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generalized critique of the Church by enumerating the following points, all of which are factually correct: *the Church isn't a unified institution, there are many internal differences and no one person or body controls everything that happens in the Church; what priests are you referring to? because there are good ones and bad ones; laypeople might be ignorant of this, but the Church is very self-critical—aside from constant debates that occur via letters that bounce back and forth across Western Europe, the popes also organize ecclesiastical conferences every few years to discuss and update dogma; are you talking about deacons, priests, bishops, abbots, archbishops, or cardinals? because the clergy function really differently depending on the level you look at.*

Particularization at such a juncture is nothing but filibustering.

We don't doubt that Science has its own mechanisms for self-criticism and accountability. In this day and age, what institutional complex doesn't? The point is, these mechanisms are not adequate for the rest of us. It can be claimed that Science is not a cohesive body nor a religion, but we can see that sufficient coordination exists for scientists to be trained with enough homogeneity that they can be compatible and communicative internationally, and that these scientists are consistently useful in the maintenance and expansion of capitalism. True, capitalism can harness anything, even the games of children, but there really is no comparison, as scientific methodologies, the products of scientific knowledge, and trained scientists themselves play an irreplaceable role at the highest levels of global capitalism and on all the frontiers of capitalist expansion.

errors, and thus never capable of contributing towards a theoretical framework that addresses Science globally. To avoid unfair generalization, we are meant to wait until the official producers of knowledge themselves conceive of and find funding for a study that could objectively demonstrate in what percentage of the cases these criticisms are founded. Pie in the sky.

Remaining cautious of the potential for demagoguery or logical manipulation that comparisons present, let us again take the example of the Catholic Church in the centuries before the Enlightenment. In serious conversation today, it is perfectly viable to speak of the Church as an institution designed to accumulate power, effect social control, mobilize myths and superstitions, and repress heresy. Are particularities lost in this widely accepted theoretical view of the Church? Of course (and ironically, when it comes to outright misrepresentation, and not just the smoothing that accompanies generalization, the scientific proponents of the Enlightenment are largely to blame, in their zealousness to differentiate themselves from their supposedly irrational predecessors). Debate was in fact encouraged in the Church in the Middle Ages. Heresy could only be punished after formal processes in which the accused usually had the opportunity to defend themselves. As for superstitions, the Church also dealt in a wealth of historical fact, they often displayed intellectual vigor in their studies, and there were many efforts to challenge and discredit fraudulent documents and data (then as now, any "fact" that wasn't politically necessary could be comfortably disputed). And regarding the accumulation of power, there are even examples of clergy who fought for the Church to give up its temporal power.

Do all these details mean that the summarized theorization of the Church's social role, articulated above, is invalid? Of course not. Now what if we imagine a priest in the 12th century responding to the wave of popular dissent, deflecting a

Elaborating an idea that was left mentioned but unexplored in the previous essay, we wish to outline some central arguments of our belief that Western science or Enlightenment rationalism constitutes a mythical worldview, a state religion, and a productive modality, which is to say, a *worldshaper*. While it is true that all religions are worldshapers, since understanding is one of the first forms of shaping, by being integrally connected to capitalism Western science is the most powerful worldshaper to date; far from neutral, it is a most potent machine. Not only do we argue the religious nature of Science, we also assert that it is a direct ideological descendant of Christianity, and while the ascendancy of Enlightenment rationalism constituted a rupture with Church power and doctrine, we would qualify this as an evolutionary rupture, incurring no more breakage or damage to Church structures and thinking than was strictly necessary for Science to gain its independence and make a qualitative leap as the hegemonic worldshaper, as the butterfly must break the chrysalis.

Mere Empiricism

From the outset we find it necessary to make a crucial distinction between Enlightenment rationalism, a category that contains nearly all the attributes people wish to communicate when they refer to "science," and the empirical method, which rationalism's coreligionists would have us believe is the pure essence and extent of real science, a method unencumbered by worldview.

In rejecting Science we do not reject the empirical method, which we consider a useful but severely limited way of gaining knowledge; rather we reject all of Western science's dark matter, all the elements it claims not to possess. We can use the empirical method without believing in Science just like we can appreciate a cathedral without being Catholic or use fire

or wheels without being animists (as were the probable inventors of those tools). In fact, the comparison is faulty, given that Enlightenment thinkers were not the sole nor the first inventors of empiricism, just as Johannes Gutenberg was not the sole nor the first inventor of the printing press. Experimentation is widespread in human history, and in many cultures it has taken on methodical forms.

Because scientists from the "hard" branches have studied neither discourse, nor symbols, nor logic, they tend to be unaware when they are speaking metaphorically, and often confuse fact with fiction (to be fair I should point out that this problem, which I had grasped but could not articulate, was first elucidated to me by a PhD candidate of the humanities). Believers in Science will generally assert that Science itself is nothing more than empiricism. This is balderdash. We enumerate below a whole host of religious elements of the rationalist worldview and characteristics that the Enlightenment uncritically inherited from Christianity. But first, it would be good to point out a chief limitation of empiricism itself. This element can be summed up as the following non-falsifiable article of faith: "believe only what you can see." Such a belief is wholly ignorant of the fact, now empirically proven, that observation changes what is being observed, and it also predisposes us to a knowledge of *aliens* rather than a knowledge of self, relationships, or fields.

