# THE GREAT TIRE-FIRE OF MODERN SCIENCE

*Modern science has been corrupted by naive empiricism, the epistemological belief that data presents its own interpretation. When science is conducted with a rigorous philosophical method, it generates an obscene amount of information without any scientific value. It does this because data is predicated on hypothetical methods, which themselves need to be vetted properly by the intellect. Modern empirical methods, due limitations inherent to institutions and humanity itself, are caught in a vicious circle where they are incapable of generating authoritative data, but instead must generate any data. As a result, most scientific fields have failed to meaningfully progress in the last few decades, particularly the social sciences and medicine.*

**Morgan Stahle**

**www.morganstahle.info**

# 2

## Accumulate! Accumulate! That is Moses and the Prophets!

Modern science is an intellectual tire fire. It continuously burns, never seems to end, although there is always some 'new' information that we must accumulate. The longer one stays with it however, a dyspepsia emerges for anyone that breathes it too deeply. Such is the result of naive empiricism. By 'naive empiricism', I understand a type of empirical study which believes that truths are found within the data itself, and that by virtue of that data, truth will be uncovered. Such a mode of scientific thinking is flawed. It results in a twisted, smoldering mess of confused thinking that leads to endless debates, but offers few definitive answers. Rather than come to an answer, one leaves with a sense of bewilderment. Much scholarship today, and most of the popularizers of scientific thinking (particularly journalists) suffer from this, and it leads to a fetishization, almost a type of tabloid science.

The problems of empirical dogmatism are both methodological and conceptual. Such error has a long pedigree, and can be easily dated back to the Greeks. The cure, for people like Aristotle and Plato was to ground empiricism in philosophy, and then use intellectual methods to set the agenda. Modern thinkers have recognized this problem as well, the best of which is Francis Bacon, the father of modern empirical science. Bacon, in his work *Novum Organon* (its title taken from Aristotle's *Organon*) gives a metaphor of three different intellectual enterprises and describes them in terms of three different insects.

> "Those who have handled sciences have been either men of experiment or men of dogmas. The men of experiment are like the ant, they only collect and use;

> the reasoners resemble spiders, who make cobwebs out of their own substance. But the bee takes a middle course: it gathers its material from the flowers of the garden and of the field, but transforms and digests it by a power of its own. Not unlike this is the true business of philosophy; for it neither relies solely or chiefly on the powers of the mind, nor does it take the matter which it gathers from natural history and mechanical experiments and lay it up in the memory whole, as it finds it, but lays it up in the understanding altered and digested. Therefore from a closer and purer league between these two faculties, the experimental and the rational (such as has never yet been made), much may be hoped."

The flaw of naive empiricism is that of the ant. Rather than digest the information and come to any conclusion, it merely 'gathers' and 'lay[s] up' information into a great whole, unable to process and digest it properly. This leads to a general fetish for information, like a bird collecting shiny objects without any purpose or end.

Immanuel Kant similarly recognized this problem and describes it in the last pages of his Critique of Pure Reason in terms of a 'heaping' problem. He describes an 'architectonic', a unified locus of understanding around a particular subject. This is what the Greeks understood 'science' to mean originally. It didn't mean any technical or empirical study of the universe, but rather the unified system of understanding that would result from such

study. Therefore, the Ancients had a science of justice, wisdom, or poetry etc. Such an architectonic is the ultimate goal of empirical study, indeed all of intellectual life. While Bacon was not the first person to see the need to unify the two, he was the most influential. He was also a good Christian, and believed that the dominion of man over the Earth included technology and reason. Thus he believed that God intended man to develop himself intellectually, and believed a shift towards empiricism was the answer. And rightly so, for the Scholastic systems of science and alchemy had run their course and a change was needed.

