



WITNESSING AWARENESS: NATURE OF CREATIVITY

by

George Sudarshan  
Professor of Physics  
University of Texas  
Austin, Texas USA

The Twentieth International Conference on the Unity of the Sciences  
Seoul, Korea August 21-26, 1995

© 1995, International Conference on the Unity of the Sciences

# Witnessing Awareness: Nature of Creativity

E.C.G. Sudarshan<sup>1</sup>

Physics Department and Center for Particle Theory

University of Texas at Austin

Austin, Texas 78712-1081 USA

e-mail: sudarshan@utaphy.ph.utexas.edu

## Abstract

The question of the nature of scientific creativity is investigated in relation to the involvement of the discoverer; the role of non-algorithmic mental processing is highlighted. Direct sense perception and logical ordering are steps; so is nonverbal nonsequential mental processing. Even after the creative insight has been gained there is a process of transcribing the inner vision into standard concepts, symbols and sentences. In as much as creativity cannot function without stimulation from external stimuli one often thinks of these as the antecedents and bridge between the realm of creativity and the observation of the external world; but no insight, no creation is common scientific knowledge until the bridge between the inner vision and the expressed discovery is crossed. This bridge is the transducer between the inner vision and the spoken word, the mediation.

Some common features of creative insight are also discussed. These include the unexpected feeling of familiarity with the new vision. It

---

<sup>1</sup>Paper presented at Session IV; Science, Nature and the Sacred at the Twentieth International Conference on the Unity of the Sciences, ICUS XX, August 21-27, 1995, Seoul, Korea

was as if one had all along known what has just been discovered. This is so strong that the past is erased: one cannot imagine a time when one did not know! Second, often this discovery comes after the standard paths have been tried and exhausted. Two legends, one from Mahābhārata and one from Gospels, allegorically pertaining to this circumstance are recounted in the text.

Where is the observer's individual mind in such creative events? The mind is essential as the bridge between the sense perceptions or interpersonal communications and the "seer;" and also for the processor between the inner vision and communicable thought chains or logical processes. Yet it is not the logical mind which is the "seer." What is the role of the mind and the modality of awareness in creativity?

It is pointed out that the awareness functions in the "witness" mode, present but not acting. The nonlogical conviction that the insight is complete, the joy that finds at the moment of the vision, the feeling of oneness, of belonging and of timelessness — all these suggest that the witnessing mode of awareness is distinct from the individuated ego awareness. Such witnessing awareness is everpresent but we are conscious of it only at times: and these are the joyous extended moments of creativity.

## 1 Introduction

Scientific discoveries and science-based inventions have amazed us and enabled us to extend our abilities enormously. We fly in the air, travel over

and under water, communicate to far distances and peer into the very small and the very far. We feel confident about the structure of molecules and atoms and we can synthesize complex pharmaceuticals. The multitude of such discoveries is fascinating: and it is amazing that the more we discover the more there is yet to discover.

The physical sciences deal with the external non-sentient world. This includes the study of heavenly bodies as well as the tides in the sea and the study of rocks and plates in the earth's crust. It spans wide timescales: from the ticks of a pendulum and the days of a month and seasons of a year to geological ages and the timescales for cosmological evolution. It deals with the differing motions of pebbles and bubbles in a pond. It deals both with concrete matter as well as with sound waves and light waves, the forces of gravity and electromagnetism. It deals with the constitution of matter and the foundations of chemical activity. With the advent of relativity and the quantum theory our ideas of space and time and the very nature of microphysical reality themselves have been altered.

Physical science deals with open systems in thermodynamics, but life sciences deal with such systems exclusively. Open systems exhibiting functional integrity and reproductive invariance are the models of life sciences. The electrochemical regulation and templating of information are characteristic ingredients. Biological systems are generally complex systems which are open to surroundings but retain their integrity. In the more complex systems there seem to emerge learned and purposive behavior; and eventually one finds it appropriate to consider them sentient. They also seem to evolve

in the course of time. The variety, the adaptation strategies, the regulatory mechanisms are all topics of study in life sciences. The interaction of life forms and the strategies for symbiosis on one hand and predator-prey organization on the other: the differentiation of sexes and sexual versus asexual reproduction are fascinating areas.

## 2 Cognitive Sciences: Algorithms and Beyond

Cognitive sciences emphasize sentience: its manifestations and processes. The path from sense perceptions to mental processing could be seen as a two-way pathway from the concrete stimuli to abstract forms. The processing at the cognitive level may be most easily seen in terms of a disciplined sequence of operations, an algorithm. Algorithms become secondary skills that can be used again and again; and most of cognitive processing is algorithmic. The recognition of patterns is a higher order processing; and increases the power of comprehension and coping. But is all processing algorithmic? In particular, are recognition, insight and discovery algorithmic? Is creativity a proper topic for study in cognitive science?

But even apart from the content of the discoveries themselves it is fascinating to investigate the modality of the discovery: how does one create new structures from the data available? How does one connect together known facts and discover a new but essential relationship between them? Is the result already there and we happen to come across it, or do we create the result? If the result is a logical consequence how come no logical mind pre-

viously did not make the connection? If it is not a logical consequence, how can a logical mind discover it? These are important questions. In this paper we would like to highlight the “witnessing awareness” which is present at moments of creativity; and to outline the anatomy of discovery.

