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Science and Scientist

Sadhu Sanga

SUBJECT AND OBJECT

by

Srila Bhakti Raksak Sridhar Dev-Goswami Maharaja



Dr. T.D. Singh: Are the objects the subject perceives also persons? When we are seeing the color red, now is red also a personality?

Srila Sridhar Maharaja: Everything has its representation in the original, personal, conscious, spiritual reality. Otherwise, there is no possibility of its being reflected into this plane as matter. First there is consciousness and then when it is in a more gross condition, it appears to be matter. In the study of ontology it is taught that when studying a particular thing, although we can know that it has certain attributes to the eye, and that it appears to the ear in a particular way, these are all appearances. Independent of appearances, the ontological aspect of a thing – what it is, the reality of a thing – is unknown and unknowable. My contention is that when consciousness is going to feel non-conscious matter it will have to pass through a conscious area to meet the material object. So the full perception of that material thing cannot but be conscious; and consciousness always indicates person. First there is conception and then the material idea.

The conscious world is very near and the material world is very far off. Therefore the great *rsis*, whose thinking is highly developed, address whatever they find within the environment as if they are all persons. In the *Vedas*, the ancient scriptural literature of India, we find that the saints and sages are always in the midst of so many persons; in the background everything is a person.

Dr. Murphey: And person means thinking, feeling, willing.

Srila Sridhar Maharaja: Thinking, feeling, willing – a living entity has three phases. And it is also the same with God and his potency. There is a subject existing first, and then his experiences. And experiences of the subtlest character come first and are given the most importance. And when the subject is coming to the more distant area to conceive of matter, that will be the farthest point from him. He will address everything by which he is surrounded with personal conceptions.

A personal conception cannot but assert that matter is far off. The direct connection of consciousness is with the shadow, the reflection of the material into the conscious world. The soul can understand that only. If matter can exist independently, then also matter has a shadow in the conscious world and the soul is concerned with that shadow.

In other words, there is the person and then the body. Just as the body is the after-effect of the conscious living agent, matter is the after-effect of spirit. Irrespective of all material consciousness, that which is in direct contact with soul is all personal. *Cidabhasa* is something like the mental substance we have within.

There are two kinds of persons, *ksara* and *aksara*: the pure liberated soul and the soul who is struggling in matter. When liberated and non-liberated persons are mixed within the world of material transactions, whether as moving or non-moving entities, or whatever their position might be, still they should be considered persons. Since everything is a unit of consciousness, everything has personal existence.

Dr. Murphey: So externally we see the Ganges as water, but in reality she is a person.

Srila Sridhar Maharaja: Everything is a person. Before we go to the material conception, we must pass through the personal conception or aspect of that thing. In Vrindavana everything is conscious, but some things are posing in a passive way. But they are all conscious: the Yamuna river, the cows, the trees, the fruit – everything is conscious, spiritual, but they pose in different ways. Being able to detect the conscious characteristic in everything, the Aryans saw all of nature as conscious and personal, and ad-



Mother Ganges

dressed everything as conscious.

Consciousness and personality are the universal basis of reality. Whatever we may experience is conscious. The reflection of a material object is within me, and the plane within me is conscious. The subject is consciousness, and whatever kind of thing the object may be, it casts its reflection into the plane of consciousness. The observer of any objective reality is involved only with consciousness from beginning to end, and can have no conception of matter apart from consciousness.

CRUMBLING PILLARS OF THEORY OF CHEMICAL EVOLUTION – PART 2 (of 2)

by

Srila Bhaktisvarupa Damodara Maharaja (T. D. Singh, Ph.D.)



It has been claimed that the so-called coacervates of Oparin [1] and the proteinoid microspheres of Fox [2] are the protocells. Let us examine what these words mean chemically. By definition, a coacervate is an aggregate of colloidal droplets held together by electrostatic charges. Coacervate formation has been observed when large molecules possessing hydrophobic and hydrophilic sites

are dissolved in water. They consist of spheres or droplets separated from the bulk solution. It is believed that coacervates are the end product of the reduction of the hydration layer surrounding colloidal particles.

