ARARAT 1976: The Exhibition as Environing Medium

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ABSTRACT

How were the problems and promises of technology addressed in the heightened public awareness of environmental issues during the 1970s? ARARAT provides insight here. It was an exhibition arranged at Moderna Museet in Stockholm in 1976. Its goal was to inform visitors about the interconnections between humans, society, and the environment and, on the basis of such knowledge, empower people to seek less wasteful ways of life. To this end, the exhibition invited visitors to become actively involved in experiments and get acquainted with everyday technologies that were less expensive to make, easier to repair, and more transparent in terms of production and life cycle. Previous research on ARARAT has focused on its relevance for current practices in art and architecture. The present article, by contrast, aims to situate ARARAT in contexts that are both more general and more specific than previous work has been able to show. The study argues, first, that ARARAT can be understood as pioneering the field of *practical knowledge* ("praktisk kunskap") before it was more formally established around 1980 in Sweden; second, that the ARARAT undertaking amounted to a new kind of *popular education* ("folkbildning") with its combination of science, politics, and hands-on experimentation; and, third, that the ARARAT project was a demonstration of the exhibition format as an *environing medium* whereby it actively took part in changing the environment by empowering the population in an era with significant collective challenges.

Keywords: ARARAT, environment, environing technology, environing media, appropriate technology, systems ecology, future studies, practical knowledge, popular education, 1970s, Sweden, art

Introduction: Situating the Exhibition

This article aims to situate ARARAT – a 1976 experimental art and science exhibition held in Stockholm – in contexts that are both more general and more specific than previous work has been able to show.[1] Doing so will deepen our understanding of how the exhibition arrived at its specific pedagogy. To this end, I will introduce three academic and institutional influences: appropriate technology, future studies, and systems ecology and note how they each in their own way related to broader societal changes. Using these to frame the concepts and methodologies adopted and forwarded by the exhibition, I will argue, first, that ARARAT can be understood as pioneering the field of *practical knowledge* ("praktisk kunskap") before it was more formally established around 1980 in Sweden. Second, I contend that the ARARAT undertaking amounted to a new kind of *popular education* ("folkbildning") with its combination of science, politics, and hands-on experimentation. Third, I propose that the 1976 project was a demonstration of the exhibition format as an *environing medium* whereby it actively took part in changing the environment by empowering the population in an era with significant collective challenges.

The concept of environing has been used by environmental historians to challenge the borders between the natural and the social as something given and, instead, treat them as subjects of ongoing production and negotiation. Environing media is a recent extension of this line of thought which puts center stage the techniques and devices used in shaping the human-Earth relationship.[2] It does so by focusing on the processual character by which environments exist and the media, broadly conceived, being used to create the very concepts that underpin our knowledge of the planet. In this way, the study of environing media differs from more traditional forms of media studies, sometimes known as "ecomedia," which are concerned, rather, with cultural representations of the environment as well as the environmental impact of different media types. The argument for understanding ARARAT as an environing medium is substantiated by its world-creating capabilities. The exhibition was set up not as a simple display of environmental problems but as a "machine" which incorporated knowledge, practices, and politics. One that people could enter and by which the environment as an object of knowledge and manipulation was made available in novel ways.

To see how the three claims made above regarding ARARAT as an object of study (practical knowledge, popular education, and environing medium) are relevant to the topic of cultural possibilities, they can be viewed through the lens of Ruth Levitas's notion of "utopia as method." Understanding utopia as a "desire for being otherwise, individually and collectively, subjectively and objectively", to Levitas utopia is always a question of method, less than a fixed goal.[3] The basic elements of her model – archaeology, ontology, and architecture – concern, in turn, locating the fragments upon which the ideas of a good society rest, interrogating which kinds of subjects it promotes and allows for, and imagining the sorts of institutions necessary to support a good society. Utopia as method is a particularly useful framework by which to characterize the visionary labor produced at ARARAT. Focused on the possibilities of the future, the exhibition was designed to first critically engage the pillars of the current world order, to educate the public on alternative ways of being, and, then, to encourage visitors to use this knowledge in creating collective imaginaries that challenged beliefs about the future as something inevitable and predetermined. With an emphasis on practices and experimentation, the "method" part of the utopian efforts was indeed prominent.

The exhibition was held 2 April–25 July 1976 at Moderna Museet in Stockholm, Sweden. An acronym for Alternative Research in Architecture, Resources, Art and Technology, the ARARAT project was the result of collaborative efforts from artists, architects, engineers, craftspeople, and scholars in the humanities.[4] ARARAT was the mountain in the Bible's Book of Genesis where Noah's ship came to rest after the flood symbolizing, perhaps, a new foundation for the renewal of human civilization. The main topic of the exhibition was the future – imagining a society in sync with its environment and meeting its energy demands in less hostile ways. The intention was to inspire active involvement and heightened awareness through participatory involvement. After its public display, the exhibition was selected to represent Sweden at the Venice Biennale that same year.

The study of exhibitions as it has developed in the past decades is related to novel approaches to understanding museums as concepts and spaces – even special forms of media – toward the end of the twentieth century. This turning to the museum as an object of study in its own right should, in turn, be placed within a broader set of changes in the humanities including the formation of visual culture studies as a field proper, a more theoretically informed cultural history of media, as well as so-called material turns across cultural sciences writ large.[5] Following this interest, exhibitions could be studied beyond the content of their displays and

investigated as distinct material forms. The pavilions and attractions at the world exhibitions in London and Paris in the nineteenth century emerged as the new media of bygone days.[6] Studies in this general area have demonstrated the changes that exhibitory spaces underwent in the years before and around the time ARARAT was being conceived. From the theme park-like Expo 64 in Lausanne to the Cathédrale d'Images in 1977, the notion of the exhibition had changed from watching a show to being part of an immersive experience. More importantly, the emphasis was on allowing people to come together to discuss ideas and change politics. In 1972, French film director and audiovisual pioneer Yann Berriet spoke of a turn from mass communication to group communication. In the former, "nothing happens", whereas in the latter, "people…try and do things together…We meet to confront powers…and more than that, [to create] the possibility of joint action".[7] The very purpose of an exhibition was, according to the new paradigm, to generate an event around which collectives could form to "invent, structure and organize situations".[8] In the case of ARARAT, the influence from these schools of thought is clear. It too strived to be a vehicle which allowed old ways to be questioned and new ones to be collectively crafted.

The ARARAT project has scarcely been studied. A dissertation in architectural history from 2011 incorporates the exhibition as one case of how architectural practices in the 1970s struggled to find ways to stay relevant in a time when functionalism seemed an increasingly inadequate response to social and environmental challenges.[9] A 2014–15 study at the Royal Institute of Art in Stockholm gathered some of the original members of ARARAT to discuss how artistic work today might draw on the experiences from 40 years ago in addressing climate change and related issues.[10] While observant of the participatory ambitions and some of the influences of the 1976 exhibition, the study has little to say about the role of technology and was ultimately oriented toward architectural and artistic practices. In the curation of its own history, Moderna Museet has selected ARARAT as one of its six most important exhibitions of all time, the sole representant of a period between the "dynamic, progressive and international 1960s" and the more "theoretical discussion of art" in the 1980s.[11] It remains one of the most visited exhibitions in the history of Moderna Museet. Still, as I intend to demonstrate, the significance of ARARAT reaches well beyond twentieth century periodization of artistic practices.

