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Understanding Science and Preventing It from Becoming Pseudoscience

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Abstract: The motivation to write a paper on the general nature of science comes from the scientific nature of Quran, which has been a guidance and help in revealing that science is an ontological and teleological construct which the Quran supports. A much-needed discussion of science had to be done because the trend among the people today suggest anything remotely sounding science has become a substituting value for religion and God. People have started believing rather blindly, in science without really understanding what it is, how it works and its limitations. What is science and what is the purpose of science? This paper explains the answers of the question and help reader understand the difference between science and pseudoscience which often people mistake as one. It explains the difference from example of macroevolution, single common ancestor and natural selection. The discussion also elaborates on the essential foundations of science that makes science, science. At the end, the paper elaborates why science cannot be used to ascertain moral truths. The discussion has been analytical in nature rooted in classic literature of philosophy of science and sociology. The readers will come to appreciate the fine principles of science and it's limitations in revealing scientific truths.

Keywords: Science, The Scientific Method, The Evolution of Science, Morality and Science, Pseudoscience

1. Introduction

The expository principles of science are rooted in Quran [1]: a) God has laid down rules whether in the form of law or processes in the spatio-temporal material realm as in Quran 41:12 b) These rules generally do not change as in Quran 17:77 c) All of spatio-temporal material existence follow mathematical rules and models as in Quran 54:49 d) Indications and hints from frame of reference of entity and phenomenon as in Quran 3:190.

The discussion starts by defining science and explaining its constituent parts and then elaborating the foundation of science called the scientific method. Then how science starts and evolve and what is the final destination of science are discussed. How science is distinct from pseudoscience [2] is also discussed, but people may easily fall in the trap of making pseudoscience science, however the discussion establishes how the two can be distinguished. At the end how science cannot ascertain moral truths is discussed [3].

2. Some Principles

All of knowledge can be summarized into three major forms: semantics, norms and facts. Semantics can be simple to complex such as it can range from meaning of a word to meanings of sentence, concept, norm, argument and for that matter any existence [4]. Norm is rather social and dictates how things ought to be i.e. prescriptive, while facts are truths i.e. descriptive, something as it is, and facts can be natural, mathematical, social and semantic. This paper mainly discusses about scientific fact which is a subset of fact. One needs to understand that all semantics, norms and science are ultimately reducible to physicalism that is to the five senses [5], but this does not mean that reality is only limited to the five senses, for example realization and feelings do not have reducibility to only the five senses. This is because the soul also has a place to achieve reducibility [6].

Take for example the abstract mathematics which has numbers as the most basic building block. However, without physical objects to count it could never have known

what the mathematical numbers signify or mean. Reducibility is thus equal to demonstrability and physical ontology. An example of both spiritual reality and physical reality is when someone feels bad or good. If someone says "I am feeling bad", spiritual reality of essential feeling of badness cannot be demonstrated but rather physical reality of referential feeling of badness can be demonstrated because it can be observed that feeling bad makes someone behave in a certain way or determines future behavior towards something or someone.

3. What Is Science

What is science? A tendency has risen which equates science as any explanation of existence that substitutes God. However, this is not science. Science can be defined from two perspectives: perspective of "identity and service" and perspective of "doing science". The perspective of identity and service defines science as what it is and how it helps. Science in the first sense can be defined as Pursuit of facts related to natural physicalism and artificial physicalism such as those created as a result of human activity such as society, economy, politics, psychology etc.

Physicalism is the spatio-temporal material existence. Science realm has three main ontologies: architecture, law and process, and three properties: regularity, recurrence and symmetry. So the reach of science is anything which strictly contains or follows any or all of the following: a) descriptive law whether natural such as biological, physical, chemical etc. or artificial [1] such as psychological, economical, sociological etc. b) process such as mendelian genetic inheritance, but process can be periodic such as circadian rhythm or continuous such as bile production or heartbeat, synchronous such as cell cycle or asynchronous such as cell division and lastly and most importantly causal such as nuclear fission c) architecture such as species and d) mathematical rules and models. So, the scientific realm consists of macro to micro entities of the spatio-temporal material existence which have architectures, and these entities are part of or under laws and/or processes created by God many of them following rules of mathematics. They follow regularity, recurrence and/or symmetry. There is no randomness in the true scientific realm.