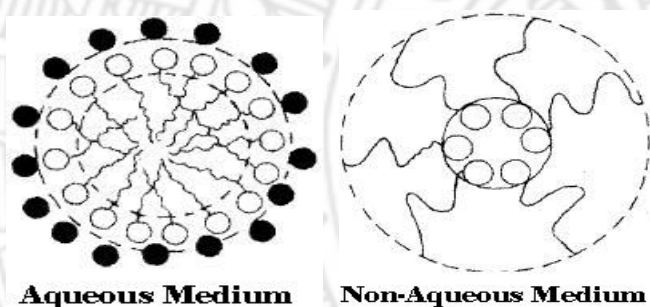
The phenomena of coacervate formation were first studied in detail by Bungenberg de Jong, [3] who demonstrated that coacervation is an effective technique for concentrating compounds of high molecular weight from aqueous solutions. The coacervate droplets are usually obtained by mixing solutions of proteins and other polymers; for example, solutions of gelatine and gum arabic, solutions of various proteins and nucleic acids, and so on. Oparin reported that in the synthesis of polyadenine in vitro in a polypeptide solution, coacervate droplets begin to separate from the bulk solution as soon as the molecules reach a certain size. [4] He further draws the conclusion that non-specific polymerization of organic compounds must have taken place in the “primeval broth,” leading to the formation of polypeptides

and polynucleotides with randomly arranged monomeric residues in their chains. These polymers might have separated in the form of coacervate droplets, thus creating isolated systems where further evolution of organic polymers might have occurred that was not possible in the solution as a whole.

Oparin suggested that as soon as the polynucleotide chain reaches a certain size, even though it has a disorderly structure, it will interact with polypeptides and other compounds in the “primeval nutrient broth” and separate out from the solution in the form of coacervates. His reasoning is that although there could not be any selection of individual nucleotide molecules when they were in simple aqueous solution, the situation is different when they separate out as coacervate droplets after interacting with polypeptides. Because of the double helical character of the two complementary chains of polynucleotides, their inclusion in coacervate droplets (or protobionts) may have had certain effects on the polymerization of the amino acids in those systems. Those arrangements of amino acids unfavorable for the increasing catalytic activity of the polypeptides would be destroyed by natural selection. In this way, the structure of the protein-like polypeptides, and also that of the polynucleotides controlling their synthesis, may gradually have become more ordered and better adapted.

This may seem promising; however, it will be clear from the following points that such concepts are purely a chemical phenomenon of molecules having long hydrophobic chain and short hy-

drophilic end, and have nothing to do with life. Coacervate formation is similar to the well known chemical process called “salting out.” For example, if the salt potassium chloride is added to a soap solution of potassium oleate, the phenomenon of coacervate formation is exhibited. The hydrocarbon chain of this soap molecule is less soluble in water. If increasing amounts of potassium chloride are added to a concentrated soap solution, two layers (phases) will form, and just before the separation of these distinct layers, oily droplets will appear. These are termed coacervates. The explanation is that the potassium chloride molecules compete with the water molecules in the potassium oleate solution, thus allowing the water molecules to separate from the hydrophobic chain of the oleate moiety. In chemical language, these droplets are commonly known as spherical micelles. In aqueous solution, the non-polar (hydrophobic) portion of the monomers reduce their contact with water and form the micellar core, while the polar (hydrophilic) portions remain in contact with water, forming roughly spherical micelles. In some non-aqueous (non-polar) solvents the reverse phenomenon is observed. The polar groups of the monomers may become solvophobic, thereby forming the cores of the micelles. These are called inverted micelles. Cylindrical or lamellar aggregates also result in highly concentrated solutions. The two types of micelles are illustrated in Figures below.



Spherical micelles

Monomers and micelles are usually in rapid dynamic equilibrium, and micelles are known to catalyze chemical reactions. Thus, one can safely conclude that Oparin’s coacervates simply exhibit the phenomena characteristic of micellar chemistry. Apart from his many “may have beens,” he is simply describing a few physical properties of inanimate matter. Fox, Oparin’s own colleague, has criticized his conjectures about these coacervates: “besides failing to answer the crucial primordial question, they are neither uniform nor stable.” [5]

Fox, on the other hand, claimed that his so called proteinoid is the “molecular missing link between pre-life and life.” [6] But, as shown below, this claim is also completely erroneous and unfounded.