Leaving behind positivism and the faith in one kind of knowledge alone, we would state that "only what can be observed and tested counts as empirical knowledge." The implication is that there are many other kinds of knowledge, a recognition unknown to men of "Science," who have chosen to name their doctrine, simply and presumptuously, "Knowledge"—in Latin of course, suggesting an entire other train of baggage coming along on tracks clearly laid down by the Catholic church.

Secondly, and more substantially, we have noticed a certain pattern. The academically trained will always insist that the scientific community is highly self-critical, yet at the same time they always (as far as we have seen) reject criticisms that come from outside of academia as "overgeneralized" or unfounded. We would argue that this is a structurally systematic response.

An institution with hegemonic aspirations, or one that has already achieved dominance, must never allow itself to be fit into a globalizing theory (for what we are offering here, to be honest, is not a critique, it is a theoretical explanation of where Science fits within an anarchist view of the world). Anticolonial movements have already criticized postmodernism for how theorizing other people's identities and histories constitutes an exercise of power over those peoples. More broadly, Science cannot accept any external theorization of its role, because it is busy trying to place everything and everyone else within a theoretical system of its own making. At this juncture, we are not trying to offer criticism or feedback that might be useful to specific scientists, and which accordingly, must be particular, balanced, and fair. We are trying to theorize about a system of knowledge that pretends to be objective and all-encompassing, and a cabal (in the Biblical rather than paranoid conspiratorial sense) that claims not to exist, not to have agency, and not to have systematic patterns of behavior and ways of shaping the world.

In other words, what we are dealing with is precisely the lack of a theoretical generalization about Science as a complex of institutions with dynamic agency and an extremely important role within capitalism. Lacking this, it does not escape our attention that the only serious critiques of scientists that will be permitted are those that originate from other scientists and are published and disseminated by the structures that Science has sanctioned for its internal communications; and secondarily critiques originating from the laity that follow the rules of good form, addressing only particular scientists and particular

be. Knowledge should never be forsworn; it must always be used for the accumulation of more knowledge. A professional class that could invent nuclear weapons plainly follows such an imperative. Curiously, power within the scientific regime operates in a way that is remarkably similar to capital—there is no bad money, and all money must be invested or lost.

As we have tried to indicate in the first essay of this series, Science, not only as a producer of technologies but also as a worldview and spirituality, is indispensable in the production of golem, who are the citizens of the world system, composed of the dust of obliterated worlds, alienated from their histories and their surroundings, held together only by the false commons of the apparatuses produced to sustain them.

Epilogue

We predict that many believers in Science, especially the academically initiated, will reject this critique as uselessly broad, if they do not dismiss it outright. This is worth analyzing. First of all, someone in a position of power, someone with an accredited brain, a priest with a position in the hierarchy, need not respond to a non-professional writer, a layperson, unless the critique begins to be so widely distributed it constitutes a threat. The overwhelming silence this article will be met with, except from other laypersons, suggests that indeed there is a hierarchy at stake, rather than a free and equal community of ideas. After all, the Catholic Church did not begin to execute heretics among the laity until subversive heresies that challenged church hierarchies were widespread and began connecting with other social fault lines between upper and lower classes (principally cleaving to the new mobile urban class of weavers or rural peasants who increasingly asserted their autonomy) a situation that attained in the 12th century.

Objectivity

While we can appreciate a limited but significant validity in empiricism, we must attack objectivity wholeheartedly as a philosophically and empirically preposterous idea, as well as a morally disturbed way of looking at the world. Nevermind the insistence that contradiction or paradox constitutes a logical fallacy (which in some cultures would be viewed as a sign of a simplistic immaturity), the belief that there exists a complete, internally aligned, finite set of facts to describe every situation implies a worldview screaming for an absent god. All facts are processed knowledge resulting from personal involvement in a situation, guided by a specific cultural and historical framing as well as individual motivations. Regardless of whether a falling tree makes noise in an empty forest, how someone understands a forest and what features of it they decide to, or are even able to, measure, are all subjectively determined factors. There are no facts without personhood, and the tendency to try to alienate the facts from the producers of those facts not only trains people in a non-ecstatic disembodied view of their own lives, it also suggests dishonesty as well as an extreme discomfort with one's place in the world. In a world not ruled by Science, psychologists would be speaking about “objectivity neurosis” rather than “oppositional defiance disorder.”

Empirically and philosophically speaking, objectivity is a concept that has been thoroughly problematized, if not to say discredited; nonetheless it continues to make the rounds and play a central role in shaping people's worldview (a dynamic that we will see pop up a number of times throughout this essay). It is now a well produced and difficult to deny fact that observation *always* changes that which is observed.

This holds true across the disciplines, from the thermometer slightly changing the temperature of the matter it is inserted into, to the velocity of one object being relative to the velocity of the object from which it is being observed, to people chang-

ing their behavior, even pandering to the scientist's expectations, when being observed by an anthropologist or sociologist. This boils down to a truism that should, at least philosophically, hold great weight: it is impossible to know the world without us.

In terms of physics, it is hard to talk about objective velocity and position because space is not a neutral, static field of fixed coordinates against which objects can be measured; in fact on a number of levels even the firm distinction between object and space is illusory, stemming from a human (or at least Western) preference for seeing things and not seeing the field that contains them.

And in terms of knowledge production focusing on other humans, we can take a moment to mock medical studies (the medical industry, ahem, profession, will be a favorite whipping boy of this article). The supposedly passive subjects in medical studies are engaged in the study for specific reasons opaque to the researchers who are ostensibly in control; they know how to give the researchers what they want, and even to play them. In many cases, they are more able professionals than the researchers themselves. And if we are to believe that an uncontrolled "placebo effect," purely psychological in terms of Science's mind-body dualism, can corrupt the results of a study, what about the psychological effects of living for several days inside a research facility, under artificial lights, an altered diet and daily routine, and constant observation, not to mention the tapping of bodily fluids? The objectivity and "control" in a medical study is a convenient lie, an industry convention designed to produce credibility, which is nothing other than an appearance.