Scientific theories which are established are proven and must always show or reveal physical existence [7]. Science does not study randomness unless it finds an observable or measurable predictability, so if the passing of genes can be studied with statistics and probability then it is the domain of science to the extent statistics and probability can be applied. So, for a natural or artificial entity science explains any or all of laws (what), causality (why), process (how) which have underlying properties of regularity, recurrence and/or symmetry, through close observation, experiment and mathematics, and this is the "how to do science" part [8]. Let's clarify some essential terms: architecture, process, causality, close observation, experiment and the scientific method.

4. Constituents of the Scientific Realm

4.1. Architecture

Architecture consists of one or more interactional and/or interrelated physical entities of space-time and a related frame of reference for them, and this frame is the observed phenomenon through which higher level of explanation is meant to be achieved. An architecture then could be for example a cell, an organism, chemical reaction, a fast-moving car, behavior of an individual or even someone opening a can with a tool. Scientific realm exists continuously, and the frame of reference can be said as a snapshot of this continuity.

Take for example there are disagreements in the definition of species and on the basis of this people have confused the extent of evolution. One can define biological species from the scientific architectural perspective. A species is a collection of biological organisms i.e. population, that has similarity in shape, size, looks, diet and organs. These physical entities are what make up a species which is a higher level physical biological entity.

Let's clarify the frame of reference. Iron is used everyday which gives out heat. This iron with its heat producing activity can be regarded as a frame of reference. From this frame of reference, one can reach higher level of explanation such as that of thermodynamics. One can understand many other frames of references from physics in everyday life, however a scientist discovers new science from frames of references, which he must correctly choose in the initial phase of the scientific method.

4.2. Law

Scientific laws are two types [9]: a) hard law which is deterministic that is, it always is active or happens given proper conditions exist for its activity and b) soft law that is probabilistic-statistical law which happens with a likelihood and for a proportion of data. While probability tells us about the likelihood of an event statistics tells us to what extent some event has occurred. For example, the laws of genetic inheritance are probabilistic statistical because it works most of the times for most of the organisms but mendelian genetics have exceptions such as epigenetics and the environment. Some deterministic laws are those of physics such as gravity and motion, gas laws, laws of electromagnetism, laws of thermodynamics, those of biology such as cell cycle, DNA sequencing and many laws from other branches of science. A law can be only followed by a single entity or many entities of matter, that is, laws of nature vary from narrow to wider scope [10]. The hallmark feature of scientific law is regularity and recurrence while as symmetry is an attribute mostly of the architecture. Recurrence means persistent and consistent occurrence even if periodically, frequently or continuously, while regularity means while the law is in

1 Artificial here means generated by or from humans.

action (recurring) it is completed or continues without interruption or obstacle and obeys all the parameters and constraints related to its functioning.

4.3. Process

Process is an ontology which is dynamic. Process consists of events, going-ons in a cohesive model. Process is "going-on" of activities which may result in developments in the system. Processes may be interacting as part of an integrated system or separate systems. Process can be seen in terms of hierarchical frames of references. One of the major process in science is causality. Process can also be defined as collective dynamic interrelationship of relevant variables of the phenomenon in the architecture.

4.4. Causality

Causality is the relationship between cause and effect, and causation is either the causing of something or the relationship between cause and effect. The relationship is what defines cause and effect. Cause and effect are sequential happening of two or more sets of events where one or more sets of events must occur first for one or more other sets of events to occur immediately after it or after an interval after it. This relationship must always hold true whenever these events take place or occur and that no other events are acting on these necessarily related interconnected events simultaneously. If there is or there are separate but connected related events also working with another one or more connected sets of related events, then distinct causal models need to be established. This is what science mainly does, that is establish the boundary of causal events and thereby identify causality. Consider an example of a man taking birth control pill and not becoming pregnant. Did birth control pill cause his non-pregnancy? There are multiple sets of distinct related events here but there are one or more distinct causal models that are the reasons of his non-pregnancy. Science has established that, being male is the main cause why he cannot be pregnant, so the causality goes down to the cellular level of the male sex.

