

Science and Ideology

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I'm going to talk about ideological threats to science; but I'd like to begin by making some general, and fairly traditional, observations about the nature of the scientific enterprise.

Science — and that includes both the natural and the social sciences — is, or at least is supposed to be, a truth-seeking enterprise. The phenomena that one decides to study may be chosen for their conceptual significance, for their social or economic importance, or simply out of personal curiosity. But whatever topic a scientist decides to investigate, she is intellectually and morally obliged to follow the evidence wherever it leads: even (or especially) if that evidence conflicts with her preconceptions or her desires.

Science doesn't always work this way, of course — scientists are, after all, human — but that is anyway the ideal towards which we strive. And if there is freedom of debate within the scientific community — freedom to hold each others' ideas to stringent conceptual and empirical scrutiny — then the scientific community collectively is more likely to reach objectively true conclusions than any of its members could do alone.

A scientist's political and social values may, of course, influence her selection of topics to study — that is perfectly legitimate. But those values should be carefully put to the side when evaluating the evidence. The goal of the scientific endeavor is to find out how things really are, not to confirm how we wish they were.

Now, many decisions that we must make collectively — about anything from educational methods to pandemics to climate change — need to be based on scientific knowledge: we require detailed factual evidence about how children learn to read, how viruses spread, and how the earth's oceans and atmosphere behave. But although this scientific information forms the essential background for public policy, it doesn't *determine* that policy, since policy decisions also involve values, and tradeoffs between competing values. But whatever your values, it still behooves you to have as accurate an understanding as possible of reality, to inform your policy choices. (If you don't, you risk implementing policies that are counterproductive as assessed by *your own* values.) And in a democracy, every citizen has the right, and should have the opportunity, to do the same.

One important social mechanism within science is peer review: proposed scientific contributions are evaluated for their correctness and importance by experts in the field (ideally double-blind); and depending on that evaluation, the article may be accepted for publication, accepted subject to revision, or rejected entirely. That system isn't perfect — it can be compromised by personal rivalries, competing research programmes, and simple reviewer sloppiness — but it is the best that we have been able, thus far, to devise. The key desideratum is that submissions should be evaluated for their conceptual rigor, their methodological soundness, their empirical thoroughness, and their importance to the scientific field. Social and political values may play a role in this last aspect — telling us which topics are the most important to investigate — but they should play no role in the evaluation of which contributions on that subject are fit to publish. That evaluation should be based solely on the scientific quality of the research, not on whether we find its results congenial.

This, anyway, has been the official policy of the scientific community for the past three centuries — implemented imperfectly, to be sure, but nevertheless functioning as

an important regulative ideal. But times have changed: now ideology threatens openly to corrupt the the truth-seeking enterprise that we call science. And in this talk I'd like to give some examples of how.

I'm going to focus on threats coming from *within* the academic community, and indeed sometimes from within the scientific community itself. That's not because other threats — from politicians and businesses, for example — are unimportant; quite the contrary, they are very important, and they are very dangerous. But we are accustomed to those threats; they have been around for a long time, and we have acquired some experience in combatting them. The threats coming from within academia are, by contrast, a fairly novel phenomenon, and we may have difficulty recognizing them for what they really are, much less combatting them. That's why I want to focus on them.

One other thing: Though science, in my definition, includes both the natural and the social sciences, in this talk I'm going to focus on examples concerning the natural sciences, simply because of the limits of my own competence.

But before I talk about present-day debates, I think it may be useful to step back 30 years into the past, and recall some now-ancient history.

In the mid-1990s, the so-called “Science Wars” — an unfortunate military metaphor applied to what is, after all, an intellectual debate — pitted two contrasting points of view about the nature of scientific knowledge. For brevity let me somewhat oversimplify, and say that, on one side, a motley crew of postmodernist-influenced literary scholars and social scientists, often (but not always) of a leftist and feminist political bent, espoused an extreme social-constructivist view of science and scientific knowledge. (And I can provide some precise quotations from their writings, if you worry that I'm exaggerating.) On the other side, another motley crew of scientists and philosophers (plus some humanities scholars, historians and social scientists), from across the political spectrum, defended traditional notions of rationality and objectivity, at least as ideals towards which to strive.

