

Is the Enlightened World View On Retreat?

By Bert Hamminga

During the centuries of the European Enlightenment, science was engaged in liberating more and more research loci from religious obstacles preventing proper light to shine. Philosophers were continuously engaged in redefining the borderline between science and religion. To most historians overseeing the course of these centuries, the process is regarded as the retreat of religious doctrines from areas amenable to scientific research. Starting from the mechanical behavior of bodies, science, in the course of the 16th to the 19th century conquered the areas of light, electricity, gases, the working of living organisms, finally to reach the human mind, the structure of social phenomena like trade and political organization. The triumph of science is one of largely unquestioned background assumptions of philosophy of science as it has taken shape in the past fifty years.

But, an important hitch has occurred and grew in seriousness. This hitch is the subject of this paper. In short: scientific and technical development now has gained a pace that can not even longer be followed by the individual human, and is now determining every Westerners' life, both in work and private. But the confrontation with the actual theories and methods underlying the techniques at work in home and job, even where the job is a scientific or technical one, has become very limited and fragmentized. The enlightened world view does not anymore emanate in Western people's personal lives as the evident way of seeing the world. Some first examples: as a teenager, you are no longer able to repair your scooter yourself; you go to a garage, where the repairman connects the vehicle to a computer that he does not understand. This computer tells the repairman to replace some part, the working and manufacturing of which he is unacquainted with. The price of the part is appearing on a screen in the garage office, in a way only known to the garage network operator, who himself has never been anywhere near a broken engine. The client pays with a credit card, a process technically understood neither by the customer, nor by the repairman, nor by anyone else in the garage.

Some other examples: in the high tech office gardens of the mobile phone companies, youngsters, while working at the next generation mobile phone system, believe in astrology and aliens. On his way home, the head of this office pops in a drugstore to buy a homeopathic, infinitely diluted medicine to cure his little daughters cold. On minarets, the singers are replaced by speakers and amplifiers, technical children of the civilization of the Western sinners, and high in space even satellites may broadcast the mosque's message, but down below, the mikes record talk about how to beat women, the bashful untouched virgins in heaven and its view down on hell.

Is the world view of modern citizens is getting immune to the general philosophical thoughts underlying scientific and technical developments in a way that would be incomprehensible to educated citizens of the 12th century world centers of civilization and science, Baghdad and Cordoba?

When, in April 1970 the astronauts of Apollo 13 were in great danger after the explosion of an oxygen tank, the American people, including the astronauts themselves reverted to *praying* for their safe return (though astronauts and ground control took some more effective measures too). In the campaigns of US politicians, the word "God" occurs in top frequency. Proposals to solve global health problems involving abortion, if only as an option, are blocked by the US government on arguments that are religious, hence alien to scientific analysis of the social processes to be tackled. More generally, the public morale in many circles, like those opposing a host of different kinds of research on plants, animals and man and promoting nature conservation and the life of primitive tribes is based upon the idea of Nature as not being

Man's business (and Punishment will follow if he tries to control!). That is exactly the key idea fought by Enlightenment from its start. The standard vocabularies in terms of which these moralism are extensively and repetitively expressed in mass media have long left the discourse of the sciences of the relevant fields.

After the disaster of September the 11th, it was hard to tell whether God featured more prominently at the side of the attackers or the attacked (though it did not seem to solve anything).

This is the problem of this paper: is there a retreat of the Enlightened world view? That would obviously threaten to turn philosophy of science into a hobby for a few isolated academics, on equal footing with other, but less isolated hobbies like UFO search, sound healing, nature conservation, computer hacking, creationist biology, speed metal pop, etc - if it is not so already, without many philosophers of science noticing.

Unbeliever Attitude to Religion: Disdain, Anthropology or Both?

Clearly, religious remnants float around in contemporary social consciousness, science has not eradicated them. The unbeliever (that is the unbeliever who considers himself enlightened) typically assumes an attitude to (contemporary) religion and the views on the contemporary world emanating it that comes close to shrugging one's shoulders.

Hence, the study of the modern and contemporary religions is, unfortunately, largely left to its believers.

A short look at such believer studies may indeed add to the attitude of disdain of many contemporary scientists and philosophers. Believer-authors on the subject of religion are often seen as pseudo scientists whose errors and tricks are too simple even to analyze, or, if believed to believe in their own proposed doctrines, to be "backward fellow humans", people whom that treasured growth of human consciousness which is the fruit of the Enlightenment itself has largely passed by. Unbeliever scientists and philosophers who do once in a while try to discuss the foundations of the religious world view with believers often get frustrated by running after them in verbal circles and finally get into stalemates of a logical simplicity that no longer allows a serious consideration of the position of the believer discussion partner.

Though this typical reaction of frustration and loss of interest is quite understandable, it is actually not suitable to the scientific mind. Scientists for instance successfully overcame the pitfall of treating the wisdom and customs of primitive tribes with disdain, as a heap of mistakes of "backward fellow humans". This marked the birth of a cultural anthropology based on a clear distinction of the belief of the onlooker and that of the object, and a clear distinction between learning to understand a belief and starting to believe it. Once you creep, for the sake of understanding, into another culture's purported truths they often turn out to form a logic that is, for the inquisitive mind, interesting to bring out, though this does not entail any defense of the system as whatever a kind of candidate alternative to whatever other belief systems. Another way to state my claim therefore, is: not enough good scientific and philosophical minds are set to the psychological, cultural anthropological, and other scientific aspects of the religions (and remnants of religions), their logic and the way they get and keep their hold on the minds of *Homo sapiens* well into the contemporary age of space travel and internet.

In many academic circles it is still fashionable to claim with a laugh that one "does not understand" believing Christians, Muslims and Jews, as if this is something praiseworthy. Clearly, the distance between such academics and such believers has not yet reached the width necessary for the birth of a systematic cultural anthropology of believers. Which academic would dare to claim with a laugh not to understand Papua's or San? That would simply mean to put yourself in the ranks of those in need to read a book or two, hardly something to confess easily, let alone loudly, let alone with a laugh, let alone in enlightened academic circles.

