

The Memetic Web

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Memetics is a tool that may help explain certain complex phenomena relating to the interaction of material systems and intangible information. There is much to be explained, and memetics has only quite recently been proposed as a method for examining the world. Therefore, it may be wise to avoid applying memetic analysis to the evolution of complex socio-political power structures - sidestepping the entire issue of advanced memetic analysis of truly complex issues until we have a firmer grasp of what memetics offers.

Postponing more complex analysis of memetic effects, what follows is a discussion of the evolutionary interplay of the physical, genetic and memetic realms. The Web is examined from the perspective of a memetically catalytic medium that accelerates both the transmission of memes and the realization of memetic artifacts.

3D: The Evolution of Memetic Evolution

A good introduction to memetic theory can be had by examining works by the 3D's - Darwin, Dawkins and Dennett. Darwin first formulated a method for arriving at the current level of complexity found in the biosphere via a process of natural selection in 1859 (Darwin, 1859). Dawkins first proposed that memes were new replicators - not self-replicating, per se, a type of "Virus of the Mind" (Dawkins, 1976). Dennett extended Dawkins' idea of memetic evolution when he proposed the concept of a "Universal Design Space" (Dennett, 1995, p. 143) in which natural selection is used as a catalytic tool to accelerate the exploration of "all things possible" in both the genetic and memetic realm.

The Universe to Date

By extrapolating Dennett's proposal to include the physical realm, it may be possible to look at the unfolding of the known universe through evolutionary eyes. Perhaps the story would look something like the following, in which we see matter "preferring" to organize into stable structures, followed by the emergence of replicating systems:

A uniform distribution of energy emerging from a point source expanded and cooled. Minor fluctuations in the continuity had non-linear repercussions as energy coagulated into matter. This material fell into countless arrangements as the universe unfolded, the more stable ones persisted and grew - galaxies emerged.

On a small planet on the outer rim of one of these galaxies, elemental materials churned in a primitive atmosphere. The elemental materials on this planet fell into countless arrangements, the more stable ones persisted and grew - life emerged.

Replicating arrangements of matter competed with each other for the resources required to grow/reproduce. The replicators that managed to survive gave birth to a new generation of similar replicators, some better suited than others to grow/reproduce in the current environment. We recognize this behavior as evolution.

The material tools that evolved to further replication of matter include DNA, the lingua franca of genetic evolution. One of the products of this (genetic) evolution included beings capable of communicating information. This made it possible to augment one's innate behavior on the

fly, in response to information communicated. DNA served as a catalyst to speed up the process of finding designs for creating efficient replicators.

The story becomes more complex as new variables are introduced; viability is no longer based solely on the simple interaction between a genetic replicator and an impartial environment. Not only had other replicators become part of the environment, but the interaction of the replicators had evolved to the point where something as intangible as information could have a direct bearing on viability.

If two primitive beings are born with nearly identical genes into similar environments, we expect their phenotypes (the physical manifestation of one's genotype) and their ability to successfully grow/reproduce to be similar. This expectation can be explained using a strictly physical analysis of the situation. However, if one of these nearly-identical beings obtains information from another being regarding the creation of a fire, then suddenly their ability to successfully grow and reproduce is changed in response to a non-material factor. Intangible information now plays a role in differentiating between two replicating beings who would otherwise be (effectively) equivalently viable.

The non-material tools that evolved to further the process of replication are called "memes" - Richard Dawkins' term for a unit of thought. Memes produced by one replicator could be communicated to others via language. Cultures emerged, wherein a group of replicators benefitted from a set of shared memes. Memetic evolution is the process by which groups of memes are communicated and improved upon by a group of replicators - the memes that help to create an environment well suited to the further reproduction of memes (which likely implies an environment well suited to the further reproduction of genes) are the ones that persisted.

One species discovered that the memetic potency could be enhanced by creating a physical record. Complex human cultures emerged as memes evolved more rapidly with the assistance of written records. Writing served as a catalyst to speed up the process of finding designs for creating efficient cultures.

Thus we see that the rate of movement through Dennett's unified design space accelerated as catalytic agents (genes, memes, new memetic media - e.g. writing) emerged. Dennett extends Dawkins' suggestion that memetic evolution is similar to genetic evolution by proposing that it is all part of the same evolutionary process.

Catalytic New Media

Mememes reproduce and evolve as ideas are communicated among memetic hosts. It is commonly accepted that human beings are good memetic hosts, capable of understanding, synthesizing and re-communicating mememes; this is to be distinguished from memetic media, which serve to carry mememes from one host to the next.

As new media for memetic transmission have come into use, they often catalyzed the rapid growth and evolution of the existing mememes. The printing press improved upon hand-reproduced documents, making it possible to inexpensively transmit mememes to a wider range of hosts. This helped accelerate cultural trends of the time. Furthermore, the introduction of the printing press also transformed the cultural environment to such an extent that new memetic structures arose from drastic mutations of the existing mememes.

