
From Workplace to Workspace – Using Email Lists to Work Together. Maureen James and Liz Rykert. IDRC, Ottawa, Canada. 1998. ISBN: 0-88936-848-1. pp. viii + 59.

This handy spiral-bound book, which evolved out of the Uganisha project of IDRC, tells you all about email lists: what are mailing lists, how to set them up, how to administer them, how to take part in them, what are the commonly-faced problems and how they could be solved, and most importantly how to keep the lists active and vibrant. Many of us in the field of education may be familiar with all that is said in this book, but it is addressed to development workers and the lay public in remote locations in Africa, Asia, Latin America and parts of the world that have not been touched by the information revolution. This book is written with the hope that it would help inexperienced users overcome their frustrations and that with proper use of email they can transform their workplace into a busy, boundless, and more productive workspace. The authors deserve to be congratulated. This book is a model of effective communication. The authors had a specific purpose and they achieved it elegantly.

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Survival Strategies – Cooperation and Conflict in Animal Societies. R. Gadagkar. Harvard University Press, Cambridge, MA, USA. 1997. 196 pp.

These are exciting times for those who are interested in evolution – of life, behaviour, language and even mind! Changes are rapid and controversies abound. Ever since Charles Darwin published his *Origin of Species* in 1859, every comment on evolution has been split apart and debated vehemently. This restless decade has seen pitched battle between ultra-Darwinists proposing (god-like) all-sufficiency of natural selection

and putting selfish genes behind the fascinating things in life; and, the evolutionary rationalists who accept the unity and power of natural selection but abhor its use in explaining ethics, politics, cultural fashions and fruitflies in the same breath. The former give a quasi-religious potency and all-pervasiveness to natural selection. The latter are biologists who seek plurality of natural causes to explain life's pathway. They reserve a place for the cosmic catastrophes and geological changes as contingencies that life has to face; or even non-adaptive traits as other causes in life's evolution.

There is another approach in the exploration into the nature of life. Spontaneous self-organization as the driving force behind life's order and that serving as general laws for the science of complexity have been proposed and extended to economic and cultural systems as well. Do self-organization in snowflake and crystallization of first life in a self-catalyzing soup follow the same laws? This is an abstract, mystical, and intellectually-satisfying theory popular among the physicists, though not as much among the biologists. At some stage all the explanations have to merge. The phenomenon of sociogenesis, i.e. genesis of any kind of social organization, must include self-organization with evolutionary perspective. For example in a colony of ants, dynamical mechanisms that lead to group-level patterns of behaviour may need to include nest structures, chemical trail networks, etc.

The word *evolution* is itself an evolved word – changing with time and new discoveries. Here we use it in reference to 'species change' or 'descent with modification'. The debate is primarily on the tempo and mode of evolution. The definition of *Natural Selection* started with something like 'preservation of favourable variations and the rejection of injurious variations', to 'survival of the fittest', and now with 'processes that deal with (gene) frequency changes brought about by differences in ecology among heritable phenotypes' – and there are more!

Why is evolution so hotly-debated and interesting? Evolution is fascinating because we thrive on origin stories – of all life forms – treating humans as another branch in the tree of life! Thus it no longer remains in the realms of science alone, but touches all spheres of enquiry – humanities, liberal arts and religion. And ever since Darwin's (and Wallace's – that

perennial afterthought in the Darwinian story!) theory of evolution was proposed everybody 'knew' that science and religion are at war. What about all those sparkling stories from the sacred books where we 'humans' have a special place in God's garden? The argument still goes on – the latest one being Pope's message on evolution. Crisply stated the stand is – 'Humans may be animals, evolved from so-called 'lower' creatures, but we are special. In as much as we are made in God's image, we are created outside the usual course of nature – and this in particular applies to our immortal souls'. But are we special?

Looking back from the end of the century, it is mind-blowing to realize that there is not much of 'Darwin-free zone' left, and this science is aiming to dominate over the whole realm of the intellect. But are all these laws/scientific knowledge transcendental truth? How much of what we see or the way we do is a by-product of our cultural/mental experience or even a construct of the way our neural system is organized? Such questions gain more importance as we deal with complex multidimensional processes such as behaviour, mind, or consciousness, and aim for universal laws in them. The majority of scientists work by accepting the fact that any self-consistent theory/hypothesis proposed on the basis of experimental data and/or mathematical arguments independent of the experimenter is true, as long as it has not been proved (using accepted norms or rules) to be wrong. The greatest impact of the theory of evolution by natural selection has been in the simplicity and universality of its premises and logic in all living systems – from bacteria to humans.