Claiming that some academic subject is neglected is, in modern times, with its unprecedented eruption of literature, a precarious thing to do. I do not mean to claim that it would be hard to come up with quite some pages of references to recent publications on the subject. My claim is that the scientific (that is: not religious) study of religion should not simply be one of the

specialisms in one of the sub departments of academic intercourse, but, given the baffling avalanche of recent cultural developments that I specify in this paper and that are straightforwardly discomforting to the fans of the enlightened world view, to which I, and, I reckon, most philosophers of science belong, deserves a much more general attention. That is because religions and remnants and reviving seeds of them are grossly underestimated key forces in the current revolution - of unprecedented pace - of cultural consciousness in the contemporary technical and scientific world.

Roots of Judaism, Christianity, Islam

The dominant religions in the contemporary world are the religions of Semitic origin. The term "Semitic" has, in politics, been misused in terms like "anti-Semitism" that are supposed to refer to a hostile attitude towards Jews. In science "Semitic" is used as a category defined in terms of language similarities. The spreading of the Semitic languages is an indication of the spreading through history of the influence of Semitic tribes. It does not unambiguously indicate the spreading of those tribes themselves, because the languages, especially Arab, were adopted by many a tribe subdued during Semitic conquests, especially the [Muslim](#) conquests 7th and 8th centuries AD (reaching from present day Pakistan to present day Spain and Portugal (see [Map](#)). To the Semitic language group belong northern African and Middle East languages, including Egyptian, Berber and Cushitic. The Semitic languages are divided into four groups: (1) Northern Peripheral, or North-eastern, with only one language, ancient Acadian; (2) Northern Central, or Northwestern, including the ancient Canaanite, Amorite, Ugaritic, Phoenician and Punic, and Aramaic languages and ancient and modern Syriac and Hebrew; (3) Southern Central, including Arabic and Maltese; and (4) Southern Peripheral, including South Arabic and the languages of northern Ethiopia. Cushites penetrated as deep down as Uganda. According to some findings of DNA research, some fairly closed Semite groups calling themselves Lemba, descending from the Jewish Cohanim priest class would have migrated even down to Zambia but in the course adopted a Bantu structure of language.

[Abraham](#), Isaac and Jacob feature as ancestors in the historical consciousness of most of these tribes, notably in the [Arab](#) and [Jewish](#) tribes. The myths surrounding these ancestral figures indicate an awareness, at least a conscious claim to common Semitic descent. [Jewish](#), [Christian](#) and [Islamic](#) faiths are variants of Semitic religious tradition. The Christian and Islamic faiths later got adopted world wide by a wide range of peoples with no close genetic ties to Semitic tribes.

The Northern Peripheral Semitic group, from the Ancient to Middle Stage, includes Acadian with its dialects of Babylonian and Assyrian, spoken in [Mesopotamia](#) from about 3200 BC until the Semites were chased out of Mesopotamia by a group of peoples merging under Hammurabi and ultimately forming part of the great [Persian empire](#), the greatest world power and world civilization in the last millennium B.C..

Hammurabi, his followers and successors had driven the Semites out of Mesopotamia. This at first led them into a nomadic life in the deserts.

This episode could well be the historical substance and clearly is an echo of what [Jews](#), [Christians](#) and [Muslims](#) call *the expulsion from paradise*. And this forced journey by [Abraham](#)'s tribe into the desert is what definitively marked Semitic religious consciousness. The Semites lost the Mesopotamian territory and made into their God the One whose betrayal by themselves was believed to be responsible for their weakness. Expulsion from

Mesopotamia made the Semitic religion a religion of the losers of an important war, fearing their mighty, wrathful God and deeply inclined to relive His act of expulsion as "punishment for their sins". The feeling of being a sinner are cherished in these religions, both by their leaders and by their flocks. Conceding you are a sinner is an act of loyalty to your fellow sinners, of reconciliation with God, and hence of averting his anger and punishment.



To show his consciousness of being sinful, a wide spectrum of [rituals of abstinence](#) of the pleasures of life has been made available to the believer, such as abstinence of sex, alcohol, food and interest on capital, though different currents of this belief system take different selections of these pleasures as target for abstinence, or limit the abstinence rituals to specific periods of the year.

The expulsion-from-paradise metaphor, and the obligation to show your consciousness of being sinful classify Semitic religions as essentially traumatic, encouraging the believer to engage in (self-)traumatizing. The making of sacrifices is not specific for Semitic religions, the aspect that is specifically Semitic is to sacrifice yourself on the basis of a feeling of being sinful and guilty. This is the root of systematic attempts to approach God by showing Him one can hurt oneself and others. It is shown to God by abstaining from different types of pleasures and, in "fighting for God", suppress your natural urge to have mercy with those whom you are told do not deserve it.

This specifically Semitic type of sacrifice enhances the exertion of leader authority, reduces fear of death and thus encourages bravery.

Heaven and Hell

Further reduction of the fear of death was achieved by the introduction of heaven and hell. The first known variant of hell, defined as a torture department in the underworld, is found among the Greek (*Tantalus* myth). Jews never defined heaven - seat of God - as a place where dead people go. After death all people were thought to linger in a weak form in a dark place somewhere down. This was not thought to be preceded by some kind of divine verdict concerning the earthly life of an individual. Such divine jurisdiction, the so called Last Judgment, was a Christian invention. It was designed to oppose Roman jurisdiction at the time, thought by religious leaders to be too strong to fight at its home ground, the real world.

Heaven and hell were taken over by Muslims, but for a different application. This time it was not to compete with the jurisdiction of an oppressor of Roman stature. It was primarily designed to convert Arab pagans, primitive desert dwellers. Muhammad wanted to propose a unified religion including Judaism and Christianity. In early stages of his efforts Muhammad thought that it would not be difficult to convert Jews and Christians because he regarded the doctrines of Judaism and Christianity essentially as part of the doctrine of Islam. After getting frustrated in his attempts to unite with Jews and Christians, he ordered the direction of prayer to be turned from Jerusalem to Mecca.