Logical ordering process and direct sense perception are steps in scientific research. Sometimes it is possible to substitute other people’s observations or logical arguments for one’s own. After all connections are recognized and organized there still remain some loose ends, some unconnected chains. Logical thinking by itself has done its best. We need a non-algorithmic non-verbal processing. When it “happens” the previously unconnected becomes connected. When this connection is cognized then the creative act has taken place.

It is still legitimate to ask certain questions: Do scientists *create* science or do they *discover* science? Is there a logical sequence of steps which lead to new knowledge? If so, could it be entrusted to artificial intelligence to make the discoveries?

Closely related are the questions of the possible *limitations* of science and what, if any, subjects are *outside the purview* of science. We could also enquire whether the *sādhaka* (the “enquirer”) is a part of the system or is he/she outside it?

A question that maybe raised is about the role of the scientist: are discoveries *created* or *cognized*? It is our experience that however long the path to a creative insight, what is cognized has an uncanny familiarity. Cognition is almost as if it were re-cognition! But the *familiarity* is *subsequent to the*

*discovery* not prior to it.

In this paper the account by necessity is personal. I am a theoretical physicist most of whose life has been spent in the practice of this discipline. I use mathematical tools to construct physical models of the universe which abstract and generalize from concrete physical situations. These abstract physical models and physical concepts are central to my discipline. The search is for the *integrity* of the *experienced* universe. The variety and richness of experience must yet find reconciliation in a natural unity: one manifesting as many and many without losing their richness merging into one. This search provides often the vision of the extraordinary in the ordinary phenomena.

In a serious scientific pursuit one does not always choose the specific problem to be solved. It often happens that certain problems “get under your skin” and will not go away until they are resolved. The logical and systematic method is the one to be employed in the first instance. There are systematic methods developed in our collective experience of similar problems in the past: it is most efficient to try these *algorithmic methods*. Often this leads to progress. When the solution is reached it is a steady progress in *time* and the *logical steps* can be *retraced* from the solution to the starting point.

### 3 The Anatomy of Insight

But this does not always obtain. The logical, algorithmic march to progress comes to a stop at a certain stage with no indication of the direction in which progress is to be made. One tries in many ways to advance but gets frustrated, dispirited and exhausted. All resources are exhausted

and the problem defies solution. There is utter darkness. Then the miracle happens: the solution appears of its own and comes to you and sits in your lap. You *recognize* it as the complete solution. It is so familiar to you that you cannot imagine why you thought this was any difficult problem to be solved.

But this also means that you have no logical steps that led to the solution. There is no algorithm by which the solution was obtained. There are no histories of the process of discovery. Ignorance is banished; it was as if the knowledge were always there.

Even the very time sequence of data stimulation — enquiry — solution is lost. Not only is the future altered, but the past is altered.

Once the insight is gained, the discovery made, the connection established there is the task of bringing that discovery into common parlance. For this we must not only have the insight but must contemplate it until it becomes indelible and then learn to transcribe it into conventional symbols and language, and finally allow the public expression so that it becomes common intellectual property. This process of the “unspeakable” act of creation, the visualization, the transcription into common symbols and the explicit outward expression are distinct but essential steps to creation. Indian philosophic tradition calls them *para* (transcendent), *paśyanti* (envisioned), *madhyama* (transducted) and *vykharī* (uttered). But whatever they are called they are the outward bound half of creative research. This is contrasted with the inward bound half: consisting of background work (*adyayana*), algorithmic mental processing (*manana*) and contemplation (*dhyāna*).



Having had an insight, it does not necessarily follow that one can articulate it. In that case the creation is incomplete.

## 4 Two Legends — sa mahātma sudurlabha

The struggle, frustration, surrender and insight are well illustrated in the dance-drama *kirātarjunīyam*, the story of how Arjuna went to Kailāsa mountain to meditate on Śiva to ask for the boon of the powerful gift of *pāśupata*. No Śiva appears but a hunter of gruff and displeasing demeanor arrives on the scene who seems least bothered by Arjuna's entreaties, and demands that Arjuna to leave him alone. Words lead to threats and to a duel: but try as Arjuna does, he cannot defeat the hunter. Instead, the hunter gets Arjuna thrown on the ground on his back, too tired even to close his eyelids to shut out the world in his shame. It is thus that he comes to see the matted hair of the hunter adorned with the crescent moon: and Arjuna, recognizes the hunter to be none other than Śiva himself. He wins Śiva's blessing and the mighty *pāśupata*.

The insistence on fitting incidents of insight into a casual-chronological framework and its inappropriateness is illustrated in a gospel story from the life of Jesus. One day Jesus saw a blind beggar at the market place and, in response to a question from his disciples, decided to cure the man of his blindness. Jesus spat on the earth, made some mud which he applied to the blind man's eyelids, and then asked him to wash them in a nearby pond. He did and regained his eyesight. After repeated questioning about the steps in the miracle cure the exasperated blind man had to tell his interrogators: I

was born blind and you have seen me blind all these years. Now I can see. That is all you need to know! All histories of insight are fictitious.