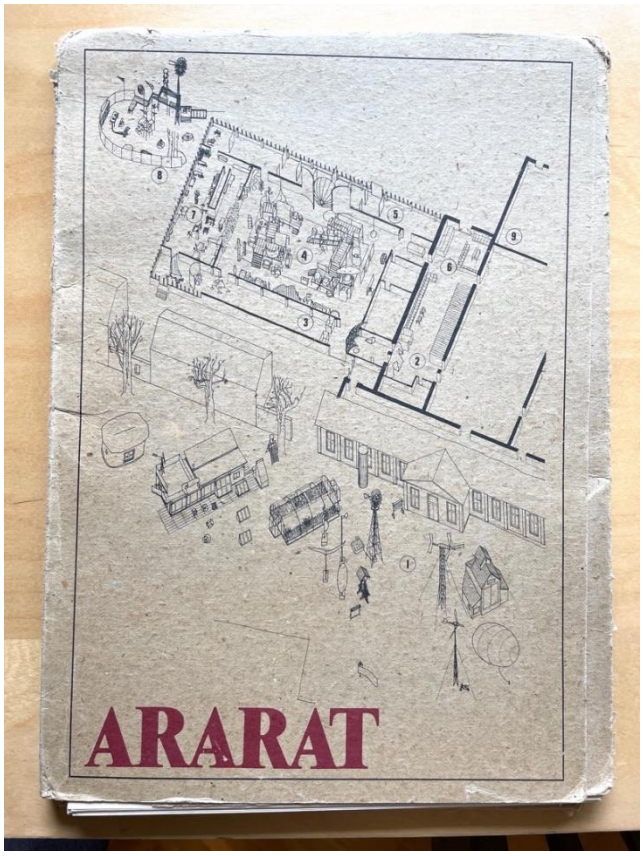


Image 1. ARARAT catalog cover showing exhibit area.

The Principal Influences of ARARAT

Appropriate technology

The initial concept for ARARAT was established by *For a Technology in the Service of the People* ("För en teknik i folkets tjänst"), a counterconference to the official United Nations Conference on the Human Environment (UNCHE) summit held during the summer of 1972 in Stockholm.[12] It sought to stir up critical thinking and attract the creative minds of visitors to the official summit, encouraging them to be part of something else: the shaping of "alternative technologies." A more common term at the time was *appropriate technology* (sometimes "soft technology"). This movement took many guises during the 1970s but was broadly conceived as technology that was neither primitive nor high technology but instead suited to the specific circumstances of its use. The International Labor Organization (ILO) was a strong proponent of this approach.[13] This implied a general view of technology as dictated by the actual needs of people, as opposed to the business motives of corporations. It also meant technical solutions could not be universally implemented but had to take into account the regional affordances of their employment. The conventional enemy of this movement was industrial, large-scale technology.

Appropriate technologies as a concept gave new life to old debates, e.g., those concerning agency and autonomy. Here, it is possible to discern two schools, a British and an American. The former emphasized political awareness, critique of industrial capitalism, and promoted a radical shift towards more sustainable and equitable societal structures, whereas the latter, with its roots in Californian communes and 60s counterculture lifestyles, was, by contrast, apolitical and advocated for a life outside of cities, corporations, and politics altogether, focusing instead on explorations of the mind.[14] Both varieties, however, stressed the importance of the right kinds of techniques and technologies to bring about change. The organizers of ARARAT were decidedly more British leaning in their views.[15]

But appropriate technology was not a simple back-to-the-land philosophy. The teachings of economist E.F. Schumacher effectively capture the "middle ground" pursued by appropriate technology. While he, too, used a variety of terms to describe his vision, such as "small-scale technology," "relative nonviolent technology," and "technology with a human face," his main concept was *intermediate technology*. This he described as methods and equipment that were cheap enough so that they were accessible to virtually everyone, suitable for small-scale application, and compatible with the human need for creativity.[16] In all of this, the question of scale was "extremely crucial."[17] For every activity there was a certain appropriate scale. "I have named it intermediate technology", Schumacher noted, "to signify that it is vastly superior to the primitive technology of bygone ages but at the same time much simpler, cheaper, and freer than the supertechnology of the rich".[18] He points out that although society was in possession of all requisite knowledge, it still required a "systematic creative effort to bring this technology into active existence and make it generally visible and available".[19] This was precisely the task which ARARAT took upon itself, the methodologies of which I will return to in later sections.

Apart from turning to the developing world for inspiration about forms of alternative technology, the 1976 exhibition was a platform to discuss poverty as a consequence of the colonial past and its problematic legacies in terms of inherited patterns of inequality and the misguided attempts of the developed world in establishing relief. These attempts had a history of backfiring on those receiving it.[20] Development economists stressed that appropriate technology as a method to reduce unemployment was contingent on its perceived and actual utility by those expected to benefit from it. Technology, appropriate or not, they claimed, needed social actors to carry it.[21] ARARAT's answer was to rethink the implementations of production: Large-scale structural problems must be addressed at local levels, starting with appropriate technology. Only by changing his immediate environment with appropriate technology, the exhibition maintained, would a small farmer be able to break his bond to the regional debtors and, ultimately, to the large corporations of the West collaborating with the UN and the World Bank.[22]

Later in the decade, the very program of the UN which was formed during the much-criticized Stockholm summit in 1972 – United Nations Environmental Program (UNEP) – became itself a major proponent of appropriate technology. In 1977 it formed *The Task Force on Environmentally Sound and Appropriate Technology*. Other NGOs followed suit. It has been argued that appropriate technology didn't survive past the mid 1980s in the United States due to it being perceived as "less manly, more feminine, than the nation's dominant technological culture".[23] Yet, in Europe, its green political parties at least partly adopted the central motifs of the movement.[24]

