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<https://sursock.museum/content/publications>

"Someone needs to explain to me why wanting clean drinking water makes you an activist and why proposing to destroy water with chemical warfare doesn't make a corporation a terrorist."

Winona LaDuke, Anishinaabekwe, founder of the White Earth Land Recovery Project

The earth floats on water (De Caelo, 294a28)
Water is the archê of all things (Metaphysics, 983b18)
All things are full of gods (De Anima, 411a7)

Aristotle, on the philosophy of Thales

It can be said that water is mining's best and worst friend. The physical extraction of mineral-containing rock using conventional mining techniques requires a dry environment. The autonomous flows of water below the surface of the earth present a myriad of hazards and hindrances to this process. The potential of encountering pressurized underground aquifers during excavation must be minimized and the groundwater saturating the water table needs to be gone in order to begin mining. Taking control of the groundwater both facilitates the extraction process and provides a free industrial resource, because once the rock is physically dislodged from the earth, water becomes an essential component in the mechanical grinding and chemical processing of it into its constitutive elements.

Rumor has it that in the early 1960s, it was a Japanese company that built the first exploratory tunnel just below the location of the current open pit mine in the Skouries forest in northeast Halkidiki. The effect—calculated or

not—that this tunnel had, was to drain the water from the high mountain springs that were used to irrigate the scattering of nearby orchards which had been tended to for generations. When the springs stopped flowing, it became extremely difficult to water the fields, and the fruit and nut trees dried up and were largely abandoned.

When the Canadian mining company TVX Gold acquired the Cassandra mining concessions in 1995, one of the first things they did was to convince the local orchard owners to sell their now-disused mountain fields. Unaware of any future plans to construct an open-pit mine, many were persuaded with above-market prices to sell their land—a decision that most people now regret.

In 1997, TVX Gold built another underground exploratory tunnel leading to the location of the current Skouries open pit mine. This tunnel was 800m long and located at a lower elevation than the first tunnel. Expecting to find water flowing at 30 cubic meters per hour, they instead came into contact with water flowing at 350 cubic meters per hour. Largely abandoned after its construction, this second tunnel has been draining water out of the mountain into the Karatzas valley ever since.

As evidenced by TVX Gold's errant water pressure calculations, the geological system of underground aquifers in the Kastelli-Kakavos mountains is complex and unpredictable. This complexity is expressed on the surface through the countless springs, streams, and waterfalls that flow from the mountains.

While it is common knowledge that the mountains are the source of drinking water for the entire region of northeast Halkidiki, there exists no published scientific model mapping this underground system or how water moves within it. The model used in Eldorado Gold's questionable environmental impact assessment is considered proprietary and therefore not available for public scrutiny. What is certain, however, is that water is abundant in the mountains, and has a life of its own.

The intricate groundwater system is an indication of the complexity of the subterranean mineralization of the region, which houses a variety of elements that in their singular combinations give the earth's surface layers their particular characteristics, energies and metaphysical properties. Mining's chemical warfare starts with the violent separation of these elements from each other, resulting in the transformation of stable or relatively inert physical and chemical forms into dangerous particles and toxic substances due to changes in their physical shape or molecular composition.

The mechanical intervention between surface and depth brings water and air into contact with substances like heavy metals (including cadmium, mercury, lead, arsenic, and copper), naturally occurring asbestos, and sulfide minerals. This contact results in the release of these

substances into the water and the air, and their subsequent distribution over a vast area via wind and flowing water. The oxidation of metal sulfides as a result of this exposure results in water becoming acidic (through the production of sulfuric acid), which in turn dissolves heavy metals into the water. This toxic cocktail kills plants and animals, and disrupts and destroys stream, lake, and sea ecosystems.

Acid mine drainage from sulfide oxidation provides an unmistakable visual warning sign by turning surface water a distinctive bright orange-yellow-red color through the production of ferrous hydroxide, a byproduct of the oxidation process. It was this festively-colored iron oxide which turned the bay in front of the village of Stratoni bright orange-yellow-red in 2002 after an accidental spill of mining wastewater, and again in 2010 after torrential rains washed oxidized waste material out of abandoned underground mine shafts straight into the Mediterranean, triggering a landslide in the process which left houses filled knee-high in heavy metal-laden toxic sludge.