Some leftist scientists, it is true, such as Richard Lewontin and Stephen Jay Gould, did advocate social-constructivist theses with regard to particular (and highly controversial) items of scientific study, notably human intelligence; and some feminist scientists, such as Ruth Hubbard and Evelyn Fox Keller, did the same with regard to other corners of biology and psychology. But no prominent scientists, as far as I know, endorsed the radical view, advocated by some sociologists and literary scholars, that *all* purported scientific knowledge — from neutrino physics to organometallic chemistry to lepidopterology — is deeply imbued with social ideology. Nor did any notable scientists advocate social constructivism with respect to long-established and uncontroversial items of scientific knowledge, such as the atomic theory of matter or the double-helix structure of DNA.

That, alas, has changed — at least on certain subjects. (Maybe you can guess which ones.)

One classic of the earlier era was sociologist Andrew Pickering’s book *Constructing Quarks* (1984). That book provided a superb and extraordinarily detailed history of modern elementary-particle physics, sandwiched between initial and final chapters of (let me be blunt about my view) astonishingly poor philosophy. On the basis of that philosophy, Pickering concluded that

there is no obligation upon anyone framing a view of the world to take account of what twentieth-century science has to say. . . . World-views are cultural products; there is no need to be intimidated by them. (413–414)

Dare I say that this is grossly misguided? Of course our *ideas* about quarks are a human historical and social construction — that is a truism — but there is good reason to believe that the quarks themselves have existed ever since the Big Bang, roughly 13.7 billion years ago.

But the reasons justifying that belief are subtle. Quarks are not, after all, directly observable. Neither, of course, are dinosaurs; all we can observe are their fossils. But dinosaurs are (or rather, were) mid-sized macroscopic objects, and we can easily imagine what they looked and behaved like, by analogy with contemporary animals that we are able to observe today. So we certainly have good reason to believe that there existed, at some time in the past (roughly 240 to 65 million years ago), the animals that we call dinosaurs.

Subatomic particles like quarks, by contrast, are very far from our everyday experience, and their behavior is extraordinarily strange. Quantum mechanics was invented by Schrödinger and Heisenberg in 1925 — next year will be the centenary — but no one today, I think, really *understands* what quantum mechanics is telling us about the fundamental nature of the universe. (Or to put this in the first person: I have been studying quantum mechanics for slightly over half that century; and the more I learn about it, the less I understand.) And yet, quantum electrodynamics can predict the magnetic moment of the electron to 11 decimal places accuracy: “equivalent to measuring the distance from Los Angeles to New York . . . to within the width of a human hair”, as Nobel laureate Richard Feynman memorably put it.

Quarks are, in fact, even more subtle than electrons. Electrons are too small to be directly “seen”, but at least we can observe their tracks in bubble chambers. But our best contemporary theories tell us that free quarks cannot exist; they are always bound within other elementary particles, such as protons and neutrons. Their existence and behavior must be inferred by a complicated chain of reasoning involving both experiment and theory. The general outlines of that reasoning *can* be explained to the lay reader — though the details require advanced mathematics and a deep knowledge of physics — but even at a general level it is indubitably subtle.

Fast forward four decades. Now the entire American medical establishment, from the American Medical Association and the American Academy of Pediatrics to the American Psychological Association and the American Psychiatric Association and even the Centers for Disease Control and Prevention, insists that sex — as in male or female — is, in the AAP’s words, “an assignment that is made at birth”. What on earth could this possibly mean?

