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2nD Edition

Chernobyl—20 years on
C.C.Busby and A.V.Yablokov

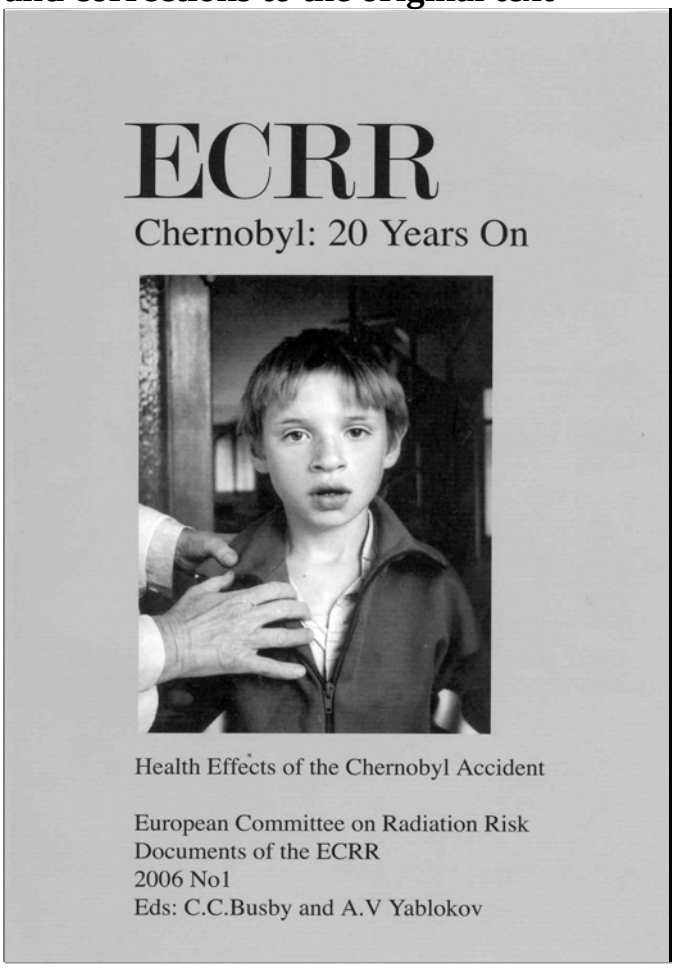
The Chernobyl accident contaminated large parts of the Soviet Union and Europe. Radioactivity was ultimately detected everywhere in the northern hemisphere. Doses to the emergency workers from external gamma-rays and internal fission-product radionuclides were significantly high, many died at the time. 20 years later, many liquidators still die and all are ill. The radionuclide contamination of the environment was significant and long-lasting. This resulted in chronic internal low dose exposure to millions of people, to animals and plants. Foodstuffs became contaminated with Caesium-137, Strontium-90 and uranium fuel particles containing a range of novel radioactive elements.

Rather than use this opportunity to investigate the health effects of these exposures, the international radiation risk community has ignored the many reports of ill-health emerging from the contaminated territories. International and National bodies (e.g. ICRP, UNSCEAR, BEIR, WHO), whose remit is the evaluation of ionising radiation effects on health, have glossed over, marginalized, ignored or denied the existence of the terrible consequences of the Chernobyl fallout. Research papers have been excluded from official reports. Cries for help have been dismissed as due to 'Radiophobia'.

Research into these effects has been mainly published in Russian language journals; these valuable contributions have (perhaps purposely) rarely been translated into English. To do so would have been fatal to the nuclear industry which routinely discharges the same radioactive substances into the environment under license.

This new ECRR publication presents the true consequences of the Chernobyl accident. Eminent scientists examine and review the data and show that, rather than fading away, the effects are only beginning to show themselves. The phenomenon of 'genomic instability', discovered in the laboratory in the UK in the 1990s, is seen now in its terrible effects on the animals, plants and human victims of the Chernobyl exposures. It is seen at doses that would have been, and still are, dismissed as vanishingly small by the current radiation protection laws. The first edition of this important book sold out quickly. This updated Second Edition published in April 2009 has a new preface and includes some corrections to the original text.

Second Edition, 2009 with a new preface and corrections to the original text



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Here are data from the real world: the world of the Chernobyl laboratory. The lessons contained in these chapters should be borne in mind by policy makers who are, even now, discussing new investments in nuclear energy and ways in which historic and future radionuclide waste can be disposed of into the environment. The committee recommends this book to scientists, policymakers and concerned members of the public, in the hope that the huge amount of work carried out by scientists publishing their results in Russian language journals and others studying the effects of the Chernobyl accident will influence their decisions in this important area of public health.

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"In 20 years it has become clear that not tens, hundreds or thousands, but millions of people in the Northern hemisphere have suffered and will suffer from the Chernobyl catastrophe...
...Official secrecy (until May 23rd, 1989) and irreversible state falsification of medical data during the first three years after the catastrophe, as well as an absence of authentic medical statistics in the former USSR, highlights the inadequacy of material concerning primary epidemiological consequences of this catastrophe...

