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BIOLOGICAL SCIENCES

Science is fundamentally self-regulated by the integrity of individual scientists: therefore young scientists must develop their personal qualities, as well as learning their subject

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The validity of science depends on the integrity of the individual scientist. It is often supposed that science is a distinctive process or system externally regulating the individual scientist; an assumption that science is a mechanism into-which data and ideas are fed and from-which valid knowledge emerges. By this view, the individual scientist is not crucial because individual errors, inabilities and (even) dishonesty are all eliminated by various feedback processes. This conceptualisation of science provides individual 'scientists' with a free pass to relax the strictness and purity of their personal honesty and motivations. But all and any possible external systems ultimately require the integrity of individuals, and inner integrity cannot be imposed but most come from within. When individuals concerned with science lack personal integrity then other lower, commoner and more powerful motivations will take-over science. The implication is that when a young scientist is learning to be a scientist he cannot simply learn the subject but must also be working on his own personal development: he must develop integrity until it becomes an iron law. In particular he must develop the understanding that: 1. Truth must become an inflexible habit; 2. Science is spiritual; 3. Truth is a transcendent value; 4. Science is not a methodology, but an attitude, a motivation, a way of being; 5. The proper attitude of a scientist to his subject is a kind of love, a devotion to the phenomenon of which understanding is being sought. Therefore, science must be dominated by honest individuals of indestructible integrity. When individual scientists lack or lose self-motivated integrity, then science simply ceases to be.

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DATE RECEIVED:
July 21, 2016

DOI:
10.15200/winn.147039.90043

ARCHIVED:
August 05, 2016

CITATION:
Bruce Charlton, Science is fundamentally self-regulated by the integrity of individual scientists: therefore young scientists must develop their personal qualities, as well as learning their subject, *The*

In one sense 'science' is a social system, requiring at least several individual scientists who are engaged in both the production and the checking of claims to knowledge. But in a more fundamental sense, science is an individual activity, and the unit of scientific activity is not the group, nor is it a system or method characteristic to science – but is actually the individual scientist. And the validity of science depends on the integrity of the individual scientist.

It is often supposed and asserted that science is (for example) a distinctive mechanism, process or system (I myself believed this to be the case, earlier in my life). For example, in the 1930s and for a generation, the Logical Positivists said that science (and indeed all valid knowledge) was characterised by public 'verifiability' (Ayer, 1936). Later, Karl Popper's views prevailed that science could not be positively verified, but was instead about other-scientists testing and failing-to-refute hypotheses (1963). More recently David L Hull argued that science worked by a type of natural selection, in which the true-est theories survived and reproduced within the social structure of science, while less explanatory or practical theories became 'extinct' (Hull, 1988).

Such views present science as, in essence, a matter of the individual scientist being externally-regulated. Over the years, this view has degenerated into the assumption that science is a kind-of

Winnower 3:e147039.90043 , 2016 , DOI: 10.15200/winn.147039.90043

mechanism into-which data and ideas are fed and from-which valid knowledge emerges (a 'truth-machine'; Charlton, 2012).

By this, currently dominant (although mostly implicit) view, the individual scientist is not crucial, because individual errors, inabilities and (even) dishonesty are supposedly all eliminated by various scientific monitoring and feedback processes such as pre-publication peer review, checking of internal and external coherence, replication of results, and building-on (hence checking the viability-of) past knowledge by its rational extension.

This conceptualisation of science provides individual 'scientists' with a free pass to pursue other, more urgent, personal goals and relax the strictness and purity of their personal honesty and motivations – on the basis that this doesn't really matter, since 'the system' will deal with any resulting errors or distortions.

Perhaps most commonly this comes-across when typical mainstream modern researchers are applying for funding or trying to publish their findings. The focus is on getting the grant and getting the work published; which is a matter of getting the approval of peer reviewers. The intent is not to be as honest as possible, but to satisfy peer review. This entails deleting and selecting, distorting and re-framing, hyping and spinning… in a word misleading. The researcher aims to mislead the reviewers (or actual/ potential bosses or bureaucrats, project managers or prize committees); aims to be as dishonest as possible so long as this is plausibly deniable. (Deniable, that is, within the - lax and declining - framework of prevalent professional standards.)

The policing mechanisms of science have failed; such that massive deliberate misrepresentation, known falsehood, blatant plagiarism and cheating, are routinely covered-up, go unpublicised and unpunished; especially when they are done by famous, influential and powerful scientists. Instead, such behaviours are rewarded with high status jobs, lavish funding, control of the all-pervasive peer review system, socio-political power, and prestigious awards and prizes. (I know of multiple examples from direct personal knowledge and also information from trusted sources – the problem is especially bad in my main field of 'medical research - as well as many more example via the professional literature and investigative media.)

The imagined corrective feedback-loop of the system of science does not any longer exist – although it certainly used-to.

