

Intelligence in Matter

It investigates the intelligence present in matter at the atomic and molecular level.

Complexities of nature

Marvels of nature surround us. The dizzying array of complex inorganic and organic matter that we run across during every moment of our life is to say the least, extraordinary. We ourselves are at the pinnacle of the miracle called life. The complex genetic code present in our DNA which has resulted in the human form has quite simply magical powers. Yet at the bottom of this incredible magic is logic and rationality, which though not completely understood, will be revealed in the near future through genome sequencing. The genome and its dance of life, a closely guarded secret of mother nature, is revealing its astonishing powers as science slowly but surely unravels the layers of veil that mother nature adorns.

Yet all these intricacies of nature were deciphered and decoded through the logic of science during the last couple of hundred years. The ancients tried their hand at revealing the secrets of nature but they were woefully ill equipped to make a dent on the facade of nature. So they solved the Causality Principle i.e. Cause therefore Effect, by simply postulating a God that had the power to create all the complexities of nature. But Science logically and rationally explained these intricacies that surround us without a supernatural being. The Atomic Theory was fundamental in breaking the first veil of nature. Just as buildings are built brick by brick, so too is matter built out of atoms and molecules which are essentially nature's bricks. The cement used to bind one brick to another is indeed the atomic and molecular forces created by the electrons in their orbit around the nucleus. Chemistry and Biochemistry explains these electrical forces in detail

Intelligence

Thus we can compare atoms to bricks and electrical forces to cement in order to create the dizzying array of complex structures present in nature. But there is one more essential ingredient, which has been a stumbling block, to complete the building and that ingredient is *Intelligence*. In order to construct a building one uses the services of an architect who explicitly designs the building stating how and where each brick should fall. But what is the equivalent of an architect or intelligence for designing the multitudes of intricacies present in nature? God has been the answer for eons. Through millenniums God was considered the supreme architect and He was predicated as the intelligence behind all His creations. Through His divine intervention and through his supreme intelligence all things were made possible. But Science abhors the supernatural as an explanation since it violates logic and rationality. Then what is the rational or scientific explanation for the intelligence which is guiding the atoms to create these exceptional organisms that are found in nature?

If a Supreme Being or equivalently an *external* intelligence is ruled out then the only other alternative is an *internal* intelligence. Internal intelligence, to emphasize, is a critical and crucial aspect of taking a scientific path to a problem that has persisted for centuries. Internal intelligence or alternately the topic under discussion: "Intelligence in Matter", is a fundamental concept and a pre-requisite to understand the creation of intelligent life without divine intervention.

But what is intelligence in matter? Indeed we are talking of intelligence at the atomic or molecular level. We all recognize complex intelligence present in organisms at the macro level. Human intelligence, for instance, is deciphered through IQ tests or excellence in ones

academic career. In apes and chimpanzees one sees intelligence in their construction of tools from twigs or stones. Likewise simpler life forms use their rudimentary intelligence to avoid predators or to seek food. But what is atomic intelligence? How do we define it and how do we measure it?

Atomic Intelligence

A definition of atomic intelligence can be: The non-random behavior of particles. A measure of random behavior is Entropy hence alternatively atomic intelligence can be defined as inversely proportional to the entropy of a system. The higher the entropy of a system the more random is its behavior and hence less is its intrinsic internal intelligence. The lower the entropy less is the random behavior which is equivalent to molecular formation in the case of an atom. Hence the ability of an element A to form molecules or compounds with other elements is a measure of atom A's intelligence.

Using the above definition we can compare intelligent atoms to unintelligent or dumb atoms. Dumb atoms are therefore those that do not form molecules and exhibit pure random behavior. These elements are referred to as noble gases or inert gases because they do not react with other elements to form molecules. Helium (He), Neon (Ne), Argon (Ar), Krypton (Kr), Xenon (Xe) and Radon (Rn) remain as atoms not even combining with their own to form molecules such as H₂ or O₂ or Cl₂. Since they have a complete octet in their outer shell they do not have any residual forces to make them bond with other atoms to form molecules. Left to themselves they exhibit random behavior by bouncing off each other and remaining in a gaseous state. This is unintelligent behavior and these atoms can therefore be termed as dumb atoms. Compared to these atoms at the other extreme is the Carbon atom that can be termed as brilliant due to the infinite number of molecules that it can form

Apart from these noble gases all other atoms form molecules. Their ability to form molecules varies with their valence which can be anything from 1 through 7. A measure of intelligence of an atom can therefore be its valence since it gives a measure of how many other atoms it can combine with, resulting in a variety of molecules. But a better measure of an atom's intelligence is also its ability to form chains or repeated links thereby forming complex compounds. Carbon with its exceptional ability to form long chains as witnessed in the chain structure of Hydrocarbons can be termed as very "clever".

IQ of Atoms & Molecules

To put a number on the IQ of an atom is a difficult task since it should take into consideration a variety of properties such as valence, ability to bond with other atoms, strength of these bonds, ability to form chains, ambient temperature, concentration, etc. The equilibrium constant of a reaction is another factor to consider. Factors such as ambient temperature or concentration which varies geographically from one place to another or indeed from one planet to another indicates that intelligence in matter can be enhanced or suppressed depending on the environment. Hence the evolution of intelligent life in the universe is highly dependent on these enabling factors present at a particular location which either facilitates or impedes intelligence in matter. Thus even though IQ of atoms is difficult to pin down, the extremes are easy to appreciate. The noble gases display zero intelligence at one end of the scale while Carbon atoms display maximum intelligence at the other end of the scale in our Earth environment. Where the other atoms fall in this scale of intelligence is a complex equation deciphering which is not a simple task and hence there are no quick and easy answers.

Similar to the intelligence of atoms one can consider the intelligence of molecules such as proteins or enzymes or hormones. These complex molecules have specific sites where other molecules fit like a lock and key triggering chain reactions. Indeed DNA can be considered the pinnacle of molecular intelligence with its ability to code complex genetic information resulting in complex organisms.

Philosophical Implications

Thus although we have not been able to put a number on the intelligence of atoms and molecules what is pertinent in this discussion is to appreciate the existence of intelligence at the fundamental level of atoms which can be termed as internal intelligence. A measure of this intelligence is its ability to form molecules.

The existence of internal intelligence as explained above leads to the confirmation of the absence of an external intelligence or God. It is this internal intelligence that is responsible for the creation of complex matter as opposed to an external intelligence which has been prophesied since times immemorial. This is the final piece in the elusive mystery of creation that has stumped philosophers for centuries.