Descriptions of hell in the New Testament and the Koran largely coincide. It involves fire, thirst, and no or disgusting food -of too high, throat burning temperature. Heaven is quite an abstract place in the Christian revelation, possibly due to the fact that articulation of the heavenly desires of Christian created the danger of bringing them back to the Roman oppressor's ideas of pleasure. In the Koran, not inhibited by the threat of associations to what could be called the pleasures of the oppressor, heaven has been concretized all over the book, containing (in order of frequency) the following features: rivers, running streams, fountains, abundant fruit, peace, (soft) couches, bashful virgins, houris (be wedded to), silk, brocade, gold for clothing and covering, shade (shady trees), (pleasant) mansions, high pavilions, drinks abundant, no idle talk (no sinful speech), grace in Gods sight, pure nectar, no toil, descendants accompany, fathers accompany, conversation, questions, young boys, dishes and cups of precious metal, wine (rivers of), spouses accompany, no weariness, view down on hell, rivers of milk, no hatred, rivers of clarified honey, abundant meat, no sinful urges, no disease.

Truth, a Revelist Concept

The source and justification of these Judaic, Christian and Muslim religious ideas are revelations: a human individual (like Moses, Jesus and Muhammad) claims successfully to have received word by God himself about Universal Truth and man's assignment on earth. Those human individuals assume the status of prophets. There is a succession of them, but the typical prophet, while paying tribute to former prophets, considers himself as the last and definitive one in the succession. Hence a revelation is to be considered as a final fixing of Universal Truth to mankind for the rest of eternity by its ruler and creator, God, through his

chosen prophet.

A believer in this kind of prophecy shall be called a *revelist*, and the Truth-concept of knowledge shall be called: *revelism*.

Revelation and Writing

Semitic revelism is *literary*: Truth is fixated by means of sacred books, Torah, Bible and Koran, containing the word of God. This considerably adds to the static character a revelation already has due to the claim to have received the Definite Word of Universal Truth by the Only God. This deprives its believers from the prudent degree of sloppiness that oral traditions employ to adapt to changed circumstances, a strategy advocated by [many wise men including Plato](#).

This literal fixation has posed huge problems to the clergy and theologians of the Judaic, Christian and Islamic religions throughout history. The problem is that a fixed text, thought to have been revealed at a certain point in time as an eternal, general, universal Truth, is not designed to cover a process of historical development. It is frozen by its nature. Since history does not belong to the kinds of things that can be halted - though leaders of religions based on such revelations have tried and keep trying to halt historic developments with the cruelest of means - the problem of authorities in such religious traditions becomes to determine how the original revealed text relates to the changing historical circumstances. Should, for instance, an animal forbidden for consumption in *Leviticus*, after that species successfully evolved into immunity for the virus that in 1000 BC made it unsuitable for consumption, be kept on the list of barred food? Should another animal that falls prey to a dangerous new mutation of a virus be kept on the list of food allowed for consumption?

In religions based on Torah, Bible and Koran, a large part of the activities through history of prudent religious leadership and scholarship consisted of relating new practice appropriate to new circumstances positively to the original frozen revelation (sometimes even going as far as disqualifying parts of the text handed down, as happened in the European Reformation, as apocryphal). This necessary bending and breaking of text by reinterpreting and disqualifying parts as smuggled into the texts by thugs naturally leads to change in the views of "what always had been meant". Humankind must deem itself deeply lucky for these efforts to read the revelations in a way that harmonizes with modern ethics, civilization and human rights, but at the same time they create profound misunderstandings about such religions. The main misunderstanding, actively promoted, is that the ethics and social structure of modern revelist communities inspired by these revealed texts are "founded" upon their textual revelations in a *logical* sense. Since such revelist communities form majorities or at least large and politically and culturally relevant minorities in most regions from the American West coast Eastward to the Eastbound of Indonesia, the numbers of believers trying to believe and promote these misunderstandings are vast indeed. The stressful intellectual activity by believers of continuously updating the "real original meaning" of Holy Scripture leads away from the reading of the prophetic books in their original historical status. The chance in danger of being missed as a result, both of the attitude of insiders continuously reinterpreting the "immutable" texts, and of outsider disdain towards the claims that these texts are the "foundation" of the relevant religions in a logical sense is to study Torah, Bible and Koran as magnificent and truly invaluable sources for the understanding the early history of Semitic culture, the history from the times of Abraham, around 2000 BC, until the period in which Muslims were the first to reach the stage of Enlightenment, not much after 900 AD and culminating in the golden age of Arab science and scholarship of the 12th Century. For the history of Christian Europe, its meaning is even stretching some more centuries, until well into the Renaissance period, teaching us why the spreading of enlightened Arab ideas over the Christian community was counteracted by extreme oppression and violence (like the brutal and savage methods of killing of many of the opponents of Thomas Aquinas in Paris academic discussion, most notably Siger de Brabant, who was later put in the Heaven of Light in the brilliant company of 12 illustrious souls by Dante, in the *Divine Comedy*).

Arab Enlightenment: *Khass* and *'Amm*

In the period of Arab Enlightenment for the first time attempts were made to define the relation of religious belief to another type of belief thought to be somehow *independent* of it, that of scientific knowledge acquisition. The most explicit attempts handed over to us were those by the Muslim Cordovan scholar Ibn Rusjd. In Paris, though his name got corrupted there to "Averros", some put their life in danger by defending his line of argument. One of them was Siger de Brabant. He finally got stabbed to death by a clergyman Rome had assigned the task to accompany him everywhere he went. Ibn Rusjd had carefully molded his argument in Aristotelian terminology, using works lost in Europe, which, if you read them for the first time after an education, as the European catholic clergy had, of mostly Bible reading and a little Plato, badly handed over and intentionally mutilated by second rate catholic clergymen, astonishes by its logical precision. The most worrying aspect of Ibn Rusjd's work was that he conceded that scientific knowledge (the result of the exercise of reason) can be, and often is, inconsistent with the literal text of the Koran. In such cases, Ibn Rusjd wrote, the Koran should be interpreted *metaphorically*. Since common people (*'amm*) due to their weak mental capacities, neither understand the exercise of reason nor the idea of a metaphor, they should not bother about it and take the Koran literally everywhere. The problems of reason and metaphor are technical issues for specialists (elite, *khass*).

Ibn Rusjd's approach was meant to create loci for scientists to explore the real world freed from the time consuming obligation to logically connect their findings to the literal text of the Koran. It marks the stage of Arab enlightenment.

