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The Big Picture

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ABSTRACT

Clinicians are key in reclaiming the medical arts ceded to clinically irrelevant technology and thereby aligning patient with fast-changing biological realities. Narrowing the chasm between virtual and real perceptions of health hazards requires: 1) becoming acutely aware of the habitat loss aggravating the pervasive dissemination of chemicals via conventional food, air, and consumer products and the proliferation of non-ionizing radiation; and 2) making strategic use of slow, system 2 thinking so as to respond wisely to the rampant epidemics of chronic low-dose toxicity disregarded or misdiagnosed for half a century. To respond adaptively, take a moment during each patient encounter to add chronic ambient poisoning to the differential diagnosis and investigate subtle symptoms and signs of irritation in vulnerable organ systems. Enacting adaptive response across our profession could ease the suffering of millions, help avert the sixth extinction, and contribute to continuation of evolved life as we know it.

Keywords:

Toxicity; Diagnosis; Personal care; Patient encounter; Patient-based medicine

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MAIN TEXT

"[We have] excessive confidence in what we believe we know, [and an] apparent inability to acknowledge the full extent of our ignorance and the uncertainty of the world we live in."

Daniel Kahneman in *Thinking, Fast and Slow*

Hippocrates would appreciate this moment in medical history: after two and a half millennia of periodic epochal change, we have once again come to the end of an old, complex, maladaptive order. Restoration of the medical arts notably advanced by Hippocrates (1), Avicenna, Maimonides (2), Vesalius (3), and the Scottish Enlightenment (4) is taking place as doctors recognize the need to catalyze the profession in its—snake-like—shedding of a senescent skin. This is good news because late modern defensive, unsustainable, micro-managed, and obtrusive complexity is failing our species even as our species is failing life on earth. To save both, doctors can gather, bring forward, and adapt useful practices from all eras, spanning from Hippocrates' *Airs, Waters and Places* to modern problem-solving and centralization of emergency services. This winnowing can also seed new processes that care for and cure patients with the evolved living contexts on which all lives depend. Such processes are needed to stem or reverse heedless human damage to the body of life that we have degraded beyond recognition—and possibly beyond repair (5) (Figures 1 and 2).

In this unprecedentedly dangerous time of epochal change and paradigm shifts (6), the role of medicine is more important and urgent than ever. The task before doctors is an old one: to choose life (7). This entails recognizing and discarding untenable modern assumptions such as human exceptionalism, breaking free of learned helplessness enforced by top-down systems, and recognizing that we are "eating our children" (8). Too few of us see—or help our patients to

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see—that humans are integral to habitats that our species is fast obliterating. We cannot care for any lives without first caring for the interdependent living context on which evolved life depends. To form a fresh, sustainable skin for our profession will require that we catalyze the restoration of life on earth as a whole.

You can begin your own process of transformation by utilizing personal agency to pause during each patient encounter and insert moments of system 2 (slow) thinking into your routine processes of system 1 (fast) thinking (9)—the processes that "save time" by invoking subliminal, automatic, conditioned responses that conform to expectations but that also might on closer examination make no sense. You need pause only long enough to: A) access your growing awareness that we are immersed in a sea of hazardous synthetic (and/or overabundant) toxins (10–12) and have too little healthy habitat left to protect us (Figure 3), and B) focus on these questions: *Could any of my patient's signs or symptoms reflect a low threshold for toxicity or a high lifetime cumulative exposure to everyday toxins? Should I take a more thorough history or physical to detect irritation of pulmonary, nervous, gastrointestinal, or excretory systems that may be vulnerable to pervasive poisons? Does the family history suggest susceptibility?*

Likewise pause before considering treatment to ask yourself: Should I aim to suppress symptoms and signs to provide immediate relief, or shall I take these as precious clues to detecting chronic exposure requiring attention and possible investigations and intervention—or should I do both? During this reality check, set your expectations that all commercial chemicals are guilty perpetrators of damage until proven intergenerationally and ecologically safe, and that any patient is honestly suffering and seeking your kind assistance. Or, put differently, don't be afraid to practice patient-based medicine or to drop rationalizations and say, "I don't know."