The main pillar in the Darwinian belief is that propagation of one's own genes is the key driving force behind the survival strategies in animal societies even if that means staying sterile or looking after parents' babies leaving one's own! The two seem contradictory, don't they? They are not, and this book by a notable behavioural ecologist shows exactly that. The book belongs to a field where different lines of thought are argued through eminently-readable books written by renowned intellectuals. But they generally promote the author's viewpoint and thus, for an outsider in the field, it presents only one side of the story.

This book is different. By the author's own admission it has been written for

the curious but non-experts. He has kept his word and once you open the pages you can see it. The language is simple and the style smooth. There are lots of stories told with deep humour. It is not only one of those books which slowly engrosses you into reading page after page of fascinating details from the life histories of animals to know why animals behave the way they do; it is also one from which you would like to read aloud to children or friends by saying 'did you know ...?' It explains some of the most difficult concepts of evolution and behaviour in simple terms. But behind this lies the work of a deep, analytical mind which sieves through much of controversial literature and long-standing debates on the puzzling behavioural traits in animals living in societies/groups. For once you can read a book which allows a balanced view of the events. It presents the arguments and counter-arguments based on different interpretations for each behavioural strategy, and finally ties it up by giving the most satisfactory (from the point of view of natural selection) explanation for the apparent contradictions. Like a true scientist he has alerted the reader of the lacunae in explanations and alternative possibilities.

It is known that behaviour of an individual in isolation and that in a group could be quite different in encountering the same situation. This is primarily due to the presence of complex mosaic of interactions with the other individuals in the group having different relationships. The ultimate outcome is survival and preservation of one's genes. Individuals in a group use different strategies to do that and some very interesting but paradoxical behaviours like, opting for death, or even being sterile and helping others in the group to reproduce, are

observed in social animals. There are many such fascinating examples of altruism, cooperation, and selfishness in this book which are sometimes difficult to explain in the light of the simple theory of natural selection. The author discusses the concepts of 'group selection', 'kin recognition', 'inclusive fitness' to describe the basic issues in the behavioural traits of social animals. He shows that traits like cooperate, help, fight, cheat, take risk or give up lives, etc. are all survival strategies in social animals cutting across taxonomic barriers – from amoeba to birds to large mammals. And all this in a language that is understandable to a non-specialist – this is no easy job!

The unstated underlying assumptions of the discourse is two fold – 'DNA neither cares nor knows. DNA just is. And we dance to its music', and that, natural selection predominantly operates at the level of the individual. But to explain much of the puzzling behavioural strategies that question the validity of natural selection, the author has invoked their effect on the total genetic contribution by considering the social components. He has taken examples from many species, such as amoebae, wasps, and birds, to show that natural selection can actually work at other levels of biological organization in social animals even if that requires death of the individual! Such modification of the theory clears many situations where there seems to be a conflict between an individual and the group. This is very important – not only because of the elegant reasoning, but, as pointed out by the author, it is easy to fall into a trap and mix up the levels that can finally lead to trivial and incorrect interpretations. Nevertheless situations exist where one has to invoke the idea that selection operates at other levels also.

Behind each of these examples are thoughtful and long, painful, detailed experiments that are difficult to perform. One refreshing change is to read about the examples that come from the excellent behavioural research done by Indian scientists on ants, bats and wasps.

The theme of this book is to study the evolutionary consequences of the survival strategies employed by animals that help them overcome the vagaries of life and propagate themselves so that their progenies continue to inhabit this earth. Examples have been taken from slime moulds to chimpanzees with the aim to have a common theoretical framework cutting across species boundaries. Then why not any from humans? Is it because *we are different*? Or, is it that the phenomenon of gene-culture interaction plays a prominent role in the evolution of behavioural strategies in human societies and thus it is best left out? May be the need for merging of different levels of explanations – molecular, physiological, organismal, cultural and evolutionary – would then be much greater for arriving at a complete picture of behavioural traits of that one species called humans which has taken over the earth not by numbers but by intelligence. One can expect a lot more of socio-political reverberations of such scientific thought to dominate the coming century. And if you want to be prepared for that, as we enter the last year of the 20th century, what better millennial reading than this book?

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