As for statistics, the ultimate in objective information, anyone who cares to knows how easily statistics can be cooked and manipulated, at the moment of presentation, of analysis, or even at the moment of data intake. Which is not to say, relativistically, that all statistics are meaningless or equally valid;

to the need of states to wage warfare against their neighbors and the need of capitalists to get an edge on their competitors and their laborers. It is not merely a complex of academic institutions that has advanced alongside, and been corrupted by, the institutions of the modern nation-state and of capital investment. On the contrary, at no point is Science autonomous within and endogenous to those academic institutions. It has always been a primary motor for the expansion—material and spiritual, to borrow the tired dichotomy—of the present world system that has colonized the entire globe, put all forms of life to work, reengineered the landscape to favor production and social control, and that is now busy rewriting the very matrix in which life and existence unfold; therefore its development has not been an exclusively academic affair but a chief concern of all the institutions of power with which it is coterminous.

Capitalism and therefore present-day ecocide do not exist without Science, neither technologically nor philosophically, and no amount of excuses about the individuality of scientists or the mutual independence of investors and inventors can change that fact. Just as feudal society is inconceivable without the clergy, even though the feudal relationship is typically simplified as one between serf and secular lord or vassal and liege lord, the scientific class are the linchpin of capitalist society, despite not properly belonging to the bourgeoisie or proletariat. Scientific investigation is a major sector of production in its own right; scientists constitute a privileged caste indispensable to the self-evaluation, reproduction, expansion, and social legitimation of state and private entities; and the scientific worldview, with its popular and professional forms, is crucial to uniting ruler and ruled in the present day and explaining existence in a way that is compatible with the interests of domination.

An unwritten rule of the scientific philosophy that is, nonetheless, abundantly evident, is the non-limitation of invention and discovery. Anything that can be invented, should

early Christians who would create the socio-political and intellectual structures that would eventually give rise to the Enlightenment were great burners of libraries, a tradition the European colonizers would carry on in modified form across the globe), scientists have continued in their search for the *atom*, that which cannot be cut, and which is therefore, supposedly, pure or more real. But what is cut in every atom, a priori, is its relationship with its surroundings.

The principles of the alien and the atom indicate that Science is not merely a method, nor even a producer of knowledge, but a *worldshaper*, a Weltanschauung that, through its connection to a complex of productive forces, codifies a modality with which to approach the world, inscribes a specific understanding of what the world actually is so that all its operations may unfold on a complementary terrain, and ends up reproducing the type of world that it believed in from the beginning, at increasing intensities and extremes of scale.

Cartesian geometry was flawed, but no matter; in the hands of surveyors, architects, and landlords it made for a more Cartesian world. Early physiologists had nothing other than muddled metaphor to support their claims that living bodies were organic machines. Nowadays, biochemists can use genetic manipulation to turn living cells into chemical factories and nanotechnicians can create robots out of artificial chemical compounds. Trigonometry can be taught as a pure math, but historically it changed the world as a mathematics of projectile warfare. Rocket science, the 20th century's symbol of pure genius (as in, "He's no rocket scientist"), likewise put the eggheads of the day at the service of a military restructuring of reality.

Leaving all the alibis aside, Science as it exists is inconceivable without its unbroken institutional, philosophical, and economic connections with policing, warfare, and industrialization. Its medical knowledge of bodies corresponds to the State's need to discipline, exploit, and torture those bodies; its funding and the areas of its advancement, its "discoveries," correspond

only that they can never be honestly used as anything more than one of many forms of knowledge, nor do they convey that chimera, objective truth.

And though scientists are not always directly involved in the production of the following discourse, the pedantic idea of objectivity that is a cornerstone of the news media only functions in a society that holds Science as sacred. The journalistic hoax that allows an infinity of perspectives to be silenced so as to present "both sides" of a story, and their refusal to educate viewers about the invisibilized questions of framing, can only fly for a public that still believes that objective information exists. It would probably not be exaggerated to view this hoax as a cover-up. If people realized that the best that can be hoped for (and not even in a pessimistic sense) is multi-subjective knowledge, they would not constantly have to devalue and suppress their own subjective knowledge, which is to say their life experiences, in the search for a superior yet unattainable objective knowledge. And someone who suppresses their own viewpoint is easier to control.

Heresy

Additionally, before we enumerate rationalism's myths and religious features, it would also do to touch on a middle area: knowledge that is validated by the empirical method, but marginalized or obscured by the acting priests of Science. We can refer to this field as *heresy*, an exploration conducted within the terminology and cosmology of the faith, rather than external to it, but one that contradicts the interests of those who hold power over the faith.

To validate our terminological comparison to heresy within the Christian paradigm, we can consider the Anabaptists. As with all heretics of their era, they were also true Christians. They used the objective material and tools of the Church,

namely the reading of Scripture, to subvert the unspoken goal of the Church institution, which was Power, the accumulation of which its heir Science has realized to a far greater extent and in a more dissimulated, innocent fashion. And just as the Anabaptists were marginalized once their ability to contest the Church exercise of power was violently eliminated, so too are heretical forms of Science marginalized, though the mechanisms of marginalization are quite different, owing in part to modern media technologies and the universalization of literacy, and in part to the functioning of research grants.