One more point to understand is that a causal model is a cause-effect process where a least number of causes i.e. one or more than one, are needed to bring about one or more effect. This is a single process. When multiple distinct causal processes work in a system concurrently, the issue of race condition arises. Either this race condition randomly makes one causal process dominant such as that happens during gene expression or there is always a law which determines which causal process will always be dominant, or perhaps dominant causal process may be understood by probability and statistics.

Causality does not happen in randomness or with events or system which have potential to show randomness, and this also includes probabilistic system where randomness is minimized by probability. Causality is established almost always in experiments because mostly in experiments one can control variables to establish causal relationship. Deterministic mathematical models of science cannot be necessarily said to reveal causation, but such models may also reveal definition, constituents or even intrinsic causal relationship among variables, that is how affecting (cause) one affects (effect) the other. For example, $F=ma$ means force produced by an object depends on its mass and acceleration even though the cause of force was something else. Now changing mass or acceleration will change the force and this interrelationship does not show any causation of the force. In this latter perspective a level of causality can be seen within the object's mechanical properties. This intrinsic causation in the mathematical model can either be proved experimentally or not, but it can also be proved quantitatively. For example, causality in F=ma can be demonstrated in experiment by keeping either m or a constant and changing the other, and then measuring the force. Also, the causality in $F=ma$ can be demonstrated quantitatively as well. keeping the m or a constant and putting in varying values for the other will give different value of force every time. So even though there is an external thing (this can be anything from human agent to actual scientific causes) causing force, there is also an intrinsic system of variables such as mass which causes the amount/quantity of force.

4.5. Close Observation

Scientific observation is achieved when the scientist is able to observe clear identifiable variables in an observed architecture, apparent process and/or potential law. A scientist thus may be able to see a correlation after many observations and from there he may go on establishing a scientific theory. If in the process of observation the scientist is able to manipulate one or more variables then it becomes an experiment, but if the scientist is only able to manipulate other relevant aspects of the observation other than the variable then it remains a close observation. Close observation for natural sciences often leads to experiments and/or mathematical model creation, but for social sciences it often remains just observational. In social scientific observation often, a single variable is observed and studied [11]. For example, to establish man is the stronger sex and/or there are sex and gender differences between man and woman, many relevant single variables may be observed, such as if women talk more than men or women are more emotional than men or men possess superior intellectual performance than women etc. Social scientific observation may not always be natural or dynamic for the relevant architecture, apparent process and/or potential law, but it may be study of architecture, apparent process and/or potential law from historical data as well.

4.6. Experiment

Experiment is what makes science empirical. Experiment is the foundation of scientific inquiry and knowing scientific truths. Experiment studies and reveals scientific architecture, laws and processes. Scientific experiment is inductive. One

can say how do you reach generalization of laws and processes of science from induction? Well as Einstein said that God does not play dice, that is chaos and randomness are, therefore, not part of nature and this is also the position of the Quran. So scientific faith demands that the conclusion of the inductive process be trusted. Experiment is the only way to establish causality by carefully studying and controlling the variables of interest. Lastly observational, experimental or mathematical variables may be discrete[2], continuous [3], categorical [4], confounding [5], control [6], independent[7] and dependent[8].

An experiment should have both internal and external validity. Internal validity determines how strong the independent variable affects the dependent variable provided the independent variable follows some variable conditions/varying inputs etc. and provided other possible variables are held constant. If under these setting the independent variable affects the dependent variable with strong correlation, then causality has been established, for example, the theory that status and income of men affects how women choose their male partner. The independent variable status and income may accept conditions such as high status/low status and high income/low income etc. and then women's response studied. An experiment may be bivariate study or multivariate study. In bivariate study there is one independent and one dependent variable while in multivariate there may be on independent variable and multiple dependent variables or multiple independent variables and one or more dependent variables. The key is to collect data accurately and find and trace a relationship to understand and conclude either a deterministic or probabilistic-statistical causality. Natural sciences often reveal deterministic law while social sciences often reveal probabilistic-statistical law.