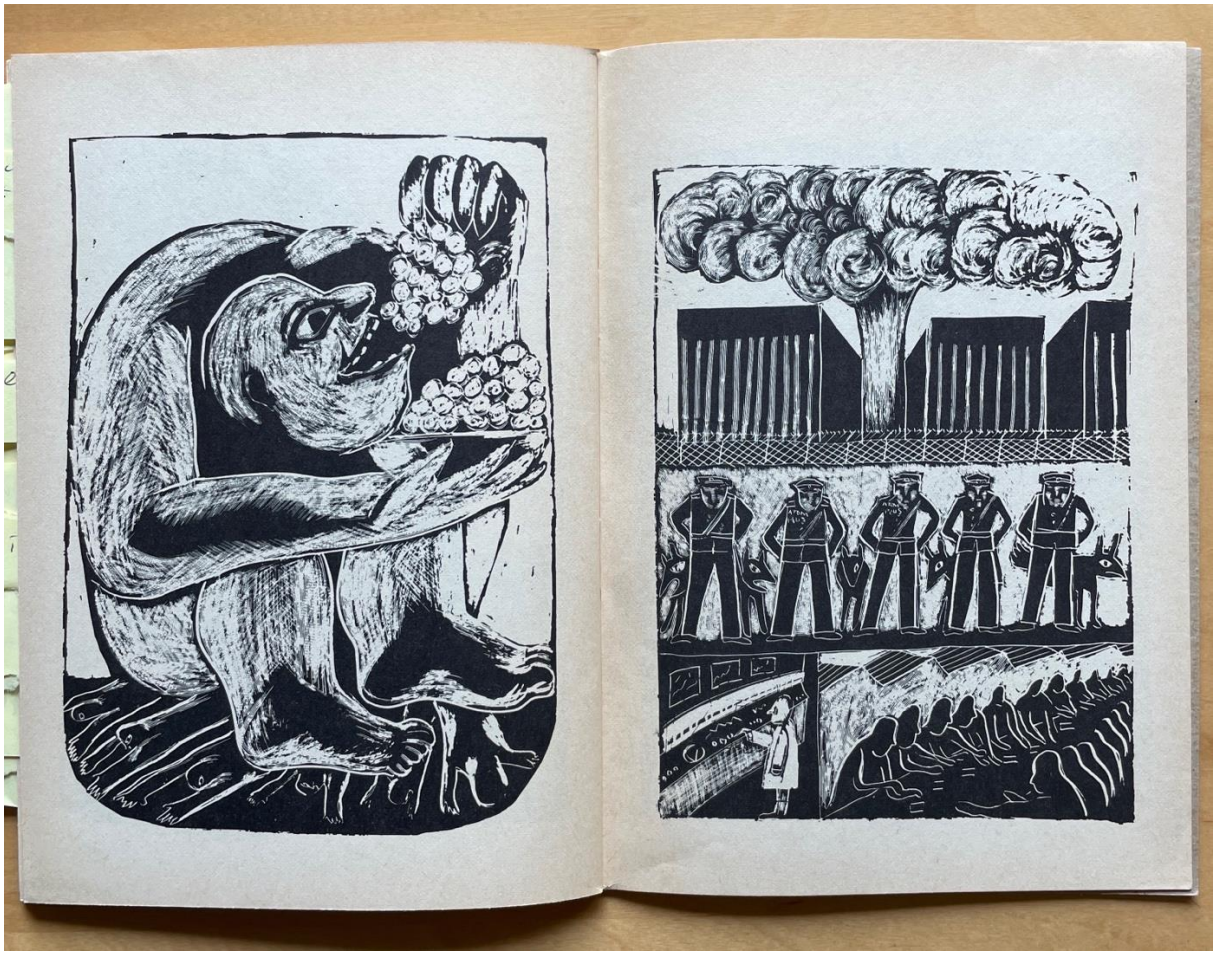


Image 2. The socio-political aspects of technology in ARARAT's view.

Future studies

Expressing the rationale for embarking on the ARARAT project, its creators declared that, more than anything, the exhibition was about the future. Indeed, one of its five main areas was named Gallery of the Future. The future, its organizers emphasized, is fundamentally open. They based this belief on the differentiation between the "logical" future, which, they claimed, was essentially an extension of the status quo, and the "desired" future – one deliberately shaped.[25] This framing can be traced to an important development around the same time: the maturing of *future studies* as a field of study in its own right.

Grappling with the future as a problem in philosophy and epistemology but also for practical purposes was, of course, not a novel concern in the 1970s. With the Cold War, however, futures thinking had changed.[26] Less an object of morality or utopia, the topic of future became a place of experiments and developments in methodology. In many cases, such efforts involved means of predicting changes in international relations and technological development.[27] Here, probability theory, mathematical models, and computer simulation would come to play important roles. In this way, the future was no longer only an imaginary arena for ideas and thoughts, our dreams and our anxieties, but became something that could take shape in the present and be explored systematically.[28] This type of knowledge – "future work" – often took shape within the

confines of postwar think tanks which emerged in the borderland between academic, military, and corporate interests.

In the case of Sweden, futurology research was introduced in three different contexts from the early 1960s. It followed a common development for future studies: from military arenas to business interests and gradually toward a perceived need for academia and governmental planning to own the initiative.[29] The government agency *Secretariat for Futures Studies* was established in February 1973.[30] By then, Sweden had gained significant experience in the new tools of the trade. The most influential text of futurology in this period – *The Limits to Growth* by the Club of Rome – had had a profound impact on the preparatory work and agenda setting of the UNCHE summit in Stockholm in 1972, particularly in pioneering digital modeling as a methodology for environmental work.[31]

But the technically driven and methodologically confident future studies that had dominated the field of futurology since the 1950s were more and more called into question. There must be ways, critics argued, to think about the future that were linked neither to the military nor to business and perhaps not even to the state, but that were based, rather, on ideas of global cooperation and solidarity. Futurology was partly transformed into *futures studies* – with an emphasis on many *futures*. A technical prophecy of the future must not, these critics held, be understood as an objective, value-free and strictly observational and analytical activity.[32] On the contrary, we should imagine these prediction factories or "prediction cultures" as contributing greatly to shaping the future they claimed to merely forecast.[33] A more democratic process was suggested, arguing that the future must be collectively invented and freely envisioned, not calculated and predicted. Fred Polak, Robert Jungk, and Johan Galtung were key figures in this transformation.[34]

While not formally a study of the future, ARARAT drew heavily on perceptions and terms made generally available from futurology and future studies in Sweden and elsewhere. The future, they argued, had to be constructed not by the powerful and the experts but by the people themselves by becoming active participants in the development of alternative ways of living.[35]