The 20th century has witnessed the introduction of several important mass media which are still in the process of being integrated into existing society. Radio and television provide a predominantly non-interactive means of communicating with a vast audience, while the Web provides a highly interactive means of allowing memetic hosts to acquire new memes (commonly called "surfing," as in "surfing the Web").

The Web differs from prior mass media in that it provides a more efficient method for communicating memes directly to hosts that are particularly susceptible to infection by a given meme. This efficiency is a result of the Web paradigm: memetic hosts directly seek new memes that appeal to them. While this behavior is not unique to Web surfing - for example, one often looks for books that are of particular interest - the Web accelerates and amplifies this behavior due to its highly interactive nature.

Is there a fundamental difference between the processes of selection, growth and reproduction of memetic technologies like the Web and traditional Darwinian evolution, or even the simple unfolding of the state of a complex physical system like a universe? Dennett would likely agree with the assertion that there is no fundamental difference, though memetic evolution occurs at a far faster rate than the plodding pace of genetics.

Conclusion: The Selfish Meme

There may indeed be a fundamental difference between the process of genetic and memetic evolution. Human memetic hosts are capable of intentional, conscious action - a factor that has far greater impact on the memetic evolutionary process than on the genetic process.

The intentionality of human memetic hosts makes it more likely that a human will re-transmit some memes much more widely than other, less interesting memes. The memetic host's desires are also shaped by memes, and it is this recursion of memetic influence that can create highly non-linear memetic effects like cultural fixation. This phenomenon may accelerate memetic evolution faster than expected.

This process is not without its physical effects - with the help of self-aware hosts (human beings), memes propagate and "wish" to be realized.

Selfish memes are like a recipe for a delicious cake; the meme for making the cake embeds itself in one's mind and can motivate action (e.g. the baking of a cake). If a memetic impulse is acted upon, the meme artifact (the cake) may help further propagate the original meme (the idea that baking delicious cakes is desirable) when other memetic hosts are exposed to the artifact.

Selfish memes desire "realization" - the process of causing a memetic host to carry out some action. Successful selfish memes often cause memetic hosts to realize actions that assist in the transmission of the memetic content.

The process by which Americans became fascinated with futurism, space exploration, and the idea of landing a man on the moon could be described in terms of a system of selfish memes that established a self-reinforcing pattern that led to realization of the memetic concept (landing a man on the moon).

While a moon-landing may have eventually happened at some point in human history, its occurrence earlier in this century - perhaps much earlier than might have otherwise been expected - may be attributable to memetic feedback cycles.

The creation and continuing evolution of the Web may also be the result of a strong positively re-inforcing memetic feedback system. In 1984, Gibson's seminal novel "Neuromancer" was published - a near-future heavily inspired by current trends.

In it, he describes a cyberspace matrix: "Cyberspace. A consensual hallucination experienced daily by billions of legitimate operators, in every nation, by children being taught mathematical concepts ... A graphic representation of data abstracted from the banks of every computer in the human system. Unthinkable complexity." (Gibson, 1984, p. 51)

Gibson's novel, influenced by contemporary cultural trends, inspired programmers to work towards the systems they were already working towards - if they had not already been working towards such systems, Gibson might not have picked up on the themes that dominate "Neuromancer". Thus Gibson's novel helped accelerate a process that was already underway - a process which, among other developments, has helped to shape our vision of online information systems.

Acting as a memetic catalyst, the Web medium promotes the creation of memetic feedback cycles more than other media due to its interactivity and immediacy. The Web efficiently transmits memes that can have the effect of heightening desires in a way that causes a host to seek out and re-transmit related memes.

The Web is particularly kind to selfish memes that seek realization beyond simple retransmission by enabling people to work together towards the creation of more complex memetic artifacts. For example, memes that inspire citizens of a town to build a bridge across a river will be assisted by the Web's ability to augment human endeavors - helping the townspeople co-ordinate the resources necessary to actually build the bridge.

The Web will likely serve to accelerate memetic evolution, but the usefulness of memetics transcends the Web. Feedback cycles, the interplay of art and science, and large scale social movements also lend themselves to memetic analysis. Along a similar vein, the greatly accelerated memetic evolution evident on the Web will have effects that transcend memetics as selfish memes seek realization in the creation of memetic artifacts.

Certain memes have embedded themselves in our common culture, selfishly wishing to be realized: many in our society are fascinated by the memes like world peace and using technology to literally or figuratively transcend the body (Lateiner, 1992). It is likely that the Web will continue to play an increasing role in fueling our imagination and assisting in memetic realization.

Notes:

Darwin, Charles (1859), *On the Origin of Species by Means of Natural Selection*, London: Murray

Dawkins, Richard (1976), *The Selfish Gene*, Oxford: Oxford University Press

Dennett, Daniel C. (1995), *Darwin's Dangerous Idea*, New York: Simon and Schuster

Gibson, William (1984), *Neuromancer*, New York: Ace Books

Lateiner, Joshua (1992), "Of Man, Mind and Machine: Meme-Based Models of Mind and the Possibility for Consciousness in Alternate Media," in *Dataspace*: <http://www.dataspace.com/documents/consciousness.html>