

Editorial

WHY a special issue of *TOS Forum* on reducing global mercury pollution? The answer is two-fold: i) the general topic addressed in this issue was unfortunately not covered at WCSB9 (there is a minor, but critical sampling issue involved), and ii) the *timing* of the issue treated in the two first articles is *critical*. At the risk of being thought of as alarmists, the Editor and the Publisher have decided to sound a warning—by offering their help in bringing the World's attention to the first two articles published in here.

- Reducing global mercury pollution with simultaneous gold recovery from small-scale mining tailings

- Barefoot sampling in San Juan de Limay, Nicaragua: remediation of mercury pollution from small scale gold mining tailings

In the first article, senior researcher Peter Appel tells the story of the preceding decade of his work contributing towards turning around what is a rapidly developing global toxicological crisis—the global mercury pollution crisis. This is a *de facto* analogue to Rachel Carson's famous alarm published in her book *The Silent Spring*. The increasing footprints from the world's growing population has one particularly dangerous impact in the amount of mercury released to the environment, stemming from the rapidly increasing number of small-scale gold miners in Asia, Africa, Central and South America, who presently provide food on the table for 10s of millions of very poor households. Small-scale artisanal gold miners use vast amounts of mercury to capture the gold, and much of this mercury is released directly to the environment. A large part evaporates to the atmosphere and the rest is transported downstream in rivers, ending up in the oceans. The amount of mercury released by small-scale gold miners alone is phenomenal: an estimated 3000 tons of mercury annually, a staggering 37% of the total world mercury emissions. A vast proportion enters the food chain in fish and

sea mammals, as well as in rice polluted by spillage waters which enter irrigation pathways. Human consumption of polluted fish and/or rice already has a severe impact on human health, and this will have even greater consequences if the current situation is not changed radically and rapidly.

The second article deals with the challenging tasks involved in sampling for gold and mercury analysis under severe economic, technology and logistic constraints because of extremely low analyte concentrations and the resultant overwhelming distributional heterogeneities. This combination of highly adverse conditions is pretty much unique, but, here, it is shown how to succeed even so.

As a didactic addendum, the last two articles also treat the issue of optimal sampling of *hidden heterogeneity*, exemplified by lots composed by animal feed and biomass. These articles form a topical complement to the two major features, and we do not ask forgiveness for having published them before; every added momentum with which better to present and illustrate the first two features is important.

This Special Issue forms a dedicated vehicle directed at a technology-poor application arena, which is of equal interest as the much more prominent large-scale (or super-scale) major commodities mining and minerals extraction sectors in general. These are characterised by abundant up-to-date high-technology and a positively over-abundance of economic means in comparison (iron, base metals, precious metals). "Interestingly", the sampling *principles* involved in the very different industrial application sectors in this Special Issue are in fact *identical*, a point well worth emphasising for the readers of *TOS Forum*.

The Mercury Crisis is another "silent crisis" mostly unknown to the global population, even though a much larger fraction is actually falling victim to it. PLEASE READ THE TWO MAIN ARTICLES MOST CAREFULLY!



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