ENVIRONMENTAL CONCERNS: FLUORIDE AS A FRESHWATER STRESSOR

by Joy Warren, BSc. (Hons) Environmental Science June 2024

It is calculated that about 2% of drinking water including fluoridated water and water containing natural fluoride is drunk by UK consumers. The remainder is lost in leaks, used in domestic settings for purposes other than drinking, evaporated by industrial processes or incorporated into manufactured food. (*Warren, 2017*).

Whilst it is hoped that all fluoride entering rivers and streams from sewage works will eventually go down to the sea, this is not certain. In cases of doubt the Precautionary Principle should be invoked. (*Precautionary Principle*)

The retained *EU Directive on Dangerous Substances in the Aquatic Environment* cites fluorides in the Annex to the Directive. When fluoride exits Sewage Works as treated effluent, half of the fluoride entering the sewage works joins freshwater systems. The other half contained in sewage sludge is often spread on fields. (*Olejarczyk, 2022*)

The *Directive* does not define how much fluoride/litre river water immediately below the Sewage Works is regarded as being dangerous. Once effluent moves away from the Sewage Works carried on the current, fluoride and other contaminants would become quickly diluted. It is assumed that when the current is constant, there would not be a build-up of fluoride at any point on its journey downstream. However, what happens when the rain doesn't fall and the speed and depth of the current are subsequently reduced? There would be a build-up of contaminants which would damage the viability of river life.

Environmental protection measures are entirely unsatisfactory when it comes to monitoring the harm caused by fluoride. (*Forrest, 2023, paras 48 et. seq.*)

With raw sewage releases having poisoned our rivers during the past few years, any addition to the pollution burden is a bridge too far.

There is also the added concern: phosphate leaches into rivers from adjacent crop fields, so it is possible that fluoride in the soils will also leach into rivers and streams. Fluoride gets into soils from (1) sewage sludge and (2) from the phosphate fertiliser used to keep soil productive. Since modern farming practices keep a field in production throughout every year, there is more and more phosphate fertiliser spread on the soil and consequently more and more fluoride in the fertiliser. Fluoride should not be in the phosphate fertiliser but unfortunately, it is not completely removed when the phosphate fertiliser was being manufactured. (Li, 2023; *FADS analysis of fluoride in Growmore® unpublished (2016)*)

Research into this adventitious pollution is sketchy. It's another case of observing the Precautionary Principle. Polluting our rivers and streams with fluoride is inexcusable just so

that little children can have their daily dose of fluoride along with an entire population of adults who only slightly benefit from drinking the toxic pollutant. (LOTUS, 2023)

From a socio/political standpoint, it is scandalous that the environment (our rivers and streams) should be further threatened from the import of hazardous industrial waste produced by another country where the producers do not want to spend money neutralising the waste in their own back-yard. (*Bryson*, 2004, pp. 150-51)

Our indignation should know no bounds: our Government is willing in its ignorance, to jeopardise the health of our rivers and streams by adding a known toxin to drinking water.

Water companies can only add water treatment chemicals to raw water to convert it into wholesome drinking water. Fluoride is not a water treatment chemical. (*BSEN 12175:2022, p.19*) Using drinking water as a vehicle for unlicensed medicine is problematical. However, UK law permits its addition. (*Water Industries Act, 1991; Water Fluoridation Act 1985; Jones, 2000*). Commonsense took a leave of absence on the day that the 1985 law which legalised water fluoridation was enacted!

The policy of adding fluoride to drinking water is a short-sighted policy which has no merit because fluoridation doesn't do what is claimed for it. Recent research attests to its ineffectiveness at completely preventing dental decay (*CATFISH, 2022; LOTUS, 2023; Connett, 2001).*

In his systematic review, Julio Camargo examined research literature on the damaging effect of fluoride in the aquatic environment. (*Camargo, 2002*) The most sensitive species to fluoride toxicity are salmon which cannot flourish in freshwater streams and rivers where fluoride is measured at and above 0.5 mg/litre river water and where the water has a low pH (i.e. the water is "soft" and acidic). Many will say "so, what is the fuss all about?" Well, with summers becoming hotter and with the volume of stream and river water becoming uncertain with slower currents, pollutants will become concentrated and that is when river life becomes challenged.

