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I recently read a book review in *The Times* which was headed `Scientists must dare to be dull'. Well, that was attention grabbing, because most of the general population probably think that we already are. The author of the review then went further in a subheading: `We should listen to this warning about how neophilia and hype is ruining research.' Now that does sound a bit exaggerated; and he seeks to make his case by quoting examples from *Science Fictions: Exposing Fraud, Bias, Negligence and Hype in Science by Stuart Ritchie.*

Now I'm not sure if `neophilia' is a neologism or not (my spell-checker doesn't seem to like it), but clearly it is intended to mean `love of the new'. And this, along with `hype', has been a feature of academic research since the early 1980s. Before that, academic research was a gentlemanly pursuit, which in theory academics were supposed to do. However, when I took up my lectureship at Edinburgh in 1971, the teaching and administration were divided up equally, and once these chores were out of the way, one was free to do some research or some other activity. Alternative activities pursued by certain colleagues ranged from collecting antiques, through small-boat sailing, to (and this was rather extreme) one colleague who seemed to be turning himself into a market gardener in his spare time.

This all changed around the early 1980s, with the introduction of research assessment exercises, in which the government turned a beady eye on the research output of academics, presumably to divert attention from its own inadequacies. From then on, everything had to be newer, bigger and more `hype worthy'. Then of course, in time, research had to have impact! But we shall say no more about that. Instead let us turn to what the effect of this has been on research in turbulence.

We should begin by observing that turbulence, like all the rest of fluid dynamics, is dominated by research on practical problems. So my observations, as always, concern the relatively small amount of fundamental work; and even here there has for a long time been an excessive concentration on newness. Given that the problems we still need to solve are really quite old, a concentration on newness seems likely to be counter-productive. My own experience over the years has been of one particular referee who invariably says of my manuscript `there is nothing very new here’ and then turns it down!

To be more specific, I would say that direct numerical simulation of the equations of motion to represent isotropic turbulence is the most obvious example of the desire for the new, where in this case the desirable `new’ is a higher Reynolds number. This undoubtedly leads to a feeling of competition, with the achievement of a large Reynolds number seen as an end in itself. I believe this to be detrimental to scholarship, particularly when other desirable features of the DNS may have been sacrificed in order to achieve it.

A particular example of this arose in 2010 when we submitted a short paper in which we showed that the so-called Taylor dissipation surrogate was more likely a surrogate for the inertial transfer [1]. This was based on theoretical arguments and on some simulations of freely decaying turbulence, for various Reynolds numbers up to about $R_{\lambda}\simeq 60$, which showed the onset of asymptotic behaviour. One referee was favourable but the other recommended rejection on the grounds that our simulation was very much smaller that his one. This seems to have echoes of the behaviour of small boys in the school playground, but it has nothing to do with scholarship. Fortunately the editor was easily persuaded of this fact, and the paper was published.

A coda to this story is that we developed our simulations over the next few years, and also introduced a theory based on an asymptotic expansion in inverse powers of the Reynolds number, which was exact in the limit of infinite Reynolds numbers. For Reynolds numbers up to $R_{\lambda}\simeq 435$ in forced turbulence, we were able to verify our predicted $1/R$ decay law and measure the asymptotic value of the normalised dissipation rate as: $C_{\varepsilon,\infty} = 0.468 \pm 0.006$. Apart from supporting our results at lower Reynolds numbers, this work drew attention to the fact that certain high-Reynolds simulations merely provide a few outlier points on our systematic treatment of the subject [2]. How much better if they had started with low values of the Reynolds number and worked up!

Turbulence is essentially an asymptotic phenomenon; a fact that was realised by early workers in the subject who measured mean velocity profiles in duct flows (and indeed other shear flows) for huge ranges of Reynolds numbers, and clearly demonstrated its asymptotic behaviour. This is what we need today. Turbulence theory is like a jigsaw, in which not only are many pieces missing, but many of those we have are unclear. In effect, we're not quite sure which part of the picture they represent. In my view, what is needed is a big collaboration to carry out simulations which we can all access and have our questions answered. But the simulation is the easy part of that: I believe that there are databases for high-Re simulations, but what about all the low Reynolds numbers which allow us to move up an asymptotic curve and actually see what is going on?

The author of the above book review sees the need for `boring, plodding research that merely provides a sound basis for the continued progress of the Enlightenment'. I don't buy that description, and presumably he is being ironic, but I do accept that that is what we need. In the case of turbulence, we would also need a sea change to more open-mindedness on the part of many members of the community of researchers. I don’t think that is going to happen any time soon.

[1] W. David McComb, Arjun Berera, Matthew Salewski, and Sam R. Yoffe. Taylor’s (1935) dissipation surrogate reinterpreted. Phys. Fluids, 22:61704, 2010.

[2] W. D. McComb, A. Berera, S. R. Yoffe, and M. F. Linkmann. Energy transfer and dissipation in forced isotropic turbulence. Phys. Rev. E, 91:043013, 2015.