation of matter; the myth of the sorcerer's apprentice overtaken by his invention; the appropriation of "divine" energy reserved to God or to the Sun; and the perfidy of an invisible radiation capable of destroying genetic potential and hence annihilating humanity.

"When the Chernobyl cloud arrived in Austria, Germany, Italy, or in Switzerland, we witnessed a veritable epidemic of catastrophism." The major German television channel counseled viewers not to go out jogging. One year after the catastrophe, German doctors were still reporting serious cases of malnutrition in people who were refusing to eat anything but food that had been canned before April 30, 1986. Many people substituted their representation of the facts for the facts themselves. Since nuclear energy is (supposedly) a fountain of evil, necessarily, a nuclear accident has catastrophic consequences. And if anyone says the contrary, they must be lying.

All this, added to the ongoing reasons which motivate the existence of the anti-nuclear groups which are extremely well structured and organized in the media as well as in the population, explains why the wildest rumors (starting with the rumor of 2,000 deaths) and the most fantastic figures were flying on the short- and long-term consequences of the Chernobyl disaster.

Let us try to get the real story, taking into account that the disorganization in Soviet relief, their tradition of secrecy on the one hand, and the legitimate anger of the Belorussians, Ukrainians, and Russians on the other, have made this exercise very difficult.

Short-term results

One hundred forty-five cases of radiation sickness were diagnosed in persons exposed to radiation during and after the accident. Of these 145 cases, 28 died, most of them within days of the accident. To these 28 dead, we must add one heart attack and two people who died immediately as a physical result of the explosion; that gives *31* dead accounted for, in total, at present. Any higher figure is the product of gratuitous hypothesis, or . . . disinformation.

Of those most exposed to radiation, 45,000 people were closely followed medically after the date of the accident. The mortality in this group is 2.2%, or less than half the average mortality in the U.S.S.R., which is explicable due to the youth of the group. All those who died were carefully analyzed, and not one of these deaths could be linked in any way

to an overdose of radioactivity.

The problem of the so-called "liquidators" remains: These are the hundreds of thousands of people, essentially military personnel, who participated in fighting the fire, the construction of the lead sarcophagus which now encloses the remains of unit No. 4, and the decontamination operations. These people have been frequently exposed to considerable radiation for short periods. They have now left for all over the U.S.S.R. and it is absolutely impossible to be sure of following them up medically.

That is where the greatest uncertainty resides about the radiological consequences. However, one can be sure that there are no cases of "radiation sickness" among these people. On the other hand, there will certainly be a certain number of cancers induced by the exposure to radiation of this group, a number which it will be difficult or even impossible to evaluate for the cited reasons.

Long-term consequences

The problem of radiation-induced cancers is extremely complex. Before tackling this question, we must keep in mind that our knowledge of cancer is still very fragmentary: There is much more statistical analysis being done, than causal analysis. Thus, in the case of radiation-induced cancers, most studies have been made based on observations of the Japanese population exposed to weak doses issuing from the two atomic bombs (since the population which was exposed to large doses died at once). In this population (42,000 persons), during the 35 years which have passed between 1950 and 1985, 3,291 people died of cancer, which is 400 more than in a population of the same size which was not exposed to radiation. These 400 cases were therefore attributed to radiation. The Japanese population of Hiroshima cannot be compared however to a normal population because it had a very particular composition (all healthy men were mobilized to the front) and it had undergone, beyond exposure to radiation, an exposure to neutron flux, stress, malnutrition, and the absence of medical care for a number of months. But even referring to Hiroshima, we can verify that the radioactively induced cancers did not appear until after a period of latency of at least ten years, except for leukemia, for which the period is of two or three years after the exposure to the overdose of radiation. *The appearances of cancer in the Chernobyl region can therefore only be attributed to a greater medical followup which permitted its detection* (more than previously) and in no case to the nuclear accident. It will only be possible to judge this starting in 1994 at the very earliest.