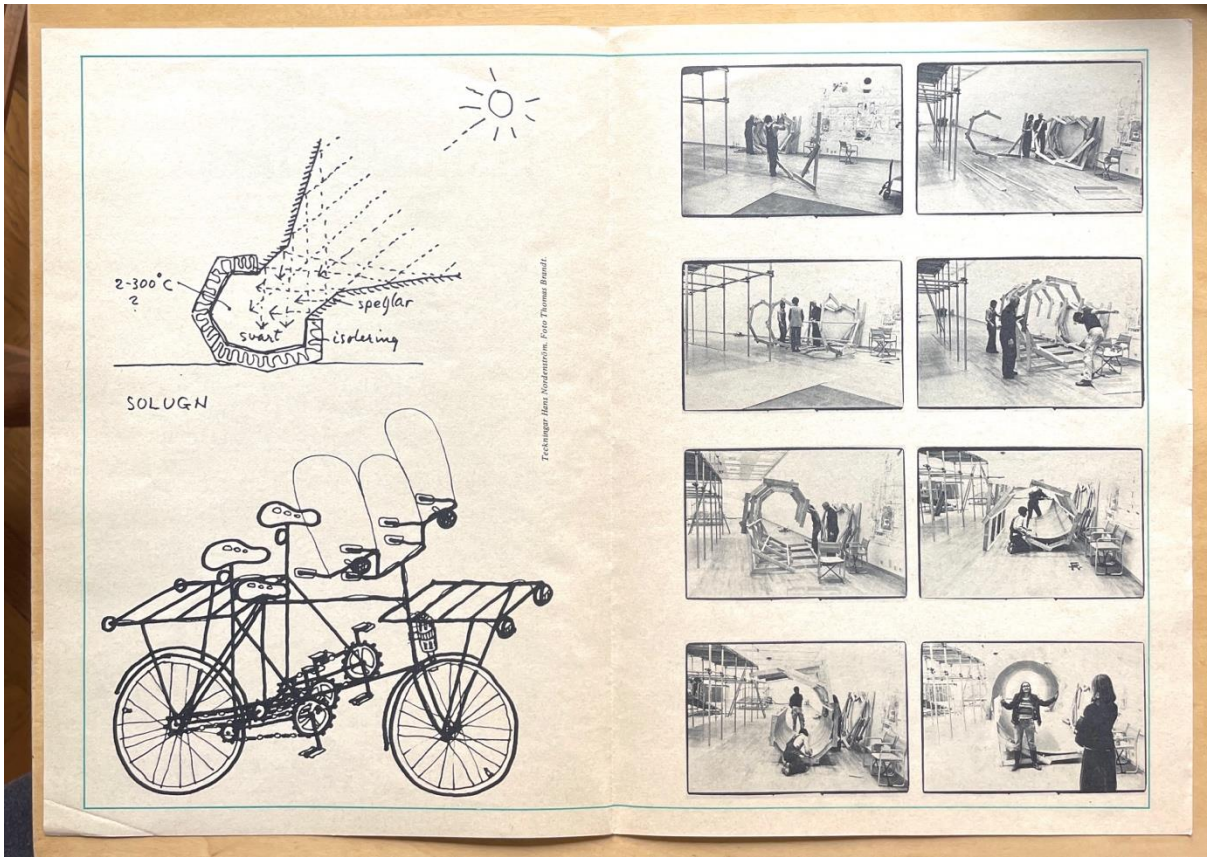


Image 3. The Gallery of the Future.

Systems ecology

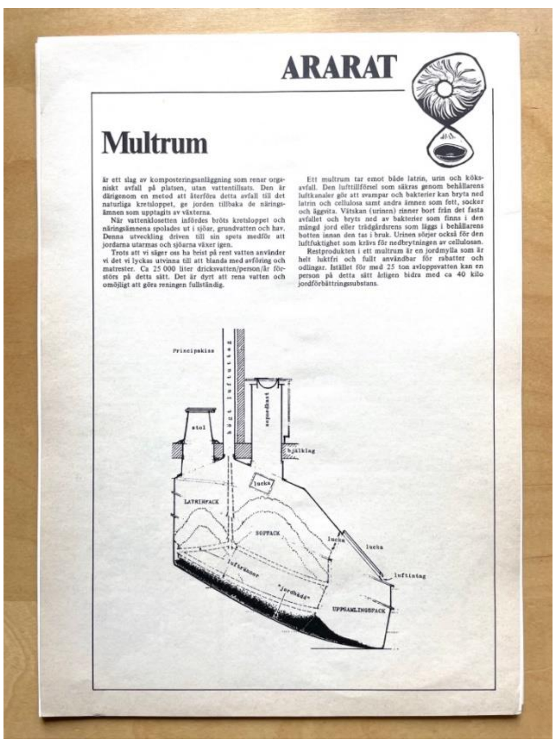
In his book on the 1972 UNCHE Summit in Stockholm, Wade Rowland writes that the mentality was such that no politician could avoid mentioning "ecology" in his speech, just as it had previously been unthinkable not to mention God.[36] Indeed, Thomas Söderqvist has convincingly made a case that there was a general "ecologization" of Sweden in the 1970s.[37] A number of influential scientists had contributed to raising the environmental awareness among Swedes. Their writings helped transform a general fondness for the outdoors into the realms of environmentalism with its ecosystem dependencies, global connectedness, and far-reaching political implications concerning the organization of society. Several of them were explicitly referenced in the ARARAT materials.[38]

ARARAT was markedly influenced by the teachings of human ecology. This field of study had originated as a biologically inspired study of social relations in United States sociology. In Sweden by the mid 1970s it could be said that human ecology operated chiefly as a combination of cultural critique and systems thinking. On the one hand, it studied how power relationships and systemic inequalities affected people's bonds to their environment. On the other, it sought to describe the complex, interconnected, and dynamic nature of these human-environment relationships.[39]

In many ways, the systems thinking that informed human ecology was an extension of the principles of ecology and cybernetics that had informed both systems ecology (sometimes called

"ecosystem ecology") and system dynamics (the MIT work behind *Limits to Growth*).[40] In the sections discussing ecology, ecosystems, and energy in the ARARAT materials, frequent reference was given to the American ecologists Eugene and Howard Odum. To the latter, ecosystems were complicated machines whose basic processes were not fundamentally different from water wheels, steam engines, and electrical circuits.[41] Close contacts were established between Howard Odum and leading ecologists at Stockholm University. In 1970 he spent time teaching at Askö Laboratory and afterwards young researchers from Sweden went to study with him in the US. Around this time Howard Odum famously developed his "energy language" whereby he proceeded to model practically any real-world phenomenon.[42]

As noted, systems ecology thinking was applied far outside of its original scientific confines. One of them concerned the reuse and recycling of materials and waste. But rather than subversive actions by antiestablishment groupings as had been the case elsewhere,[43] reuse and recycling activities in Sweden were largely the outcome of the progressive nature of the welfare state and an expanded network of interest groups.[44] Consequently, it might be argued that ARARAT visitors were already accustomed – or "pre-trained" – in the appropriate technologies of reuse as part of a general systems ecology thinking. In sum, I hold that appropriate technologies, future studies, and systems ecology can be seen as the principal influences of ARARAT. Together, they provided the backbone for how to think, what to aim for, and the methods applied in the pursuit of arriving at a future where human endeavors were better aligned with environmental constraints. In the following, I will demonstrate how the exhibition made actual use of them.



ARARAT

Multrum

är ett slag av komposteringsanläggning som renar organiskt avfall på platsen, utan vattentillsats. Den är därigenom en metod att återföra detta avfall till det naturliga kretsloppet, ge jorden tillbaka de näringsämnen som upptagits av växterna.

När vattenklosetten infördes bröts kretsloppet och näringsämnena spolades ut i sjöar, grundvatten och hav. Denna utveckling driven till sin spets medför att jordarna utarmas och sjöarna växer igen.

Trots att vi säger oss ha brist på rent vatten använder vi det vi lyckas utvinna till att blanda med avföring och matrester. Ca 25 000 liter dricksvatten/person/år förstörs på detta sätt. Det är dyrt att rena vatten och omöjligt att göra reningen fullständig.

Ett multrum tar emot både latrin, urin och köksavfall. Den lufttillförsel som säkras genom behållarens luftkanaler gör att svampar och bakterier kan bryta ned latrin och cellulosa samt andra ämnen som fett, socker och äggvita. Vätskan (urinen) rinner bort från det fasta avfallet och bryts ned av bakterier som finns i den mängd jord eller trädgårdsrens som läggs i behållarens botten innan den tas i bruk. Urinen sörjer också för den luftfuktighet som krävs för nedbrytningen av cellulosan.

Restprodukten i ett multrum är en jordmylla som är helt luktfri och fullt användbar för rabatter och odlingar. Istället för med 25 ton avloppsvatten kan en person på detta sätt årligen bidra med ca 40 kilo jordförbättringssubstans.

Image 4. The "Multrum" composting solution for human waste.