So he decided to develop a new methodology which would explore the world more generally, but loosen the grip of the spider that had strangled the Scholastics and alchemists. Unfortunately, his insights have been taken to extreme in recent centuries. A balanced empiricism, an empiricism of the bee, has given way to the empiricism of the ant. Naive empiricism loses sight of this balance. As Kant describes the flaw, already emergent in his day, he shows how a proper scientific method doesn't heap knowledge, but instead begins with a form of the whole, and proceeds such that it is expanded properly. He uses the metaphor of an animal "whose growth does not add a limb but rather makes each limb stronger and fitter for its end without any alteration of proportion." By this he means that a proper field of study will not look like a Frankenstein's monster, with limbs added unnaturally. He, like Bacon and many others, have recognized that to merely heap information together isn't conducive to knowledge, but instead leads to contorted and convoluted thinking. Naive empiricism fails by failing to conceptualize the form of the whole. It blindly searches for data, but has nothing to do once attained.

This error is based in a misunderstanding of the innate separation of data and its interpretation. The fallacy is that data

can be heaped together and that some form or organization will eventually emerge therefrom. The error in this, is in the assumption that a theory can be created merely from the collection of data. This is backwards however. When one begins an experiment, it is impossible to know what type of information is actually 'data'. For to interpret the entire manifold of sensible reality is impossible, and so one must begin at a finite point. But which point should be the beginning? Such a scientist would easily reply, "the data!", but what is that data exactly? This is the problem of a hypothesis, and the contradiction that a direct, or naive realism. Because we must have a hypothesis to merely the collect the data at all!

So which of the two should come first? This is the problem that has led us to unsystematic science, because it believes that the chicken should come first – or that data should 'just be collected'. But how can a chicken exist unless there is an egg?

This is the basic problem of an unsystematic science. To understand this, we must look at its methods and concepts in detail. Since they parallel each other, we'll discuss them simultaneously. The origins of ant-like thinking appear to be two-fold. The first is a perceptual and cognitive limitation of human being. And the second is the bureaucratic and iterative structure of academia. Limitations of humanity are known as problems of finitude, which are innate limitations to us as a species. These problems will never be overcome. When finitude is not recognized, it will automatically lead to heaping since it will seem natural to process information as we do naturally. This however is problematic, for our conceptions of the world are quite dubious in their default state.

The problem of human finitude as it applies to science manifests itself in two ways. The first is in the iterative-nature of

the scientific method, because one experiment tends to inform a second, and eventually a third etc. This is because the mind is generally incapable of seeing the potential pitfalls and outcomes of the experiments before they occur. The second manifestation is innate difficulty of architectonic thinking. Creating an entire system and worldview is difficult, and it seems to fall only to the greatest minds to overcome them, a Copernicus or an Einstein.

The general problem of finitude is that scientific inquiry, and the organizational capacity needed are not cognizable by all persons, even those with advanced degrees in the field. The number of simultaneous predicates and training required to construct an architectonic is not a requirement for post-graduate degrees. Worse yet, the qualifications of these degrees has fallen tremendously, and there is a glut of over-educated post-graduates, most of which are not much better off than they were before their education. Grand-theorists need to be of a character that is entirely opposed to the bureaucracy that creates post-graduates. Systematizers need to be independent thinkers, whose lack of restrictions enable them to think beyond tradition. Modern academia is entirely opposed to any change in tradition, and so has become entirely ossified, as bureacracies tend to do. With little wonder there are no more grand-theorists in any of these institutions. Not only are the required minds rare, but at this point, there is every selection pressure against them. As a result, inferior minds are given the priority of education, something which has been standardized in progressive education for decades – and it's even seen as a boon. Such minds are not seemingly capable of architectonic thinking, for either they are not trying to progress their field, and so are guilty of negligence; or who are incapable, and so we are left with finitude as a viable explanation.

Even those who merely peel carrots in the service of science are still affected by these problems. For instance, each experiment is going to be collected based on the intelligence and tradition of that department and its grant restrictions. Such restrictions, either institutionally, financially or even intellectually tend to work against the needs of good science. Either the study is too small to be significant, or too expensive to collect the necessary data, or too controversial to attract funding. The result is that no study becomes scientifically sufficient. And as a result, the majority of studies are nearly useless because they fail to achieve sufficient standing. Every year then, hundreds of half-studies are conducted and published. Unfortunately, two half-studies do not a whole study make. And all of this is even assuming that the researchers are even capable and interested in finding unbiased truth. The reality is of course that most researchers probably have a pet theory they'd like to publish on, or have an agenda, political or otherwise that might interfere.