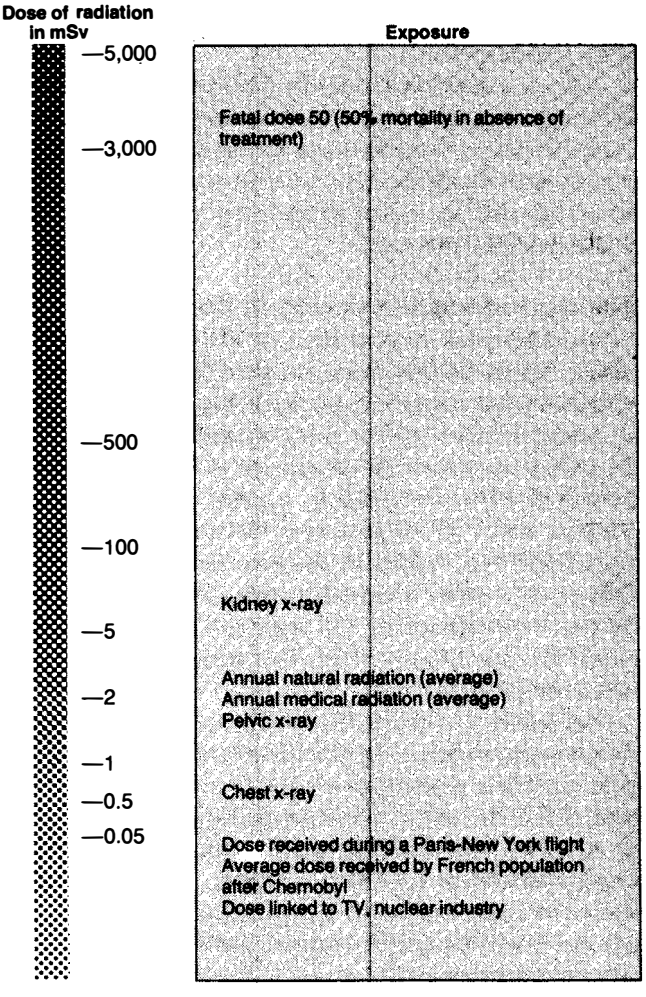
As far as the environment is concerned, we can separate the zones into three categories:

- a zone contained within a radius of 30 km around the plant, which was the most affected, i.e., about 3,100 square kilometers.
- a zone within which cesium-137 (Cs-137) contamination was about 500 kBq/m^2, a zone which the Soviet authorities called "strictly controlled zone" (SCZ) which covers approximately 7,100 square kilometers;
- a zone in which Cs-137 contamination is above 40 kBq/km^2 (or 5 Ci/km^2) about 18,000 square kilometers.

In total, there are 832,000 people who inhabit this region. The doses received by these persons varied considerably according to the geographic situation and the countermeasures adopted, countermeasures which were in some cases very tardy. From 1986 to 1989, the population of the SCZ received a median dose for the total body estimated at 35 mSv. After 1990, the values went back to lower levels, comparable to natural radioactivity: between 0.5 and 4 mSv per year (see **Figure 1,** for a comparison of doses received as a function of different sources).

In regard to the consequences on animals and plants, they have only been analyzed for a 30 km radius zone around the plant.

FIGURE 1
Radiation, relative scales



Source: Fusion magazine No. 37 (France).

Chernobyl in perspective

The Chernobyl catastrophe has to be resituated in the general context of the communist countries before their liberation, countries where human life does not have the same value as in the Western world. Occupational safety, health, and the environment are thus much lower priorities than in our countries. On the other hand, those who attempted to raise their voices to denounce the scandals touching these subjects were rapidly put into limbo in their professions, if they had not been sent into reeducation camps because of "sabotage" or "anti-social behavior."

Thus, the Soviet Academy of Science estimates that 20% of the population, or 50 million people, live in "ecological disaster areas" which are so dangerous for health that, according to Western criteria, no one ought to live there. The cotton plantations in Uzbekistan, for example, have been subjected to massive, uncontrolled doses of pesticides, and infant mortality has gone up to 10%! In Poland, 25% of the soil has surpassed the threshold of concentration of heavy metals beyond which it should not be cultivated. The entire world knows the situation in the hospitals of the East bloc, the orphanages in Romania, of which atrocious images have been broadcast on television, and that is only a pale reflection of the general situation.