The facts about sex are straightforward — much more straightforward than the facts about quarks! — and are taught in any half-decent high-school course in biology. Nearly all animals, as well as many plants, reproduce sexually. In almost all sexually reproducing multicellular species this occurs by combining a large gamete, called an ovum (or egg), with a small gamete, called a sperm. Though some (“hermaphrodite”) plants and animals produce both ova and sperm, there are no hermaphrodite mammalian species. In mammals, each individual produces only one kind of gamete. Those individuals that produce (relatively few) ova are called female; those that produce (large numbers of) sperm are called male. Whether a mammal embryo develops into a male or a female is determined (at least when things go right, which is nearly all the time) by a pair of sex chromosomes: XX for females, XY for males.

In short, sex in all animals is defined by gamete size; sex in all mammals is determined by sex chromosomes; and there are two and only two sexes, female and male, because there are two and only two types of gametes, ova and sperm.

For sure, quirks of mutation or prenatal development may leave some individuals unable to produce viable gametes at all. But an infertile individual with a Y chromosome is still male, just as a one-legged person remains a full member of our bipedal species.

Much is speciously made of the fact that a very few humans are born with chromosomal patterns other than XX and XY. The most common, Klinefelter syndrome (XXY), occurs in about 0.1% of live births; these individuals are anatomically male, though often infertile. Some extremely rare conditions, such as de la Chapelle syndrome (0.003%) and Swyer syndrome (0.0005%), arguably fall outside the standard male/female classification. Even so, the sexual divide is an exceedingly clear binary, as binary as any distinction you can find in biology.

So where does this leave the medical associations’ claims about “sex assigned at birth”?

A baby’s *name* is assigned at birth; no one doubts that. But a baby’s sex is not “assigned”; it is determined at conception and is then *observed* at birth, first by examination of the external genital organs, and then, in cases of doubt, by chromosomal analysis.

(An interesting remark: My UCL colleague Alice Sullivan has drawn my attention to very interesting data showing the sex ratio at birth, in various countries, since 1950. In several countries, mostly in Asia and Central Asia, there has been, starting in the mid-1980s, a huge preponderance of boys over girls, reaching a peak ratio 118:100 in China in 2005 (it has now decreased to 112:100). The obvious cause of this disparity is the cultural preference for boys, combined with the availability of sex-selective abortion. And sex-selective abortion is possible precisely because sex is determined at conception and is observable *in utero*, well before it can be “assigned” at birth. Indeed, aborted

fetuses, which are never born, also have a sex: in some countries preferentially female.)

Of course, just because sex is *observed* at birth doesn't mean that that observation is always correct. Indeed, *any* observation can be erroneous — that is a fundamental principle of science — and in very rare cases the sex reported on the birth certificate is inaccurate and needs to be subsequently corrected. But the fallibility of observation does not change the fact that what is being observed — a person's sex — is an objective biological reality, just like their blood group or fingerprint pattern — not something that is “assigned”. The medical associations' pronouncements are social constructivism gone amok — this time about a subject that has been more-or-less accurately understood by humans (albeit without all the scientific details) ever since the beginning of our species. Sex, unlike quarks, is not subtle.

So let's go back to the medical associations' dogma. What could possibly have impelled sober-minded scientists to advocate such a bizarre and easily refutable view? The cause is evidently political. The medical establishment's new-found reluctance to speak honestly about biological reality — and its insouciance in speaking dishonestly about it — presumably stems from a laudable desire to defend the human rights of transgender people. But while the goal is praiseworthy, the chosen method is misguided. Protecting transgender people from discrimination and harassment does not require pretending that sex is merely “assigned”.

The bottom line is this: It is never justified to distort the facts in the service of a social or political cause, no matter how just. If the cause is truly just, then it can be defended in full acceptance of the facts about the real world; if that cannot be done, then the cause is not just.

And when an organization that proclaims itself scientific distorts the scientific facts in the service of a social cause, it undermines not only its own credibility but that of science generally. How can the public be expected to trust the medical establishment's declarations on other controversial issues, such as vaccines — issues on which the medical consensus is indeed right — when it has so visibly and blatantly misstated the facts about something so simple as sex?

