

Traumatic Holocaust legacy

A large proportion of Jewish survivors of the Nazi Holocaust — particularly those who endured extreme atrocities in concentration camps — suffer from post-traumatic stress disorder (PTSD) nearly 50 years after World War II, according to a report in the March *AMERICAN JOURNAL OF PSYCHIATRY*.

Studies of prisoners of war have documented high rates of PTSD up to 35 years after release from captivity (SN: 2/2/91, p.68), but few follow-up studies of Holocaust survivors have emerged in the last two decades.

Of 123 Jewish survivors living in the Toronto area and applying for compensation from the German government, 58 suffer from PTSD, assert psychiatrist Klaus Kuch and psychologist Brian J. Cox, both of the University of Toronto. PTSD symptoms include recurring memories and nightmares of traumatic experiences, emotional detachment from loved ones, extreme suspicion of others, difficulty sleeping and avoidance of any situation reminiscent of past traumas.

The sample included 78 people who had been confined in concentration camps for an average of nearly 15 months (including 20 who faced extreme atrocities and the constant threat of death at Auschwitz), and 45 individuals who had been in labor camps and ghettos or had hidden with families that offered shelter to Jews. Half of the concentration camp survivors — and 13 of the Auschwitz survivors — suffer from PTSD, compared with about one in five survivors who had not been incarcerated in concentration camps.

Only a small minority of Holocaust survivors reported receiving psychotherapy or other psychiatric care at any time following the war, the researchers note. Survivors may avoid mental health treatment because they are demoralized or fear reexperiencing past traumas, and physicians may avoid taking detailed histories of brutality and thus miss many PTSD cases, Kuch and Cox contend.

A suicidal combination

People with a history of both severe depression and headaches accompanied by sensations known as auras experience a greatly increased likelihood of thinking about and attempting suicide, asserts psychologist Naomi Breslau of Henry Ford Hospital in Detroit. Migraines heralded by aura symptoms, such as ringing in the ears, nausea, blurred vision or extreme sensitivity to light, boost the already elevated risk of suicide among severely depressed individuals, Breslau contends in the February *NEUROLOGY*.

The brain chemistry linking migraines with auras and severe depression to suicide attempts remains unclear, she says. However, other research has found abnormalities in the chemical messenger serotonin for all three conditions.

Breslau and her colleagues interviewed a random sample of 1,007 adults, ages 21 to 30, who belong to a Detroit-area health maintenance organization. Of 788 "control" participants reporting neither migraines nor severe depression, about 2 percent noted past suicide attempts. About the same rate of suicide attempts appeared among 51 volunteers who experienced no depression and who had migraines without auras.

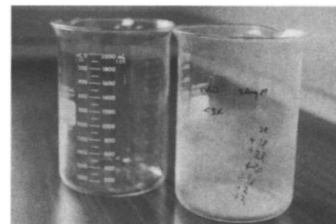
In contrast, 14 of 26 adults who suffered severe depression as well as migraines with auras had attempted suicide — by far the highest rate of any group in the study. Suicide-attempt rates of 33 participants reporting only migraines with auras, 91 reporting only severe depression and 18 reporting migraines without auras plus severe depression also markedly exceeded the control rate, but to a considerably lesser degree.

Volunteers with a background of depression and migraines with auras also reported substantially more prior thoughts about death and suicide, and far more periods during which they wanted to die, than any other group.

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Of humus, glass beakers and radwastes

In tanks at several federal facilities, the Department of Energy (DOE) maintains huge stores of highly radioactive defense wastes. The 177 tanks at its Hanford Site in Richland, Wash., for example, hold between 55,000 and 1 million gallons each. Concern over leaks of radioactive wastes at Hanford — totaling some 750,000 gallons



Foreground beaker shows etching by dilute humics.

— has added urgency to DOE's waste-solidification program. Later this year, the agency plans to begin demonstrating vitrification (incorporation into glass) of sludges distilled from liquid radwastes, according to DOE spokesman Fred Lash. Full-scale waste vitrification may begin next year, he says, initially at DOE's facility in Savannah River, S.C.

DOE chose to stabilize its wastes in borosilicates, Lash explains, because of all solids, these glasses are "probably the most stable and insoluble." Borosilicates will not break apart, even if subjected to large amounts of water and heat, he says. But DOE aims to prevent such aqueous encounters by sealing vitrified wastes in stainless steel drums at very dry hideaways.

Experiments now under way at another DOE facility underscore the wisdom of taking those additional precautions: The tests indicate that natural organic hydrocarbons present in even pristine groundwater can leach radioactive materials from borosilicate glass, dissolving them in the water.

As leaves and other plant materials decay into humus, they create a mix of complex hydrocarbons known as humic acids. At Argonne (Ill.) National Laboratory, Jeffrey S. Gaffney has been studying humic acids' ability to leach radium, thorium and uranium from rocks and sand — and to transport the radionuclides long distances in water. Though ubiquitous at widely varying concentrations in soil, lakes, springs and even groundwater, humic acids "have been ignored in the models to determine whether [borosilicate] glasses will be stable" over the centuries they must bind radioactive wastes, points out Argonne chemist Nancy A. Marley. That oversight could prove important, Gaffney believes, since their work indicates that humic acids "are [chemically] active, even at fairly low concentrations." Indeed, he notes, "they literally etched the [borosilicate] glass of a new beaker in just a few hours."

Marley made that discovery a few years back when she inspected the apparent residue left by bog water boiled in the beaker. Close examination revealed that "natural humics in the water had actually removed silica from the beaker," clouding its surface, she recalls. The finding, which Marley is preparing for publication, initially surprised the two researchers: Beakers are supposed to be nonreactive, and the water in this one had a pH of only about 6, typical of normal rain.

Marley and Gaffney now suspect that carboxylate (COO-) sidegroups are a predominant constituent of the still largely uncharacterized humic acids. Carboxylates would explain the high solubility — and therefore the long lifetime in water — of the organic hydrocarbons, Gaffney asserts. That carboxylates "are fairly active binding agents for free metals" might also help explain their affinity for the radionuclides, he adds.

But could humics actually leach radionuclides from glass? Preliminary findings of tests begun at Argonne last month by Marley, Gaffney and Ken A. Orlandini indicate that the water-borne acids indeed removed uranium from borosilicate glass and held it in the water. This suggests that even if such a process were allowed to proceed very slowly in nature, "over the years it's going to be important," Marley says.

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