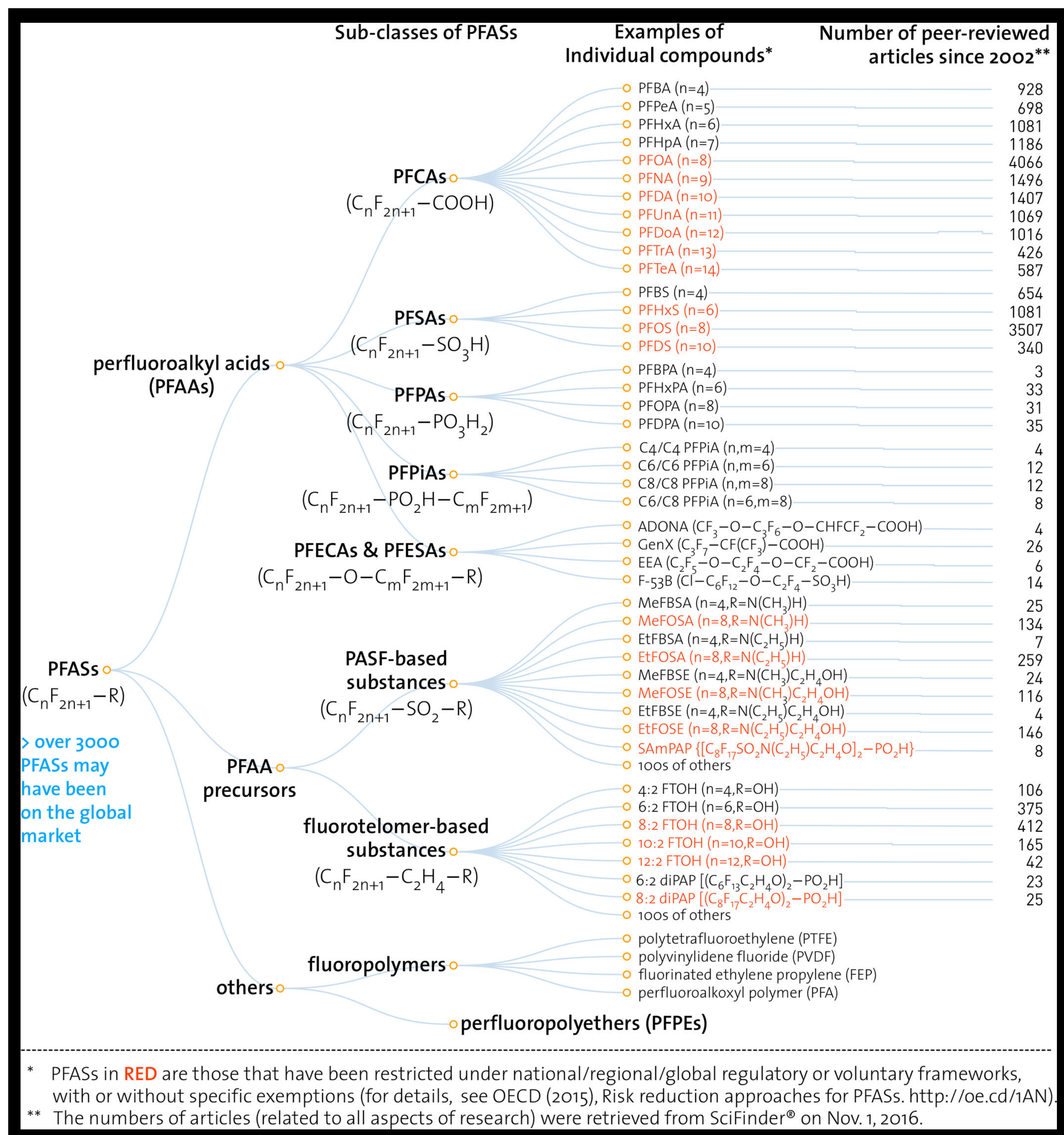


A Toxic Family Tree



Caption

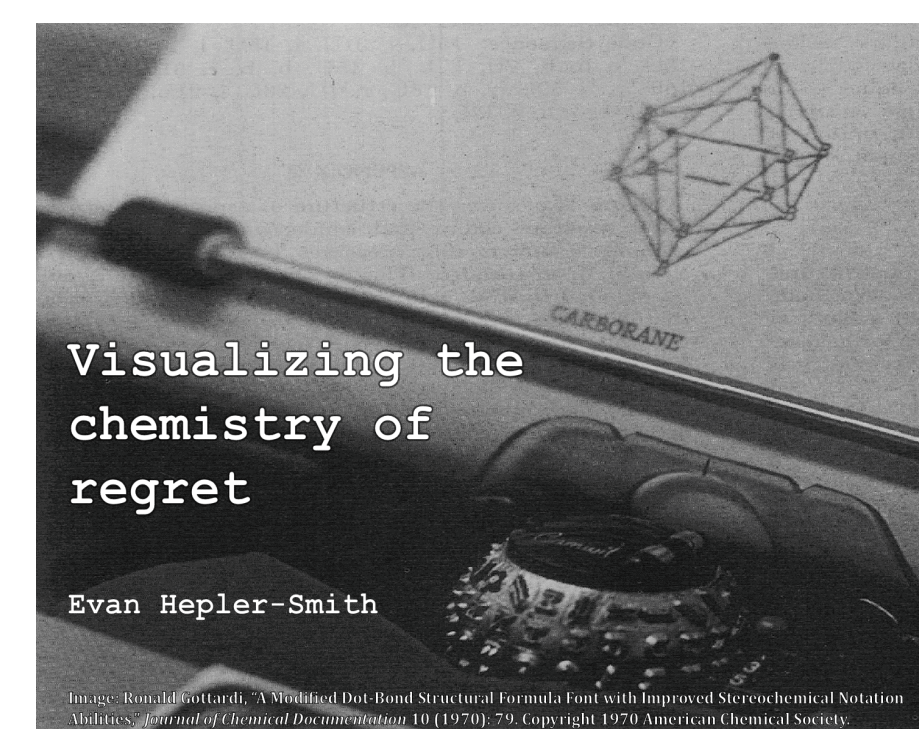
The taxonomic tree is a common way natural scientists (among others) visualize relationships—pinning down entities to specific positions within an all-encompassing hierarchical order. Such diagrams often overwhelm in their scope and complexity. They may claim mastery of complexity through classification or, as here, dramatize how specifics defy comprehension. Environmental toxicologists deployed this image to portray and critique the tendency of chemical research to focus on individual molecules. Ethnographers may wish to point out that hierarchical taxonomy itself is a choice; relationships of other kinds may be relevant for grappling with toxicity. Scrutinizing and experimenting with visual modes of relational thinking can strengthen ethnographic understandings of how knowledge gets made and used.

Design Statement

This image portrays environmental toxicology and toxic substances regulation as trapped in a molecular double bind. On the one hand, the quantity of studies dedicated to PFOA and PFOS attest to how much work it takes to begin to understand the long-term, low-dose toxicity of a specific chemical compound—let alone to take action to address it. On the other hand, the molecule-by-molecule list of PFASs at right illustrates how focusing on specific compounds risks missing the chemical forest for the molecular trees. In sum, according to this figure, there are too many molecules to know, and it's very hard to know anything at all about any of them, in large part because there are so many of them to know. The impression that there is just too much to know is a general feature of the "informing of environmentalism" (Fortun 2004). Historically, such concerns have tended to emerge in the wake of novel technologies that afford new practices and imaginaries and scales of information management (Blair 2010).