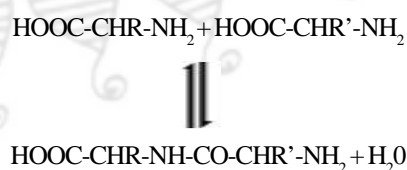
Proteinoids are formed by pyrocondensing dry amino acids. The amino acids are heated at 140^o to 180^oC for about six hours. Only a sufficient proportion of one of the acidic amino acids, aspartic and glutamic acids, or of the basic amino acid, lysine, is required. The reaction mixture is treated with hot water and, after being stirred, the water insoluble material is separated by filtration. When the filtrate cools down, the product precipitates as microscopic globules that Fox calls proteinoid microspheres. The molecular weights of the products can be as high as 20,000 when glutamic

acid is heated with glycine. The proteinoids give all the color test results common to proteins. Fox further claims that the amino acid sequences in these proteinoids are highly non-random. Proteinoids catalyze like enzymes in hydrolysis of esters, decarboxylation, amination, and deamination reactions. He also claims that these proteinoids multiply by division in a manner similar to that of living cells.

We would like to suggest that all the above properties are simply the physico-chemical properties inherent in such molecules. They have nothing to do with the characteristics of living cells. Chemically, it is expected that when a mixture of amino acids is heated at elevated temperatures, polymers will be formed. These are the peptides, and they show the properties inherent in proteins. However, Fox’s argument for the non-random sequencing of the amino acids in his reaction is quite objectionable. As a matter of fact, some of his own supporters accuse him of deception. Miller and Orgel, in this respect, remark: “...the degree of non-randomness in thermal polypeptides so far demonstrated is minute compared with the non-randomness of proteins. It is deceptive, then, to suggest that thermal polypeptides are similar to proteins in their nonrandomness.” [7]

They continue by saying: “The importance of these thermal syntheses in pre-biotic chemistry is a very controversial matter. We do not believe that they were very important because we doubt that polypeptides could have been synthesized in large quantities at the surface of the earth by thermal reactions of the kind so far demonstrated.” [8]

So many unique events and conditions have to be simultaneously fulfilled in Fox’s model of proteinoid formation that it is very doubtful whether many chemists will ever take it seriously. First of all, the temperature specified by Fox for the heating of the amino acids is very unlikely to occur on the surface of the earth. Although the temperature in some hot springs may rise to 140^o or 180^o C, such reactions are extremely improbable. Fox’s conditions require that the amino acids be in the right place and also be dry. The polymerization reaction of amino acids does not take place in the presence of water. In fact, the reverse reaction will be favored, and the polypeptides will be completely hydrolysed into amino acids under such conditions. The thermodynamic free energy of this condensation reaction is about 2.00 to 5.00 kcal/mole, which means that the reaction is very unfavorable towards the product side.



$$\Delta G = 2 - 5 \text{ kcal/mole}$$

The other possibility of temperatures as high as 140^o to 180^o C is in volcanoes. Here again, the conditions are not favorable for the

production of the polypeptides. In volcanoes the temperature of molten lava is about 1,200° C, which will completely destroy the amino acids. It should also be mentioned that ultraviolet radiation, being a very powerful source of energy, can not only create organic molecules but also destroy them – especially macromolecules such as proteins and nucleotides.

Finally, from a purely chemical point of view, Fox's proteinoids may be expected to possess some catalytic activity as general acid base catalysts according to a catalysis law of the Bronsted type. This has nothing to do with the true nature of a living cell and, therefore, with life. One can see that all these claims amount to no more than *molecular stories*. They are like taking a rope to be a serpent. Thus, from the above evidence, we can see that assumptions (2) and (3) have no valid scientific foundation.