It took quite some casualties in the European Christian world, but three centuries later similar points of view gained a beginning of acceptance there too. Moreover, due to the rise of the general level of education, *khass* gained, and *'amm* declined in social importance in the western world, which finally led to the dechristianization process of the last century. Meanwhile, the Arab world was overrun, first by the Mongols and then by the Turks, who, after a first lapsing into savagery inspired by primitive versions of Islam, quickly (that is, in little more than a century) took over the enlightened Arab view on the relation of science and religion. This led to general technical superiority of the Muslim Turks over the Christian Europeans, also with respect to military hardware. This enabled the Turkish Empire to conquer Byzantium in 1453 and ultimately led to a prolonged military stand-off ending only in 1683 before the gates of Vienna. Most of the so called European technical inventions of this period, ranging from heavy duty precision cannons to croissants and cappuccino, actually found their way from the Muslim world to Europe in this historical development.

The True, the Real, and the Local

The marked difference between the religions of Semitic origin and most other religions in the world is the claim of Universality, and corresponding zeal to convert mankind to its principles. There is only one place where I found something carrying a remote similarity: the pastoralist Karamojong tribe in North Eastern Uganda believe they were given all cows in the world and hence can take any cow they see anywhere because it must have been stolen from them.

The Jews did not yet have such a far reaching claim of Universal Truth. And they never adopted it. There is, in Jewish revelation, only one God, Jahwe, that is, only one God *for the Jews*. But, for instance in the Torah, the Moabites, a tribe unlucky enough to inhabit the promised land before the rivers became, as we read, red of their blood and the promised was taken, had another God, and lost the war, according to the Torah, because their God was weaker than Jahwe. That is not a matter of uniqueness and generality, but of quality, which is quite a different issue. In defending their stance in situations of conflict and despair relating to problems with non-Jews, Jews are not accustomed to refer to God, as for instance Americans and Arabs do. Americans and Arabs, especially in political contexts, seem to think they are only convincing if they suggest that God is behind them. This behavior can be traced back to

Jesus, who unambiguously made the transition to a claim of general, Universal Truth. There are no others. This was taken over by Muhammad: "There is only one God and his prophet is Muhammad".

Claims of revealed Eternal Universal Truth are hot potatoes. Its defenders are vulnerable to questions on observations made and other practical issues that seem to put the revealed doctrine into question. But, even worse, they are serious obstacles in practical negotiation under conflict and disagreement. Seeking compromise between two inconsistent Universal Truths is formally impossible, and if prudence nevertheless requires it, any such compromise should - by both parties! - be venerated as being wholly in harmony with their own Universal Truth. This is either impossible or leads to very complicated unperceptible pieces of argumentation beneath which monsters keep active ready to raise their ugly heads. Well known utterly curious dogmatic compromises on historical meetings of revelist top clerics can testify, but a good example is also the Universal Declaration of Human Rights. At first sight this could seem an inappropriate example indeed: the Holy Scriptures abound with places where God and prophets encourage or even command the flock to commit human rights violations. But what underlies the Declaration is the (vain) revelist hope of universality, and so is its revelist practical use as a weapon against a political enemy.

In short, claims of Universal Truth in practice have a disintegrating effect. This can properly be dubbed the *inverse dialectics* of universality aspirations.

In the early stage of analytic philosophy, philosophers introduced the axiom that claims of universal truth are a hallmark of science. From a logical point of view, the universal quantifier was widely thought to be the first sign in any formula representing a scientific theory of law. This view is still widespread among philosophers of science, especially in the traditions in which works of for instance, Popper and Nagel are recognized as significant sources.

In history, however, science progressed by local hypotheses, not by Universal Truth. It did not progress by replacing the integrated general body of human belief by another one, not even by trying to maximize its claim of as large an area of application as possible. Such a maximization strategy, blowing the balloon up as far as possible, is a type of revolution that reminds more of the birth of a new religion at the moment of a new revelation. On the contrary, in the course of Enlightenment, science wrestled its way out from under religion in a piecemeal way by establishing more and more local knowledge. That obviously was the wisest way to keep out of trouble with zealots. But by the same token, these claims of local, but independent area's of knowledge acquisition by the early scientists were what mostly worried the Pope. Galilei did not get into trouble by his dealing with the structure of the solar system, which after all, even today, as is well known by contemporary popes, and can safely be assumed to have been anticipated by 16th century ones, is uninteresting, unknown or at least unclear even to most contemporary voters, consumers and certainly most regular church visitors in Western countries. The trouble was caused by Galilei introducing *local* claims to knowledge not based on revelation. Galilei may or may not correctly have been thought to have refuted the claim of universal Truth of Christianity, but what he put forward was much scarier than just another claim to universal Truth: he came up with a little bit of local knowledge that is, claims just resting on some partial interpretation of just a few things that one can only observe by using specialized equipment.

Osiander, in his preface to Copernicus tries to explain that *truth is a religious thing, not a scientific one*: "He who takes as the truth what is devised for another goal will come out of this science with greater ignorance than the one he entered with." (Copernicus (1883)) His words have turned out to be more scaring and unacceptable to Christian revelists than the actual results of the sciences: this new intellectual enterprise called science, claiming to produce valuable thoughts *outside the realm of truth*, made them unsure, with good reason, about how it could affect religious authority. As science progressed, its particular results have at many more occasions caused fear to revelists - think of the idea of evolution -, but nothing compares to the fear caused by Osiander-type explanations that *the very notion of truth* has nothing to do with science. This not only shook revelists. It aroused philosophers of science and induced them to

attack such "instrumentalist" positions, and to defend "realism" against such scandalous scientific paganism.

Nietzsche, as he realized, was far too early in claiming that the desire for truth is a Christian residue: "To laugh about yourself, as you should in order to laugh yourself out of the whole [idea of] truth..." (Nietzsche, *Die fröhliche Wissenschaft* (undated) p.42, book 1, section 1) and his characterization of truth as the "weakest form of knowledge" (*ibid.* p.152, Book 3, section 110). Now, in the 21st Century, more of us have enough experience with scientific and technological progress to start understanding what Nietzsche tried to say.