Coincidentally, Stratoni is the headquarters of Hellas Gold—Eldorado Gold's Greek subsidiary, and has a history of heavy metal contamination as a result of the disposal of mining waste directly into the sea by the then state-owned mining company from the mid-1970s until the early eighties. In 1980, tests revealed elevated levels of heavy metals in the sea water directly off of the beach, prompting officials to declare the waters unfit for bathing or fishing and ordered the municipality to install warning signs forbidding anyone from entering the water. The spill in 2002 and the landslide of 2010 compounded the presence of heavy metals, which because of their weight persist long after the brightly colored particulates disperse.

Heavy metals and other forms of mining contamination like airborne asbestos are invisible and undetectable, and thus their toxicity is easy to ignore. After Eldorado Gold acquired Hellas Gold in February 2012, the warning signs on the Stratoni beach mysteriously disappeared. In August 2014, Eldorado Gold/Hellas Gold sponsored a beach party on the very same beach for local geology and engineering students, celebrating their summer internships with the mining company. Photos and videos appeared online of smiling young people having fun on a warm summer night by the sea, celebrating the fact that they had a job in the midst of a severe economic crisis and paying no mind to the heavy metals.

Because gold and arsenic-containing minerals have a tendency to coexist, arsenic poisoning is one of the most common threats posed by gold mining activities (drilling, blasting, excavating) to underground drinking water aquifers. Arsenic (AS) is a metallic grey element classified as a toxic heavy metal. In Greek it is known as arsenikon, the neutral form of the word arsenikos (ἀρσενικός), meaning "male" or "virile," most likely due to

its lightly stimulating effects when ingested in non-lethal doses. Arsenic was used in aristocratic murders because of its effectiveness and discreteness, and the multiplicity of ways it can affect the body, making the cause of its symptoms difficult to identify. Its acute effects on the body include diarrhea, vomiting, headaches, stomach pain, and muscle cramps, and its elevated consumption over a long period of time is related to the development of cancer, heart disease, strokes, and diabetes. It has been shown to alter DNA expression, which is hereditary and passes on a susceptibility to tumor formation—i.e. cancer.

Arsenic was used as a popular insecticide around 1900, said to burn the earth when used in agricultural settings. Arsenic-based compounds are known to disrupt plant metabolism (photosynthesis) and during the Vietnam War, the arsenic-based cacodylic acid—otherwise known as Agent Blue—was one of the rainbow herbicides used in the US Army's Scorched Earth policy via chemical warfare, employed specifically against rice paddies in order to deprive communist guerillas and local populations of their most important food source.

Because of the already high concentrations of naturally occurring arsenic and other trace heavy metals in the region of northeast Halkidiki, any artificially-introduced arsenic through mining would almost certainly toxify the groundwater. The increase in free acidity due to the oxidation of sulfide minerals results in the release and dissolution of arsenic from its pyrites, which occurs when underground tunnels and exposed open pit minerals come into contact with ground or rainwater. In September 2013, the mayor of the village of Neochori—home to many current and prospective Eldorado Gold mine workers—announced that the village's water supply had dangerously high levels of arsenic, and that no one should drink or even touch the water coming out of their taps or the village spring. Local mine workers reacted with immediate denial—of both the health impacts of arsenic as well as the possibility that the elevated levels came from the mining company.

While it was speculated that the contamination had resulted from the drilling of exploratory boreholes by Eldorado Gold/Hellas Gold, no legal action has been taken against the company. While the miners continue to use the now-contaminated water, anyone who voices opposition to the mining company in Neochori is pegged as a threat to jobs and marginalized (a local shopkeeper suffered a boycott as a result of his opposition to mining). The water quality study determined that the village would have to locate a new water source farther away, and it was suggested that water might need to come from Thessaloniki, where the water infrastructure is now being forcefully privatized as a result of the July 2015 economic austerity measures demanded by the European Bank and the IMF. This is one example of how water contamination contributes to the loss of autonomy and deliverance into the hands of private corporations.