Leslie Orgel, in a 1998 review article entitled, "The Origin of Life—a review of facts and speculations" has summarized our current state of affairs in regard to life and its origin as – "There are several tenable theories about the origin of organic material on the primitive earth, but in no case is the supporting evidence compelling. Similarly, several alternative scenarios might account

for the self-organization of a self-replicating entity from pre-biotic organic material, but all of those that are well formulated are based on hypothetical chemical synthesis that are problematic." [9]

Hence, sadly, none of the stories when rigorously scrutinized explain the observable characteristics of life. Life is, therefore, beyond molecular concepts.

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PERSONALITY IS THE ROOT OF ALL SCIENCE AND PHILOSOPHY

by

Sripad Bhakti Madhava Puri Maharaja, Ph.D.



"The great thing however is, in the show of the temporal and the transient to recognize the substance which is immanent and the eternal which is present. For the work of Reason (which is synonymous with the Idea) when considered in its own actuality, is to simultaneously enter external existence and emerge with an infinite wealth of forms, phenomena and phases – a multiplicity that envelops its essential rational kernel with a motley outer rind with which our ordinary consciousness is earliest at home. It is this rind that the Concept must penetrate before Reason can find its own inward pulse and feel it still beating even in the outward phases. But this infinite variety of circumstances which is formed in this element of externality by the light of the rational essence shining in it – all this infinite material, with its regulatory laws – is not the object of philosophy....To comprehend what is, is the task of philosophy: and what is is Reason." [1]

It is best to study Hegel as he presents himself in the context of his own writings. In this way we allow Hegel to teach us what the Science of Philosophy is, and how, through such Science, the Absolute Truth reveals or rationally unfolds itself, although this may challenge, in a radical and transformative way, the accepted ideas and methods we may currently have of philosophy and science. By taking the approach of simply following Hegel's thought in its own development, we discover in the process that we have actually re-invented Philosophy and Science in a such a totally comprehensive and systematic way that we are finally able to integrate Mind and Matter into an Absolute Whole that tran-

sends and encompasses both while yet maintaining a clear differentiation and distinction between them – a genuine unity in diversity that has been the cynosure of philosophical inquiry from time immemorial.

The task is to scientifically comprehend the ability of Reason to simultaneously hold contradictory sides, such as identity and difference or unity and diversity, within a higher unity, the Absolute or Spirit, without reductionistically collapsing their difference. The explicit process involves three stages [2]: (1) the abstract understanding of the separated sides of the contradiction, (2) the dialectical relation of the sides, which dissolves their abstract independent separate existence (negative reason), and (3) the raising of this dialectical relationship into a dynamic unity – a process Hegel calls *aufheben* or sublimation, and in his later writings – positive reason. The ability to rationally think through this process provides us with an insight into the essence of the Concept (*Begriff*), whose intrinsic dynamic is constituted by the dialectical and sublimational activity that is self-evoked by the very nature of the various aspects or moments of the Concept itself. To understand this requires a rigorously scientific or systematic treatment and sound philosophical grounding in order to follow the dialectical and sublimational movement consistently throughout the whole development of the Phenomenology, Logic, Nature and Spirit until the entire scope of Reality is taken up into a rational, systematic Whole – the Absolute Idea or Divine Personality.

The Absolute Idea in (or by) itself and for itself, freely releases itself in its totality as external to or outside of itself as Nature. This is not a logical transition but a free creation – what we may call

another perspective that is external to and thereby related to the Absolute in this externality. In the external Idea as Nature not only the Idea but each of its moments also exists outside of each other. This element of externality as an actuality or reality is space, and in its ideality is time. Each moment of this externality is a moment of the Idea in itself or implicit Idea. As such the moments appear as inherently spatial, and the being for other, difference or relation of the moments to each other again appears as spatial or outside one another. Being mutually bounded in this way constitutes the sphere of finitude. This objective or real externality as space also has its inseparable subjective or ideal externality as time. In this sense bodies do not exist in space and time but as spatial and temporal by their very nature.