4.7. Mathematics

Mathematical language is symbolic. It is not vague and ambiguous. It is abstract and deals with abstract entities called numbers and operations. Essential symbols of mathematics include logical, set and algebraic function. Every mathematical statement has an object and a property and possibly genus. Mathematics is the science of translating real world scenarios into quantifiable objects. So, one major purpose of mathematics is to make measurements (discrete/continuous) of real events or solve measurements of logical events (proofs). There are two fronts where mathematics work: Abstract mathematics (proofs, theorem axioms etc.) and Model mathematics (semantics of real-world contexts). Abstract mathematics done through axioms, theorem and proofs. Model mathematics done by capturing and precising contexts from real world then applying a priori rules on it. When capturing contexts all relevant quantifiable information should be taken and what quantifiable data is missing should also be considered. Mathematics is also used in science to predict phenomenon such as force needed to achieve something or prove phenomenon such as equations of motions or electromagnetism. Mathematically proven scientific theories are always deductive and correct, because if something was missing or incorrect the proof would not be achieved.

However, in social sciences mathematics acts inductively because of certain extent of randomness of the data. Still in the social sciences mathematics need to quantify variables. Such quantifications often depend on the subjective nature of source of data. For example, in psychology a psychology may ask a test subject or a patient to number his or her pain or feeling or anxiety, say between 1 to 10. This numbering will vary from individual to individual. However, if the data is source externally from the subject then it may be more objective than subjective. This is because still the subject will have to inform about the data. For example, researching family and marriage if the researcher, assuming that the couple wants to be together, asks them how much time and focus do they give to each other then the answer would depend on whether the marriage is a nuclear family, that is working husband and housewife, or a feminist family where both of them works. The researcher would then find out from the subjects' answers that in a nuclear family the wife, and as a result the husband, has the opportunity to give more time and focus to each other and the household which has the higher potential to increase familial attachment, intimacy and closeness between the husband and wife while a career seeking feminist wife adds stress and workload to the family as she may bring her work, directives and deadlines in home and affect the matrimonial relationship reducing the time and focus for the family. The probability of happiness in the nuclear family thus according to the researcher would be always higher. Of course, the researcher also needs to take into consideration, quantitatively, the emotional inclination and even attachment of the couples with the opposite sexes in their workplaces that may influence their matrimonial relationship. The issue here is that, even in social sciences quantification of variables is important to achieve a mathematical probability towards establishing a social theory or social study.

5. The Scientific Method

This is what makes science, science. It was pioneered by

2 Discrete variables are countable in a finite amount of time. For example you can count how many wives a man has.

3 Continuous Variables would (literally) take forever to count. For example, take age of marriage. You can't count "age" as it would literally take forever. For example, marriage age could be 4 years, 10 months, 2 days, 5 hours, 4 seconds, 4 milliseconds, 8 nanoseconds, 99 picoseconds…and so on.

4 A non-numerical variable that describes categories such as a woman's eye color, level of intelligence etc.

5 A variable that is not accounted for in a correlation.

6 A control variable in scientific experimentation is an experimental element which is constant and unchanged throughout the course of the investigation. A woman's sexual preference can be a control variable in an experiment to determine how status and income of men affect women's choice of marriage.

7 Variables that stand on their own and aren't affected by anything but rather affects other variables.

8 Variables that cannot stand on their own and are affected by independent variable.

the great Islamic scholar and scientists Ibn Haytham. Ibn al-Haytham developed rigorous experimental methods of controlled scientific testing in order to verify theoretical hypotheses and substantiate inductive conjectures. Ibn al-Haytham's scientific method was very similar to the modern scientific method and consisted of a repeating cycle of observation (O), hypothesis (H), experimentation (E), and the need for independent verification (C) [12] of the problem/hypothesis (P), so in short the scientific method is POHEC. This method if establishes a theory must never be refuted later on. That is established science cannot refute itself to uncertainty and skepticism. Only additional perspective is allowed to be added to established theory or its domain of activity restricted [13]. Even if experimental equipment may be not advanced enough to record most precise data or that the data that an equipment collects may be interpreted with a very limited scope still if these, that is experimental data and the interpretation is of certain level of quality then a theory of science may well be established. This means even with approximation of the whole experimental method and scientific interpretation theories may be established. This means the natural and artificial physicalism may not always be so sensitive to the inaccuracy of the experiment. This is the inductive method which if absorbed into the deductive method through mathematics may well establish a theory, reveal a causality or explain a process.