Gaia theory, the Kropotkinian view of evolution, and Reclusian theorizations in geography are three examples of heresy in the rationalist paradigm. Articulated by trained scientists with a scientific terminology, compatible with systems theory and other contemporary theories that are given more credence, modifiable in the face of empirical testing so as to separate them from pseudo-science; nonetheless they all have been effectively marginalized. The latter two, theorized by anarchists who won great praise in their day, have been largely erased from the history books, only starting to make a reappearance today, whereas the former has been marginalized primarily through derision. Rather than being subjected to scrutiny, it is affixed with an aura of mysticism (granted, the name helps) enough to keep away research funders and scientists concerned about their careers. Simultaneously, the police on multiple continents wage a fierce and bloody war, under the rubric of antiterrorism, against anyone who would attach the Gaia theory worldview to a social force (in other words, radical environmentalists who see life as a planetary quality, and the earth as a living system that can only be protected holistically). As much as the skeptics would insist that these two maneuvers in the current war on heresy are separate—the derision and the repression—we must not forget that the police today, like most other professions, conduct themselves

edge but a simple, non-interfering gaze that could belong to any subject, simply observing already existing facts that lie scattered across the terrain. An alien, of necessity, is violently uprooted from its surroundings, and it is the very process of observation, categorization, and analysis, as part of greater socio-economic processes, that achieves its alienation. Science, upon knowing an alien, has already fucked it thoroughly and irrevocably, yet it pretends that the alien already existed as an alien before the intervention of the scientific gaze.

Rationalism has perfected a number of apparatuses ostensibly intended to display knowledge. In practice, these apparatuses are factories of alienation that train us to understand things as dismembered bodies whose relationships and histories are as invisible as they are extraneous. These apparatuses are the encyclopedia, the museum, the zoo. In order to appear in a zoo or a museum, a body must already have undergone a process of colonization, uprooting, kidnapping, trauma, muting, and domination. For Science to claim (and to do so without speaking, to naturalize the idea) that a zebra in a zoo is the same thing as a zebra in its herd in the Serengeti, or that a ceremonial mask stored with reverence and used to bring the rains in Borneo is the same as a mask sitting in a display case in London, it must engage in a very powerful and evil kind of magic. It is a transformation of the most pernicious kind. In one kind of transformative magic, a person can be made a fish or a bird, and discover the interconnectedness of all things, and the mobility of the spirit. In rationalism's transformation, two beings that are completely unlike—one free and the other imprisoned—are made into the same being, teaching us the sameness of all things and the transferability of objects.

Picking up after their idols, the Greeks (though there is no direct intellectual continuity from the Greeks of antiquity to Enlightenment rationalism, contrary to scientific mythology; in fact it was primarily the medieval Arabs who built upon and improved the previous intellectual traditions, whereas the

of Enlightenment rationalism. To fully accept acupuncture or any other component of Chinese medicine would be to acknowledge that Science is partial rather than absolute, that it is only one knowledge system of many, and that would be unacceptable.

Let's compare their treatment of Chinese medicine with their adventures in psychiatry. True to their preference for mechanistic and divisionist forms of knowledge, as mentioned above, they have "isolated" (a truly spiritual term that accurately reflects their depraved philosophy) the components of the brain that produce the chemicals connected to certain emotions. Once you know what chemicals need to be blocked and what chemicals need to be produced in greater quantity, you've got the emotions all figured out. Simple, right? (Hopefully, readers read those last two lines in a Mickey Mouse voice, or at least with the voice of Joey from *Friends*).

The result of this kind of brilliant thinking are antidepressants that cause higher rates of suicide, as well as other forms of intimately disturbing unpleasantness. Some highly civilized people might not believe that extreme stupidity is just cause for execution. Nonetheless, we are confident that many who have been at the mercy of psychiatrists (for they, along with other scientists, do nothing if not exercise power over people) would agree with us that certain of these experts should be dragged out into the streets and shot. But, since the shoe is on the other foot, we can at least start with a bit of well earned mockery.

A Worldshaper

Science has perfected a knowledge of *aliens.* An alien is an Other, but not an autonomous Other necessary for the understanding of the self; the alien helps the scientific self promote its alibi of non-selfhood or objectivity, that it is not a being intervening in the world and producing specific kinds of knowl-

scientifically, and that they generally do not attack social groups granted legitimacy by other powerful institutions.

A fact published by Silvia Federici illustrates the link between the enthusiastic explorations of science and of the police; Francis Bacon, the father of empiricism, was also the Attorney General for the British Crown. He conducted political repression for the State, becoming involved in the interrogation and torture of subjects, an activity that perhaps expanded his understanding of the methodical acquisition of knowledge. And even though today, given centuries of complexification, the ecologist and the police investigator, both scientifically trained, are not the same person, it is hard to ignore the community of interests they work for. One is employed by Exxon to carry out investigations that will either raise doubts about global warming or open up new product lines for "clean energy," and the other has a "domestic terrorism" assignment that was created after political lobbying by Exxon in the face of a direct action campaign against a pipeline. Or perhaps his job post was indirectly created by Weyerhauser, or Monsanto, or Huntingdon Life Sciences, but in that case one only need go a level higher, to find that both companies use the same bank.

Mythical Inheritance

One of the prime hand-me-downs that is pervasive in Enlightenment rationalism is the tension between the material and the ideal, which is perhaps the definitional tension of Western civilization, apparent in Plato, apparent in Christianity, and apparent in Science. Although each of these paradigms has seized on somewhat different resolutions to the tension, the dichotomy itself is peculiar, arbitrary in the way that all cultural values are arbitrary.