One might respond to this by observing that medicine is not, strictly speaking, a science: rather, it is an applied field that combines biological science with psychological and social notions of highly variable rigor. And it is from this latter side that politics has entered and has taken precedence over truth.

So it is fair to ask: Are there any examples of similar politicization corrupting physics, chemistry or biology?

In Galileo's time, physics and astronomy were subjects of political-theological dispute; but for the past two centuries, it is principally biology that has been on the firing line. For a long time, religious conservatives were loath to accept the fact that biological species, including humans, have evolved over time — much less to accept Darwin's explanation of that evolution by natural and sexual selection. Those anti-evolution views continue to be strong in the USA, as well as in some parts of the Muslim world, and the

resulting political pressure distorts the teaching of biology in the public schools. But the effect on research and teaching in the universities is minimal.

Nowadays the pressure on research and university-level teaching in biology comes principally from the “left” (I use the quotation marks advisedly), and until recently it concerned mainly the investigation of statistical differences in human traits (especially psychological traits) by sex or geographical ancestry (a.k.a. “race”). But now even mentioning sex as a biological fact can elicit a Twitterstorm of condemnation. And the main victims, not surprisingly, are researchers with untenured, precarious contracts. (Superstars like Richard Dawkins and Steven Pinker are “too big to be cancelled”; campaigns against them are intended as a warning to others.)

Harvard biologist Carole Hooven, a much-praised (but untenured) lecturer in the Human Evolutionary Biology department and author of an acclaimed book on testosterone, got herself into hot water when she dared to say on national television that

The facts are that there are ... two sexes ... male and female, and those sexes are designated by the kinds of gametes we produce ...

Though she stressed that

we can treat people with respect and respect their gender identities and use their preferred pronouns, so understanding the facts about biology doesn't prevent us from treating people with respect ...

— using the word “respect” three times in one sentence! — this didn't stop the graduate-student director of her department's Diversity, Inclusion and Belonging Task Force from lambasting Hooven's remarks (on Twitter, of course) as “transphobic and harmful”. To make a long story short, Harvard's administrators failed to defend Hooven's reputation or even her academic freedom — issuing the usual weaselly two-sided statements — and 18 months later Hooven resigned.

A similar fate befell Penn State biologist Colin Wright — a postdoc — who dared to author an article arguing that the observed statistical sex differences in human behavior are probably at least in part grounded in evolution, and that — even more shockingly, it seems — there are two sexes, male and female, and over 99.98% of all humans belong unambiguously to one or the other. To make matters worse, Wright later co-authored an essay entitled “No One Is Born in ‘The Wrong Body’ ”. Shortly thereafter — at the height of the academic-recruitment season — someone posted a listing on the major ecology and evolution job board: “Colin Wright is a Transphobe who supports Race Science.” The activists (possibly a very small but loud group) were explicit in their attempts to intimidate any university foolhardy enough to offer Wright a job. Two months later, he quit academia. He recounted the details of the story in an article shrewdly titled “Think Cancel Culture Doesn't Exist? My Own ‘Lived Experience’ Says Otherwise”.

But as Hooven and Wright are at pains to emphasize, the harm arising from this politicization of scientific inquiry is not just — or even primarily — the manifest injustice done to researchers like themselves. Rather, the principal harm is done to the scientific endeavor itself: by inducing researchers to self-censor as a matter of personal

and professional preservation, “cancel culture” undermines the freedom of debate that is the cornerstone of the scientific community’s claims to knowledge. As John Stuart Mill pointed out a century-and-a-half ago, giving the example of Newtonian mechanics,

The beliefs which we have most warrant for have no safeguard to rest on, but a standing invitation to the whole world to prove them unfounded. If the challenge is not accepted, or is accepted and the attempt fails, we are far enough from certainty still; but we have done the best that the existing state of human reason admits of . . . This is the amount of certainty attainable by a fallible being, and this the sole way of attaining it.

When that freedom of debate is curtailed, even true ideas stop being rationally justified. (I’ll elaborate on this point towards the end of my talk.)