ARARAT – Teaching Practical Knowledge to Change the World

Pioneering the Field of Practical Knowledge

ARARAT was in many ways an experiment in types of knowledge. Understanding the underlying principles or facts of society and the environment was important. This was how you found out why things had gone wrong and how they could be corrected. But ultimately, such understanding was by itself insufficient. This knowledge had to be applied – made operational – in actual situations, i.e., translated into mechanisms for transferring and using energy to do work. Appropriate technology – in the form of durable water pumps, water-sealed fermentation pots, composts, windmills, bikes from reused materials, shoes from recycled tires, etc.– was essentially a series of concrete implements reflecting a general attitude toward the world: its history, present, and future. More than objects, however, the exhibition adopted what Carl Mitcham has termed *technology as activity* which denotes "that pivotal event in which knowledge and volition unite to bring artifacts into existence or to use them; it is likewise the occasion for artifacts themselves to influence the mind and will".[45] "Knowledge", the organizers asserted, "is still the only thing we have to resist the economic powers".[46] The type of knowledge here inferred, I hold, was of a distinctly practical nature: a performed activity. In fact, ARARAT can be considered as having advanced a type of *practical knowledge* before this became a proper research field in the early 1980s.

In Sweden, this tradition grew out of a series of studies concerning what can broadly be described as the transition into a post-industrial or an information-based economy and its consequences for professional work and labor markets. In this setting, it became important to recognize and examine the non-formalized aspects of human work. How much of our collective work consisted of elements that resisted automation or was better left alone? What were the limits of mechanization? The competence to critically reflect on one's actions in relation to the circumstances at hand or to identify oneself as part of a tradition, drawing on the experiences of others and events in the past – these were skills deemed worthy of investigation and evaluation in the face of new narratives of the automation of everything.[47] What we learn in our jobs, this line of reasoning observed, is, perhaps, not "technology" but how to make better judgments by gaining experience from practical situations.[48] One of the key aspects of the kinds of practical knowledge embraced and highly valued by this research was its implicit or undocumented state. This kind of knowing, often called *tacit knowledge* ("tyst kunskap"), can only be passed on to others under certain circumstances, e.g., not learned from a book. Traditionally, this is the master-apprentice relationship: learning by doing or imitating.[49] Michael Polanyi (a key reference for this research area next to the late Wittgenstein) famously expressed the realm of this kind of unarticulated acquaintance with a subject area as "we know more than we can tell".[50] On this note, he observed that "our body is the ultimate instrument of all our external knowledge, whether intellectual or practical" and that, in fact, tacit thought forms are an indispensable part of all knowledge.[51] This includes scientific forms.[52] ARARAT, I hold, can be seen as a live demonstration of this research field before it had found its form, illustrating – even operationalizing – the philosophy of practical knowledge.

Critical to the conceptual framework of ARARAT was the notion of "four elements." Thematically, it was congenial to the venue – since 1961 Moderna Museet had greeted its visitors with the support of Alexander Calder's monumental mobile sculpture *The Four Elements* which was permanently installed on the way to the main entrance. The experience of the predatory

attitudes toward nature and its resources in the last century necessitated, according to the ARARAT organizers, a return to the ancient view of the four elements. The exhibit attempted to illustrate them not as "fixed assets" but as a "flow of forces in magnificent balance".[53] The "four elements" pedagogy worked in two ways. On the one hand, it instilled in visitors a humility of sorts: you are part of this gigantic, dynamic play of forces, and it is your duty to comprehend the interaction between things larger than yourself, i.e., you are small, but knowledge will make you grow. On the other hand, visitors were given the freedom to experiment, build, and repair technology based on renewable resources that would extend their agency. Here, the exhibition seemed to say: these are some of the ways in which nature can be manipulated into serving your needs. They are potent skills – use them wisely.

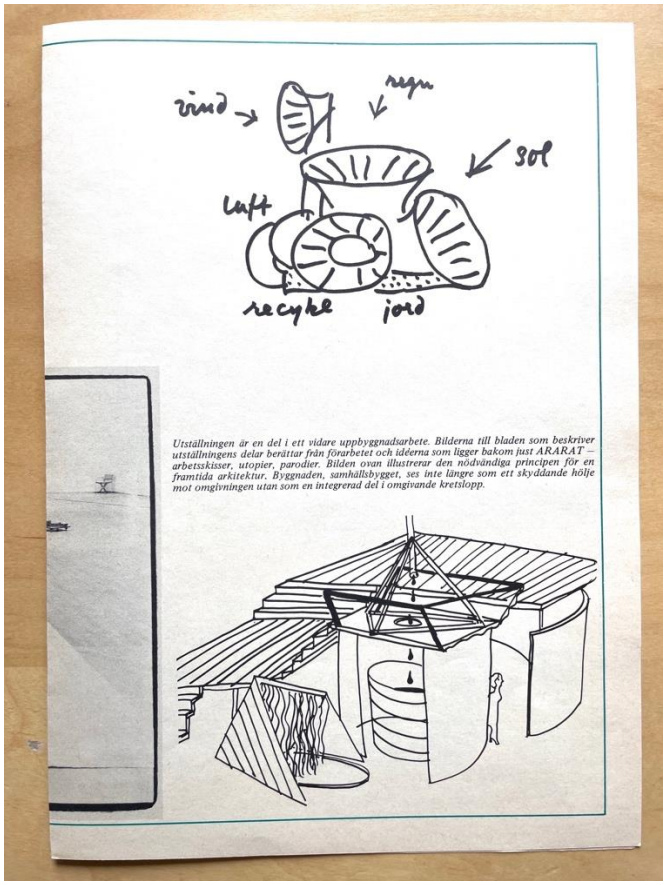


Image 5. Building conceived as open to the environment; its protective layers removed.

The design of the *Workshop* section of the exhibit is instructive for how practical knowledge was conceived at ARARAT. In a simplified but not unfounded framing, the craft and skill of workers in pre-industrial times were embraced as sound. They worked by the coordinated art of hand and eye, with an informed sense of the origins of their materials and an astute awareness of the affordances and limitations of the different kinds of matter. Practices of reuse and reappropriation were innate to the process, and they labored the raw materials all the way to finished product, end-to-end.[54] This idealization of the human as worker outside of a factory, using her full range of faculties to sustain the local needs of her community, fit well into the overall frame of appropriate technology. The knowledge needed to change society cannot come

from theory alone. It must begin with direct experience and observation. The Workshop was arranged as a series of stations with a "nature lab" demonstrating ecosystem principles and a "reuse shop" for wood, metals, and textiles. An outdoor area provided experiments with renewable energy from wind, solar, and water as well as archaic pottery methods and planting from compost. The participatory element was critical throughout. By some logic, it was an early form of citizen science training.[55]

If ARARAT utilized the ancient notion of "four elements" to discuss improved uses of energy, I will argue that its main epistemic orientation was Aristotle's *phronesis*. The term is often translated as "practical knowledge" or the sense of knowing how to act wisely in particular circumstances, often built on prior experience. The methodology used by ARARAT might be described as starting with concrete situations or problems, e.g., polluted cities or impoverished rural areas, allowing them to be reflected in broader historical, societal, and scientific contexts, and then improved by relevant technology. Following Aristotle's terminology, the broader contexts here can be characterized as *episteme*, while equipment and skill (in ancient times it also included art) can be termed *techne*.[56] The work of *phronesis*, I suggest, was to connect *techne* to *episteme*. This was practically achieved through the insistence on technology being "appropriate," i.e., suitable to a particular situation or area of concern. As noted, knowing only the relationships between facts in the world was not sufficient, but nor was the bare technical skillset leading to implementations of advanced and complicated machinery. Rather, *phronesis*, or practical knowledge – which included an awareness of the social and environmental challenges of the world – was critical in finding a poise or balance between, first, a fundamental understanding of the natural sciences, and second, the hands-on expertise required to work toward more sustainable ends. Expressed differently, we might say that ARARAT insisted that politics, knowledge and making cannot be separated.[57] This is apparent from studying the exhibition layout and it is documented in the catalog and booklets that supported the project.[58]

One way to understand my suggestion that, in the case of ARARAT, *phronesis* acted to bridge *episteme* and *techne*, is to think of theoretical insight and technical knowledge as tied together by a critical stance and a personal involvement where something is at stake. According to this model, if we seek both scholarship and craftmanship, these must be obtained as learning and skill but can only be activated and wielded as useful and meaningful assets if accompanied by a genuine commitment to act. E.F. Schumacher, in proposing his vision of *intermediate technology*, noted that "to talk about the future is useful only if it leads to action *now*".[59] Practical knowledge, as conceptualized by the exhibition, carried with it that same sense of urgency.