What is meant by addition to established theory or restricting its domain? Let me give an example from the computer machine to illustrate this. Suppose in a post-apocalyptic world the natives of a locality suddenly came upon a computer machine running the shell program with input ready to be inserted. Now the natives observed the machine, then gradually tried typing in from the keyboard and they saw, through various tries, every input has an associated output. Now through induction they concluded that all computer machines process (valid) all text inputs. Even though this claim in principle is true but not entirely accurate. Different shells understand different commands and have different standards of error and warnings, some machines do not have shells running but are locked with biometric scan or password, some running GUI, some just monitoring other systems. These varieties of, let's say systems and rules, are not immediately known to the native researchers but as they make more observations and experiments they will come to restrict the first rule they made, that is all computer machines process (valid) all text inputs. In this metaphor the computer system is the universe with various laws with various scope and context of existence.

No matter how scientists use their respective inquisitive research paradigm, if it is incorrect, science cannot be established, even though the incorrect but not necessarily inaccurate, interpretation may look like science to us. This is because if one talks with the universe sincerely the universe will talk back sincerely, because God has created the universe on truth and because science is supposed to give us truths about physicalism. This scientific truth in the universe and existence is what is called established science. For example, many scientific theories have been proven by different scientists. In statistical medical studies of ascertaining the efficacy of a drug or some biological processes through drug, scientists may get varying and even conflicting results even using the same statistical methods and experimental designs but it is also the case that even different statistical and experimental designs give the same result establishing a scientific theory. This shows that even if the designs are somewhat not similar still scientific truths may be revealed but even if the designs are similar no scientific truths may be revealed. This shows that scientific nature of existence is only too eager to be revealed as long as a certain level of experimental and mathematical accuracy, correctness and precision are achieved.

To ascertain the validity of the theory it must go through the following validation techniques [14] which are collectively called systematic empiricism: testable, generalizable, predictive, replicated with same results, repeated with same results, and falsifiable by mathematical, experimental or observational methods such that for example inconsistent results are produced or that results do not support the theory. Scientific theory has some features also: clarity[9], precision[10], consistency[11], continuity[12], coherence[13], existing in a model[14]. Scientific theory is established from scientific method and this means there must a relevance between facts and the theory to be established but sometimes a scientist may either fail in this due to being unable to explain his close observation or experiment or misinterpreting the close observation or experiment.

6. How Does Science Start and Evolve

How does science start and evolve, that is how scientific explanation (theory) discovered? It starts with a belief called hypothesis and through the scientific method ends up as an established theory or rejected, and this is the point when the scientist makes new hypothesis. First of all, hypothesis, also called preliminary theory, is made to explain an aspect of the natural or artificial physicalism. Hypothesis can be made from reading previous research, from using metaphor, analogy or model, or simply from one's curiosity, creativity or guesswork.

Metaphor and analogy are used all the time in science to explain things. For example, often brain and computer processor are compared to explain neuroscience, or kinetic theory of gases being explained in terms of motion of a large

9 The theory must not contain any confusion as to it's meaning of terms and how it works.

10 The theory must define an entity or phenomenon with observable or measurable parameters.

11 The theory must not fail if falsifiability is applied.

12 The theory should work continuously.

13 The theory should not contradict other established scientific theories.

14 The theory must be part of a greater scientific model i.e. architecture, phenomenon, system and/or entity.

number of infinitely small and highly elastic bodies contained in a cubical box, or Maxwell's approach to electromagnetism by analyzing an electromagnetic ether in terms of vortices along lines of magnetic force. Metaphor and analogy help scientists explain the phenomenon better through observation, experiment and mathematics. When concepts are clarified through metaphor and analogy application of established rules and logic become easy. Metaphor is used to express or create new meaning, model and concepts.

Let's take the example of Mendel father of genetics. Mendel was a Christian monk but a curious man. As he roamed around the nurseries of the religious community where he resided during the nineteenth century, he saw that his pea plants appeared to be unique from each other in various manners. Some were tall and others short. Some had green seeds, and others had yellow seeds. Mendel wondered what caused the differences he observed and decided to conduct a series of simple experiments for ten years. In a process called crossing, he mated parent plants to see what their offspring would look like." Mendel's example shows science is slow and patience is a virtue in scientific journey.