Science pretends to resolve the tension by producing a dead universe (a philosophical projection that Science as a

worldshaper may be close to achieving). The ideal or the spirit has been abolished, assumed to be a fiction of the material world, which in rationalist terms is the only world (almost an inversion of Manichaeism, which is curious given the fury with which the medieval Church attacked the followers of Mani). Scientists still are not any closer to furnishing ultimate explanations of consciousness, life, or creation—though their "I don't know" has gotten fascinatingly more detailed—and they continuously have to return to their relationship with religion, their explanations of the power of the mind, the placebo effect, reports of altered consciousness among people who experienced temporary death, and so on. This wouldn't be a problem if Science did not pretend to be an absolute system of knowledge. As far as answers are concerned, Science is much better at cobbling them together than most other systems of knowledge, but the weight of its pretension to absoluteness causes it to stumble painfully over these few details, again and again, that it still cannot smooth down.

It is worth noting that, even though today, pre-Enlightenment Christianity is portrayed (in anachronistic terms) as fanciful and mystical, in fact Christianity took many important steps towards the dead universe of Enlightenment rationalism. Notably, Christianity succeeded in enclosing the sacred, which had once been a commons. The heresies that the Church attacked most violently were precisely those heresies that claimed that everyone could talk to God without priests as intermediaries. The Church was founded on the erection of barriers between common people and the sacred. What's more, Christianity was a notably skeptical religion for its day, discussing doctrine and evidence with a high premium on logic, method, and objectivity. The chief difference is that the primary materials they operated on in their theoretical laboratories were not observations of the world around them, but Scripture; nonetheless Church scholars regularly debated with vigor what stories, traditions, and documents were

community—all the things that Western medicine ignores or at least minimizes. And without a doubt, this latter theory would have a much better track record at dealing with disease, because rather than doing essentially nothing until antibiotics could be invented, it would have encouraged people to question food monocultures, urban crowding, air quality, poverty, and more.

To speak more concretely, we could state that saying germs cause sickness is like saying air causes fire. At least with many common sicknesses, the germs are always, or often, present in any human community, but people don't get sick as long as their immune systems are working well. Likewise, air is always present (on the planet's surface, anyway), but fuel and a spark are needed before you get fire.

To draw another example related to health, since in this field (along with ecology), the ignorance and blundering of Science has been most apparent (and, come to think of it, the health of our bodies and the health of the environment are basically the two most important things one might study), we can consider acupuncture. In our own lifetimes, acupuncture has gone from a treatment that was ignored or ridiculed in the West, to one that has been confirmed as effective by scientific studies. This reaction belies the hypocrisy and also the implicit racism of empiricist mythology, as acupuncture is based on thousands of years of observation and testing, only it wasn't bearded white men who were in charge, so it clearly doesn't count. And despite its proven effectiveness, acupuncture is still belittled or dismissed, providing more evidence of the cultural supremacy (an important component of any religion) implicit in Science.

Part of the reason that scientists cannot easily promote acupuncture is that they have no idea how it works. People trained in Chinese medicine know how acupuncture works, but their explanations are completely useless for believers in Science, since they rely on concepts like energy meridians, yin and yang, that are meaningless within the worldview

subject progresses—in other words it would be unfair to fault scientists if earlier models proved insufficient, when we should be congratulating them for their honesty. On the other hand, we should also consider that these schema—particles, matter, even circles and squares—that are sold to us as objective representations (this phrase is a hilarious oxymoron, though we doubt anyone who has only studied hard sciences is capable of getting it) are not the fruit of testing and experimentation, as the mythology of empiricism would have us believe, but are rather cultural, spiritual constructs born of a specific worldview that are imposed by the scientist on the object of study (revealing at a deeper level what in superficial, quantitative terms has already been accepted as scientific fact, that all observation changes what is observed, another of these new discoveries that other cultures have known for a long time). In other words, atoms, squares, and the dualism between matter and energy were not discovered; they already existed in the Western imaginary and were used as symbolic tools, imposed on the inchoate knowledge that was gradually being produced in order to simplify and organize it.

Consider another example. Referring to a case of heresy in Milan in 1028, a Church chronicler writes about the heterodoxy as a disease that needs to be eradicated before it can "contaminate" the rest of Italy. Is it a mere coincidence that the scientific understanding of disease that would arise centuries later (now with the aid of microscopes) would promote this exact same vision of a neutral field invaded by impure agents that spread through contact? They did not know about germs and bacteria, but they already spoke of unclean agents that caused contamination. Could it be that scientists utilized a pre-existing logic to simplify and describe the complex reality of sickness? Yet we all know that germs are an objective reality. There is no other valid theory of disease, right? On the contrary, a worldview based on fields and relationships would have us overlook the germs and focus on the diet, the body, the weather, the

fraudulent rather than accepting any tall tale placed before them.

True, the Catholic Church certified a great many miracles in order to canonize their saints, but their actions must be compared with what came before them, not what came after. Catholicism constituted a much less miraculous universe than the pagan one that had preceded it. Theirs was a universe in which miracles could not be commonly experienced and proclaimed, but had to be granted institutional recognition. Moreover, the honoring of sainthood was a necessary Catholic concession to the paganism it worked hard to supplant. Much of the opprobrium reserved by Protestantism and then rationalism for the Catholic Church was directed at its worldly compromises with a decentralized spiritual practice that, by the 17th century, had already been stamped out. It is no coincidence that the countries where the witch burnings were most thorough and the bloodiest forms of Protestantism most active would also be the cradles of scientific rationalism.