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Note that this is likely to be difficult. If you break ranks to practice patient-based medicine or to use your wits (13), you will feel the system resist and possibly punish you. Fortunately, unlike the rigid, stretched, unresponsive, metric-distorted systems that bind modern medicine, you as an astute and wily patient advocate can attend to warning signs and so prevent disability, final common pathway diseases, new syndromes, and—perhaps—unexplained cirrhosis or multi-system atrophy. If you pinpoint known local sources and consequences of habitat injuries, you can engage your patients in curing themselves by practicing the science of everyday life (14). By thus perceiving and benchmarking living rather than virtual realities, you can restore necessary acumen, efficacy, and agency.

As your awareness of harm to life increases, you may begin to detect toxicity everywhere. You may be amazed that you didn't see it before, which may pique your creativity. You may see the need to imagine additive, catalytic, and cumulative exposures and to group them. You may consider many new options for prognosis and treatment. This will free you to pursue the phenomenology of low-dose toxicity with patients, local wildlife veterinarians, and others, and to recover arts of medicine and discovery that have been lost under production management by people who know not what they do. In pursuing the pith of your profession rather than meeting muddled modern social expectations, keep in mind an aphorism once taught at U Pittsburgh to incoming medical students: Half of what we teach you is wrong, we just don't know which half. Staying aware of life on the human scale and above will teach you what's wrong.

As you help patients reduce their toxicity (14), you will become a part of the long-resisted paradigm shift and see beyond the modern views that presently conceal late modern ailments (15). Embedded in modernity is the illusion of control, the imperative that you must

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control life and death. As you recognize how much of your time has been wasted on reducing legal risks and easing managerial anxieties rather than on responding to medical and ecological realities, you can leave behind the modern worldview and its homicide-suicide trajectory and help to transform moderns from biome-blind to life-loving.

The mainstream One Health program has begun a true process of transformation in the area of infectious disease (16), notably in the anticipation of the COVID-19 pandemic. In this program, biomedical disciplines converge as they do in other boundary-crossing processes through which the modern ethos is shifting (17,18): doctors join wildlife veterinarians, virologists, environmental scientists, and others, and could join with ecological restorationists to serve life. In so doing, they are leading medicine in creating a Hegelian thesis to sunset modern antitheses, and in using syncresis to offset reductionism and narrowness (6). While some have taken integrative or environmental medicine as sufficient to support emergence, these have to date perpetuated the anthropocentric, reductionist, excessively molecular, co-dependent, and addictive worldview of late modern medicine.

If the natural experiment of life as we know it is to continue, each and all must follow nature's lead by cooperating with biological evolution in ecological time. This requires changing our minds, which—as emphasized by Dr. Oliver Sacks (19)—is very difficult work indeed. In looking to other fields that have been leading post-post-modern change—and proposing yet more change—we can gather constructs and processes that enable emergence and survival such as: biocentric, human-scale, and ecological views; biomimicry; soil to soil sustainability; macro-biological disease constructs (20); development of both anticipatory and responsive care and cure; embodiment of agency; experiential learning (21); solving in lieu of becoming co-dependent with problems; development of localism with experiential learning; and artisanal

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approaches. Once any denial is breeched, you may become exhilarated, and may come to lead the save of saves: restoring the living future.

CONFLICT OF INTEREST STATEMENT

None declared.