Many scientific discoveries were made accidentally as well. For example, Penicillin was an accidental discovery. Sir Alexander Fleming, a Scottish researcher, is credited with the discovery of penicillin in 1928. During that time Fleming was experimenting with the influenza virus in the Laboratory of the Inoculation Department at St. Mary's Hospital in London. Published reports credit Fleming as saying: "One sometimes finds what one is not looking for. When I woke up just after dawn on Sept. 28, 1928, I certainly didn't plan to revolutionize all medicine by discovering the world's first antibiotic, or bacteria killer. But I guess that was exactly what I did." There is no doubt that human efforts are many a times rewarded by God and some rewards are more than what was struggled towards.

The journey of science is headed towards finding basic principles that can describe all of physical existence. This is called the reductionist paradigm. Reductionism means reducing complex things into simple principle foundational parts. Reductionism can be semantic, scientific, mathematical and normative. Semantic reductionism states that every proposition can be reduced to logical construct upon terms. Take for example the concept of biological antibody which even though is not possible to be reduced physically, there are many ways it can exist and work, but nonetheless can be reduced semantically because in principle it is something which does something fixed, that is it counteracts specific antigens. Scientific reductionism tries to bridge gaps among theories of science. It tries to explain how theories are connected on some low-level principles. These low-level principles can be called atomic principles. Atomism that is most basic physical constituents need to be totally universal but may be atomic depending on context of physical ontology and level of ontological activity. Such as atomic constituent of psychology or neuroscience.

Reductionism thus proposes that these atomic scientific constituents can explain all of science or branches of science and the intertheoretical relationship across all or many scientific domains. For example, the atomic theory in physics and chemistry acts as a low-level principle which defines many established theories of both biology and physics for example. Take example of the heredity theory of evolutionary biology which is dependent on chromosomes which are made of genes which are made of DNA and which is made of molecules and proteins and which are made of atoms. This atomic theory is also relevant to theories of physics such as laws of gas and thermodynamics. Think of the ideal reducibility as a sophisticated mathematical model capturing all the relevant variables of multiple theories. It can also be thought of relevant variables combining multiple theories into one theory or fewer theories.

Contrary to reductionism, emergentism suggests that many scientific theories can be separate and distinct from these low-level scientific constituents because these high level emergentism are ontology in themselves and cannot be explained by the low-level constituents [15]. For example, even though some parts of psychology can be explained by reductionist genetic theory, but some other parts still cannot be explained by genetics, rather needing sociological and the individual perspectives. It is fair to say both reductionism and emergentism are needed in science and choosing only one may not be fair for the journey of science. Unifying both reductionism and emergentism scientific explanations can be further enhanced by integrating and/or compartmentalizing many theories of science, for example, the micro and macro perspectives of particles can propose a better explanation of the universe.

7. Pseudoscience

Pseudoscience simply is not science because it is a collection of beliefs or practices mistakenly regarded as being based on scientific method that means it is neither verifiable nor falsifiable, but pseudoscientific claims may be true but not scientifically established that is neither by close observation, experiment or mathematics on the basis of scientific method.

There are three facts that have been established in regard to species and cells: a) Genes can pass either through inheritance (vertical) or transference without inheritance (horizontal) b) Mutation can occur and c) Genetic similarity among species. Now from these facts arise pseudoscience of single/multi ancestor theory, drastic speciation i.e. macroevolution [16] and natural selection, neither of these have been verified or falsified.

7.1. LUCA

It was thought all of us began or evolved from a single ancestor from the start of life on earth but now the hypothesis has changed that is life actually could have started from many cells but eventually our current species, that all current living species have a single ancestor, which is called last universal common ancestor (LUCA). No fossil of the LUCA

exists, so accurate genetic study is impossible. Even if LUCA is a fact (i.e. verified) then still, macroevolution cannot established. It may have been LUCA creating multiple cells through mitosis and these cells went on becoming unique species in their own rights without evolving into new distinct species. There are two established ways of genes transfer: vertical which is genetic inheritance, and horizontal which is from organism to organism without inheritance. DNA similarity among animals on earth may be due to this horizontal gene transfer to achieve fine tuning for all species to survive earth. Science is not certain whether horizontal or vertical genes transfer is the reason for genetic similarity among species. Biochemical similarities could have been achieved due to various environmental factors such as temperature, food, pollutants, population density, mechanical and physical affects, and parasites. None of these have been verified.