Therefore Hegel's concept of Nature cannot be considered pantheistic. Hegel considers the Absolute Idea in its "otherness" to be Nature. [3] A clear distinction exists between the Absolute Idea in and for itself, which Hegel describes as "God before the creation of the world and finite spirit," [4] and the external Idea in itself as Nature. This latter is the sphere of finitude as explained above. But the Idea in itself has to become for itself and thus breaks through the bond of Nature to rise to the sphere of Spirit, which characterizes the return to the Idea that is for itself out of its immersion in external otherness. For Hegel, Nature and Spirit make up what is called the *realphilosophie*. The final stages of the development in *realphilosophie* end in Art, Philosophy and Religion that closes the circle, so that finite spirit returns to the Absolute Idea in and for itself or God. Finding itself at home with itself in its self-determination or Freedom is more or less the point at which Hegel's philosophy ends. The life of the liberated spirit within the Absolute is not discussed or known by him. For this we must go to the vaisnava literature on *rasa* and *lila* that takes one beyond liberation or freedom to the platform of Divine Love. Why is personality ultimately involved here? One may gain an intuitive grasp of this simply by becoming conscious of the fact that everyone – scientist, philosopher, etc. – is fundamentally a thinking being – a specific personality. Whatever conceptions one may have of their own origins – be it from atoms, molecules, angels, space-time warps, strings, one celled organisms, etc. – the fundamental fact remains that there is a thinking being at the foundation of all such conceptions. The idea that the world consists of atoms, molecules, etc. is ultimately conceived of and developed by scientific or philosophic personalities. Thus they are originally concepts. Later we may come to learn about these concepts and theories as if they are the given facts of nature, and accept them in that way. But the truth is that they are preceded by a lengthy historical development of thought before they are ever assumed as given facts of nature and, most importantly, they all have their ultimate origination in a thinking being – or personality, which much exist *pari passu* along with any and all kinds of experience. Then what comes first? Is it the thinking persons or the atoms that such persons think they are originated from? It is in scientifically comprehending the answer to this question that the whole of Hegelian philosophy has to be understood.

Although it seems to have been well-known shortly after Hegel's death (see for example Cunningham's "Thought and Reality" [5] or Caird's "Hegel" [6]), for scholars of our own time, with a few exceptions, it has not been widely recognized that Hegel's philosophy is the essential affirmation of the personal nature of the

Absolute Truth, although he clearly affirms this throughout his writings. [7] I think there are a few major reasons for this.

(1) Hegel, himself, directly explains that his purpose is to present philosophy in a strictly scientific form, and that this must be done in terms of concepts. Thus 'Subject' is preferred to 'God' which is more a name of the Absolute than a concept. [8] Personality is such a concrete concept that it is really only to be invoked at the conclusion of Science, for, as we have indicated, it is also where the whole of Science comes from – therefore it is both the origin and conclusion. Consequently Hegel claims that genuine philosophy is a circle of circles.



Hegel

(2) Another reason is that in our modern age there is a persistent prejudice toward impersonalism when it comes to understanding truth that is objective to us, i.e. the prejudice that the Absolute must be Substance rather than Subject. If Spinoza shocked the age in which he proclaimed that the Absolute was Substance, it has now become common place in our time, and it is Hegel who now shocks the world with the scientific conclusion that the Absolute is Subject [9] and Personality.

Even when we hear the word "subject" we are unwilling to think in terms of personality and would rather think of it in some abstract way. This is correct as far as abstract Science is concerned with concepts, but we must understand that there is also a Reality or Actuality involved. There is certainly a logical difference in meaning between Subject and Personality in keeping with these terms as Hegel develops them, but just as Subject does not exclude its Substantial Reality, so too does the concept of Personality necessarily, and perhaps in a way more easily conceived, include its reality. Thus, for example, we call a person 'brave' only if they have manifested an act of, say, saving someone's life, so that personality is not only something subjective but is integrally connected with its manifestation or actuality. In this way it is only with the inclusion of Actuality and Ideality in the wholesome consideration of the Absolute in its Spiritual Reality that leads us to the comprehension of Truth as Divine Personality or God.

(3) We have not known or been taught how to scientifically deal with a Reality that is personal. Modern science, especially, has been developed only in terms of a merely physical nature, the attempt having been made to reduce even life to purely chemical and molecular factors via objective evolutionary theories. Everything from the origin of the universe to the origin of human society has been based on such evolutionary thinking from some primitive state or substance to the presently observed world. Recent scientific revolutions of the twentieth century, however, have called all of that into question. The organismic conception of life turns the table around and has the organism as a whole determining the parts, and this is becoming the ruling paradigm in the physics of field theory and quantum theory as much as biology and certainly ecology.