Of course, claiming that science is about local knowledge does not mean to deny that in science, the establishment of more and more local knowledge led to attempts to integrate dispersed local knowledge suspected to be interrelated. Many of those integration projects turned out to be based on daring but useless assumptions and had to be abandoned. A few, and those are the famous ones, like the Copernicus-Kepler-Galilei-Newton-Einstein development, resulted in integrated structures that held modified forms of the initial local integration candidates, according to the logical relation that has been called dialectical correspondence (Nowak, L and I. Nowakowa (2000), p.185-8). But of course also the latest structure in any hitherto successful sequence will, just like the previous ones, not last for long in the future. *Theories*, as Osiander, Nietzsche and that part of the modern philosophers working along instrumentalist or idealizationalist lines express themselves: *are no truths*.

The best way to rid yourself of the idea of science as truth finding in the context of modern science is to study the method of idealization and concretization (Nowak, L and I. Nowakowa (2000)). The idea is that scientific laws typically hold only under ideal conditions. Such conditions typically are never met and could never be met in the real world. In that sense such ideal conditions could be called "false", but that notion of falsehood is a kind of category mistake if applied to ideal conditions. Ideal conditions are not *meant* to be "true". Nevertheless, for revelists, truthists, realists, anti-instrumentalists and universalists it may be good as a first approach to think of laws as "false in the real world" and "only true in an ideal world". It helps you to get rid of the romantic idea of science as the Quest for the Hidden Truth of the Universe. Stating that scientific laws are true in an ideal world, however is in itself a tautology: by - logical - definition, for every consistent statement there always are ideal worlds in which it is true.

If this "falsity of laws" claim would have been the message of idealizational philosophy, the harvest would have been as small as Tarski's definition of truth ("p" is true if and only if p) if taken as the message instead of the medium (Tarski (1956), p.152-278). The revelist notion leads to a modal logic: "p" is a universal Truth, "p" is a universal Falsity, or "p" is neither. The first two options are interesting to the Enlightened mind only in logic and mathematics - and authority there is *argument*, no prophets or church leaders. It is a relatively small field. The Enlightened mind shades the enormous "neither" class in a subtle multitude of colors, always remaining ready to slightly shift color at any time. This is what has been reconstructed as the *approximation strategy* in the method of idealization and concretization.

The idealization/concretization approach to scientific theories is meant to deal with this "neither universally True nor universally False" class and to replace their Truth with *approximation*. Approximation is a relation between a theory, a set of mathematical functions or a computational model, and the data sets the scientist works with at a particular time. Approximation is crunching numbers with functions (and crunching functions with numbers). Both math and data sets are continuously changing in reaction to the results of approximation calculations. *Fantasy*, and readiness to shift, in the light of approximation problems, from one fantasy to another is important in science but *truth* plays no role. Whoever, philosopher of science, propagandist or (would be) scientist, puts a rude metaphysics of "Truth", "Reality" and "Universality" below the subtle and fluent development of modern scientific theories as an immovable or definitive "foundation" of science is a hypocrite or a fool: one day later, his "truth" has faded in the versatile minds of whatever scientists he took it from and he belongs to the past.

Revelist Remnants in Modern Science

Though historically the process of Enlightenment is the triumph of science over revelism, science has been hampered by revelist remnants and sometimes even had its revelist revivals. The reader may have the inclination to see this section as dealing not with science but with "pseudo-science". Such a distinction has, however, proven to be so treacherous and ideology dependent that I will not make it at all. Science is being understood here in a no nonsense way as what is done, said and written by those generally regarded as scientists by their society.

Interparadigm argumentation. The claim that *scientific theories are not Truths* is even in modern day science not an uncontroversial one. It can be seen contested, or at least overlooked, in the rhetoric of scientists' debates as soon as beliefs are dogmatically expressed, especially beliefs in the deep theories underlying whole branches of science, such as relativity theory, thermodynamics, the theory of evolution and the theory of free market competition. In debates among scientists about the rival fundamental principles dubbed "incommensurable" by Kuhn, scientists have been shown not to be shy to defend revolutionary new points of view by reverting to the truthist and realist conversion strategies that remind of revelists. The subject we touch upon here is the "politics" of science in times of deep controversy and scientific "schism". Because rival viewpoints are largely backed by what their pay off will be in solving the agenda of *future* applications ("puzzles", as Kuhn called them), rival "political" leaders in science are in need of followers willing to have faith in the promise. Since research funds are scarce and the flock is constrained in size, to attract a sufficient number of research workers for a new approach is a territorial matter in which propaganda may be directed to what wins funders and followers over rather than to what private doubts scientific leaders may have about their own approach.

An illuminating example is that of Avogadro refusing Gay-Lussac the right to round off 1.97/1 to 2 in the volume analysis of oxygen-hydrogen reactions, while after having found 1/4.75 for the weight ratio of N and H in NH he wrote "because an integer remains easier in memory, we prefer the ratio 1:5 until a more precise ratio has been obtained" (Hooykaas, R. (1976), p.230).

Nice also are the "bandwagon effects": after scientists of authority have measured the value of a natural constant, there is a tendency of values close to it to be reported until another scientist of authority reports a significantly deviant value. This then marks the building up of a new "bandwagon".

Such social phenomena in science exist, despite the fact that science and Universal Truthism root in fundamentally different metaphysics. The message of Enlightened tolerance is to find local solutions for local problems. "Mechanics", for instance, is a local solution. It is of little help in explaining most known phenomena. Those who have proclaimed mechanics as a universal solution, like materialists, lost their energy in revelist philosophies that did neither contribute to the growth of successful scientific applications of mechanics nor to the growth of any other field of scientific knowledge. The enthusiasm of such proponents of grossly universalist claims is at least quite similar to the phenomenon of lapsing back into revelist fundamentalism. As Thomas Kuhn noted, even once most of the leading research workers in a field feel that an old basic theory has been convincingly surpassed by a new rival, typically a gradually ageing group of die-hards will remain, defending it against the odds. At such occasions, Truth takes its toll. Such lapses no doubt have been seen most frequently - and seen up to totalitarian proportions - in universities and academic institutions. The paradox of the university world is that it depicts itself as the carrier of scientific progress, but in practice acts as the maintainer of scientific traditions, which is by nature a conservative task. Universities typically formalize a hierarchy in faculties and departments and thus impose requirements of discipline on those who should, according to the Enlightened world view, be independent minds. Thus it is at least far from certain that universities are the institutions from which to expect the largest of contributions to the growth of knowledge. And indeed a surprisingly large amount of great minds of the Enlightenment lived in filthy garages, on dusty attics and in the

wilderness. Such minds typically are either much poorer than university professors and not bothering about it, or much richer. No wonder totalitarian societies cherish their universities as useful instruments to counter Enlightened tendencies. Their very structures makes them suitable indeed for that purpose.

