Integration of Responsibility Ethics into Western Scientific Methodology

Responsibility Ethics

Responsibility ethics is an "ethics based on care and a sense of responsibility as well as obligations to others".[1] This sense of responsibility arises from four basic principles in Traditional Ecological Knowledge (TEK): Community, Connectedness, The Seventh Generation, and Humility.

The first, "Community", recognizes that we are all part of a community that includes both human and non-human elements. We benefit from being a part of our community, and in turn have obligations to others. This belief extends to non-human members of the community as well. The second, "Connectedness", recognizes that no actions or physical elements of the world can be treated in isolation due to the complex interdependent relationships required to exist. The third, "The Seventh Generation", requires all human intent and actions to be made with a consideration of the impact on future generations. The fourth, "Humility", recognizes the limits of human understanding in relation to complex interdependent relationships in nature, and asserts that we must be humble in the face of that limitation. These four basic principles form the basis of responsibility ethics. Because these is a recognition that we are all part of a community with both human and non-human members, and therefore connected and impacted by any actions taken by another member of that community, we have a "personal moral [responsibility]" to act in such a way that does not cause harm.[1] Not only does this avoid harm to others, but by extension avoids self-harm. This is due to the notion that we are not separate and apart from our community (principles 1 and 2), and therefore "by despoiling the place one lives, one destroys and damages oneself".[1]

Tradition Ecological Knowledge (TEK) and Western Philosophy

The concept of the self as constructed from our relationships with other humans and non-humans as well as our connection to place is central to TEK. This differs from dominant Western thought that casts "individuals as rational, isolated agents," separate and apart from each other as well as the environments we inhabit.[1] This separation goes hand in hand with a more abstract understanding of morality and ethics. If the self is not defined by its interactions with others, it must be defined by predetermined abstract essential qualities.

In Western mainstream science, isolation of test subjects is a common practice when conducting research. In fact, it seems almost essential to the scientific method—a method with the goal of creating a process that will yield the same results when replicated must minimize uncontrolled variables. Although this process has undoubtedly led to the acquisition of an immense amount of knowledge, it is limited in its ability to understand how those test subjects may behave in a natural environment. Assuming the test subject has essential qualities that do not change regardless of its interactions and relationships in its natural environment is directly related to Western philosophy's conceptions of the self and individuals as isolated agents. If not considered in scientific study, this phenomenon can lead to misunderstandings and incorrect interpretations of experimental results. At worst, it can lead to destructive and harmful practices on a catastrophic scale, such as the widespread application of DDT post WWII.

Applying Responsibility Ethics to a Current Environmental Issue: Mycoremediation with White Rot Fungi

There is a widespread belief that white-rot fungi (WRF) can be used successfully in both in situ and ex situ bioremediation by mineralizing toxic environmental pollutants, thus minimizing toxicity. This has been communicated and popularized through many widely read publications, using peer reviewed studies as sources.[2-3] The ability of WRF to degrade stubborn and persistent pollutants is due to the presence of unique enzymes that make them capable of breaking down lignin, a complex molecule in cell walls that is more difficult for organisms to breakdown than cellulose.[4] The use of WRF is promising for bioremediation as it is considered a sustainable approach that relies on natural processes. Numerous laboratory studies over the last 30 years have shown that white-rot fungi can break down many types of dangerous environmental pollutants, including pesticides,[5] by-products of synthetic dyes,[6] and heavy metals.[7]

However, these studies among others typically use methods that create ideal conditions in a lab. Lab experiments control for abotic factors such as pH and temperature, whose fluctuations might otherwise inhibit the process. These studies also isolate WRF with the experimental pollutants, creating conditions in which the WRF is presented with only that pollutant as a food source. These are not likely to be the conditions found in real world contamination sites with a complex web of life, and indeed, most field studies have not yielded the same results (Paul Przybylowicz, PSMS lecture, September 24, 2023). The viability of mycoremediation at the industrial and commercial scale remains in question. While future testing should undoubtedly be carried out, the idea that these types of fungi will “save us” is

dangerous in its potential to overstate the capabilities of mycoremediation and understate the long-term threat of environmental pollutants.

I feel that responsibility ethics can be applied to this example in a variety of ways. First, there should be a recognition of the limitations of laboratory studies to account for how an organism behaves in the natural environment, immersed in a wide variety of biotic and abiotic factors, and affected by its interconnectedness to this community. Responsibility ethics requires a humble approach, and an understanding of the limits of the knowledge gained through laboratory testing. While we may ascertain through scientific study how an organism is likely to behave if introduced for in situ bioremediation, it's essential to acknowledge that introducing any organism for bioremediation at a large scale could have unintended consequences on the ecosystem. Although we may find that the persistence of untreated toxic pollutants presents a worse alternative, applying responsibility ethics to the issue requires consideration of the potential effects of introducing a new community member over a short period at large scale. Lastly, the effect on future generations from overstating the potential of bioremediation needs consideration. These studies have the potential to be co-opted by industries that stand to gain from the continued release of toxic by-products. Responsibility ethics reminds us to be wary of justifications for environmental degradation despite possibilities for remedy.

Works Cited

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