But the flaws of naive realism do not lie solely in institutional and methodological failures. Instead, they must also be understood conceptually. Tradition holds that the scientific method is composed of a three-step process: 1) postulate, 2) experiment, 3) evaluate and re-postulate. The thinking goes that, over time, researchers will be able to refine methods, experiments and concepts to such a degree that the truth will eventually be found. The hidden assumption here is that empirical science is similar to refining precious metals. It assumes that empirical truths are in the world themselves, as elemental gold is found in mere rock. Therefore, the thinking goes, that by putting the impure gold into a process of refining, all the impurities will eventually be burned away, and one is left with elemental gold. The mistake is itself born from the idea that truth exists in the world. This is an epistemological mistake that good philosophers have long guarded

against, since truth is not predicated of the world, but of the mind itself. The categorical error is in assigning the predicate of 'truth' to something which doesn't possess it – minds possess truth, electrons don't. Electrons, like any empirical phenomenon, are capable of description only. Truth is a predicate of explanation, something which is orthogonal to description.

To be clear however, empirical science is a great descriptor of things, and indeed its ability to quantify and organize phenomena is far superior to anything we've yet developed. Despite this however, description is not explanation. This is part of the categorical error innate to epistemological materialism and realism. David Hume recognized an aspect of this problem in his billiard-ball example. In his famous sketch of the problem, Hume described his own difficulty with finding causality in the world. He found that in watching one billiard-ball hit another, he could not find anything already present to explain their interaction beforehand. Causality needs a necessary connection, for without an effect being predictable to a cause, a cause does not exist. The problem is that there is nothing innate to a collision that predicts the transfer of momentum. We only know that it does because of past experience. But if past experience is always contingent, then there is no necessary connection, only contingent connection. Worse yet, it is not even clear what the connection is – there is no third object that intercedes to transfer the momentum, it merely happens. As a result, it becomes near impossible to find the actual cause of anything.

It is of course against Hume and indeed the problem of induction that naive realism has set itself up for its own failure. If causes and explanations cannot be found in the world, that makes them purely subjective and thus unscientific, right? Wrong.

It is possible for a thing to be subjectivity predicated but objectively agreed. Take a simple example of a person's happiness. There is no veridical means of identifying happiness. Surely we could do some brain scans and blood-tests for certain neurotransmitters or certain diseases, but that's still indirect. And if a person comes in claiming that they are happy, we don't ask them for their proof, moreover they would have no proof to offer! After all, it's entirely in our own being, and will always resist empirical measurement. Yet I challenge a naive empiricist to disbelieve their own happiness merely on these grounds. If they refuse, then one would rightly question the validity their epistemology, if not their own good faith. Happiness, like many important predicates, doesn't rely on absolute objectivity.

The problem is rooted in confounding the basis of truth, namely its objective necessity; with its subjective perception. Namely, attempting to combine percepts of the world, and those of the mind. Both are necessary, and neither can retain superiority over the other. Bacon saw this in his metaphor, and Kant wrote the First Critique with this middle-road in mind. We can succinctly state that the problem is of a 'cause-is' variety. Specifically, that causality is of a separate predication than 'is'. In other words, understanding is not of the same class as being. The former is a byproduct of the minds digestion of the the latter. The data cannot present its own interpretation. A mind is needed to internalize the mechanism by relating the phenomenology with reason. It is often thought that the data provides this, but it cannot, it is the mind which supplies the interpretation. In-fact the history of science shows this quite clearly, with virtually all of the major contributors being interested not in data as such, but in the religious, mythical and otherwise intelligible foundations of their empiricism. This is why virtually all of the prodigious

scientific thinkers were alchemists (a similarly misunderstood endeavor).

Now, while there are some answers to Hume's famous problem, and answers to those answers; the true fallacy can be seen in the history of scientific developments in the 20th century, and the decline of Grand-theorists and other major figures whose work is architectonic. Instead of figures like Freud of Jung, we're left with partial systems like those of Bowlby's attachment theory, Piaget's development of children, or Maslow's hierarchy of needs. Worse yet, those are often the greatest of the system-builders, and virtually all others work far below that in terms of systemic integration. Even the meta-analysts have this same problem, being unable to digest the information, and instead organize the heap into a slightly more readable form. When someone like Ellen Berscheid puts a help-wanted sign up inside an academic journal, it is suggestive of the scope of the problem. Worse yet, her sign didn't even properly consider the task required, and instead reads, "Sociologist or Anthropologist Preferred" – as if the rigid specialization in academia wasn't itself a cause of the problem.