Project Statement

My challenging toxic subject is the molecule. Not any particular nanoscale unit of potentially hazardous substance, nor any particular substance in the aggregate. Rather, I am interested in the material and historical grounds for the peculiar idea that molecules and only molecules may be the proximate causes of (chemical) toxicity. The origins of this history lie in visualization: the late 19th century convention (much the same today) of representing chemical substances using doodles of letters, representing atoms, and lines, representing bonds. The principle of toxin-as-chemical-as-molecule came about through the transformation of such doodles into fixed chemical names and notation. This molecular vocabulary ordered the chemical world for the convenience of chemists and, especially, the synthetic chemicals industry. I would like to reverse this process. By foregrounding the contingency of the molecule as toxic agent, I wish to open space for remapping environmental toxicity along dimensions new and forgotten, such as that of 19th century Alsatian chemist Charles Gerhardt, for whom chemicals were beings "defined by their metamorphoses, that is, by their past or by their future."



Hepler-Smith, Evan. 2019. "A Toxic Family Tree"

In "Visualizing the Chemistry of Regret." In Visualizing Toxic Subjects, curated by James Adams and Kim Fortun. The Center for Ethnography. May.

<https://tinyurl.com/y4l2sypo>

Image: from *Journal of Chemical Education*, A Molecular Model Structural Formula Font with Improved Stereochemical Notation. *Journal of Chemical Education*, 46 (1979): 79. Copyright 1979 American Chemical Society.