Moreover, in this notion of *phronesis*, an encounter must take place between that which is one's own and that which is foreign so that the improved understanding of the latter will enrich and strengthen the former.[60] I will argue that the major influences of ARARAT – appropriate technology, future studies, and systems ecology – were presented to visitors in a manner that encouraged the practices of this kind of *phronesis* or practical knowledge. It seemed to say: Here is the science about our Earth, here are some alternative technologies for less wasteful habits – now, bring your own experience and personal motivations to our exhibition. In this context, for knowledge to be valuable, it must enable its bearer to understand and interpret the world they inhabit well enough to be able to change it.[61]

A New Kind of Popular Education

If practical knowledge was the focal point of ARARAT's teachings, where does it belong in the educational system of 1970s Sweden? The existing system, according to skeptics, created individuals who were highly skilled in their field but lacked a broader understanding of life and their role in the world. What was needed, instead, was an education that respected and nurtured the human spirit, encouraged critical thinking, and fostered a sense of responsibility toward the world and others. This sentiment reflected a wider set of post-World War II sentiments about the obligations placed on mankind in the age of world-exterminating technologies.[62] This kind of education could not be achieved by the mere disciplining of youth. It starts from within and is a perpetual process of learning with no predetermined goal.[63] "A society that blindly accepts the decisions of experts", submitted the prominent environmentalist René Dubos, "is a sick society." Therefore, he reasoned, society needed "another class of scholars and citizens who have broad familiarity with the facts, methods, and objectives of science and thus are capable of making judgments.[64] Knowledge – what it was, who had it, and how it spread – was becoming highly contested ground.

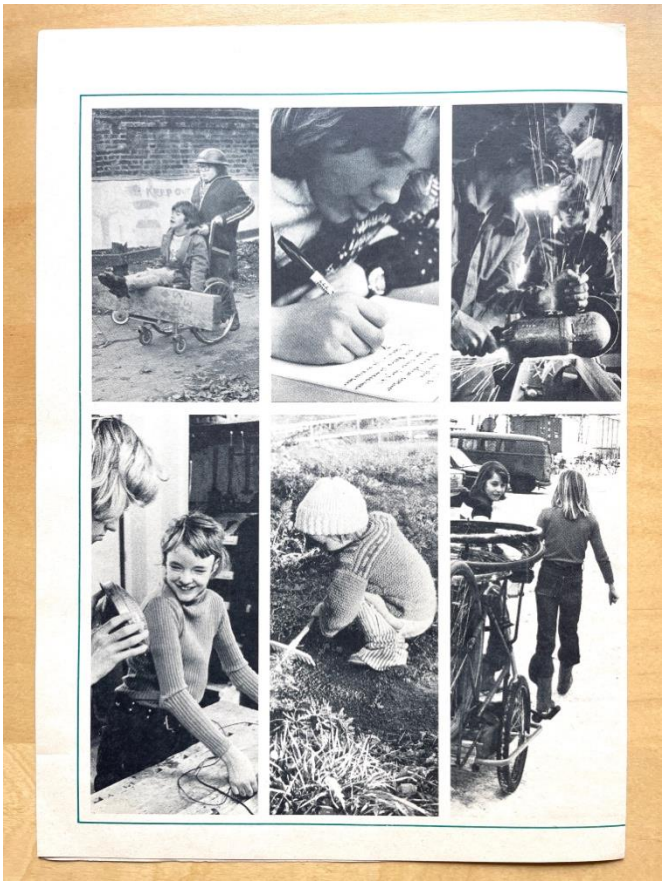


Image 6. Workshop activities.

Sweden has a strong tradition of popular education ("folkbildning"). While religiously motivated at first, by the late nineteenth century popular education was increasingly seen as an alternative for the lower classes to improve their conditions outside of more formal paths. Central

government had looked favorably on this as a method for workers to organize but also to keep from undesired activities such as drinking and gambling. During the twentieth century, popular education in Sweden became increasingly politically oriented. The different “folk high schools” (”folkhögskola”) and educational associations (”studieförbund”) now adopted their specific directions and profiles. Popular education had for some time been regarded as a method for teaching democratic values. In 1975, the bond with grassroots movements was formally recognized in a public education inquiry. It soon became a basic requirement for study circle funding that the association was grounded in one or more national organizations with a grassroots movement nature. The labor union's own folk high school, ABF, organized study circles devoted solely to Hans Palmstierna's celebrated book *Plundring, svält, förgiftning*.[65] Already in 1919, the folk high school statute had stressed that folk high schools were to foster the “personal development” of students, giving them a vivid understanding of their responsibility as human beings and members of society. At the same time, though, it was emphasized that they were to impart ”practical knowledge and skills”.[66] I claim that ARARAT in 1976 perfectly encapsulated the merger of these two traditions in the context of using practical knowledge to address the most pressing issues of the grassroots movements of its day.

Embedded in the teachings on appropriate technology as well as in the diagnoses of where the industrialized world had failed, was the ideal of simplicity. Here, ARARAT echoed several of the eco-luminaries of the 1960s and 70s. Reflecting on its outdoor experimental area and the things assembled there, the organizers observed that anyone can make a complicated machine even more complicated, whereas work toward simplification was more demanding. Only activities which strove toward the less complicated, it was believed, would be congruent with what was often referred to as the “self-balancing system of nature”. Therefore, instead of trying to repair or overcome failed technical implementations with more technology of a similar kind, fundamental changes in attitudes were called for.[67] This debate is still very much alive.[68] Throughout ARARAT, this sort of reflection between sophisticated cultural critique and the hands-on activities in workshops was a deliberate pedagogical instrument. In that sense, it combined the seminar room, the garage, and the garden.

To further extend its reach, ARARAT included “Ekoteket,” an informational network for the spreading of ideas about ”soft technology” and alternative ways of life. It was essentially a means of communication between research in ecological engineering, the public, and a range of interest groups. Ekoteket's conception of “soft technology” – which they also called “socially meaningful technology” – reflected the exhibition's general understanding of how technology impacted human life in general, but added that “its characteristics are durability, health, and beauty” and concluded that “soft technology is a means to social ends and creativity”.[69] Clearly, the use of ”soft technology” here went beyond practical considerations and proceeded to provide a way to health, beauty, and meaning.