In the physical sciences, by contrast with the biological sciences, the main attacks on the freedom of research have come from right-wing politicians attacking climate science and environmental science and attempting to defund them. This threat seems to have receded somewhat in recent years, as conservative politicians have mostly retreated from questioning anthropogenic global warming and have focussed instead on the allegedly excessive cost of transition to a non-carbon economy. But it could resurge if Donald Trump wins the next American election.

There is also some pressure on the physical sciences and mathematics from the “woke left”, but at present it is mainly concerned, not with the content of research, but with vague calls for the “decolonisation” of curricula and for “decentering whiteness and cisheteropatriarchy” in pedagogy.

It’s tolerably clear what “decolonisation” can mean in history and literature, but it’s less clear what it might entail in the natural sciences and mathematics, which purport to produce — and in my view *do* often produce — universally valid knowledge. However, some advocates of “decolonisation” take the radical position that scientific and mathematical knowledge is *not* in fact universally valid, and in New Zealand this postmodernist idea has now become official policy. The National Curriculum explicitly mandates “equal status for mātauranga Māori [Maori knowledge]”, asserting that it has “equal value with other bodies of knowledge”, presumably including modern science. Indeed, the chemistry curriculum was revised to include the concept of *mauri* — the “the binding force between the physical and the spiritual” — that students are taught “is present in all matter”. As one chemist perceptively commented:

Who discovered this binding force between the physical and the spiritual? And what evidence was involved in its discovery? If this binding force is real, then everyone needs to know about it. It needs to be in the chemistry syllabus of every country, not just in New Zealand.

(It now appears that the inclusion of *mauri* in the chemistry curriculum was quietly rolled back after protests from scientists.)

Other advocates of “decolonisation” accept the universality of scientific knowledge but simply urge greater attention, in teaching, to the non-Western origins of much mathematics and science. That is a sensible suggestion: for instance, every mathematician knows that the concept of zero as a number arose in India in the fifth century CE, and that algebra was developed by Islamic scholars starting around 800 CE, before being elaborated in Renaissance Europe; students deserve to know that too. But the main focus of science and mathematics teaching has to be on our subject (in which we lecturers can rightly claim some expertise), not on its history (in which most of us are rank amateurs). Students who want to pursue the history of science should learn it from professional historians of science: learning “how to think like historians and how to critique theories such as decoloniality rather than simply accepting them as fact”, as one critic put it.

One final aspect of “decolonisation” is the proposal to rename the contributions of scientists whose behavior is now considered to be morally lacking, or whose extrascientific ideas are now considered to be offensive: Isaac Newton (allegedly benefited from colonialism), Fritz Haber (developed chemical weapons) and William Shockley (racism and eugenics), among many others. The downsides of such “cancellations done in the name of maintaining moral purity” — which in earlier epochs targeted Marie Curie (affair with a married man) and Alan Turing (gay) — were eloquently explained in a recent article, “The peril of politicizing science”, by the chemist Anna Krylov.

What about decentering whiteness and cisheteropatriarchy in teaching? One article on “dismantling whiteness” in physics teaching was published recently in the journal *Physical Review Physics Education Research*: this is the section of the prestigious *Physical Review* devoted to “experimental and theoretical research relating to the teaching and learning of physics and astronomy”. I won’t enter into the details of the article, which you can read for yourselves. More interesting is what happened when four physicists took up the editors’ invitation to contribute “constructive and respectful criticism of published articles” — referring specifically to this one — “in the form of Comments”. The four authors’ duly submitted Comment was *rejected* by the journal’s editor on the grounds that it was “framed from the perspective of a research paradigm that is different from the one of the research being critiqued”. As the authors dryly but accurately pointed out:

This is akin to stating that an astronomer must first accept astrology as true before critiquing it. Such notions should be, at a minimum, dispiriting for anyone who sees educational practices as worthy of empirical investigation.

I’d like to mention one more example of politicization arising from *within* the scientific community, that I believe should raise great concern.