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FIGURES

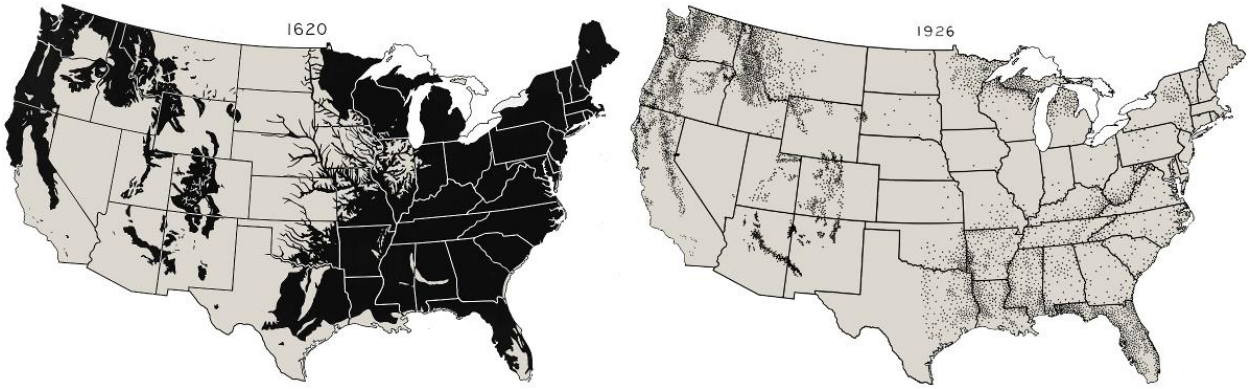

Figure 1. Virgin forest in the contiguous US, 1620 and 1926. Adapted from maps by the US Forest Service(22).

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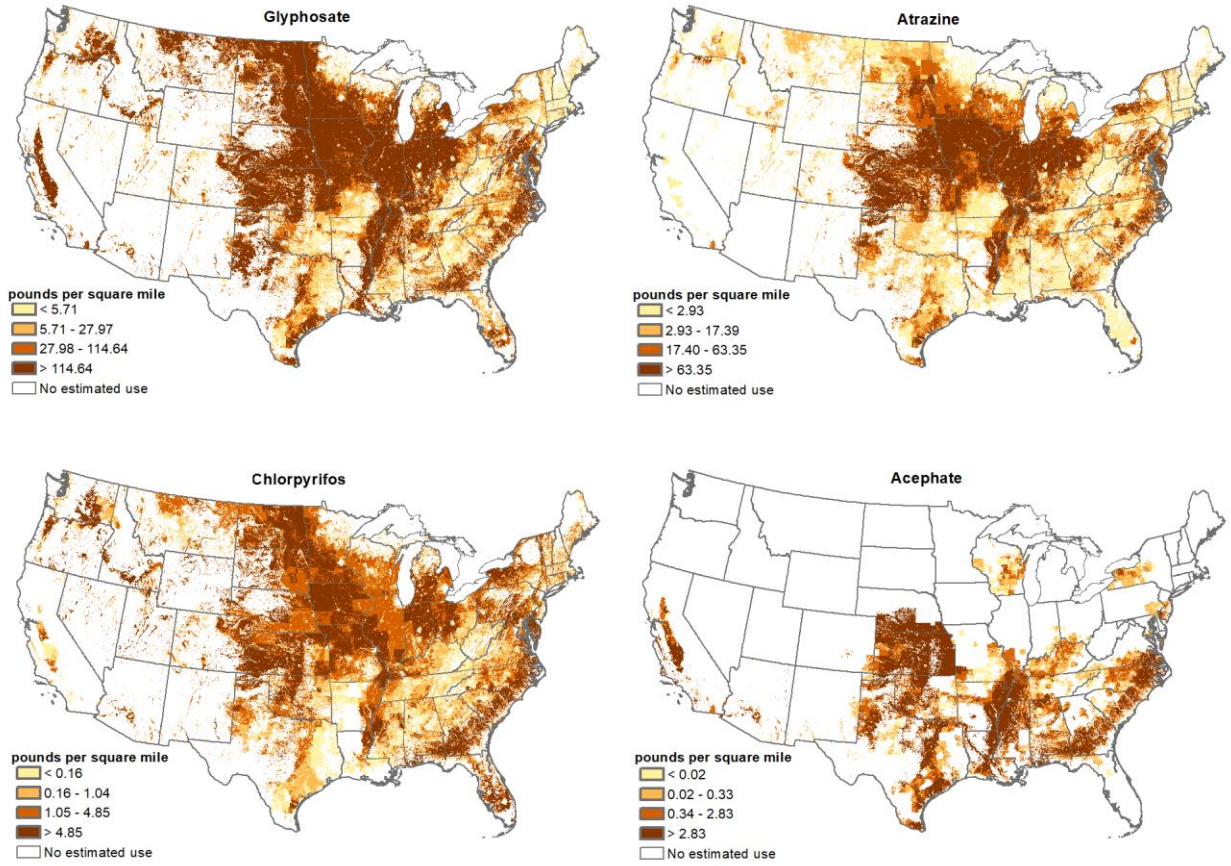

Figure 2. Estimated use in pounds per square mile of selected common pesticides on US agricultural land in 2019(23): glyphosate (herbicide, organophosphonate), atrazine (herbicide, triazine), chlorpyrifos (insecticide, organophosphate), and acephate (insecticide, organophosphate). Adapted from maps developed by the USGS based on county-level farm surveys using the "EPest-high" analysis method, which interpolates missing data from surrounding regions**(24)**.