Nor is it a coincidence that many of the early men of science were monks or trained ecclesiasts, such as Copernicus, Mendel, Albertus Magnus, Roger Bacon, Georges Lemaitre, Nicolas Steno, and many more, while others like Linnaeus were educated for the priesthood before branching off into other fields of study.

Science has gone one further, abolishing the sacred sphere that the Church had enclosed and placed beyond easy access. Nonetheless, it not only suffers this absence, it continues to produce a world ruled by abstraction, often to a neurotic degree. Far from solved, the tension between matter and spirit it inherited from Christianity remains alive in Science.

We can also fault Science for its proliferation of simplified myths. *Ishmael*, by Daniel Quinn, articulates perfectly how our scientific society is based on anthropocentric myths about evolution. Ask anyone to explain the evolution of life, and they will tell you a story that starts with single-celled organisms and

ends with humankind, the pinnacle of progress. Scientists have an easy out, for they can always claim that this is not really a factually rigorous or "objective" explanation of evolution, and they can't be blamed for other people's ignorance. What they can't explain is why that myth has *always* been reproduced at a far greater frequency than any empirically accurate rendition of the evolution tale, and often issues from the mouths of trained scientists themselves.

In fact, practitioners of Science are far more guilty of this simplification process than their predecessors. With the Christians, the simplified myths tend to involve simply glossing over contradictions. It is my impression that most Christians don't know that the Bible is actually full of contradictions, or that, for example, Genesis actually contains multiple creation stories that differ on important details. With Science, however, the mythical simplifications tend to be far more crass, often flying in the face of empirical evidence in order to articulate a myth that is calming or convenient to the social order. Examples abound, from the already cited evolution myth that depicts a hierarchical progression culminating in homo sapiens, to apologia for nuclear energy, to essentialist justifications for traditional gender relations. Frustratingly, such myths are hard to challenge, because scientists are not usually instructed in the nuances of symbolic communication, and thus do not recognize a myth if it slaps them in the face (on the contrary, they tend to operate in the Christian realm of truth, taking their own narratives as objective, and those of other religions as preposterous absurdities). If effectively confronted, any of these myths can be conveniently jettisoned as pseudo-science, but an explanation is never offered as to why such myths are so often produced by scientists themselves, and why opportunities are systematically generated for their distribution.

Because Science is operating in a much more complicated textual terrain than Scripture, and because of the attendant professionalism, no scientist has a global picture, the way an

like) who discovered relativity and revealed the shortcomings of Cartesian geometry. However, well over a thousand years earlier, Daoists and Buddhists were already promoting a worldview that clashed with Cartesian geometry but was largely compatible with the discoveries of quantum physics. We reference Einstein because it is the only way to get the faithful to listen; believers in Science refuse to recognize outside sources. Quoting the Dao De Jing to back up a certain worldview would be about as effective as quoting the Quran to convince a Christian that a part of their doctrine is flawed.

But the empirical method, one might argue, should not be abandoned. Scientists cannot go chasing down every last traditional spirituality as the basis for its worldview. Scientists had to pass through the fallacies of Cartesian geometry in order to arrive at relativity, because they could not have discovered quantum physics or field dynamics without prior discoveries, adequate microscopes, and so forth. Is this credible? Maybe not. The concept of *atoms* comes from the ancient Greeks, who lacked microscopes. Yet the concept fit with their worldview. Were they really intuitive, or is it just a coincidence? Or is it possible that atoms do not objectively exist, that they are just one of multiple ways of understanding the composition of things? *But I have seen atoms*, some readers will no doubt react, referring to the drawings and diagrams in any high school physics textbook, just as students a century earlier were treated to pictorial renditions of the Garden of Eden (and how perfect, in the end, that objectivity comes to us in a series of representations that we forget, from one moment to the next, are representations). What is objectively true is that what we call atoms are not atoms, or otherwise the category of "sub-atomic" would be meaningless (see: a-tom, etymology). And it turns out that at the subatomic level, the division between particles and waves, matter and energy, breaks down.

On the one hand, it is only reasonable that the schematics placed on a subject become more nuanced as the study of that

objective facts, that wolves eat deer and deer eat plants and plants feed off the soil and the sun, then in objective terms a food chain as a theoretical heuristic lacks nothing that another knowledge system might contain, even though it puts all the attention on discrete agents rather than the living field constituted by the dynamic relationships between them, and therefore leads to a number of disastrous misunderstandings about ecosystems (remember the Cane Toad!).

Nonetheless, we will try our best to reveal what is lacking, similar to how astronomers must discover black holes by looking at the things around them.

Quantum physics and Cartesian geometry may be a good place to start. Just as Cartesian dualism remains embedded in Enlightenment rationalism, the Cartesian geometry of flat planes and right angles remains integral to the scientific worldview, even though it has been invalidated by the principle of relativity (whereas the determinism of classical science up to and including general relativity has been contradicted by the uncertainty of quantum mechanics). If space itself is not a neutral, static phenomenon, something as stable and happy as a square or a triangle can be nothing but an illusion or a convenient lie. (This is a part of Science's mythical simplification, elements of the worldview that it cannot actually defend, but that it nonetheless perpetuates, through mechanisms that will be dishonestly chalked up to "pop science" if ever called to account.)