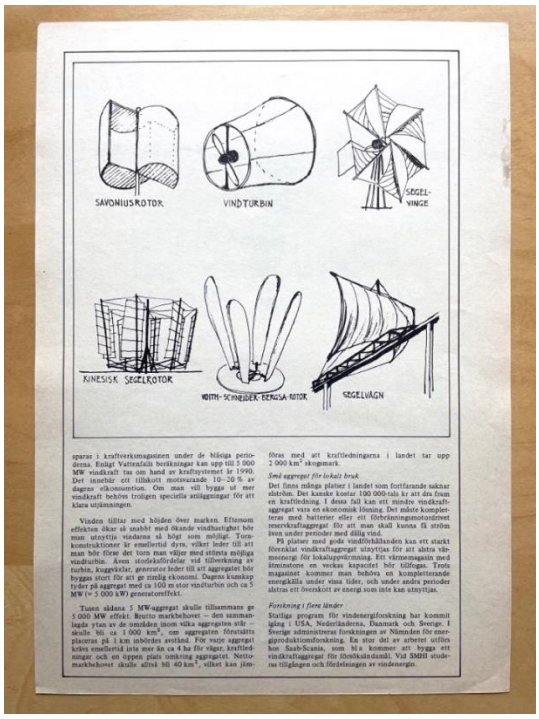


Image 7. Different types of blades for wind powered energy.

By its arrangement, ARARAT was committed to changing people's view of technology: from what it was – a global machine wasting our resources and energy in the hands of a few – to what it could be – a small-scale, well-designed set of implements that (almost) anyone could build, maintain, and repair. From technocracy to empowerment. If the human had evolved from a low-tech animal to one with the means to destroy her own habitat, she must now use her judgment to adapt her forces to the planetary constraints. In providing a path toward this future, the exhibition demonstrated a new kind of popular education. In so doing, it incorporated the highlights of a strong tradition in Sweden – a blend of real-world usefulness and democratic idealism – with its own distinct form of practical knowledge.

The Exhibition as Environing Medium

The 1976 exhibition was divided into five main areas: The Outdoors (“Utomhusdelen”), Gallery of the Present (“Nutidsgalleriet”), The Grand Hall (“Stora salen”), Gallery of the Future (“Framtidsgalleriet”), and The Workshop (“Verkstan”). Visitors first encountered the leitmotif of four elements, proceeded into the troubled earthly state of affairs, then emerged into a display of the interconnectedness of things, went on to contemplate what a preferred future might embody, and advanced, finally, to experiment with appropriate or alternative technologies that could, potentially, bridge the present and the future. If ARARAT, as I have argued, pioneered the research field of practical knowledge in the format of a new type of popular education in Sweden, what should we make of the exhibition itself, the actual space where these processes were given room?

As previously observed, the past two–three decades have seen the emergence of a field of research which decenters artists and their works to concentrate, instead, on the presentation

formats through which they meet audiences. Here, the exhibition itself becomes the focal point of analysis. Rather than an empty container where the biographies of artists and the provenance of their pieces are temporarily and transparently housed, curators are seen as creative agents and *the exhibition as a medium*, acting as a composite of mechanisms whose sum generates a specific range of signals. Turning to the historical context of ARARAT, this research has positioned "the exhibition as the reconstruction of a new environment".[70]

We thus have the notion of exhibitions as media capable of creating environments. Yet, the concept of *environing media*, as noted in the Introduction, has more far-reaching implications. While allowing museums and their exhibitions to be considered media is part of a significant broadening of the term from its traditional twentieth century connotation as carrier of mass communication, to say that they perform environing work is to further expand the understanding of what media can do. Environments, thus perceived, are less about the exhibit space and more about the outside world. In short, environing points to the power of some media to actively contribute to the making of environments by fundamentally acting as the material instruments through which we can make sense of reality. Possessing this quality, our use of them impacts our elementary concepts of what constitutes the environment in the first place, including its transformation over time. In this sense, the labor of environing is closely related to types and limits of knowledge.

The theoretical framework of environing media is a specialization of the concept *environing technologies*.[72] Focusing on the processes where analytical instruments are used to study the environment, e.g., automatic data collection to determine air pollution, water quality, and wildlife populations by a range sensing apparatuses, modeling, and simulation activities, these theories hold that such work effectively reshapes our conception of the planet. Within environmental history research, these perspectives have emerged to demonstrate that technology not only monitors, measures and reads the environment, but also *creates* it through these very activities, with more or less favorable consequences.[74] The analytical tools used to investigate our environment, then, should not be viewed as belonging exclusively to some intangible sphere of purely diagnostic or investigative endeavors. Instead, the methods by which we study our surroundings possess "environing" powers on par with more traditional cultural activities such as farming, mining, or foresting. Satellite imagery, for instance, does not merely reflect but produces environments; it articulates specific possibilities for perceiving reality.[75] By this logic, the tools we use to make sense of the planet and its state are not simply representational but retain "world-leveraging power".[76]

In the case of ARARAT, I submit that the exhibition as a whole acted as an *environing medium*. By this characterization, I propose that it presented the past, present, and future of the environment in a manner that transformed it as an object of knowledge. By this, I mean to say that ARARAT, by engaging its visitors in a new kind of *popular education* whereby they gained *practical knowledge* of how to use appropriate technology in their everyday lives, actively contributed to changing their conceptions of the environment. Moreover, I follow Bernhard Siegert, Michel de Certeau, and Susan Leigh Star – different as they may be in their interests – in their shared view that both environments and infrastructures are produced through use: Before they have reality, elements must be traversed and places "practiced". Constructs need to be used, misinterpreted, and distorted.[77] The 1976 exhibition provided ample opportunity for this. The different modalities and interactive formats of the exhibition's components – indoor stations, outdoor experiments, laboratories, workshops, seminars, discussion groups, a library, lectures, etc. – were all geared toward active participation, all were intended to collaborate with visitors in

the attempt to transform people's perspectives of the environment from the ground up. In accordance with IPCC graphs but closer, perhaps, to computer simulations of cloud movements – both of which have been framed as environing media – ARARAT had its users enter into the medium itself to pull its levers and spin its wheels.[78] In this way, it has affinities with Lewis Fry Richardson's early 1920s vision of a Weather Forecasting Factory, the computing theater dome where he pictured humans and machines co-producing what would become "the weather" for scientific, military, and general purposes.[79] Similarly, ARARAT did not simply display or represent the environment and its problems in spatial and temporal dimensions. It contributed to producing them as concepts and objects of knowledge. It was the conviction of its organizers that this kind of environing labor should be seen as the first step toward changing the future.

The Legacy of ARARAT

ARARAT was widely reported on and discussed in all the major news outlets in Sweden during the spring and summer of 1976. Most of the commentary and analysis was appreciative but the exhibition did receive criticism for being politically vague and socially naive. Some voices found the high variation in the level of sophistication between exhibition elements concerning. General principles in the sciences of physics and chemistry shared space with oversimplified and speculative ideas for solving transport and housing. It also wasn't finished by the time that the doors opened. This was to some extent deliberate as an invitation to not only let visitors participate in organized experiments but, more far-reaching, to build and change the exhibition as it was ongoing in ways that its originators had not expected and could not have predicted.