Scientific backing of political ideologies. This brings us to a second reason that some may be doubting the claim that science is not about Truth, let alone universal Truth. In many social and political situations, scientists, especially those with state or party university backgrounds are found backing political ideologies such as racism, nationalism, socialism, and communism. In their messianistic rhetoric they are typically drawing predecessor scientists into their camp, not infrequently putting them in roles reminding of that of the revelists' prophets.

Since such kinds of scientific developments in Nazi Germany and the Soviet Union have been covered extensively by its intellectual and political enemies, let us start with a 20th Century English example, the *Eoanthropus dawsoni*.

In a series of discoveries in 1910/12, Charles Dawson, an English lawyer and amateur geologist, found what appeared to be the fossilized fragments of a cranium, a jawbone, and other specimens in a gravel formation at Barkham Manor, on Piltdown Common near Lewes in Sussex. Dawson brought the specimens to Arthur Smith Woodward, keeper of the British Museum's paleontology department, who announced the find at a meeting of the Geological Society of London on Dec. 18, 1912. Woodward claimed that the fossils represented a previously unknown species of extinct hominid (*Eoanthropus dawsoni*) that could be the missing evolutionary link between apes and early humans. His claims were endorsed by some prominent English scientists. The primacy of Great Britain in the world was established by research in what is the True Foundation of Mankind: the earth's crust, Sussex. The display of *Eoanthropus dawsoni* was opened by Her Majesty the Queen.

A later examination of the Piltdown remains showed them to be the skillfully disguised fragments of a quite modern human cranium (about 600 years old), the jaw and teeth of an orangutan, and the teeth probably of a chimpanzee, all fraudulently introduced into the shallow gravels. Chemical tests revealed that the fragments had been deliberately stained, some with chromium and others with acid iron sulphate solution (neither chromium nor sulphate occurs in the locality) and that, although the associated remains were of genuine extinct animals, they were not of British provenance. The teeth, too, had been subjected to artificial abrasion to simulate the human mode of flat wear (Source: *Encyclopaedia Britannica*).

Research with similar aspirations abounds in Russia, China, the Holy Land and elsewhere. Governements have usually some interest in monitoring the results of home archeology and it is well known that many countries discourage the advent of foreign archeologists.

Let us go to France. In 1952 Swedish dentist Sten Forshufvud read the recently published account of Napoleon's death by Merchand (Sten Forshufvud, (1995)). Based on his knowledge of toxicology, Forshufvud came to the conclusion that Napoleon had been murdered. Fortunately, a number of Napoleon's staff had kept locks of the Emperor's hair, which were passed down the generations, sometimes coming up for auction. In the 1960s this happened and in order to prove this theory Forshufvud turned to Glasgow University forensic scientist Professor Hamilton Smith, who had developed the nuclear techniques to record very small levels of arsenic. Since it has been established that hair grows at approximately one inch every two months, if it is shaved at the scalp and the date is known, then tests for arsenic in the hair can determine almost to the day when arsenic was ingested. Using these techniques it was shown that small quantities of arsenic were present in Napoleon's hair. It was possible to poison a person without detection by slowly exposing him/her to small quantities of arsenic. This technique was known and was described in a book that Albine de Montholon had with her in St Helena. Forshufvud concluded that Napoleon had been murdered by the Comte de Montholon. This obviously had implications for the correct view on this episode of English and French political history. To investigate further details, Forshufvud went on search for more specimens of Napoleon's hair. The French Academic network, however, had made sure that no further of the known specimens would be made available to Forshufvuds research, a French

academic attempt to keep French history French. (It failed. British scholars later found that the British wallpaper of Napoleon's room at St. Helena contained some arsenic too, though - but the lobby behind this last addition has yet to be identified - not in lethal quantities).

These are all fine examples, but the revelist remnant of revealing the hidden Truth in history, and fixating it in a Book has become the best known by the work of Karl Marx and the status that this work acquired in socialist and communist doctrines. Marx was well aware of the structural analogy of his view on history and that of the Bible, from the paradise of Genesis to John's Apocalypse. Moreover, he gave his followers, in the form of *Capital*, their own Book. Lenin adapted the doctrine to make it fit the Orthodox Christian flavor of early 20th Century Slavic culture by molding it more emphatically into the eschatological sequence of Paradise (Original Communism)- Fall (Original Appropriation, Feudalism, Capitalism) - Satan-in-Chains (Dictatorship of the Proletariat) - Heaven (Final stage of Communism).

In communist thinking, ideology covers all science in the same way as religion was stipulated to cover all science in the European Middle Ages. The Enlightened idea of science as objective research work done by independent minds is, in communist thought, rejected as a bourgeois mystification of the Truth of the scientific suppression of the proletariat under capitalism.

Marxism was by far not the last scientific current backing political doctrines. In the second half of the 20th Century, the Last Judgment regained popularity: politics first saw scientists supporting the limited resources movement (Club of Rome, Meadows (1972)). After resources turned out not to be the most acute problem, the Western world saw the rise of the ozone layer/global warming movement, supported by an extensive scientific lobby. After a brief interruption by fear for a temperature jump inversion to an ice age quickly followed by the sudden fear of the possible collision of the earth with a meteorite, the attention of public opinion was turned back to the main world diseases, like AIDS, malaria, diabetes, obesity etc, all of them attributed the status of the globally most serious disease in the world, at least by the mass media, at least each of them in turn around the time of the annual world congresses of their respective medical research communities.

So far for contemporary scientific backing of ideologies.

