



Commentary

Physics is not merely a ‘subject for study’ but a ‘religion by itself’ in Practicing Agriculture

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Introduction

Fourteen billion years ago, our universe decided to come into being. We do not know what, there was before (if there was anything before), and it started to expand in all directions and is doing so ever since. In the first few nanoseconds after the big bang, all of reality was a glowing and frothing soup of particles, millions of times hotter than the Sun. As the universe spread out, things cooled, some precisely tuned fundamental physical constants with precise values came into being, particles stabilized and atoms of fundamental elements were born. Elemental atoms, are the building blocks that nature uses in creating everything from beet roots to automobiles. Studying the atomic elements and their uses is, what we call chemistry, and the behavior of all accumulated masses of atoms and their molecules, called matter, under the influence or application of various physical energies or forces as physics. The entire universe is therefore nothing else but an inter-play of matter (*as chemicals*), forces and energies of varying kinds. The clothes we wear, the air we are breathing, the pages of paper, on which this article is printed, the food and fruits we eat daily, are all chemicals. When we mix two parts of the element hydrogen with one part of the element oxygen, we get in scientific notation as H_2O , we call water, the most famous and abundant chemical in the world. Chuck in a bit of the element carbon and we produce $C_2H_4O_2$ – household vinegar. And when we multiply each of these ingredient by three, we get $C_6H_{12}O_6$, more commonly known as

sugar. That indicates that there is practically no limit to what can be described once we know the atoms of elements involved in the structure of a compound. Consider this best example (Sterner and Elser, 2002);

$H_{175,000,000} O_{132,000,000} C_{85,700,000} N_{6,430,000} Ca_{1,500,000} P_{1,020,000}$
 $S_{206,000} Na_{183,000} K_{137,000} C_{1127,000} Mg_{40,000} Si_{38,600} Fe_{2,680}$
 $Zn_{2,110} Cu_{76,114} Mn_{13} F_{13} Cr_7 Se_4 Mo_3 Co_1$

This is the chemical formula for a human being with correct ratio of all essential chemical atomic elements in a single cell of a human being. We need to multiply each number by 700 trillion which is the approximate number of individual cells that makes the whole human body. Thus, chemistry is not an abstract subject, confined in chemical laboratories; it's happening everywhere in the universe, around us and everywhere within a living human body.

Under the present scenario, lessons in physics and mathematics should be made mandatory for the students of all biological sciences and particularly in agricultural sciences, because they are directly and primarily concerned with the use of natural solar energy in terms of photosynthesis and the yields of plant and agricultural produce. All the efforts, indulged into, by the agricultural scientists, in breeding and hybridization of new crop plant varieties, for increased or optimized yields are, in fact directed towards efficient harnessing and utilization of solar energy under normal or specific environmental conditions from various agro-climatic locations. A critical scientific look at the crop breeding programs pursued by the agricultural plant

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breeders will reveal that the measures adopted by them are indeed directed to bringing about necessary changes in the existing varieties in terms of increased biomass production, qualitative and quantitative changes in protein, carbohydrate and sugar syntheses and other associated changes besides appealing colour, shape and size, taste, cooking qualities, economic production, resistance to pests and diseases, partitioning of harnessed solar energy for auto-synthesis of insect toxins (Bt.) for self-protection by the crop plants and for enhanced post-harvest shelf life. And all these involve complex dynamics of energy harnessing, transportation, biosynthesis and storage of molecules within plant cells to produce what we call the crop yield. Such changes are mediated through the changes incorporated into the DNA sequence of the concerned crop plant-cell using several well-known conventional and modern molecular genetics techniques for gene transfer. Complexities arise because most of the characters of crop plants are controlled by multiple genes, and their sequential locations on the DNA molecular strand. Understanding of the energy basis of nature and of the physical processes that are involved for maximizing energy harnessing in any of the physical, physiological, biochemical, metabolic and biosynthetic processes is therefore essential to modulate, regulate and engineer crop plants suitable for new requirements and demands. No wonder, crop plant breeding is not an isolated enterprise but an activity that needs considerable inputs from physics and physical sciences (Meteorology, Soil Physics, and Agronomy that is intimately related to micro-meteorology and various kinds of 'morphogenetic energy fields'). And such conscious integration of different disciplines was one of the main reasons indeed, for the success of the All India Coordinated Crop Improvement Projects launched by the Indian Council of Agricultural Research (ICAR) in the early sixties that led to the first green revolution.