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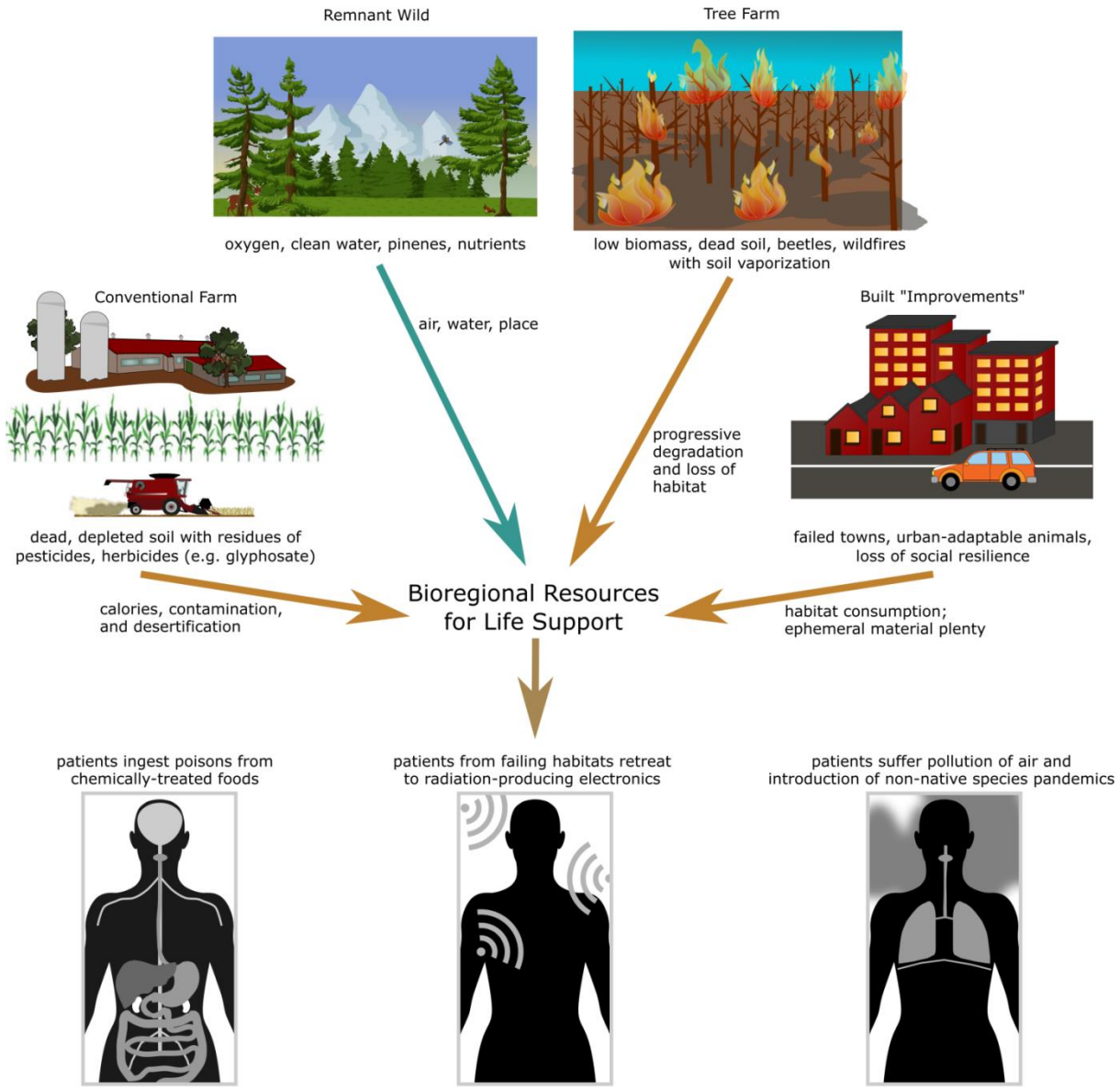

Figure 3. Contemporary sources of toxins and protection from toxins.