If one had any doubts that explicit lamentations weren't enough, one can see this implicitly in the course of development over the decades. This problem is obvious by the manner in which theoretical concepts are developed: namely that they are developed provincially, and not in cosmopolitan fashion. In attachment theory for instance, it began as a theoretical orientation in Bowlby, but then gradually develops a bit, a few decades later with the development of the attachment style, a four-part classification of different responses to intimacy. In the decades since, the studies have merely expanded to include different domains or applications. Since the early studies focused on children, the studies now include descriptions of their influence on distant relationships, like those of romance or work. But none

of this has much direct intersection with other psychological or sociological principles. While many studies of the Five-Factor Model have been compared to Attachment Theory such overlap is always contingent and fragmentary. And when they are 'integrated', it becomes a Frankenstein's Monster, with ideas protruding from all sides without any coherent reason or purpose, except that 'the data says so'.

The basic problem is that data-collection can't be meaningfully separated from a hypothesis neither generally nor specifically, and therefore the data of different theoretical models aren't remotely fungible. If one carries certain assumptions about the nature of the problem, then the data-collection will reflect that. This will be true even if the experimenter doesn't have any bias at all, but is instead innate to the concept of a theory or subject itself. For instance, the attachment situation deals with the tendency of humans to anchor themselves to certain figures, like parents and then base the majority of their social responses accordingly. Such an orientation allows a person to focus on a particular aspect of humanity -- the origins of an open (or closed) intimacy style with other people. But this theoretical orientation precludes the study of other phenomena, and indeed it must, for the collection of that data would only serve to distract and obfuscate the present theory. The problem is that in a finite-mind, only certain areas of study should be allowed to fill the space, and it is right and proper for that subject to fill the space entirely. Like an artist painting a picture of a tree will ignore the flowers, it is proper that a scientist only focus themselves on a particular subject. By making a choice of one subject (the tree), it necessary separates the data from other subjects. Thus over time, different drawings of a particular tree emerge, but no sane researcher would claim to paint a tree and then instead paint the flower. He'd lose all standing and funding!

As if this basic contradiction between local and universal emphasis wasn't problem enough, the situation gets worse when one has non-objective predicates. For instance, in the social sciences there is no absolute basis to begin any experiment. There are far too many predicates to be parsed, and too many frameworks that can be applied to them. Even so-called hard-sciences like chemistry had extraordinary difficulty with the discovery of universal concepts like heat, mass or pressure. For instance, Lavoisier, considered by many to be the 'father' of modern chemistry, had no sufficient way of measuring heat nor mass. He was a far better quantifier of data than those who came before, but it wouldn't be until the invention of molar-masses and thermodynamics, nearly a century later, that such ideas actually took on their present form. Certainly a primitive notion of 'heat' and 'mass' existed, but they had no relationship to what would come later. And if having a primitive insight into 'heat' were good enough for scientific discovery, then even a cave-man could be considered a scientist! Certainly those chemical concepts eventually evolved, but they certainly didn't come from the data itself, even though they were empirically present before their invention. And if the presence of data alone were sufficient to induce one towards truth, then wonder would have a difficult time explaining the slow evolutionary process of science. For what is data outside of a theory?

To the soft sciences this is the central problem they must find for themselves. For without any means of finding veridical data, how should one interpret any particular study? The psychology literature is fraught with this type of problem, and it can be seen in every meta-analysis, since they have to find a way of trying to reconcile the irreconcilable. Take for instance, a concept like depression, whose use and study is incredibly important, but yet a universal definition still doesn't exist. Some define it in

terms of its emotionality, others in terms of its pathological manifestations, and even others in terms of its duration or chemical effects. Similar problems affect almost every other form of social science, where the number of simultaneous predicates is high. This is of course, in contradistinction to the mechanistic sciences, who easily reduce the number of simultaneous predicates to one. For instance, when studying gravitational attraction, the meaning is clear, and there is no room for misunderstanding. The ball rolls down the plane, and it rolls at one speed, and travels a particular distance, and is described by a single set of equations. The essence of gravity is clear: that objects with mass attract one another at mathematically quantifiable rates.

