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In my early years at Edinburgh, I attended a seminar on polymer drag reduction; and, as I was walking back with a small group, we were discussing what we had just learned. In response to a comment made by one member of the group, I observed that it made the problem seem horribly complicated. The others nodded in agreement; with the exception of an American who was visiting the Chemical Engineering department. He turned on me and said reprovingly. 'You mean that it's beautifully complicated.' The implication was very much that this problem was a foe worthy of his intellectual steel, so to speak. Well, I wonder how he got on with that?

It struck me at the time as an indication of a different culture. Physicists and mathematicians seem to see beauty in simplicity, even to the point of regarding it as evidence in favour of a particular theory. Do applied scientists and engineers really see beauty in complication? Even engineering structures as different as a bridge, a motor car or a ship are often held to conform to the old engineering adage: *if it looks right, it is right*! That surely is an appreciation of simplicity of design, is it not?

Nevertheless, the idea that there are different cultures came to me early on in my career. I can remember when I started out in the nuclear power industry, a colleague who was a chemical engineer (this is just coincidence: I haven't got it in for chemical engineers!) said to me. 'I don't see any point in physics as a discipline. What's the use of it?' So I pointed out that we both owed our employment to physics and he had to

reluctantly concede that perhaps nuclear physics had some point after all! That was in the early 1960s, and since then developments in condensed matter physics have, through the agency of materials science, chemistry and microelectronics, transformed the world that we live in.

Over the years I have heard many comments like that made by engineers about physics but I cannot recall any physicist making a similar comment about engineering. Generally, the attitude that I have picked up is a sort of respectful assumption that the engineer has other skills which generally produce impressive results. Perhaps the difference here is that the physicists are clear about their own ignorance of the details of engineering science whereas engineers tend to assume that what they don't know doesn't exist?

Shortly after my first book on turbulence was published [1], I received a letter (yes, not an email!) from the late Stan Corrsin, who commented on it and also sent a copy of a review that he had written of David Leslie's earlier book [2]. I found his review very interesting because it addressed the problem that seems to be ignored by most people: that when theoretical physicists start tackling turbulence the results should be of interest to engineers but may in fact be unintelligible to them. This is not a matter of not being able to follow the mathematics so much as *'not sharing assumptions about what is natural or appropriate to do in any given circumstance'*. In other words, what I am trying to describe by the word 'culture'. This is about all I can remember from the review. I may still have it in my office, but that has been off limits to me for more than a year now, and I have been unable to find the review online. One other phrase that I do recall, is that Corrsin said, in effect, that Leslie's book did help to bridge this gap, but that '*it was no Rosetta stone.*'

Sometimes I think that it is impossible to provide a Rosetta stone for this purpose and it is only when theoretical

physicists become tired of staring at their own navels, that we will see a flowering of theory in turbulence and other practical problems. That will happen when they become bored with strings, multiverses, dark matter, quantum gravity and similar fantasy physics.

[1] W. D. McComb. The Physics of Fluid Turbulence. Oxford University Press, 1990.
[2] D. C. Leslie. Developments in the theory of turbulence. Clarendon Press, Oxford, 1973.