(4) The Judeo-Christian heritage from which modern science arose

in the West seems to put the Personal feature of the Absolute Truth outside the system of Nature and the world in general. This may certainly be correct as regards material nature but the situation is more complex than that. In order to fully comprehend the relation between God and World requires a careful understanding of the Concept in its integral and differential moments, where distinct difference and unity both play a role. This is the domain of scientific philosophy as Hegel developed it. The principle of identity in difference or identity of identity and difference that forms the basis of rational thought, distinct from abstract understanding, requires a comprehension of God as both transcendent and immanent with respect to His creation and creatures.

Thus, for instance, Hegel shows that Thought as Absolute Objectivity in and for itself, overarches subjective thought and its opposing objective matter, and are dialectically connected in a process of dynamically canceling and producing one another. It is this dialectical movement of thought at the subjective-objective oppositional level of reality that, when conceived as a unitary organic whole, rises to the level of an overarching Concept that is intimately and dynamically tied up with its various moments or parts yet distinct from them. This same organic structure, according to its content, is found throughout the whole of Reality, be it God, Idea, Concept, or the relation of Spirit to Logic and Nature.

(5) The idea of a majestic unity overarching a servile multiplicity brings the fear of a bygone era of authoritarian hierarchies, a concept that springs from an abstract, static understanding of unity as opposed to multiplicity. The rational principle of the identity of unity and multiplicity dispels that fear as irrational for a society that has risen to the platform of Science. As Hegel writes, "...in the Idea infinity is genuine; individuality as such is

nothing and simply one with absolute ethical majesty – for which genuine, living, non-servile oneness is the only true ethical life of the individual.”[10] Here “individuality as such” means individuality conceived as an independently subsisting unit held in abstract opposition to the universal. It is this abstraction of individuality that is dissolved or nothing, whereas genuine individuality has a “true ethical life”. Without comprehending the principle of identity in difference through which Hegel devel-

ops his philosophy, it is very easy to mistaken certain excerpts from his writings as abstract monism.

When we think in this way it seems rationally unavoidable that personality must be the conclusion of any science or philosophy because, as we have mentioned above, the rational thinking of a person is already involved at the root of all science and philosophy. To ignore thinking being that originates science is to fail to comprehend what the original object of scientific philosophical endeavor was in the first place – to understand the origin of one’s self. This insight proves to be of essential importance in grasping the standpoint from which Hegel’s system is developed. In other words, the knower is the essential unity of knowledge and the known. In this sense it is similar to the Kantian unity of apperception of the “I” but Hegel presents it in a more consistent and scientifically developed form.

If we try to comprehend Hegel without taking this basic perspective into consideration we will have missed the most important contribution of his whole philosophy to the modern world. For it is a perspective that does not ask us to abandon any of the great achievements of science that we have already gained, but to expand upon them and integrate them in dimensions that a merely substantial or physically based science could never comprehend.

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7. Hegel, G.W.F., *Hegel's Science of Logic*, translated by Miller, A.V., Humanities Press Intl., p. 824 (1990) “The absolute Idea, as the rational Concept that in its reality meets only with itself, is by virtue of this immediacy of its objective identity, on the one hand the return to life; but it has no less sublated this form of its immediacy, and contains within itself the highest degree of opposition. The Concept is not merely soul but free subjective Concept that is for itself and therefore possesses personality – the practical, objective Concept determined in and for itself which, as person, is impenetrable atomic individuality, but explicitly universality and cognition, and in its other has its own objectivity for its object. All else is error, confusion, opinion, endeavor, caprice and transitoriness; the absolute Idea alone is being, imperishable life, self-knowing truth, and is all truth. It is the sole subject matter and content of Philosophy.”
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“Not once in the dim past,
but continuously
by conscious mind
is the miracle of the
Creation wrought.”

—Arthur Eddington

Sir Arthur Eddington, Scientist-Philosopher