Over time then, this leads to iterative developments of concepts and the experiments designed around them. In the case of gravity for instance, one begins with the intuitive understanding of the world: things fall to the ground. Eventually that is replaced with a more precise description of it: all things fall to the ground at the same speed, ignoring friction. Eventually that precision is increased as new concepts are added and refined. Soon, 'things fall to the ground' is replaced by: objects undergo acceleration at 9.8 $m/s^2$. And acceleration is then connected to velocity (or speed), which becomes itself related to the distance traveled. Once a complete understanding is derived, it becomes possible to know all kinds of things from the initial premises. For instance, one can calculate how much time it will take an object to hit the ground from 100 feet in the air. Moreover, it becomes possible to calculate the velocity when it hits the ground.

These mathematical feats however are predicated on the ability to develop basic concepts and premises, and eventually test them. Thus scientists must move from the basic idea of, 'things fall downwards', into more advanced concepts like 'acceleration',

'velocity' etc. At some level, these need to be defined mathematically and then measured in the real world. Concepts like acceleration and velocity however are not in the data itself. How can they be? After all, you need a concept like velocity to even design the experiment.

The problem is that this doesn't translate for the same reason as the problem of realism above. The predication is not in the world. If we're studying depression for instance, there is no objective 'gravitation' that can be applied in a purely empirical framework. It originates in humanity itself, which has dozens of immutably confounded predicates. It is impossible to determine the hierarchy of those, nor even if they are rationally reducible. Consider for instance, the situation of a mathematical problem with more variables than there are equations to solve. This is the task of a empirical science as it relates to humans, for there is no proper restriction on the objectivity of human reality. Empiricism works with simple systems with a low number of systems and a high degree of reducibility and extension; but what happens when those conditions are not applicable?

In the case of depression for instance, how does one make an objective test? How might the data find itself? After all, that a person experiences negative moods and becomes morose doesn't exactly provide a detailed theoretical model. After all, people have been morose for centuries, and sometimes it stays for a while, and other times it doesn't. Who is to say which is more prior? At some point psychologists need to get together to identify the core predicates (assuming they even exist): the psychological equivalent to 'velocity' or 'acceleration'; or if they're really struggling: the difference between 'up' and 'down'. Unfortunately, this is not an empirical problem, and cannot be solved by empirical means. There is no equation that determines which direction is down!

It is a philosophical problem, and must be deduced by careful analysis of predication. The Ancients called the analysis of predicates 'metaphysics', and indeed Aristotle's *Metaphysics* (like almost all of his writings) is a careful analysis of the organization of ideas, and their logical origination. As an aside, even the concept of metaphysics has been perverted by this naive realism and materialism. Rather than be the 'study of science' as in Aristotle, it's somehow been reduced to the 'study of the nature of reality'. But such is a pitiful shadow of metaphysics. To study reality then is merely to perform physics. So then what is the point of metaphysics? Unfortunately, this sort of materialism has naively cut off its intellectual roots, and then complains when it fails to produce fruit – fruit must grow in the soil.

Now, since most empirical scientists are not trained in classical metaphysics or philosophy, it is no surprise that they are ignorant of this problem. That however hasn't stopped them from vaguely realizing the problem and trying to fix it empirically. In the last few decades this problem has emerged in the field of personality studies and provides itself as an interesting example.

At the beginning of the 20th century, there was an increased appreciation for the differences between humans, notably in the specific traits that make us different from each other. So personality tests and schema were developed hoping to organize people along certain variables and hopefully shed light on our subjective character. Perhaps the most famous of these tests can be found in the Myers-Briggs Type Indicators, a system derived from Jung's concept of the psyche. Today of course there are dozens of these tests.