...The calculations made by the author of this review showed that the average age of 162 liquidators who died during last 10 years in the town of Tollyaty (Samarskaya province, Russia) was about 46.2 years old (Tymonin, 2005). The average lifespan for 169 liguidators from nuclear industry institutes who died between 1986 – 1990 was 45.5 years (Tukov et al., 2000). In the Kaluga province - National register data, - the average age of death for 84.7 % of liquidators was only 30 - 39 years old (Lushnykov and Lantzov, 1999)..." - ***A.V. Yablokov***

"The dose dependence of the radiation effect may be non-linear, non-monotonic and polymodal in character...Over certain dose ranges, low-level irradiation is more effective with regard to the results of its action on an organism or a population than acute high-level radiation...

...Radiation-induced changes in the population structure result in an unpredictable response of the population to various events. In the work by A.P. Akif'ev et al. [12], an apparently healthy population of the posterity of exposed Drosophila exhibited a so-called 'populational breakdown' in one of its generations and was ruined by a law other than that for other generations. In the work by I.I. Pelevina et al. [13], it was shown that 15 generations of cells irradiated with the doses 10 to 50 cGy "remember" the irradiation and respond to external stimuli differently than the control...

....The results of surveys and biological monitoring of children and adults of Chernobyl point unambiguously to a steady, rapid and dramatic (for an individual human life) deterioration of health of all victims of the radiation impact of the Chernobyl accident..."- ***E.B. Burlakova & A.G. Nazarov***

"According to a wide range of scientific data reviewed, the following hypotheses can be proposed: 1) exposure to low-dose ionizing radiation is a risk factor for accelerated aging processes and neurodegeneration; 2) aging and neurodegeneration processes after exposure to ionizing radiation could be enhanced by the synergetic influence of heterogeneous pathogenetic factors, such as immunological, oxidative stress and molecular-genetic changes."- ***K.N. Loganovsky***

"The detected cytogenetic effects of chronic low-intensive irradiation in the germ and somatic cells of wild animals exceeded the expected levels deduced from extrapolation of the data from the high-dose range of acute or chronic irradiation. In wild murine rodents increased frequencies of cytogenetic injuries in somatic and germ cells, as well as embryonal lethality, were shown to remain over the life spans of no less than 22 generations (Goncharova & Ryabokon, 1998)..." - ***E. Yu. Krysanov***

"In addition, a view of the radiobiological processes induced in plants by chronic irradiation should elucidate the main tendencies in the formation of late effects of irradiation. As this takes place we bear in mind that these late effects in plants could not be related to 'radio-phobia', as it is called, as there is a tendency to assign the cause of injuries observed after the Chernobyl catastrophe merely to a ***fear*** *of irradiation. We have seen, since the accident, clear and diverse effects of irradiation in plants over time...*

...It appears that there are two adaptive strategies to stress impacts in plants, namely; ontogenetic and population or phylogenetic adaptation. The first type of adaptive strategy is revealed by radioadaptation and resides in an augmentation of radioresistance after irradiation in low doses. The second type of adaptive strategy lies in an increase in frequency of genetic diversification, which enlarges the possibilities for active natural selection..."- ***D.M. Grodzinsky***

"Using new infant leukemia data from the UK supplied by the Childhood Cancer Research Group, Oxford, it is possible to combine the populations of Germany, Greece and the UK and carry out a meta analysis of infant leukemia in those children who were in the womb at the time of the fallout. Using published exposure doses to the foetus the infant leukemia yield in Europe is more than 160 times higher than that predicted on the basis of the external irradiation yields found by the obstetric X-ray data studies. This means that the ICRP risk model is at minimum in error here by a factor of 160-fold. The dose response is biphasic..." - ***C. Busby***

"Clearly, the true damage to health attributable to the Chernobyl disaster has been kept from the general public through poor and incomplete scientific investigation..."- ***R. Bertell***

The European Committee on Radiation Risk
(Comite Europeen sur le Risque de l'Irradiation)

The European Committee on Radiation Risk was formed in 1997 following a resolution made at a conference in Brussels arranged by the Green Group in the European Parliament.
The ECRRs remit is:

- To independently estimate, based on its own evaluation of all scientific sources, in as much detail as necessary and using the most appropriate scientific framework, all of the risks arising from exposure to radiation, taking a precautionary approach.
- To develop the best scientific predictive model of detriment following exposure to radiation, presenting observations which appear to support or challenge this model, and highlighting areas of research which are needed to further complete the picture.
- To develop an ethical analysis and philosophical framework to form the basis of its policy recommendations, related to the state of scientific knowledge, lived experience and the Precautionary Principle.
- To present the risks and the detriment model, with the supporting analysis, in a manner to enable and assist transparent policy decisions to be made on radiation protection of the public and the wider environment.

The committee now has more than 50 experts from many countries collaborating on the issue of radiation risk and has set up a number of sub-committees and groups. The committee's risk model was presented in 2003 in Brussels and is published as the ECRR2003 Recommendations: the Health Effects of Ionising Radiation Exposure at Low Dose for Radiation Protection Purposes (ISBN 1897761 24 4). The report, now in its second printing, has been widely circulated and translated and published in French, Russian, Spanish and Japanese. The price of the English edition is £45 with a concession price of £15 for students/ NGOs. It is available by order from any bookseller or direct by emailing an order to **admin@euradcom.org** or from the publisher, Green Audit, at the address below.

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