7.2. Macroevolution

What is meant by changes is the architecture of the new species must be drastically different from its ancestor. Darwin's Finches do not satisfy this as those bird categories are no more dissimilar in looks than various human ethnicities are in relation to each other. Even though speciation may cause small changes as with Darwin Finches but to think that from single ancestor monkey, pig, bird, octopus etc. drastically differing animal architectures produced is non-sense. In other words, Darwin's finches do not verify macroevolution [17][18]. Look at the lost tribes which have existed in the jungles for centuries isolated from the rest of the mankind. These uncontacted people are communities or groups of indigenous peoples living without sustained contact to neighboring communities and the world community. The Sentinelese people's language is markedly different from other languages on the Andamans, which suggests that they isolated for thousands of years but they look similar to the rest of the mankind and did not turn into a new form of species. However, their immunity might not have evolved as much which just suggests only microevolution within a identical looking architecture is only probable. This shows that mankind and species in general are resistant to macroevolution. Well, this specific example falsifies the macroevolution theory which can make macroevolution scientific rather than pseudoscientific.

7.3. Natural Selection

Natural selection is a "fill the gap" hypothesis of pseudoscience and this can neither be verifiable nor falsifiable [19]. Even though DNA sequencing is not random but inherited traits are randomly produced through genetic processes such as selection, replication, recombination and others from the gene pool of the parents of the said species. Atheism fills the vacuums of randomness by the hypothesis of natural selection, which Dawkins calls the invisible force. Some scientists reject natural selection as the only mechanism of evolution but proposes other theories such as hypothesis of random drift. Now the question arises how you differentiate between natural selection and random drift, because as Beatty suggests random drift cannot be distinguished conceptually from natural selection [19]. Also, Millstein argues that when the two concepts are conceived as processes rather than outcomes, they can be distinguished from one another [20]. This means as they are not process, they cannot be called scientific truths.

Consider the fact that adaptation as proposed by natural selection does not happen always because for example it is believed that a bird's feathers evolved to assist in thermoregulation, but they are now used for a different function: flight. Another example is long, thick, chisel-like beaks of woodpeckers that are adapted for drilling wood and chipping away tree bark, enabling woodpeckers to feed on insects and tree sap but a bee sting will cause a bee's own death or that moth will directly fly into fire thinking it as light. Much of evolution, Gould and Lewontin claim, may not be adaptive after all [21]. Also consider that life is a hierarchy of genes, cells, organs, organisms, species, population and higher levels. On which level natural selection works? If natural selection was empirically and/or mathematically established, it's level or levels of activity could have been identified but as it is not, natural selection cannot be verified. This inability in part also arises because the relevant variables involved in the architecture and/or process and/or law of natural selection cannot be identified, as either the architecture, process or law associated with natural selection which are needed for verification or falsification cannot be known. So, Darwin's natural selection theory which stands on three principles: struggle for survival among organisms i.e. survival of the fittest, heritable traits from parents to and adaptable traits, are just pseudoscience and a philosophical way to explain nature and species.

7.4. Adam and Eve

The Islamic story of Adam and Eve could be also called pseudoscience when you use scientific analogy to describe it. For example as Adam was created from the soil and water of earth (which cannot be verified) then it could have been a horizontal gene transfer that caused mankind to have genetic similarity with many other species, and as Eve was created from Adam (which also cannot be verified), then it could have been similar to mitosis/meiosis where one cell creates two new cells and that the male XY chromosome/XXY chromosome [15] is duplicated to create two female X chromosomes in Eve, but the opposite, that is XY chromosome needed to create male from female (only has X chromosome) could not be biologically possible. This is the pseudoscientific way of seeing the story of Adam and Eve. Even if through induction it is verified that human can be created from soil and water in principle or woman can be

15 Even though at this stage of our microevolution this XXY chromosome is termed as a reproductive disease called Klinefelter syndrome but in the first man when microevolution was nonexistent and who was not conceived, this syndrome could not have existed.

created from man for example through cloning, still DNA or some deeper level of biochemical sample would be needed, which has not been discovered, from Adam and Eve to prove these claims in regard to them, otherwise it would just remain possibility or even highly probable events, of course in the scientific sense.