It is not a question of denying the breadth of the nuclear catastrophe in Chernobyl, nor minimizing it. It is simply a matter of sticking to the facts and placing them in perspective in relation to other facts. Also, we must always weigh against the nuclear risk, the risk of no nuclear power and the risk of no technological progress.

The state of nuclear energy in the U.S.S.R.

The Chernobyl accident showed, like that of Three Mile Island, that the nuclear world has gone far beyond national borders when it comes to mass psychology. This is why it is of interest to follow what is going on inside the U.S.S.R. in the nuclear arena since the catastrophe of April 26, 1986. At the end of 1990, the U.S.S.R. counted 15 nuclear power plants in which 45 reactors were functioning, of different types (24 VVER, 16 RMBK, and five others) which supplied 12% of the country's electric power. During 1990, these reactors were affected by 135 stoppages, which is a figure some 17% above that of 1989. Two research reactors were shut down for good.

According to Nikolai Chernberg, the chairman of the Gospormatomnadzor—the official agency in charge of oversight of nuclear production—"nuclear energy is developing in the U.S.S.R. in close correlation with the other branches of the economy. Thus one finds there all the negative tendencies which characterize the latter at present. These last years, we observe a relaxation of technological discipline in the enterprises which supply the nuclear plants. This is translated into a deterioration of the quality of the equipment which is delivered to them, as well as of spare parts and repair work." Thus 31.5% of the stoppages are due to human error, 24.5% to inadequate quality of material, and only 17% to construction defects.

Thus it is legitimate to ask what have been the supplementary safety measures taken by the Soviets since Chernobyl. Let us first of all make it clear that the anti-nuclear protest movement in U.S.S.R. is intimately tied to protests against the power of the "center," i.e., the struggle for the liberation or independence of the different republics which make up the mosaic of the empire; this was notably the case in Armenia, in Ukraine, and in the Baltic states. This attitude is understandable because they saw the arrogance of the Soviet experts and the criminal incompetence which prevailed at the time of the accidents and over the immediately ensuing weeks.

That said, it must be understood at the same time that the central government, as in every country of the world, regards nuclear energy as absolutely indispensable to the economic development of the country. It is well aware of the fact that, in order for nuclear plants to become acceptable again to the population, "it is indispensable to arrive at a technological level which is in no way below the best world levels and to raise the level of exploitation" (N. Ponomaryov-Stepnoy).

Hence, besides the closing of the two research reactors mentioned above, the central government has taken certain other measures:

1) Changes in the conception and management of safety for nuclear plants with RBMK reactors (both in service and under construction) of which Chernobyl was an example. Although some experts have asked that this kind of plant be totally abandoned in the future, because it is intrinsically unstable, nonetheless there remain a certain number in use (16 plants producing 17,000 MW) which it is economically impossible to envisage abandoning under the circumstances of the present economic crisis in the U.S.S.R. The measures essentially provide for improving the apparatus which failed at the time of the accident, and particularly the mechanism of the control panel of the reactor. The 16 RMBK units in existence were all provided with these improvements between 1986 and 1990.

2) Measures destined to assure the feasibility of the mechanical safety apparatus for plants of the VVER-1000 type (a more conventional Western-style unit). Seven containment vessels of VVER-440 have been reinforced to improve their resistance.

In fact, the goal is to cause the first and second generation units to pass to a safety level corresponding to that of the third generation unit. Finally, the Soviets are conducting studies on a new type of pressurized water reactor (Project VVR-92) by integrating all the recommendations made by international safety agencies. The construction of the pilot unit is supposed to be launched in 1995-96. For them, the "passive safety" reactors of 600 MW corresponding to the American projects as well as to high-temperature reactor

(HTR) plants to be used for urban heating are under study.

3) Raising of the level of the personnel: They will have to be recertified and take a supplementary course of study. Finally—and this is a revolution in the U.S.S.R.—safety principles are to take higher priority than production.