Two years ago, the prestigious journal *Nature* issued a new “ethics guidance” concerning proposed submissions. But the guidance isn’t about the protection of human research subjects; that issue has been strictly regulated for decades. Nor is it about

restricting the publication of information that poses serious material dangers, such as facilitating the production of nuclear or biological weapons. Rather, the guidance purports to address other forms of “harm” that could be caused by a scientific publication. And on these grounds, the editors arrogate to themselves an astoundingly broad power:

Regardless of content type (research, review or opinion) and, for research, regardless of whether a research project was reviewed and approved by an appropriate institutional ethics committee, editors reserve the right to request modifications to (or correct or otherwise amend post-publication), and in severe cases refuse publication of (or retract post-publication): [OK, THAT’S THE END OF THE LAWYER-LIKE STUFF; HERE’S THE KICKER OF WHAT THEY PROPOSE TO CENSOR]

...

Content that undermines — or could reasonably be perceived to undermine — the rights and dignities of an individual or human group on the basis of socially constructed or socially relevant human groupings.

That vague and subjective language is an open door to ideological censorship of valid scientific contributions — a censorship that the editors do not even attempt to disguise. So I propose to evaluate critically the justifications that the editors of *Nature* have offered in support of this brave new policy.

The document starts ominously:

Although academic freedom is fundamental, it is not unbounded.

(Vague assertions of this kind are always a bad sign: one knows what’s coming next.) The guidance purports to apply “ethical principles” analogous to those used to protect human research subjects, but now concerning other types of “harms”:

For example, research may — inadvertently — stigmatize individuals or human groups. It may be discriminatory, racist, sexist, ableist or homophobic. It may provide justification for undermining the human rights of specific groups, simply because of their social characteristics.

Let’s slowly unpack these claims.

1) What could it mean for scientific research to “stigmatize” individuals or human groups? And to do so “inadvertently”?

Suppose research finds that obesity can cause cancer (it can). Does that “stigmatize” overweight people? Some people would argue that it does; but that is shooting the messenger because we don’t like the message. In fact, suppressing this research would do harm above all *to overweight people*, by denying them information that they could use — if they wish, and only if they wish — to protect their health.

Or suppose research finds that gay men have more sexual partners, on average, than heterosexual men (they do). Does that “stigmatize” gay men? Maybe it does, at least in the eyes of people who disdain sexual promiscuity. But it is also important information in

planning interventions to reduce the risk of sexually transmitted disease — interventions that would disproportionately benefit *gay men*.

The editors of *Nature* have thus assigned to themselves the purely subjective task of judging which scientific research “stigmatizes” some social group, and have empowered themselves to suppress valid scientific contributions — information that is likely to be *true* and important — on that sole basis.

2) What could it mean for scientific research to be “discriminatory, racist, sexist, ableist or homophobic”? If the research incorporated racist or sexist *presuppositions*, that would be an *epistemic* defect that would undermine the quality of the research, and perhaps invalidate it entirely, purely on traditional scientific criteria; no new “ethics guidance” is needed on that score. Clearly what the editors are getting at is not racist or sexist presuppositions, but rather *conclusions* from the research that the editors, in their infinite wisdom, judge to be racist or sexist. But that is again shooting the messenger.

Suppose, for instance, that research finds (as it seems to) that men show larger variation than women over a range of cognitive and psychological traits, including various types of intelligence — so that men are overrepresented at both the low and high ends of the scale, even when the means are equal. Surely this is not the only reason why women are underrepresented among scientists — sexist stereotypes, influencing girls and young women, must also be a major contributing factor, and there are undoubtedly other factors as well — but it might form part of the explanation; it might mean that even in a future non-sexist society the majority of scientists (and also of people with intellectual disabilities) will be men. Should this information be suppressed? If that happens, then our ignorance of relevant facts will interfere with our ability to determine accurately the extent to which sexist discrimination persists in different fields; and it will also impede us from distinguishing between ameliorative policies that are effective and those that are not.