In late December 2015, a shepherd was out with his sheep when the 40 animals stopped to drink from a stream. They died immediately thereafter. Rumors have it that this stream—which originates from a small, disused open pit mine near Stratoni and ends in the Mediterranean—is turned on and off by the mining company. The shepherd reported the deaths to the municipality, but was compensated by the mining company and quickly silenced. Extremely high arsenic levels were reported to be the cause of the poisoning.

Unlike underground mining, open-pit mining requires the removal via mechanized force of what in Canadian extraction industry lingo is referred to as “over-burden” (trees, root systems, topsoil, and the water table). Even before the carpet bombing-esque blasting associated with open pit mining begins, a tremendous amount of dust is produced through the use of heavy machinery to construct roads, clear cut tracks of forest, and build mining infrastructure. The rock just below the earth’s surface in the location of the Skouries mine is known to contain fibrous tremolite, a silicate mineral classified as one of the six recognized forms of asbestos, a term derived from ancient Greek meaning “inextinguishable” or “indestructible.” Inhaling the microscopic fibers causes them to become lodged in the lungs, where they disrupt cell activity, produce internal scarring and lead to severe lung damage, including cancer.

The association of asbestos with severe respiratory problems was already documented in the ancient Greek and Roman empires amongst slaves working in asbestos mines. While the 3000-page environmental impact assessment for the Skouries open pit mine refers to the presence of tremolite, the word asbestos never appears. In 2014, a public complaint was filed with Hellas Gold/Eldorado Gold and the Ministry of the Environment by residents of Ierissos, claiming that the company had deliberately concealed the presence of carcinogenic particles in the dust generated by all phases of mining activity in the mountains. Testing of air samples taken from the location of the open pit mine in December 2015 by regional inspectors confirmed the presence of dangerous asbestos particles in the air, and the violation of worker safety standards by Hellas Gold/Eldorado Gold for not monitoring the air quality or providing any type of respiratory safety equipment.

In his contemplations on the phenomenon of *akrasia*, or willingly acting against one’s better judgment or doing things that you know to be wrong—things which are often to some extent self-destructive—Aristotle departed from Socrates’ postulation that no one would willingly act wrongly, and that if they did it was because of a simple lack of information. Aristotle introduced a number of subtle factors that could account for *akrasia*. He differentiated between active and passive knowledge, and acknowledged

that the anticipation or hope of pleasure often leads to one acting in a way contrary to better judgment based on knowledge.

While debates on the topic of *akrasia* could be easily dismissed as moralistic, as one could argue that there is no universal “wrong” per se, the word does become helpful in describing the contradictory tendency of mine workers to simultaneously depend on and dismiss “science” depending on the desired conclusion. In what could be described as a puzzlingly inconsistent moment of Aristotelian logic, mine workers assert that their self-vampirizing jobs are more important than their own health and that of their surrounding environment, while claiming that they work for the benefit of the nation state, their communities, and their families. They label anyone who argues that large-scale open pit gold mining will very likely lead to the catastrophic destruction of both the environment and existing local economies as a traitor—an activist—paid by outside interests to take away their jobs.

How would Aristotle approach his explanation of *akrasia* today, within the fever grip of modern capitalist crisis, his marble eyes gazing upon the gaping hole in the once forested mountains of his birthplace, where the drone pilots of finance capital have territorialized like a “war machine” that “looms up and bears down from without, killing memory;”¹ where men operating heavy machinery churn up his seemingly harmless elemental categories into clouds of toxic dust and flows of contaminated water? I would hope he would plead for the revival of an ethics of positivity associated with *enkrateia*—the making of choices because of their positive outcomes for many—which would almost certainly necessitate an immediate and conscious rejection of the short-sighted, individualistic, and temporary material gains of capitalist consumer culture that have resulted in generalized destruction for so many others. I think Aristotle would agree that we must urgently engage in a re-consideration of ourselves, within a world of spirited objects, floating on water.

1 Gilles Deleuze and Félix Guattari, *A Thousand Plateaus: Capitalism and Schizophrenia*, translated by Brian Massumi (London and New York: Continuum International 1987), 507.