After a few decades with so many of these studies, all of which were empirically rooted to some degree, it became bothersome to have so many competing tests. It was thought that there

should be a single test, one which is clearly superior to all others, and is the most accurate. Unfortunately, such a test never emerged, and still hasn't. Yet these tests are all rooted in the empirical nature of humanity. They use questionnaires and have rigorous empirical criteria that supposedly makes them useful. Yet which is supposed to be right? After all, how can one test disprove the efficacy of its competitor? How can a ruler profess to measure another ruler more efficiently? At some point, the problem is arbitrary. Unfortunately, science is not arbitrary, and one ruler is superior to another. But how does one know if a ruler is ideal, if there is no 'perfect ruler' already, to compare it to? How is it that a perfect knowledge can be attained from an imperfect means?

Hopefully, we can anticipate the specious appeal of a 'refinement' metaphor. But yet how is it that Galileo, or any other scientific thinker has overcome this problem? How did someone like Kepler or Newton find a way towards a superior form from a lesser one, without a mindless appeal to 'the data'?

If we take a step back and think thru the predication itself, we realize that truth is merely an objective idea of the mind. If that's the case, then we can see that explanation will necessary conform to our mode of being, and thus we will supply the explanation itself. At some level, nothing is an explanation outside of a metaphysical architectonic, but in the scientific sense of prediction and extension of principle, an explanation is possible, but not solely derived from data. Surely it is quantified in data, for how else would a proper expansion be known to exist? But to use the data by itself is merely to parrot reality.

Thus if an explanation is the extension of principle to the sensible world, then we see that the efficacy of a ruler is a misguided effort! For a ruler is a late part of principle, itself

being earlier. Thus with personality tests, one must ask about the principles at play. In a sense, this was eventually realized and become codified in the saying, 'garbage in, garbage out', referring to the fact that certain personality tests were merely the reflections of the interests of those who constructed the test. This is of the course the problem of subjectivity which naive empiricism attempts to overcome. Yet it doesn't quite make it.

The issue is that of iterative thinking. Thinking that is iterative is merely wrong in steps. The human mind is discursive in rationality, but non-rational everywhere else. Discursive thought makes our notions about the world subject to hierarchies of predication. This hierarchical model ensures that the refinement of ideas is not predicated on the world, but instead on axioms or principles. For this reason it is most important to analytically understand the assumptions before anything else is done. This is because the assumptions basically determine the conclusion via the congruence bias. The data does not speak because it has no voice. It is up to scientists to speak for it, and hope not to mischaracterize it in the process.

To many however, this proposition, that the 'data is silent', is untenable and goes against the materialism and realism that modern science is supposedly founded on. It does not. Empirical science is not founded on an unbiased interpretation of the data. And any honest reading of the great thinkers and scientists will quickly disabuse themselves of this dogma. Science is a synthetic activity, it forms its propositions out of the available motifs and myths within a society and constructs systems of thought out of that. It must not impose too much of itself onto the data, or else objectivity is lost into spider-ish solipsism and subjectivity. This is the mistake the realist narrative seeks to avoid.

But the contrary case, that the 'data speaks for itself' is at best a mere repetition of reality; and at worst, is an endowment of dogma into the data, without recognizing it as dogma. It allows a loophole of pseudo-objectivity which can lead to dogma with supporting statistics, which is the confirmation bias.

Data is not unbiased, it's not capable of bias! Data can't have either predicate – it just is. Because human experimentation is affirmative, it will never be reactive. There must always be a somethingness first. How one constructs an experiment is itself a matter of conception, and introduces congruence into an experiment. We typically call this conformance 'theory'. Certain experimental methods can be known to produce a certain type of conclusion. Consider for instance if archaeologists only chose to dig a certain number of layers deep when looking into the fossil record. It would probably produce extraordinary consistent results, and create a nice narrative. We could go even more extreme and argue that digging isn't needed at all! It would be reproducible and would be great for certain hypotheses. Unfortunately, it wouldn't be scientific, despite that we could place it within the costume of empirical science. The problem is that a true science must incorporate the vastness of the manifold. The archaeologist must dig to the bottom.

This problem gets worse as the data becomes less objective, and constructed from elsewhere. The social sciences and medicine are the worst offenders here, since they are compelled to produce data, and get published. But many scientists don't agree about the basic concepts they use. The result? A ever increasing backlog of papers that meta-analysts, grand-theorists and philosophers will never read.

