Rediscovering Consilience

The ability to step beyond one’s own academic domain and work in collaboration with other experts, sometimes even beginners, on an egalitarian platform is the order of the day. Most research initiatives today are inclusive, wherein boundaries between disciplines are kept amorphous by design. Words such as multidisciplinary or inter-disciplinary are passé, and the diffidence that one harboured in exchanging or sharing data is diminishing at a rapid pace.

It is in this context that the concept of Consilience is valid. Consilience or the unity of knowledge, as it was originally understood, has its origin in the ancient Greek concept of intrinsic oneness that governs our cosmos and is inherently comprehensible by logical process. It is a vision which is at odds with mystical views of many global cultures. This rational view was at its prime during the period that immediately followed Renaissance, but was subsequently marginalized as a reductionist approach to knowledge and science achieved what until then seemed impossible to mankind.

Consilience, a word apparently coined by William Whewell in the Philosophy of the Inductive Sciences in 1840, remained locked in obscurity until 1999 when it was revived by E. O. Wilson, through his book entitled Consilience: The Unity of Knowledge. Wilson through his argument of ‘Ionian Enchantment’, asserts that science, arts and humanities have a common goal, which is to lend to all researchers a conviction that is far deeper than a mere working proposition, and that the world is orderly and can be explained by a small number of natural laws. Although the term ‘Ionian Enchantment’ was coined by the physicist historian, Gerald Holton, the roots of the concept date back to the 6th century BC to Thales of Miletus, who is ironically remembered to illustrate how astray early Greek speculation was. Apart from its inherent strength of precision, the approach of Consilience demonstrates that intellectual pursuit and understanding human nature at a higher degree of certainty can be achieved.1,2

The conceptual unity proposed by Consilience is ably illustrated and rather familiar to those individuals and groups trying to understand and conserve our natural resources. For instance, an inquiry on dwindling forest resources or disappearing wetlands would invariably begin with when and how the abuse began, for human actions are always rooted in history. Further, while the ecological merit of conserving the natural resources is rather well understood, the other drivers that contribute to local-level conservation continue to be enigmatic. It is rather comforting to take refuge in economic considerations and believe that it is the key factor contributing to conservation; but one does get taken aback when farmers reveal that despite the damage caused to the agricultural yield by rodents they would not decimate them, since rodents are part of their landscape. At such points where real-world problems are encountered and where fundamental analysis is required, a unified approach is inevitable. This need to make real-world contributions was also the common notion expressed, notably by M. G. K. Menon and M. S. Valiathan, during the 72nd Annual Meeting of the Indian Academy of Sciences at Indore. Consilience can help in not only reducing the gaps between different disciplines, but also enhance the diversity and depth of knowledge that humans so diligently seek. And, as Wilson states in his treatise, ‘It (Consilience) gives ultimate purpose to intellect’.1


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Authentication and voucher number for crude plant drugs

In the last few decades, investigation of herbal drugs has become an important area in pre-clinical, clinical and pharmaceutical research. We, at Agbarkar Research Institute, Pune, maintain an internationally recognized herbarium, namely the Agbarkar Herbarium at Maharashtra Association for the Cultivation of Science, and provide facilities for authentication and voucher deposition of crude drug samples. This facility is offered at nominal charges for academic purpose to researchers, pharmacy and ayurvedic colleges, clinical research units and pharmaceutical companies. According to WHO guidelines, the first stage in assuring quality, safety and efficacy of herbal medicines is identification of the plant species or botanical verification by the currently accepted Latin binomial name and synonyms3. Currently, as part of Good Laboratory Practices (GLP), peer-reviewed journals expect authentication as well as voucher number in manuscripts for herbal samples used in the studies. While offering this service, we came across certain difficulties.

The steps involved in authentication are organoleptic, taxonomic, macroscopic and microscopic studies, powder analysis and in some cases, thin layer chromatography study for confirmation. Majority of the plant material for research is procured from the market with blind faith in traders, sometimes resulting in substitution or adulteration, either knowingly or unknowingly. It would be ideal to submit herbarium of the collected plant along with the flower, since identification keys are mostly based on flower characters. If the material has typical organoleptic characters, then it is possible to identify it easily.

Many a times, though fresh material is submitted, due to improper handling it is spoiled by fungal or bacterial infection; it is then difficult to authenticate and preserve such an infected sample. It is
The crisis in Indian science is more than meets the eye

This is in response to the correspondence by Shukla et al. I am in full agreement with the fact that due to low rating of some universities by the National Assessment and Accreditation Council (NAAC), teachers with exceptional abilities are the worst sufferers because of the dismal performance of other less committed departments and their faculty. There is indeed a dire need to devise and put in place effective empirical criteria for evaluation of teachers. The teaching excellence by exceptional teachers, however, often goes unrewarded. Besides evaluation by students, an alternative system needs to be devised to distinguish teachers on the basis of teaching proficiencies. Despite great disparity amongst Indian universities with regard to infrastructure and other basic facilities, some quality teachers working under ordinary conditions produce results that are globally comparable to those of pioneers and stalwarts in their respective fields. Such teachers deserve due recognition, appreciation and encouragement by UGC and other academic bodies, allied organizations and scientific societies.

Being currently faced with a string of intricate issues and problems, Indian science calls for an immediate and holistic redressal. In order to effectively address the declining motivation of youngsters to science and failure of the scientific community to deliver goods, we need to address a myriad of subtle issues in a decisive way. The important questions that merit priority attention in this regard include: (a) Is science really ailing in India and if so, why? (b) Is science here policy-driven or vice-versa? (c) How to restore the state of science and how to make policies science-driven?

The first and foremost responsibility of the scientific community is to have a fair assessment of the basic bottlenecks in the pursuit of its problems. Do our research programmes make an economic sense in this free market globalization regime with due concern to our social needs? Are our methodologies and approaches of investigating these problems based on holistic understanding of the way systems function? Are our observations, findings and results of research sound enough to drive the public policies at different levels? And above all, in this rapidly progressing science-dominated era, where do we stand at the global level? How honest are we in our research dealings, particularly in terms of originality of contributions in the process of knowledge creation and technology development? Or at least, how efficient are we to draw existing technology to the benefit of our society? These million-dollar questions demand urgent solutions.

Analysing the above problems in a broader perspective along different dimensions should not leave us disappointed. There are no two opinions in that whenever and wherever Indian students have worked in reputed research institutes abroad, they have earned more reputation than others for their creativity, dedication, determination and zeal. Then why not so at home? There are more than one reason for this. Even scientists who work abroad for their doctoral and post-doctoral programmes, when given an opportunity to work at home, turn almost useless. They are used to working with sophisticated and highly sensitive instruments and with good laboratory facilities. However, back home, in most of the universities we find an entire department with an annual budget of what on an average scholar abroad uses in a month. The government needs to reconsider its budgetary allocation to science and tech-