The future of nuclear energy in the U.S.S.R. therefore seems assured, as in the entire world, since this energy is indispensable to economic development. However, there are some huge dark spots with regard to the stability of a social infrastructure capable of managing the ambitious program which has been undertaken and with regard to the capacity for openness (glasnost) of the Soviet technical community. Now this openness toward the citizens, in the U.S.S.R. as everywhere else, is fundamentally necessary for the pursuit of peaceful exploitation of nuclear energy. Western countries have well understood that they had every interest in opening up collaboration with their Soviet colleagues to prevent at all costs another serious accident, which would ruin the efforts they have made to improve what sociologists call "the social acceptability of nuclear power." This would be a very crucial terrain for the intervention of the European Bank for Reconstruction and Development which has just been created.

The 'cloud over France' business

One of the most astonishing manipulations around the Chernobyl affair is the so-called "radioactive cloud which stops at Strasbourg." It has been claimed that French authorities, especially Raymond Pellerin, the chief of the Central Protection Service Against Ionizing Radiation, had hidden the truth from the population by denying that this cloud had really passed over the country. Worse yet, a hate campaign was launched against these authorities, accusing them of having caused the population to run a risk without taking any countermeasures, in contrast to Germany.

An article in the *Dernières Nouvelles d'Alsace* of May 9 illustrates how the confusion has been spread in France. Jérome Strazzulla shows it very well. In a big article dedicated to Chernobyl, two short items were placed side by side. The first explains that " 'after two days, the radioactivity in the air all over France returned to the level it had before the Chernobyl accident,' Denis Baudoin, the spokesman for Jacques Chirac, said yesterday, referring to authoritative sources." The second item explains that "the primary German television channel launched an appeal to all joggers in the F.R.G. to momentarily cease their activities because of the risk of radiation that they run."

It is absolutely false to state that the existence of a cloud was hidden from the French. Professor Pellerin had circulated four press releases. In the first, on April 29, he gave the estimated composition of the cloud; in the second, he stated that "the cloud, very diluted, has reached France." And now we quote the fourth release of Mr. Pellerin to AFP wire service:

"No public health countermeasures are justified in France following the Chernobyl nuclear accident, neither in the present situation nor later, and the preventive taking of iodine is 'neither justified nor opportune.' . . . The relative heightening of radioactivity reported over French territory in the wake of the accident was very much below the limits recommended by the International Commission on Radiation Protection and the French regulatory limits, which are themselves set with a very considerable margin of safety. One would have to imagine a rise of 10,000 to 100,000 times greater, in order to start to pose significant problems to public hygiene."

The total dose released by Chernobyl for one individual increased in France to 0.063 mSv on average, which is extremely weak in comparison with the average natural irradiation (2.4 mSv average per year).

The radiation due to the radioactive cloud from Chernobyl corresponds roughly to two weeks of vacation in the Alps. So, since *Libération* speaks of "radioactive lies," and *Le Monde*, of "disinformation"—two of France's leading national daily newspapers—who should be accused?

The only thing that Professor Pellerin could be reproached with, is not having communicated immediately all the figures, which were extremely low, for the supplemental radioactivity corresponding to the Chernobyl cloud. This "defect" seems professionally infinitely less serious than that of the journalists who credited the idea of thousands of deaths without ever publishing the refutation, and who still today are continuing, for example in *Le Point* of April 22, 1991, to cite statistics without ever reporting precisely on the official evaluation of such figures.

How radiation is measured

The unit commonly used to measure radiation absorbed dose equivalent is the sievert (Sv). Because it is a relatively large unit, radiation dose equivalents are generally expressed in millisieverts mSv, which are 1/1,000 of a sievert. The sievert replaces the unit previously used, the rem; 1 sievert equals 100 rem. One chest X-ray is equivalent to about 20 millirem or 0.2 mSv.

The curie (ci) measures the rate of disintegration of a radionuclide compared to the disintegration rate of a gram of radium (2.22 per minute). The curie has been replaced by the bequerel, which is 1 disintegration per second. These units are used to measure amounts of radioactive material. For example, ordinary soil contains 1 to 2 picocuries per gram.