Nonetheless, it is useful to train people to think in terms of Cartesian geometry, because the discipline has been extremely active in enclosing and dividing land or rationally governing construction through blueprints (as Deleuze and Guattari have written, blueprints are not required even for the construction of complex buildings, unless the construction process needs to be subordinated to an external and rational authority).

It would be easy to say that this whole line of argument is flawed, since it was scientists themselves (Einstein and the

erudite Biblical scholar might have a global picture of his respective textual terrain. In other words, scientists inevitably have to address aspects of empirical knowledge that are outside their field of expertise. Their vision of other fields is often fed to them by the same mass media that take the fall for being the propagators of pseudo-science. But what we are dealing with is something systematic. *In a knowledge system that is far too complex for any one mind to appreciate all of it, or even a tenth of it, the mechanisms by which knowledge is simplified for the non-specialists, and by which a global portrayal of the knowledge is produced, must be analyzed as a structural part of that knowledge system.* Western science, however, dodges the bullet on this one by avoiding holistic analysis of its methodology. Against such a laughably broad claim as "Science produces a mythical view of evolution," the institutional body need only trot out an expert on, say, the evolution of color-perception among insects, to give a suitably detailed description of evolutionary processes and thus deny responsibility for the inaccuracies of pop science. But the pop science and the mechanisms that produce it are an integral part of Science itself.

In the most charitable analysis, individual scientists or scientific institutions would do well to analyze this enduring failure to communicate. Why are so many inaccurate narratives and so much misinformation distributed and reproduced, long after the advent of the Age of Reason? No doubt, politicians or television can be blamed, but any sincere skeptic cannot help but to see the way these mythical narratives are structurally reinforced, and the way they are beneficial to power-holders in a hierarchical society.

The structural component is important, and reveals other forms of Christian heritage. Similar to the medieval church, the advancement of Western science is accomplished by professionals who are patronized by financial and territorial powers, free to research and debate within the informal but very real boundaries established by patronage, while bringing no em-

powerment or enlightenment to the masses, only instructions. After all, the average citizen of a modern, scientific country gains no real tools for understanding or influencing the world around them. On the contrary, they are consigned to believing their doctor or the scientists who quality control the products they consume (a frequently foolish and sometimes even fatal mistake), and gleaning simplified versions of larger truths from copies of *National Geographic* or a productive half-hour spent watching the Discovery Channel.

Like the Church hierarchy, the hierarchy of scientific tenures is not a meritocracy as they would like to believe. One encounters an endless number of nincompoops with PhDs. And while we may find academic, peer-reviewed journals to be an invaluable resource for research, as well as a useful vehicle for the production and evaluation of empirical knowledge (this is of course a meek understatement), it is not infrequently that one comes across authors in such journals who are total hacks incapable of marshaling facts or analyzing their own data; and the only reason they were published is because they boasted a fancy piece of paper and a prestigious post.

And while that nebulous network we can ironically refer to as Science is not as nepotist as the one that, with more precision, we can refer to metonymically as the Church—although tell that to the Harvard Admissions Board—entry into the club and ascendance in its ranks is determined at least as much by class considerations, dexterousness at university politics, alignment with other power structures, and success in publishing and receiving funding (which means selling to a market) as it is by merit or ability. We personally know of an intelligent scientist and excellent professor who was prevented from getting tenure in her department simply because her politics differed from those of the department chair.

Such personal anecdotes are hardly scientific and can't be taken as solid proof of anything, of course, but the day the professionals publish an empirical study revealing once and

entists and mathematicians talking about numerical relations comprising a secret language behind the façade of the physical world, even as a sort of key to decoding existence; fractals enthusiasts promote this thinking with particular frequency);

--The articulation of mechanical relationships (as opposed to reciprocal or dynamic relationships: what is overwhelmingly interesting for Science is not to discover how to maintain or effect states of balance that foster well-being, but how to achieve reproducibility and control, isolating operative factors so that a certain input will always produce the desired output);

--Discoveries resulting from divisionism, or the search for pure elements that cannot be divided or cut (in the popular parlance, the search for the "building blocks" of life, matter, the universe, etc., which belies a rather simplistic view of how things are constructed, as well as a zeal to identify component elements so that reality can be reconfigured).

What other kinds of knowledge are there, and what is wrong with the types of knowledge enumerated above? After all, as of the 20th century Science can also boast a knowledge of field dynamics, dynamic equilibrium, and chaotic systems. Give them enough time, and our boys in labcoats will discover it all, right?

Naturally it is hard to talk about what we don't know or haven't been able to discover, and perhaps even harder to reveal the presence of a lens when our whole lives we have been trained to look only at the object, and from the same perspective no less. Objectivity is an extremely pervasive, subtle philosophy specifically because it trains its adepts to believe that the only meaningful differences are, well, objective. If they are aware of the existence of, for example, ecosystems, they are unlikely to recognize that another culture understands ecosystems better or possesses knowledge that the rationalists do not, especially if that other culture has no quantitative studies to demonstrate their knowledge. It will be hard for them to grasp how much perspective, emphasis, and mythical framing can affect knowledge. If both knowledge systems perceive the same

Partial Knowledge

As we have stated earlier, Western science constitutes a knowledge system. The knowledge it produces is frequently valid, up until the point it claims to be absolute. Since it is very difficult to think outside of a paradigm, it might be useful to review the kinds of knowledge that Science is predisposed to produce. This will further reveal the mythical, religious nature of rationalism. And in case our position is unclear, we must insist that there is absolutely nothing wrong with myths—on the contrary humans cannot live without myths—unless they are myths that claim to be objective truths. Rationalism, like any other cosmovision, is spiritual at its core, but on this point we will take sides to argue that the spirituality of Enlightenment rationalism is fundamentally sick, corrupted, alienated, authoritarian, ecocidal, patriarchal, and sociopathic.