And why should they? What can be proven or known from sub-samples of college students and their ideas about dating,

personality, social injustice or politics? Worse yet, ideology can slip in and science becomes a propaganda tool. Consider the idea of the 'just-world hypothesis'. This is one of many rabbit-holes of political ideology masked in the shroud science. The finding, as goes the narrative, is that humans are delusional when they believe that the world has a sense of justice and order to it. Not only is this vehemently opposed to all common notions of the subject, it's not even a remotely falsifiable construct. Yet it is widely considered a scientific principle and Melvin Lerner is considered a pioneer in the field of social psychology. Not only is justice not a predicate of the world, it's not even a concept of science, yet Lerner is considered a respected academic.

All of this raises the important question: What should the purpose of science be? Should it be the indoctrination of political ideology? Let us hope not. The ancients believed it was about the attainment of a unified system of understanding about a subject. Such an understanding is only found by laying oneself and their preconceptions aside. A good start must include the forgetting of the self in the process -- the removal of the spider-ish tendency which seeks to create truth out of its own essence. Aristotle for instance, schematized the understanding into four distinct causes, since it appeared to exhaust the human understanding on a particular subject. Thus, when the four causes were mapped, and its relationship to the others were known, a concept or system would be complete.

Unfortunately, there appears to be no purpose to such a science, except the subversive introduction of bias into an otherwise respectable intellectual process. But here again the system is not capable of handling such, and indeed has reduced itself to the measurement of trivia, which Freud warned us about. Whether intentionally or seditiously it matters little; for the perpetual motion machine of modern science cares little for actual

achievement, but is instead satisfied with creating lots of papers and data that no one will bother to digest and make into honey. When something like a Q-score begins to matter more than anything else, one can see the fire burning hot. Ideally, a science should have an end, else it becomes a cancerous growth, a blight on intellectuality. But most scientists are merely bureaucrats, and bureaucracies are famous for creating pointless procedures and policies that don't serve anyone, except the bureaucracy itself. Academia has become obsessed with its 'T.P.S' reports, and then complains that it can't get anything done.

But because it is a bureaucratic machine, this growth cannot stop, worse yet, it's now being done by people whose intellectual capacities are far beneath the subject, and so excellence is now cast aside in favor of expedience. When science loses itself in this way, it becomes an absurd contradiction where its methods won't achieve its ends, and eventually they won't even want to. And it appears to have become locked in a vicious circle of never-ending citations and data-masturbation. Indeed one is reminded of the British comedy show, "Yes Minister!", and its cousin in bureaucratic parody, "Brazil!" For in both is the futility and pointlessness of endless paper-pushing made explicit. But they do allow for mass employment and the mob-rule of intellectual life.

With all this in mind then, we can return to the futility of the refining process. Truth is not found in the refiners fire. It is not an iterative predicate. To misjudge such is to introduce a blindness more paralyzing that the worst dogmas of the Dark Ages. Worse yet, they will think themselves superior to dogma because they have clothed themselves in the words of the latest 'saints' – the verbiage of Q-scores and factor regression. But such failures cannot be hidden, and indeed the more experience one

has with the subject, the more dyspeptic they become. The exception is of course, those whose employment is at stake.

So let us explore one of these case studies of monumental failure in the history of science, and indeed it is easily found in a field with a higher number of confounded systems, who, with blind faith, seem to think that monkeys will eventually produce Shakespeare. This case study is that of the futile search for the cancer virus, and the utter disaster that resulted not merely from laboratory negligence, but from dogmatic rigidity and epistemological hubris. Better yet, it provides an excellent metaphor for the cancerous nature of growth when one loses purpose in an iterative endeavor.

The story starts in the 1950's with a woman named Henrietta Lacks, whose cancer cells were collected and used for various genetic scientific experiments. Before her cells were collected, it was found that growing cells inside the laboratory was quite difficult. Her cells however seemed different and were capable of surviving inside the lab and reproducing. As a result, they became popular because they allowed an infinite set of test conditions for biological research, and indeed the majority of modern progress has been the result of her cells. Ever since, the cells became known as HeLa cells, and have been reproduced successfully for decades. As of yet, they appear to be immortal.