Treated sewage effluent exerts a biological oxygen demand (BOD). (*Wikipedia*) Untreated sewage effluent exerts an even greater BOD resulting in even less oxygen-containing water. Fish and other fresh-water dwellers require oxygen. Less oxygen stresses them and they are more likely to succumb in the presence of pollutants.

Humans are setting up a perfect storm of freshwater extinctions. There would be a knock-on effect further up the food chain with kingfishers, dippers, otters and birds of prey, etc., finding their food source diminished. There would also be the problem of biomagnification. Pollutants will be ingested by carnivorous animals/birds - the prey animals - and accumulate in their tissues. We remember with horror the damage caused by DDT which reduced the thickness of birds' egg shells. (*Carson,1962*)

Fluoride is just one of the pollutants entering our rivers and streams. It may not be a major pollutant but it is a "dangerous substance" and adds to the pollution burden. Consequently, it could be the tipping point in the death of our rivers.

References

Warren J. (2017) A Complete Waste of Money! Water Fluoridation Costs for England, 2013-2021. Researchgate. https://www.researchgate.net/publication/319460176_A_Complete_Waste_of_Money_Water_Fluoridation_Costs_for_England_2013-2021, p. 5.

Wikipedia. Precautionary Principle https://en.wikipedia.org/wiki/Precautionary_principle

Directive 2006/11/EC (Retained) of the European Parliament and of the Council of 15 February 2006 on pollution caused by certain **dangerous substances** discharged into the aquatic environment of the Community . https://www.legislation.gov.uk/eudr/2006/11/contents

Sewage Effluent: Olejarczyk, M. *et. al*. Management of Solid Waste Containing Fluoride—A Review. Materials 2022, 15, 3461. https://doi.org/10.3390/ma15103461

Forrest, D. (15th December 2023) Water Fluoridation Environmental Impact Assessment: The use and disposal of hexafluorosilicic acid. Unpublished. Read here.

Li, H. *et al.* Fluoride contents in commonly used commercial **phosphate fertilizers** and their potential risks in China. *Environ Monit Assess* **195**, 1051 (2023). https://doi.org/10.1007/s10661-023-11623-w

Fluoride Analysis Database Service. Analysis of fluoride in Growmore® Not in the public domain. The analysis found 4mg fluoride in 5g of Growmore®

Goodwin M. *et. al*., Evaluation of water fluoridation scheme in Cumbria: the **CATFISH** prospective longitudinal cohort study. *Public Health Res* 2022;10(11)

Moore, D., *et al.* (2024) How effective and cost-effective is water fluoridation for adults and adolescents? The **LOTUS** 10-year retrospective cohort study. https://doi.org/10.1111/cdoe.12930

Bryson, C (2004), *The Fluoride Deception*. New York Seven Stories Press. ISBN 1-58322-526-9, pp. 150-1.

BSEN 12175:2022. Chemicals for the Treatment of Water for Human Consumption: Hexafluorosilicic Acid. Not in the public Domain. It's important to realise that the

statement on p.19 of this BS contradicts the title of the BS. Annex, p.19, "Function: "Hexafluorosilicic acid is used for the fluoridation of drinking water to increase the resistance of consumers to dental decay".

Water Industry Act 1991, ss. 87-91.

Water Fluoridation 1985 Act. This has now been incorporated into the Water Industry Act. At the time the vote was taken in 1985, the Conservative Government of the day imposed a 3-line-whip. The results were reported by the BMJ. See Jones, J. below.

Jones, J. (2000) "Fluoridation: The Politics". *British Medical Journal* . *BMJ* 2000; 321 doi: https://doi.org/10.1136/bmj.321.7265.855

CATFISH – Goodwin M. *et al.* Evaluation of water fluoridation scheme in Cumbria: the CATFISH prospective longitudinal cohort study. *Public Health Res* 2022;10(11)

Connett, P. (2001) Another Look at Brunelle and Carlos in *Fluoride Alert Network*. https://fluoridealert.org/content/ifin-290/

Camargo, J. (2002) **Fluoride toxicity** to aquatic organisms: a review. https://www.sciencedirect.com/science/article/abs/pii/S0045653502004988?via%3Dihub

BOD – Biological Oxygen Demand. Wikipedia. https://en.wikipedia.org/wiki/Biochemical_oxygen_demand

Carson, R. (1962). *Silent Spring*. New York: Houghton Mifflin. Carson's biography is available on www.brittanica.com/topic/silent-spring .