Given its background in Christianity and platonic philosophy, Science is predisposed to produce the following types of knowledge:

--The charting of ahistorical genealogies (as in the classification of species not according to their role or relation with other species, to name one of many possible organizational schema, but according to their presumed genetic descendance; perhaps it is not unreasonable to see in this a marked Old Testament influence);

--An awareness of alienated units (swallowing—until recently uncritically—the Enlightenment concept of the individual, along with other sovereigns like the nation, scientists have overwhelmingly favored an analysis of discrete bodies rather than of fields, fluxes, or interconnections, which is akin to analyzing the ocean as a large collection of waves);

--The development of mathematics as the language of nature (revealing something approaching a kabbalist mysticism, rather than simply understanding numerical relations as one of multiple ways to describe the world, examples abound of sci-

for all how many of their colleagues are total idiots, perhaps we can give up on our rude, country mouse ways and stick to The Facts rather than bewildering readers with romantic little jaunts through Storyland. In fact, this absence of data reveals an important point: scientific institutions will not produce knowledge that is not useful to the exercise of power. They would only conduct and publish a study revealing how many accredited scientists were airheads if there were some institutional pressure to reform admissions processes; in the meantime, such studies are useless because they would serve to discredit the institutions.

Science, like Christianity in the Middle Ages, is the custodian of collective memory. Whereas before it was only clerics who recorded the history of society, now nearly all primary research is conducted by trained scientists (social and other). Subsequently, the masses may do with this data what we will, but the questions of what forgotten epochs or aspects of history will be opened up to us and from what angle they will be mined are decided entirely by professional researchers.

Another artifact of Christian inheritance is the progressive, unilinear view of time that rationalism has strongly favored. This was the dominant Christian temporality once the Gnostics were defeated around the 5th century and while since Einstein it no longer holds water in physics and has been challenged in recent decades in many of the social sciences, the myth of progress is still firmly entrenched. Examples include the evolution myth already discussed, in which humans follow chimpanzees, or the long dominant and still taught anthropological framework that has states following chiefdoms following tribes following bands, another story with no basis in fact. In his excellent research, Stephen Jay Gould documents a number of scientific blunders among linguists and others who assumed that the simple must be followed by the complex, as well as an abundance of examples from the natural and social sciences demonstrating the non-progressive multilineality of evolution.

Another prejudice Enlightenment rationalism inherited from Christianity is the belief in a unitary cause. Just as Thomas Aquinas based his proof for the existence of God on the non-falsifiable assumption that existence needed a unitary, original cause, physicists and mathematicians continue to perfect Grand Unified Theories in order to come closer to a "theory of everything." And in other fields, scientists cleave to Ockham's Razor, a prejudice towards the simplest explanation (developed by a Franciscan friar no less). And while Ockham's Razor is clearly useful, and a necessary complement to falsifiability, it can also accustom thinkers to blind themselves to complexity, or to see causation and change occurring in unilinear chains rather than as dynamic equilibria shifting across a field.

Enlightenment rationalism directly inherited Christianity's zeal for speaking in the name of nature; in fact as it reached maturation Science directly contested the ability of the Church to speak for the natural world, usurping that throne for itself. Just as Christianity in certain moments declared homosexuality, sex out of wedlock, working on Sunday, or going naked *unnatural*, Enlightenment rationalism began to justify its own social values through a particular characterization of the natural world. This new world they produced, both discursively and to an increasing extent socio-economically, is a mechanical and hierarchical world. Natural patterns were described as "laws," originally assumed to have been drafted by a clockmaker God. This latter figure, embarrassing for later scientists, quietly disappeared, but His clocklike universe and laws remain. Living bodies continue to be characterized as *machines*, and with their typical obtuseness the proponents of this view generally do not know if they are speaking literally or metaphorically.

Perhaps the most important element shared by Christianity and Science is their pathologically immature fear of death. A large part of scientific production is designed to seek everlasting life for individuals (those who can afford the treatments, of

course) and for the species. Nevermind that scientists claim to speak for the natural world and in nature species die out; humanity must survive. Does Science, therefore, think to change the productive processes it has given rise to, since they are the greatest current threat to human survival? Of course not. These processes must be accelerated so that humankind can colonize Mars before we destroy the biosphere, colonize other solar systems before our sun dies, and in the meantime set up a planetary defense system should any asteroids come too close. Scientists evidently cannot get over themselves and accept that everybody dies.

Why is our species more important than all the others, and more important than the inorganic processes of the universe? The only possible justification for getting ourselves, at the cost of all others, off the planet is, "because we can." If that is the ultimate ethic of our civilization, it is only fair that it be applied not only to scientists but also to their opponents. We can hope the luddites and primitivists take note. Anything that can be done, must be done. Any scientist that can be killed, should be. Why not? It's not like there's anything, in the grand scheme of things, to lose.

Therefore, any supporter of Western science and in particular the project to send human life out into the stars should recognize that Ted Kaczynski and more recently ITS in Mexico were absolutely right in assassinating scientists. They had the power to do it, therefore it was right. But if, perhaps, they feel reluctant to place their lives in the hands of such a mercenary ethos, maybe, just maybe, it's because their only real morality is the belief that everything they do is right. Not so different from the Christians in the end, are they?