This self-serving careerism is done by nearly-everybody, and it is normal – indeed normative and enforced. And it is done with a 'clear conscience', on the bland assumption that 'the system' will nonetheless – somehow – take this lying and incompetent garbage and process it into valid knowledge. But what this prevalent view neglects utterly, is that all possible external regulatory mechanisms depend on the integrity and self-regulation of individual scientists (and, indeed, all those concerned with science).

Thus, the garbage/ lies/ 'noise' nowadays utterly swamp the reality/ truth/ 'signal'.

Think about it: All and any possible external systems ultimately require the integrity of individuals, and inner integrity cannot be imposed but most come from within – because all attempts to impose integrity themselves require individuals of inner integrity! (Charlton, 2009)

For example, any scientific knowledge claim must first be understood and then checked for internal consistency and also consistency with external observations. Whether or not the claim is really understood depends on the honesty and self-awareness of the individual tasked with understanding – does that individual really want to understand? Has he really paid sufficient attention, really given the subject sufficient thought, checked that he really does understand it?

Assuming the knowledge-claim has indeed been understood; has the process of checking been done honestly and rigorously? Is the person capable of this, have they in fact done it in an honest way?

Following on; the results of such stages of understanding and checking then need to be validly applied and implemented – according to a scientific agenda; and not, therefore, any other kind of agenda.

If and when individuals lack integrity, these vital steps will not be done honestly and in accordance to seeking, speaking and applying the truth (as best it is known). Instead, individuals may merely pretend to understand the knowledge claims; may fail to check internal consistency; may fail to make a truthful attempt to check the claim against relevant observations (which also involves evaluating the validity of the claims concerning prior and subsequent observations – it cannot be merely assumed that earlier consensus observations are necessarily valid, and new observations which conflict with them are necessarily wrong).

And finally, the results of these steps may fail to be applied – but instead what is implemented has been pre-decided on non-scientific grounds (careerism, politics, malice or whatever).

If the individuals concerned with science lack personal integrity; then the likelihood is that other, much commoner – and often more powerful - motivations will instead be doing the regulating. And this is precisely what is found almost-everywhere in the endemically-corrupt world of modern professional research (which calls-itself 'science', but actually is not).

Instead of core scientific values such as the habit of truth and truthfulness, internally-generated and spontaneous interest-in and love-of the subject – instead of this there is a culture of expediency, of doing whatever is most convenient and advantageous. Whatever best avoids trouble, protects reputation and promotes career. This involves adherence to bureaucratic monitoring, obedience to official targets, diligent work in ways and means dictated by superiors; and constraint by current (changeable) social or political norms… in a phrase: 'Zombie' science is produced in pursuit of external goals such as funding, input and output measures, consensus approval, status awards and the like (Charlton, 2008).

Many things regulate modern research – but not 'the one thing needful' which is individual integrity. Upon this depends absolutely everything of value in science. The corruption and loss of individual integrity means the corruption of science. And lack of individual integrity means no science at all; but instead a mere simulacrum of science: that pseudo-science which has substantially replaced real science in the paid-for, official, professional world (Charlton, 2012).

The strong implication is that when a young scientist is learning to be a scientist – for example, a biologist – he cannot simply learn the subject (even if his understanding of 'the subject' is more coherent and deeper than the usual understanding). The young scientist must also, and at the same time, be working on his own personal development: he must develop integrity until it becomes an immoveable habit.

This necessity for developing personal integrity therefore needs to be added to my list of ten principles for the young biologist (or any other type of scientist; Charlton, 2016). In a nutshell, the lesson is: Scientist, Change Thyself!

1. You need to develop the habit of truth – by always seeking and speaking truth-fully, about the smallest things as well as the greatest. This must be an Iron Law. As Jacob Bronowski (1956) said – in science truth is all-of-a-piece: either we are truthful always and about everything; or else the dishonesty ramifies, the rot spreads, and rapidly we are being honest about nothing.

2. You must have a spirituality of science, become sensitive to the 'mystical' significance of what you do. Science is not, and should not be, a 'religion' – but its practice should be treated with all the seriousness of a religion.

3. Truth is a transcendent value. That is, truth lies beyond the world of human minds and communications – truth is real and eternal, and truthfulness is a value. Thus, truthfulness is not merely what is most efficient for science, although it is indeed the most efficient way of doing science – truth is

a value which is ultimately integrated with both beauty and virtue.

4. Science is not a methodology, there is no such thing as 'scientific method'. Science is essentially an attitude, a motivation, a way of being.

5. The proper attitude in scientific work is a kind of love, a devotion to the phenomenon of which understanding is being sought. Nothing less is sufficient to integrity. Only one who loves the object of his work will be honest, through-and-through, about it - including being self-critical. (Every scientist needs to be, ultimately and over the long-term, his own most rigorous and valid critic.)

In sum, scientific education requires individual change, individual growth, spiritual-deepening and integrity-strengthening. This personal transformation entails evolving a personal relationship with the phenomenon under investigation. This is necessary to science – and ultimately it is also sufficient.

Because science can survive (albeit not thrive) as nothing more than a collection of honest individual scientists having personal integrity. But when individual scientific participants lack or lose self-motivated integrity, then science simply ceases to be.

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