Could it be that the mind (or the brain?) was working furiously at a subconscious or unconscious level and developing *logical connections* which are *hidden* from us? Is it that since we are unaware of these hidden connections we see it as without a historical sequence? In what way could we assert that the *texture* in such insights different from the logical, sequential discovery? These are legitimate questions; and there are people who would like to restore causality to this realm by introducing hidden causes and unconscious mental processes. The framework of Freudian psychoanalysis with its role in therapy, explanation of wit and humor and in the psychoanalytic reinterpretation of literature come to our recall.

It seems to me that there are some characteristic differences of the two kinds of discoveries. (1) The *witnessing awareness* (*sākṣi bhāva*) in which the ego is absent. (2) The total *familiarity* with the discovered insight. (3) The non-logical *conviction* that the discovery is *complete*, so much so that the *past* where the insight was not there *is erased* from your mind. (4) Most important of all, the sense of *joy* (not pride) and *oneness, humility* and *timelessness*. For a logical chronological discovery on the other hand, the ego is present and justifiably proud of a job well done; and one can trace the sequential steps to the discovery.

In days of old, it was the generally held view that the earth was the center with the heavens as concentric crystal spheres. This Ptolemaic *geocentric* system was convenient and appeared natural. The close observations of the

motion of the heavenly bodies showed that while they moved in the same direction, rising in the east and setting in the west, there was a series of complicated motions with some retrograde motions along the way; these orbits were epicycles. It was postulated in the Coperincan *heliocentric* system that all the bodies *including the earth* moved around an almost fixed sun. It was soon shown by Kepler that the planetary orbits around the sun were confocal ellipses and that the sun-planet line sweeps out equal areas in equal times. Kepler's three laws of planetary motion were much simpler than the epicycles of the geocentric sytem; and, in turn, led to Newton's discovery of the law of universal gravitation. This is a different world view in which the earth is deposed from a preeminent position and beomes just another planet. Anomalies and retrograde motions dissolve in the heliocentric system; and the epicycle is an elliptical orbit around the sun as seen from the earth which itself is pursuing an elliptical orbit.

But this view took time to get general acceptance. Galileo had to stand trial for this heretical view. People continued to use the geocentric system and talked about the sun and other planets rising and setting rather than think of it as the earth rotating around an axis daily. But now when we do this we are aware of the heliocentric system which brings about clarity and simplification; and use the geocentric system for everyday use.

## 5 Witnessing Awareness (sākṣhibhāva)

Science as sākṣi bhāva removes the egocentric universe in which the individual person is making the discovery; and installs the principle of knowledges

itself, the Self as the fiducial entity. We may refer to it as the Self-centered universe. In this, the role of the individual is as a witnessing awareness, very much in the spirit of the felicitous symbol of the two birds in harmony with Mundāka Upaniṣad “dvā suparṇa sayū sakhāya ...”. (Two birds allied in friendship sitting on two branches of the same tree; one eats the sweet and bitter fruits while the other merely looks on.) The witnessing awareness, the onlooker bird, is the cognizer, and the individual rises to that level. There is no longer the fragmentation of awareness into a separated individual mind. This higher level of awareness may be called the Self or the Lord or the God as one’s personal preferences go. St. Paul would like to say that Saul is dead according to Law, but Christ speaks through Paul. Rāmānuja and other theists would invoke the functioning of grace, *Śri*, in insight. Sankara would identify the Self as the principle of knowledge as described so eloquently in *Dakṣiṇāmūrti* stotra in the two stanzas beginning “viśvam darpaṇamāna nagaritulyam ...” and “bijasyāmkuri prāṅg nirvikalpo punar ...” respectively. (The world like a city seen reflected in a mirror is perceived as if it were outside; this is nescience. When reality is cognized by the grace of the preceptor what is outside and the Self are merged. From undifferentiated awareness the transient notions of time space and causation emerge just as a tree emerges from a tiny seed. This overwhelming of primary awareness into limited varied forms is māya, and the teaching of the great preceptor releases these limitations.) It seems to me that by and large this is a matter of terminology. But in all these versions the individual ego is no longer the center.

Is it possible that we could have a mind or even a brain-centered theory of the witnessing awareness and of insight? It will make many people more comfortable. It would certainly be convenient to have a mind-centered theory of everyday activities including everyday science. This is similar to our use of the fixed earth as a reference point and talk about sunrise and sunset and the sun moving along a zodiacal arc during the day. So also for most purposes we use a fragmented ego awareness; when making discoveries and creating science; we can also talk of hidden connections and unconscious processes. But if we wish to deal with scientific insights in their simplest form, a Self-centered system is most appropriate. It is not for everyone and all at times, but *only when it matters*. Such an awareness is rare, as stated in the Bhagavad Gita,

bahūnām janmanāmante  
jñānavān mām prapadyate  
vāsudeva sarvam iti  
sa mahātma sudurlabha.

[At the end of many cycles of being and nescience the insightful person declares that the indwelling spirit manifests itself in all things: people with such wisdom are rare indeed.]