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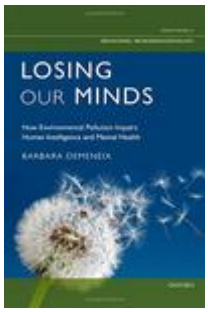

Fear and Uncertainty Regarding Environmental Pollution and Mental Health

A Review of

Losing Our Minds: How Environmental Pollution Impairs Human Intelligence and Mental Health
by Barbara Demeneix
New York, NY: Oxford University Press, 2014. 284 pp. ISBN 978-0-19-991751-8. $59.95

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Reviewed by

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Losing Our Minds examines the possibility that a variety of chemical pollutants, especially those developed from modifications of the phenyl ring, directly impact thyroid hormone production, or thyroid hormone action, with negative effects on mental well-being. The book contains an exceptional amount of detail regarding the mechanisms and importance of the thyroid gland and points towards many potential damaging influences on thyroid function. Anybody involved in thyroid research is likely to find much of value in the book. Unfortunately, for the non-specialist, the material is simply dense. The vast number of chemical agents that may influence the thyroid, and the abundance of potential mechanisms, quickly become dizzying and distracting rather than helpful. Discussion of thyroid hormone production, for example, includes descriptions of autoimmune disease, thyroid storm and the dangers of prescribing T_3 for weight management. Even when the prose is seemingly directly relevant, the unnecessary density and gratuitous detail makes it diversionary. Consider this description of T_3 and T_4 synthesis:

> De novo synthesis of the iodothyronines T_4 and T_3 results from the coupling of two iodotyrosines, a process that is restricted to the thyroid gland in most vertebrates. . . The thyroid is composed of colloid-containing follicles that represent the functional subunit of thyroid tissue. A single epithelial cell layer forms the follicle, these specialized follicular cells being the thyrocytes that secrete the thyroglobulin (TG)-containing colloid. (p. 99)

Detail like that continues across hundreds of pages with the only message seemingly being that thyroid production is complicated, delicate and easily influenced at multiple different points by a wide variety of chemical agents.

Ignoring the density and the many diversions, the case that Demeneix constructs is not compelling. Demeneix suggests that chemical pollution affecting thyroid production is directly responsible for falling IQ and rising incidence of autism and attention deficit hyperactivity disorder (ADHD). The author uses a significant number of rhetorical devices to make her case. For example: "In 1981, the values of PCBs in [breast] milk samples obtained in 1977 and 1978 were published. Significant contamination was found. . . concern was raised for the long-term health effects" (p. 5).

"Significant contamination" is not specific and the "concern raised" is not explained. The reader is left uncertain as to whether the concern was ever substantiated. Such comments are vague and rhetorical, designed to generate concern and win support for an agenda rather than to inform. The entire book is, unfortunately, agenda driven and represents a case of advocacy research, designed to convince the reader of something the author already understands to be true.

Demeneix recognizes the problem of advocacy-based research when she condemns chemical industry experts who defend the use of phenyl chemical compounds. Such experts are potentially tainted by their a-priori position of supporting the chemical industry. Demeneix, however, fails to observe that she may also be subject to ideological and personal interests that drive her own role in condemning the chemical industry. Appearing as an expert scientific witness for the OECD, for example, may not involve any large financial gain but does provide influence and gravitas that may also be a source of bias. Demeneix's critique of a spokesperson for the Soy Nutrition Institute is illustrative:

> However, the paper provides no actual data on children but provides data on piglets. . . . The fact that one of the authors on this paper is a member of the Scientific Advisory Board of the Soy Nutrition Institute may again help to explain why the abstract concludes with the ambiguous and unfounded statement that soy formula, "*may* be even advantageous for bone growth." (p. 160)

Here, Demeneix attacks the relevance of animal research and yet virtually every mechanism she raises to illustrate the potential negative impact of phenyl chemicals on human brain development and cognition follows from animal research. Here, she also attacks the use of vague language and yet throughout the book she points to possible and inferred causes. That is, she points to vague possibilities of cause.

For psychologists reading this text, the most obvious criticisms might be directed against Demeneix's interpretation of IQ and data on autism and ADHD prevalence. IQ is normative and has been rising for a long time (Flynn, 1987). The exact reasons remain uncertain, but decent housing, universal education, improved healthcare and sanitation and a higher level of nutrition are likely to be involved. Wholesale reversal of this happy situation because of the use of phenyl chemicals, even if the effects described by Demeneix have some traction, is unlikely.

Autism prevalence has increased considerably over the past thirty years. Possible reasons for this increase include actual changes in the prevalence of autism or broadened diagnostic boundaries with an increased tendency to recognize autism. There is evidence for the broadening of diagnostic boundaries (Bishop, Whitehouse, Watt, & Line, 2008; Eyal, 2013) and the increased recognition of autism in children with normal IQ (Rutter, 2005). Demeneix considers the possibility of diagnostic changes explaining rising incidence but

rejects those claims because studies using the same diagnostic criteria indicate changes in prevalence. This evidence provides some support for the contention that an external pollutant might be involved in increasing the prevalence of autism and ADHD. The time frames of the studies quoted, however, were relatively short and the studies cannot undermine the possibility of the same criteria being applied less stringently.

Demeneix also misses broader changes in the way children with learning difficulties are treated. Fewer children are institutionalized and parents play a more active role in the diagnosis of their children than in the period prior to 1990 (Eyal, 2013). These changes have created a move away from the diagnosis of mental retardation and towards the seemingly less condemnatory diagnosis of autism. Moreover, a recent study, involving 6,423 participants, has demonstrated that 95% of the variability in clinical diagnosis of autism is predicted by genetics, which restricts the basis for an environmental pollutant having an effect (Colvert et al., in press).

The possibility of an environmental pollutant causing low level cognitive impairment that may be related to reductions in IQ, and increased autism and ADHD prevalence, remains a theoretical possibility. *Losing Our Minds*, however, does not provide a convincing case that this theoretical possibility is a current reality.

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