Realism and anti-instrumentalism in the philosophy of science. Philosophers of science, often posing as "realists", contest the claim that scientific theories are no Truths. They often label this view as "instrumentalism": the idea that theories have no ontological claims in themselves but just hold together an integrated body of relations observed to hold approximately in the area's covered by those who "work with" that theory. Philosophers of science infuriated by instrumentalism are not seldomly warning against it as a cultural danger. Their "realism", the doctrine that good scientific theories are true in the real world (under a Mediaeval plethora of rival definitions of what is "truth" and what is "reality"), is claimed to save the world from the "instrumentalist" danger.

Popularization of science in mass media. The revelist mistaken image of the scientist as a hero searcher and finder of hidden Truth is actively enforced by the popularization of science, for instance in the TV broadcasts of Discovery and of National Geographic Channel. There, the attention of the TV audience is turned emphatically from the nasty math to the face of the scientific prophet-Truth finder who, in an adventurous quest full of despair, finally uncovers the definitive Truth. Big media successes typically report on scientific research proving truth of claims occurring in ancient revealed texts, such as finding traces of habitation of the Black Sea floor and ruptures in the Bosphorus area indicating a Noah type of flooding of the Black Sea basin due to global warming around 5000 BC. This mass media behaviour suggests that Ibn Rusjd was not far off the mark with his *Khass-'Amm* distinction.

Concluding: unfortunately it cannot be denied that scientific research every now and then degenerates into a Truth finding mission. Revelist approach to knowledge seems to keep an appeal allowing it to deformate the image of science and even to creep in scientific procedures.

Superstition Given New Opportunities By the Present Big Bang of Science

Despite liability to infection by revelist remnants, the contemporary growth of scientific knowledge is explosive. In the seventeenth century it had become impossible to acquire all available scientific knowledge in such a way as to be able to actively participate professionally in all fields. Nowadays, no one can be expected to keep updating the overview of even only the main results of the main fields of physics and biology. There is no evidence of any kind of decline of the acceleration of the growth of knowledge.

Within scientific fields, finding and keeping track of related fields, the results of which are relevant to one's own, is now constituting a major problem. No one can be sure not to have lost track of others whose results should have been monitored. Theories may start to diverge not due to conscious disagreement but simply due to lack of mutual acquaintance of the research groups working with them. The astonishing explosion of knowledge, the process crucial to the future, is *uncoordinated, autonomous*. Nobody is in charge. It just happens, and nobody is going to stop it. Every individual involved only sees (let alone controls!) a negligible fraction of it.

Despite this historical process of loss of individual grip on history, the "We"'s and "Mankind"'s broadcasted by priests, networks and politicians have become more and more encompassing, and by now long has reached the stage that "We" have to save the earth (for some danger or another, by some means or another). "We" have responsibilities, tasks and missions. "We" discuss genetic research and nuclear proliferation as if "We" could exert any influence on its development. Everybody, scientists included, is ready to back up claims on the issues "We" have to address. "Mankind" is the standard subject to enter the ecoliturgy at the end of nature documentaries: "Whether this unique species will survive, depends on whether *Mankind*....".

The belief in "We" and "Mankind" as a collective subject is no doubt the chief item of contemporary superstition. It is found everywhere, until deep in the labs of the Nobel Prize winners. And it is this "Mankind" for whom the prophets wrote their revelations down. As far as Darwinist biologists and sociologists are concerned, it does not exist.

But this is only the very summit of all opportunities that the Big Bang of science provides to superstition. Once science became an autonomous social process, Enlightenment became a feature of social structure: anyone who has any talent that is of any use to any fraction of science has a good chance to be absorbed in the process of scientific growth, be it in a lab, be it by on line partnerships between people working at common interests, be it in a company designed new types of products for industry or consumer. Whatever beliefs you have apart from this one talent that may suck you in the scientific social structure, is irrelevant. If you can deal well with UTMS communication software you will be hired, no matter whether you believe in aliens, are a pro-life pro-death penalty Methodist, or even a post-modern deconstructivist. Who cares? Enlightenment has become independent and autonomous nowadays and only tends to occupy a very small part of the human soul, the rest of it is free!

The situation today is, of course, only one particular stage in a historical development of, it seems, ever increasing speed.

At the beginning of the Enlightenment, the revelist idea of Truth prevailed: the idea that knowledge is Truth based on holy books and that (religious) authorities are in charge of interpretation problems. Such authorities do discuss controversies but, due to discipline of *khass* and illiteracy of 'amm (to stick to the terms of Ibn Rusjd) only their common conclusions tend to reach the general public.

Then, in the 16th, 17th and especially the 18th Century an intermediate stage was reached where the public still generally considered thought to be a specialism exerted by *khass*, but different and inconsistent *khass*-opinions started to spread wider among the general public (the spread of literacy, the introduction of newspapers, later the widening of democratic rights) and started to be discussed there. The general public was getting accustomed to the existence of divergence of opinions and discussion.

At the contemporary stage, philosophers and scientist do not differ from any other social group

like rock musicians, sporters, film stars, artists, filmproducers, TV documentary makers, web editors. Everybody develops his own thoughts fitting to his own life, and there is simply little time and little interest to study thoughts of those who lead other professional lives. The only ones who need to keep track of the development of thoughts other than those of their own group are those who work for politicians or for the selling departments of producers of mass consumption goods. Hence the observable features of their work (advertisements, political campaigns) are the only ones that are put to the test of *general* public approval (in terms of earnings and votes). These reflect the continuous multi-billion dollar research aimed at improving the operating system of societies, at least of the part that forms targeted consumers and voters, albeit a system that merely aims at having their members buy some product or cast their votes some way rather than another. The data of advertisement and public relation offices are the only wider ranging generalizations available. The contents of advertisements and political campaigns makes clear that this is not what many of us would like to think of as the main achievement of western civilization.