Around this time, biological research had gotten tremendous funding, and much of it was put to use trying to understand the origins of cancer and other diseases. It became common to obtain cells and perform experiments on them. One source was using newborn cells, but interestingly many of the cell cultures became cancerous within a few days, even though neither the child nor mother themselves had cancer. It became believed that cancer might be caused by a virus, and so some cells would be suscep-

tible to a virus and such would offer a cure. As more cell cultures were kept and studied, a difficulty started to emerge. Some of the cells, although they might be from different populations or organs, began to look the same. Whether from kidneys, lungs, stomachs or brains; all the cells seemed to share the same markers.

As it turns out, a near majority of all cell cultures had been contaminated by HeLa cells, and for over a decade scientists across the world were doing tests and producing no usable results. In their search they would test certain chemicals thinking it was one type of cell, meticulously collecting and publishing the data, when in fact all the results, from dozens of labs across the world, were all being done on the same cell-culture. And virtually no one noticed for years.

The reason for this was that HeLa cells were extremely robust, and so even a single cell could contaminate and ruin an experiment. This went undetected for years, and so virtually all of the research produced during that time was of no value. Worse yet, the contamination problem wasn't even fully recognized by all people, even after the fact. Because there was a measurable genetic marker change that was plausibly linked to cancer, it led many to legitimately disagree with the contamination thesis. And so a debate emerged, one that was rooted in data, but couldn't be empirically falsified. The big lesson that was revealed was that the data can't distinguish between the two cases. An active intelligence was needed. No amount of computing power or quasi-artificial intelligence would see beyond the problem.

This case study, which was eventually overcome by realizing that the data couldn't all be correct. Which was a painful realization for those labs who had wasted a decade of their time and

money. It eventually became obvious, only after years and years of persistent failure, that all the results couldn't possibly be the cell-cultures that they thought they were. Kidney cells are different than liver cells or lung cells. The different cultures couldn't have manifested the uniformity of the outcome, yet many scientists failed to notice it because it was 'data'. It is a great example of the narrow usefulness of data by itself. Science is not like gold, where more intense heat or refinement will eventually produce something useful. Instead, science is better understood like an engineering project. Assume for instance that one gets a contract to build an airplane. If for years, one puts in effort to build wings, propellers or engines with a particular purpose or design in mind, and then the contract changes; say they want a space-ship instead, then all that work goes entirely to waste. There is no real application of a wing or a propeller to outer-space.

One can easily imagine a similar situation in medicine today, the next greatest offender aside from the social-sciences. Imagine if a study on cancer in men failed to collect data on the testosterone of the men themselves. Since the Y-chromosome mutates very rapidly, and is apparently moderated by testosterone levels, such a data-point would be necessary for understanding the true origins of cancer. Without such data, it would be impossible to see the true cause of cancer, and instead might lead to sympathetic magic narratives about certain chemicals as being 'innately harmful', like coffee, alcohol or tobacco, all of whom have been widely claimed to cause cancer, and none of which actually predictably reproduce it.

The great myth of modern science is that objectivity implies veridicality. Such an idea is a mistaken conclusion, drawn from the erroneous association that subjectivity is unreliable. This is a terrible mistake, one that must be overcome. In principle, the

goal of education is the improvement of the mind itself. It is to overcome the innate superstition and imprecision of the mind. It ought to replace the lazy and haphazard reasoning with rigor and intellectual clarity. In the days before our regressive (sometimes mistakenly referred to as 'progressive') education took hold, this was the job of philosophy. It was to develop the self into a veridical thinker, not to trust blindly in external authority, be it data or tradition. It was to turn the mind into something capable of recognizing and minimizing its own error.

Since such is no longer considered respectable, those who wish to overcome this must train themselves. Understanding the nature and necessity of predication is key. And for this, I'd recommend the Philosopher himself. Tradition holds that Aristotle once had hundreds of people at his employ and thru his guidance was able to uncover an incredible amount of things about the world. His science became the basis for much of humanity for almost two-thousand years, ranging from biology and rhetoric, to epistemology and politics. No modern thinker will have that impact, and yet we have data, tools and resources that far surpass anything that he produced. And yet most academics are thought to have had a successful career if they are relevant in half a century. Put another scientific paper on the fire, they seem to burn so quickly these days!