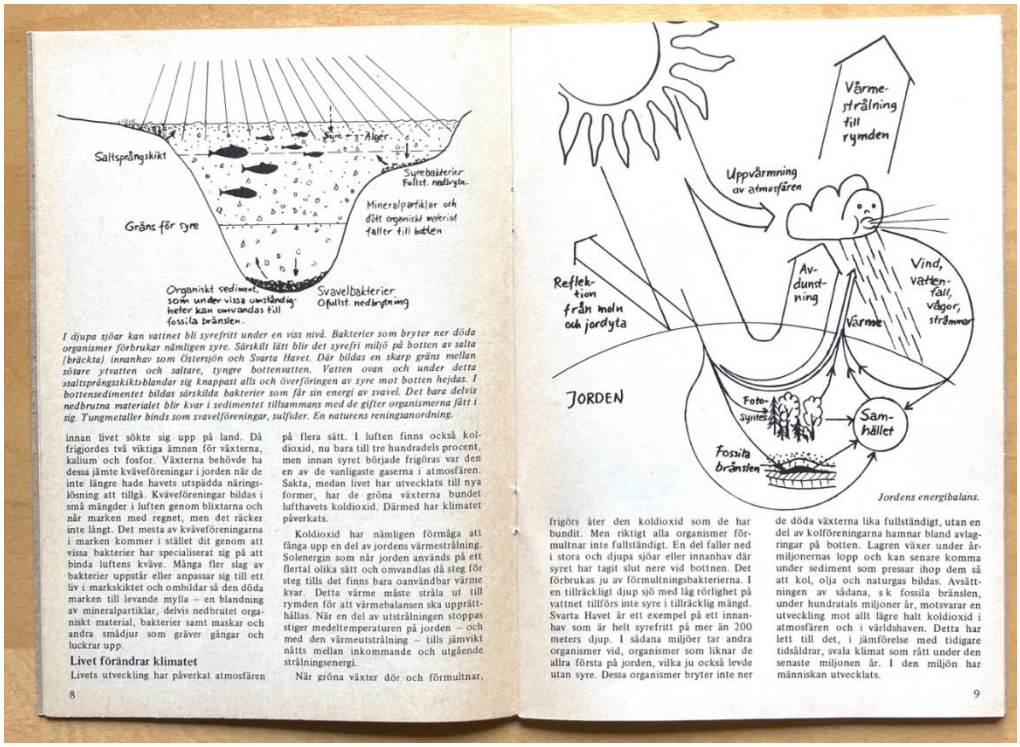


Image 8. The ecological impact of the sun.

By combining practical knowledge with a strong public education emphasis, ARARAT sought to empower its visitors with the tools necessary for supporting a transition toward a future existence within the limits of planet Earth. In so doing, I submit, it performed the work of an environing medium: it contributed to shaping and delimiting the concepts of our environment and in so doing, changed our environment. A decade later, the movement of appropriate technology was passing into less activist and more institutional forms. In Sweden, popular education was bracing itself for neo-liberal regimes. Yet, after 2020, about a decade into an era of significantly broader awareness of climate change and almost a half century after ARARAT, environmental thinking is promoted – and obstructed – in most channels and areas of society. Future studies has managed to retain its relevance by developing a critical stance toward the kinds of discourses that tend to limit imaginations and, instead, promote a manifold of voices and expressions on what the future could be.[80] Interest in forms of practical knowledge has benefitted from post-digital discourses. The appeal of alternative technology has surged, again, albeit most notably in maker culture and critical maker movements which tend to focus on building and hacking digital devices. The terms are new: *post-automation* against *future essentialism*, but the discourse is remarkably similar to that of the 1970s.[81] Kasper Schiølin says it well: democracy is in trouble "when those who imagine the future and decide upon its values are the same as those who own and sell the technologies that are imagined as driving it".[82] Academically, the idea of practical knowledge is highly compatible with the material turn in media studies and, more specifically, with critical infrastructure studies with its strong interests in the tactics of repair, reuse, tinkering, waste, maintenance, and overall questions of sustainability in relation to technological systems and human thriving.[83]

As noted, the organizers of ARARAT were clearly left-leaning in their political sympathies. But they were also informed by the new forms of knowing of the day: systems ecology and future studies. By its design, we might conceive of the exhibition as an early expression of what Bruno Latour and Nikolaj Schultz have termed the emergence of an *ecological class*.[84] In putting material habitability as principal goal for world politics, this new class, they suggest, must cut across previous alliances and make obsolete quarrels in terms of left and right. A movement from growth to enveloping, from production to maintenance, from the use of resources to an understanding of territory. None of these transitions, Latour and Schultz assert, can be managed by the current forms of state. Gathering supporters from all levels and varieties of society, the ecological class, these authors suggest, must occupy the state. This time people, not workers, need to organize as a "class" that is formed around a consciousness based on ecological thinking. Ecology, not socialism, must define the direction of history. Adding to this heightened call for action from within academia, encouragement of destructive behavior against environmentally disastrous industries has emerged from the very discipline which provided the theoretical backbone of ARARAT: human ecology.[85] Even if such affections remain marginal, they do bring up questions that were present for the organizers of the exhibition in 1976, albeit with less revolutionary sentiment: should society be reformed, completely overturned, or moved in the direction of something altogether different?

ARARAT insisted on the refusal to separate mental and physical work. A grasp of environmental politics and ecology informed hands-on exercises. Thereby, it succeeded in the difficult task to combine the existential and institutional aspects of producing change. In this sense, the exhibition's take on practical knowledge and popular education has, as noted, several kinships with Ruth Levitas's framing of utopia as method. Utopian thinking, she observes, must be relieved of its burden as the totalitarian end product of one-directional thinking and, instead,

be conceived of as a method to keep society open to alternative futures. Possibilities are indeed different from the probabilities of forecasting. "The method of simultaneously critiquing the present, exploring alternatives, imagining ourselves otherwise and experimenting with prefigurative practices", Levitas declares, "is all around us".[86] If this is true, ARARAT is part of the history that took us there.

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[1] The present article draws on original archival materials from the ARARAT exhibition. These consist of the exhibition catalogue which is a folder with some 80 sheets of papers presenting, on the one hand, the exhibit layout and the thoughts behind its respective parts and, on the other, some basic topics that the engaged exhibit engages, such as renewable energy, natural resources, poverty, non-destructive design, the future, small-scale technologies, etc. The archival materials also include 8 booklets specially made for the exhibition that discuss, respectively, human ecology, the four elements – fire (sun), earth, air, and water – as well as the rationale behind the project and a guide to further study. These materials are available at the Royal Library (KB) as well as at Moderna Museet, both in Stockholm. The quotes from the archival materials are my own translations from the Swedish original text. Special thanks to Bosse Holmqvist for bringing these materials to my attention in 2021.
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[4] The original core team was made up of Kerstin Abram-Nilsson, Valdemar Axelsson, Lars Englund, Bo Hall, Sivert Lindblom, Lennart Mörk, Hans Nordenström, and Monica Nordenström. Philip von Schantz, the Museum's director at that period, designated Björn Springfeldt as the curator for the exhibition while Per Stolpe was responsible for organizing seminars, events, and publication.
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[16] Schumacher, E. F., *Small is Beautiful: Economics as if People Mattered* (1973, New York: Harper, 2010), 35.
[17] ibid., 71.
[18] ibid., 163–164.
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