Reasons for Location Specificity of crop plant species and varieties

Rupert Sheldrake, the well-known biologist has recently come out with his path breaking 'New Science of Life' the role of physical forces and morphogenetic fields in what is called the

morphogenesis of organic molecules and forms within living organisms. Several reports of studies conducted by the NASA-USA also corroborate the fact that radiations, electrically charged plasma, coronal mass ejections, solar flares etc. from the Sun and outer galaxy, affect the geo-magnetic fields on the Earth and life forms in both positive and negative ways. And it is time; investigations on the components of such morphogenetic fields are intensified. Perhaps, Physics departments in agricultural research institutions can take a lead. There appears great potential in this area of research as much of the problems of photosensitivity and location specificity in some cash crops such as cotton, *durum* and *dicoccum* wheat, spices from tropical humid climatic locations, alfonso mangoes from Ratnagiri, citrus and oranges from Vidarbha region of Maharashtra, coconut plantations along sea coastal regions etc. and the crypto-biological aspects of insect-pest proliferation despite huge loads of insecticide and pesticide applications over the years, can be possibly linked to the presence or absence of strong or weak morphogenetic fields at various locations. Recently, Hugh Lovel, an organic and biodynamic pioneer, who developed a device called 'Quantum Field Broadcaster' combining principles of quantum physics, biochemistry and the mind / body link, demonstrated the use of his stationary self-driven device that induces self-reinforcing, resonant fractal patterns, like homeopathic potencies, directly into the life energy fields of soil and atmosphere. It not only improves the patterns of lime in the soil related to mineral release, nitrogen fixation, digestion and providing nutrients to plants, it also works with the atmospheric patterns of silica related to photosynthesis, blossoming, fruiting and ripening. Healthy lime and silica patterns are also believed to have the potential to change rainfall patterns and restore health to barren lands. Another classic and yet baffling example of how possibly, morphic / morphogenetic fields modified by the presence of soluble and other impurities in water from any location on the earth affect the shape, size, symmetry and purity of snow, ice and water crystals formed from that water has been clearly demonstrated by a Japanese practitioner of Alternative Medicines Dr. Masaru Emoto. And such snow and water crystals have also been reported to be responding to mental

energies and human emotions through possibly, 'morphic resonance' (my interpretation). This seems logical because water constitutes over 90% of human, insect, animal and plant body masses.

This paper advocates the need for reorienting and strengthening teaching of physics in schools, colleges, engineering, medical and agricultural universities and in management oriented academic institutions for overall comprehension of the complex problems in a holistic way and more than this; to empower our young graduates and post graduates in tackling challenging problems of enhanced food production and food security for the billions living on the earth or mass-production of consumer goods for human comfort and necessities. Physics is not merely a 'subject for study' for a university degree but a 'religion by itself' and a philosophy for life and our existence on the Earth. Because the only Universal Religion for every one of us is to collectively and individually maintain himself / herself mentally, thoughtfully, physiologically, nutritionally and physically in sound good health, depending upon geographical location on the earth, because food intake, its nature and effective digestion by the body's metabolism, are mediated to a great extent by the external environmental conditions and mental strategies to combat them for survival. This is the only meaning of spirituality and essence of all

religions, past or present that have flourished on Earth. Almost all the so erroneously called 'religious texts' of ancient Indian history e.g.; Vedas, Upanishads and Bhagwad Gita, are indeed scientific treatises. It is our negligence in learning the Sanskrit language that has alienated us from the science (as modern as we can think of) contained in them. Late Dr. M.R. Guney, a Nuclear Physicist from the Bhabha Atomic Research Centre has clearly brought out the scientific aspect of the Gita in his book in Marathi- 'Dnyaneshwari che Bhava-Vishwa' (*The Emotional World of Dnyaneshwari –a treatise on Gita in Marathi written by Sant Dnyaneshwar over 700 years ago*).

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