IN THE DEFENSE OF “SMALL SCIENCE”

Oxford University must be in a dire state to ask an Israeli of Hungarian descent to make an after-dinner speech in English in these most Oxonian surroundings.

Trying to figure out the possible motives for such an act of recklessness, I came up with a number of hypotheses. The most obvious is that my peers have decided that my life as a scientist is over and they, most gratefully, will let me express myself on subjects at a safe distance from major scientific controversies. I even suspected specific persons in the field of NADPH oxidase research to be the initiators of this “transfer” from the battlefield of scientific competition to the haven of post-prandial alkalosis and rising ethanol blood levels. Whatever the reason, most of you might be nurturing the hope that, overwhelmed by the awe of Oxford and of a truly wonderful meeting, I shall limit my comments to pleasant, positive, reassuring, and congratulatory statements. I am sorry to have to disappoint you.

Those who invited me to say a few words should have known that it is most unlikely that somebody who grew up in Stalinist Eastern Europe, after the second world war, will ever make a “positive”-sounding speech. I heard too many of those in my youth! I shall therefore profit from your dinner-induced euphoria in trying to contradict a few of the cherished dogmas about the conduct of science. “Conduct” is a good term! It has just the required vagueness of meaning and resembles quite a lot one of the most cherished terms of our colleagues in the soft sciences, “discourse”.

In the August 26 issue of SCIENCE there is a Report, entitled “Tool Study Supports Chimp Culture”, on a new discovery in animal behaviour. In this report, the authors describe as “chimp culture”, the ability of chimpanzees to follow the example of one dominant fellow chimp, in opening a food dispenser. The authors write, with great admiration, the following (this is the exact citation): “The vast majority in the group followed the example of the dominant chimp. Even when the animals stumbled on an alternative method to get food from the dispenser, they tended to stick with what the rest of the group was doing”. In plain language “conformism” is taken as the epitome of culture. I have only one question to ask: How many of you would like to have one of these chimps as your next postdoc?

As a young man, in a remote village in the Swiss Alps, my wife and I went to see the movie with Julie Christie and Alan Bates, based on the novel of Thomas Hardy “Far from the Madding Crowd”. The title of Hardy’s novel, I learned, comes from the poem of Thomas Gray:

“Far from the madding crowd’s ignoble strife
Their sober wishes never learn’d to stray;…
They kept the noiseless tenor of their way.”

I think that this should apply to us just as it applied to Hardy’s heroes in remote Dorset. We, scientists, have to resist (as much as I like chimps) “chimp culture” and have the courage to disagree with and oppose the tyranny of those who tell us how
to do the thing that we do best. This applies to what we should investigate and to how we should investigate.

I feel a special affinity for the philosopher Karl Popper. He originated in a part of the world where I was born and came to England as a refugee. He wrote a book called “The Open Society and Its Enemies”, in which he argues audaciously with Plato and Marx and says, in plain language, that these two great philosophers are responsible for many of the contemporary attacks on freedom and reason.

I think that what we should call “open science” is under attack. But the danger comes not only from the supporters of the “intelligent design”. It is born in our midst.

We are being told by those who have never seen a laboratory bench and who have never written a scientific paper that:

- “Big is beautiful”
- “If you do not subscribe to a multidisciplinary approach and are not part of a multidisciplinary team you belong to the backwaters of science”
- “Tutoring your students might negatively affect their chances of becoming independent scientists”
- “The only “factor” that you should be aware of, is the “impact factor”, and the only “index” of significance, is the “citation index”

Where is the Karl Popper to write the book entitled “Open Science and its Enemies”?

At all academic institutions, the race is on in two directions.

1. The first is some kind of “omics” or “ome”. The number of various “omes” is growing at an exponential rate. One of the best is the “interactome”. Those few ignorant of its definition are enlightened in the August 1st issue of The Scientist. I cite: “the human interactome is a map of the totality of human protein-protein interactions”. And what about the “cabbage interactome”? What shall the totality of lipid-protein interactions in Rickettsia felis be called? Will it be a “interlipoprotoactome”? And how many unemployed Ph.D.s will finally find the fulfillment of their wildest dreams of original and exciting research in elucidating the 10 to the 18th interactions between lipid and protein in the North-Korean “zebra-sparrow”?

Will those few of us who recall the dark times of what used to be called “hypothesis driven research” have their brains cleaned of subversive ideas by the new Zhdanovs? For those too young to know, Zhdanov was Stalin’s “science advisor”, responsible for the virtual and, frequently, physical elimination of Russian Genetics and geneticists.

2. The second is “systems biology”. To be honest, I still have not found out what “systems biology” is. Whenever you dare to ask, you are being told that, as a being of modest intelligence and low computer literacy, whose biggest achievement is, probably, to put together a powerpoint slide (which becomes a total mess because you forgot to “group it”), you should stick to your one megabyte computer and not bother those who do have a full understanding of the term.

Related to the latter, is also the absolute imperative of performing “high throughput screens (HTSs)”. Most of us did this quietly and unobtrusively, whenever running
hundreds of ELISA plates. Unaware of what we did and not rewarded for it by acceptance to the exclusive club of the HTSs, we felt like Monsieur Jourdain, the hero of Molière’s “Le Bourgeois Gentilhomme”, when he asks: “When I say, Nicole, bring me my slippers, am I talking prose?”.

I would also like to say a few words about the language of science, in general. In the past, we were bothered by not being understood by the laymen. Now, we make a great effort not to be understood by ourselves. Some of the proposals we adopted come straight from the “deconstructionists”, such as: “Employ new and unusual terminology in order that familiar positions may not seem too familiar”. Others are just anglicizations of healthy and perfectly good terms. At Tel Aviv University, Biology became Life Sciences; Botany, Plant Sciences; Geology, Earth Sciences, and Astronomy, Planetary Sciences. By walking down South Parks Road, I became aware of the fact that Oxford is going through the same linguistic contortionism. What it actually amounts to is the victory of English over Greek and Latin. Fortunately, Arabic is much sturdier. “Algebra” and “algorithm” are still around.

Where is the Alan Sokal¹ of biology who will dare to write the gibberish paper, submit it to Cell and get it published?

I am a great reader of “Reflections” by those who made major imprints on the history of science. I always hope that I shall find the recipe for success; better later than never. I must confess that the search for the magic formula is rather disappointing. In a recent “Reflection” published in an August issue of the JBC, the author (P. Talalay) concluded that since science is more like an artistic endeavour, it is highly unlikely that there are rules for success. There was, perhaps, one conclusion to be drawn: “Good fortune plays a major role in discovery. Much as we might try, there is no "road map" to discovery”.

Indeed, there is a lot of talk about “road maps” these days and those who follow developments in the part of the world that I come from know that a lot of people who cannot properly read a map are drawing road maps for those who are very good in reading maps. It is the same in science: We should not let outsiders draw road maps for us. These are, quite frequently, written by the incapable for the capable, by the blunt for the sharp, and by the sleepers for the doers. We are frequently reminded of how short-lived scientific discoveries are. The half-life of road maps is even shorter.

Finally, Ferdinand and Isabella of Castille were not too great on maps – They sent a desperate Genovese to find a road to the Indies and he discovered America. I wish and hope that some of us can emulate that.

So the message, this evening is, BE YOUR OWN MAN OR WOMAN. Then, you can sing, with Frank Sinatra “I did it my way”.

Edgar Pick
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