Be this as it may, the contemporary fruit of the Enlightenment is that there is no social danger anymore in top soccer players wearing crosses from their necks (as long as they use the stretch strings given to them by the scientifically versed training staff), believing they should never step on the line when entering the field, rock stars believing in aliens, web editors believing in God and captains of industry cured from cancer by miracles. Frequency and depth of such beliefs are continuously monitored by the market research workers of politicians and mass producers, and as soon as they become socially significant, they enter the advertising and political campaigns. Scientific knowledge is an "objective" power, but it is not to be located in the consciousness of the public. As advertisements show, the public is not interested in the theories underlying cell phones, but in for instance, their helpfulness in getting into contact with someone desired to become a sexual partner. The public is not anymore interested in economic theories underlying political programs but in whom of the professional cheaters contending for some seats deserves their "trust". Science is everywhere: no mass product, no political program can be successful without science, but it has become autonomous, unconscious, objective, collective, a force by itself.

This process of Enlightenment becoming independent and autonomous is not to be identified with the Ibn Rusjd's *khass/amm* distinction. Whoever worked with the youngsters actually doing the developing work at the front edge of technology knows that in their office-gardens top soccer players believing they should never step on the line when entering the field, rock stars believing in aliens, and web editors believing in God are quite at home. Ibn Rusjd would probably conclude that today *khass* has disappeared because science did not need it anymore.

The general image emerging is that science and technology now got so fragmented that the single individuals' knowledge of it has become too small to allow for a rational world view that reflects the state of available knowledge. The single individual, even if he is thoroughly schooled in some scientific or technical specialism lapses for the unoverseeable part of nature he is not specialized in, into the world view radiated by TV channels, rock star albums, Popes, Imams, government press offices, deodorant advertisers or other public "authorities" at hand.

It is as soon as they are seen as research objects, not to be argued against (for such arguments are easy to give and already satisfactorily supplied for many centuries) that the subject shifts to the peak of relevance to the humanities. Clearly the questions are:

- What make the pre-Enlightenment metaphysics so tenacious and attractive that it has resurfaced as soon as Enlightenment gained autonomy? Why are notorious believers immune to the well known arguments against their religions? Why does this phenomenon of archaic belief extend not only over political leaders and exponents of top sport, but even to the ranks of scientists, research workers and skilful astronauts?
- How do believers abundantly exposed to the fruits from the culture of Enlightenment prevent these fruits from entering the core of their being where they could deconvert them into nonbelievers?
- Why do they do that?
- What is the explanation for on the one hand, the inclination of believers to form social groups around a doctrine and, on the other to breaking them up in often bloody fraternal doctrinal strife?

Contemporary Science and the Contemporary Meaning of Theories

Not wishing now to enter the skirmish between rival views in the philosophy of science we stick to the basics: roughly, scientists communicate and update with three things: *data sets*, *functions* and *theories*

1. *Data sets*, containing variable values collected mathematical and computational
2. *Functions* that have proven effective in restricting the possibilities in what data sets can result from the collection of variables. They allow obtained datasets to be labeled as standard, problematic, anomalous, etc. or to conclusions that some unmeasured parameters must have certain values.
3. *Theories* about what's going on, making sense of the functions that are thought useful in the process

A striking thing of the explosively growing speed of scientific developments in the last decades is that the life cycle duration of this third element, *theories* - between adoption and dumping - has shortened enormously, even at a pace similar to that of consumer durables. In the 19th Century, adoption and dumping of theories still were big and emotional happenings, both to an individual scientist and to a research group. Nowadays, proposing to replace an old theory with a new one is a routine thing at every lab's colloquium session. Like consumer durables, modern scientific theories have become lighter. They should just contain enough to visualize the processes studied in a way nicely symbolizing the math currently applied. Theories are not the big issue anymore. A theory is OK if it helps you thinking through the math you apply and how it does well in some and badly in other applications (think of the speed in which new proposals for new types of subatomic particles and new types of energy are succeeding each other in contemporary pure physics). The important thing for a scientific research worker is to be tolerant to may be even strange ideas that might come up in yourself and your colleagues. Though this seems where enlightenment has naturally taken us, at the same time it means that what formerly may have fiercely been fought as "superstition" is not such a big deal either - provided you keep doing the math and keep checking and worrying where and how data fit it nicely and where they do so unsatisfactorily.

To contemporary scientists, theories are fun things to play with and no big deal to dump. In this respect, research workers are well integrated in the culture of homeopathy, astrology, fundamentalist fire arm lobby Christians, pro life pro death penalty Presbyterians, child pornography, nature conservation, anti-globalization, Catholic pedophilia, Muslim fundamentalism, Gay rights activism, aliens, worm architecture, UFO's, anti-immigration politics, ozone layer defense, plane hijacking, animal rights, slavery reparation payments, post modern deconstructivism and everything else nowadays tried out in the mass media, on the internet and elsewhere. Modern scientists are product of a culture allowing you to deal as liberally, freely and smoothly with your ideas as toddlers do. After all, it is by now well established that as far as the speed of growth of knowledge is concerned, toddlers are superior by far to adults. It is no accident that nowadays adults acknowledge and admire this, while even fifty years ago, to adults toddlers were not more than inferior animals that could only hope to become human by eating and obeying. This is the trend in modern western society and this trend is unstoppable.

True Enlightenment frees man of the burden to treat his theories as universal Truths. The astonishing explosion of light ideas and theories floating around in the worlds is not a token of the end of Enlightenment. It shows how playfulness makes scientists, artists and others astonishingly effective once they are unhampered by "Truth".

Enlightenment has become the obvious practice and thus disappearing from conscious considerations. Hence, as a conscious world view it lost its necessity. It turned into the fabric our social structure as happened with the free market economy, which, quite similarly started as an idea. Similarly, few are able to consciously ponder the differences between a market

economy and a hunter-gatherer economy.

The larger and most powerful part of civilization ceased to take matter of "Truth" as its daily object of thoughts and doubts. Its hands are free to create an unprecedented explosion of knowledge, technology and power. We have reached the stage where the gods, heavens and hells featuring in private homes, TV shows, computer games and holy places - apart from some escapes from the closet in the form of youngsters trying their computer shooting game at school or practicing the Koran maxims in aero plane raids - can do no more harm to civilization and the progress of knowledge than their competitors: aliens, stand up comedians, soaps, advertisements and political campaigns.

Conclusion

Revelism got free of its roots and is now fully accepted among Enlightenment's freely floating debris of theories.

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