Commentary

A Complex World

There are many phenomena, such as stock market prices, that have resisted our attempts to model or predict, because they are too complex. Complexity theory provides a way to probe these phenomena, and in the essay "A Complex System View of why Stock Markets Crash", Sornette (2004) brings together much of his work in the field in an easily readable form. It is worth noting that Sornette has been working in the field of complexity theory for many years now and financial markets are just one of several areas that he has addressed.

For the reader looking for a more rigorous treatment of the subject, Sornette provides a sizable reference list for an essay. Like many physicists, Sornette provides pre-prints to on-line archives, which greatly facilitates further exploration of the topic.

References:
Sornette, D. (2004), New Thesis, *2004 (1), 5.*

A New Way to Look at Life

The ability to model phenomena is an essential component of scientific progress. It confirms to us our understanding of the phenomenon being modelled, enables predictions to be made, highlights new areas for investigation and enables us to control the phenomenon in question. Biology is no exception, and there are numerous models that describe things as diverse as the relative abundance of predator and prey in a particular environment, and the chemical pathways associated with respiration.

The DNA in a cell is commonly viewed as a repository of information, which is replicated and transmitted as part of the normal activity of the cell. Any serious errors that occur during this process are likely to be detrimental to the survival of the cell (CJD, for instance, is the result of a mis-folded protein). The cell is known to employ various mechanisms to guard against harmful mutation rates or errors that occur during replication, transcription, and translation. But has the cell evolved a resilient way of encoding the information itself ?

Information theory has developed very rapidly in order to address problems associated with modern communications systems. It also provides tools by which one can begin to address the sort of question just posed.

It seems unlikely, although not impossible, that a system that exactly mirrors human ideas should have arisen through Evolution. Nonetheless, in the second part of the paper "Towards a Biological Coding Theory Discipline", May (2004) presents evidence that there is a phenomenon that is worth investigating, and that we either have the tools or could develop the tools required to carry out such investigations. This is complimented by an introduction to coding theory in the first part of the paper, which is made readable by the provision of several brief worked examples.

Following from the first paragraph of this comment is the idea that the further development of a biological coding theory would provide a powerful tool that can be applied to increase our understanding of the cell and evolution, and possibly lead to improved control of living organisms.

References:
May, E.E. (2004), New Thesis, *2004 (1), 19.*

Sources of Inspiration

It is no easy matter to identify and define an essential feature that can be used as a basis for grouping together different subjects under a single banner such as: arts, humanities, sciences, social sciences, etc. Yet, as this list illustrates, such groupings have a powerful influence over the way that different subjects are approached, developed, taught and funded. In "The Sister Arts", Haines (2004) puts aside the idea of a common essential feature and argues that the arts "co-exist in a network of 'family relationships' which is

characterised by the richness of their exchanges with one another". Exchanges can, of course, take place outside the immediate 'family group', and in the second part of the paper Haines discusses a possible link between painting and the philosopher Jaques Derrida's claim that writing is an 'inaugural' art form.

The paper focuses squarely on the arts, but the more general reader will find the idea of exchanges and borrowings between related disciplines to be of interest. To ease the reader into the subject, Haines provides historical summary of the changing ways that the arts have been viewed. In the second part of the paper, the author does a good job of communicating the difficult concept of writing as an inaugural art form. At the very least, the patient non-expert reader will gain some insight into apparently inexplicable developments in the arts; such as the importance of abstract painting.

For those looking for parallels, arrangement and rearrangement of a hierarchy of arts has an interesting parallel in how the sciences have been viewed over history: chemistry becoming dominant with the creation of the periodic table, and physics dominating during much of the last century. In addition to having a common single feature, the scientific method, there also exists a rich exchange of ideas between the different branches; the borrowing of evolutionary theory by computer science, in the creation of genetic algorithms, being only one recent example.

References:

Haines, E. (2004), New Thesis, *2004 (1), 39.*