8. Morality and Science

Science cannot ascertain moral truths i.e. what should be morally followed and what is good and bad, but it can only help us understand morality by consequences of scientifically analyzable beliefs and acts. If God did not reveal His religion - and this is impossible as God only holds us accountable only after humans are told what to do and warned about what not to do – humans still could have used science to adopt or reject some of the moral norms, rather than establishing moral truths. Some of these norms are prohibition of smoking, alcohol, nudity and adoption of patriarchy and marriage. These moral norms could have been scientifically judged as to the consequences they create either probabilistically or with certainty, rather than science judging these moral norms as good and bad, because for some still it is up to humans, and for others to God to consider the standard of good and bad. The Aztecs considered human sacrifice as divine even though evolutionarily it is harmful as it destroys reproductive organism and therefore the opportunity and source of passing of genes, or our secular society on many occasions consider alcohol drink a necessity even though, according to science, no amount of alcohol is safe. Sciences such as biology, chemistry, sociology, psychology and others thus could have been used to understand the wisdom and science behind certain morals.

9. Conclusion

Science can be defined from two perspectives: perspective of "identity and service" and perspective of "doing science". The perspective of identity and service defines science as what is it and how does it help. Science in the first sense can be defined as Pursuit of facts related to natural physicalism and artificial physicalism such as those created as result of human activity such as society, economy, politics, psychology etc. Physicalism is the spatio-temporal material existence. Science realm has three main ontologies: architecture, law and process, and three properties: regularity, recurrence and symmetry. For a natural or artificial entity science explains any or all of laws (what), causality (why), process (how) which has underlying properties of regularity, recurrence and/or symmetry through close observation, experiment and mathematics, and this is the “how to do science” part in the form of the scientific method. It was pioneered by the great Islamic scholar and scientists Ibn Haytham.

Ibn al-Haytham developed rigorous experimental methods of controlled scientific testing in order to verify theoretical hypotheses and substantiate inductive conjectures. Ibn al-Haytham’s scientific method was very similar to the modern scientific method and consisted of a repeating cycle of observation (O), hypothesis (H), experimentation (E), and the need for independent verification (C) of the problem/hypothesis (P), so in short the scientific method is POHEC. Science starts with a belief called hypothesis and through the scientific method ends up as an established theory or rejected, and this is the point when the scientist makes new hypothesis. The journey of science is headed towards finding basic principles that can describe all of physical existence. This is called the reductionist paradigm.

Contrary to reductionism, emergentism suggests that many scientific theories can be separate and distinct from these low-level scientific constituents because these high level emergentism are ontology in themselves and cannot be explained by the low-level constituents. For example, even though some parts of psychology can be explained by reductionist genetic theory, but some other parts still cannot be explained by genetics, rather needing sociological and the individual perspectives. It is fair to say both reductionism and emergentism are needed in science and choosing only one may not be fair for the journey of science. Unifying both reductionism and emergentism scientific explanations can be enhanced further by integrating and/or compartmentalizing many theories of science, for example, the micro and macro perspectives of particles a better explanation of the universe can be proposed.

Pseudoscience simply is not science because it is a collection of beliefs or practices mistakenly regarded as being based on scientific method, but even though pseudoscientific claims may be true but not scientifically established that is neither by close observation, experiment or mathematics on the basis of scientific method [22].

Science cannot ascertain moral truths i.e. what should be morally followed and what is good and bad, but it can only help us understand morality by consequences of scientifically analyzable beliefs and acts.

The future of scientific understanding and it’s philosophy rest on delimitating the proper scope and reach of science. Towards this end philosophers and scientists should collaborate and update themselves in their latest discoveries and arguments so that through proper synchronization an agreement on this matter is reached. Neither religious bias nor scientific bias should be adopted.

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