3) And what, finally, can it mean to “provide justification for undermining the human rights of specific groups”?

Consider again the research about sex differences in the variation of mathematical ability. Would this research provide a “justification” for discriminating against women scientists? Absolutely not! It might provide a lame *excuse* for such discrimination, but not a justification. Since each individual’s work can be evaluated on its own merits, the statistical properties of the groups to which that individual belongs are completely irrelevant.

So what the editors seem to have in mind is not research that could *justify* undermining the human rights of specific groups — indeed, it’s hard to see how *any* scientific research could do that, simply because one cannot derive an “ought” from an “is” — but research that some people might attempt to *misuse* as a supposed justification for undermining human rights. But valid ideas should not be suppressed because some people might misuse them; rather, it is the misuse that should be criticized instead.

The bottom line is that the editors of *Nature* have arrogated to themselves the right to suppress valid scientific work — work that is both correct and important — purely because it allegedly

undermines — or could reasonably be perceived to undermine — the rights and dignities of an individual or human group.

But what could it mean for a *scientific* contribution — that is, information about reality — to undermine anyone’s rights or dignities? Once again, the editors are perpetrating a severe confusion between “is” and “ought”; indeed, the policy is entirely founded on that confusion.

But then the editors cover their tracks by introducing, in astute lawyerlike fashion, a new element: the scientific work need not *actually* undermine anyone’s rights or dignities; rather, it suffices that some unnamed people (note the editors’ strategic use of the passive voice) could reasonably *perceive* the work to undermine someone’s rights or dignities. But this is an extraordinarily broad criterion: it is likely that *any* controversial scientific work that has public-policy implications will cause *some* people to perceive it as undermining someone’s rights or dignities. For instance, an article reviewing the neuropsychological effects of puberty blockers will likely be labeled by advocates of gender-identity ideology as undermining the rights and dignities of transgender people (“stigmatising an already stigmatised group”, as one of this article’s anonymous peer reviewers did explicitly put it); others will reply that this research helps to *protect* the rights of gender-nonconforming teenagers by offering them accurate information about the benefits and risks of proposed medical interventions.

Admittedly, the editors require that the research slated for suppression could *reasonably* be perceived to undermine the rights and dignities of an individual or group. But who gets to decide which perceptions are reasonable, and which are not? The editors themselves, of course. And these are the same editors who insist, among other things, that sex as defined by gametes and chromosomes — the well-established biological understanding — “has no foundation in science”, that “sex [is] more complex than male and female”, and that the now-outdated (according to them) biological view “would undermine efforts to reduce discrimination against transgender people and those who do not fall into the binary categories of male or female”.

Consequently, any scientific article that employs the standard biological concept of sex now risks being characterized by the *Nature* editors as undermining the rights and dignities of transgender people — and *ipso facto* as being reasonably perceived as doing so. Since that criterion would exclude a huge chunk of work in biology and medicine, the editors can’t apply it consistently without sabotaging their own journal. So they will of necessity apply it selectively: to suppress those studies whose conclusions they dislike. As psychologist Bo Winegard¹ has perceptively pointed out:

Imagine for a moment that this editorial were written, not by political progressives, but by conservative Catholics, who announced that any research promoting (even “inadvertently”) promiscuous sex, the breakdown of the nuclear family, agnosticism and atheism, or the decline of the nation state would be suppressed or

¹I have recently learned that Winegard has expressed controversial views on other subjects that I do not endorse. It should go without saying that favorably citing author A on issue X implies nothing whatsoever about whether one endorses author A’s views on issue Y, Z or W.

rejected lest it inflict unspecified “harm” on vaguely defined groups or individuals. Many of those presently nodding along with *Nature*’s editors would have no difficulty identifying the subordination of science to a political agenda.

The *Nature* editors attempt to soften the blow of their brazen announcement of future censorship by declaring that

There is a fine balance between academic freedom and the protection of the dignity and rights of individuals and human groups. We commit to using this guidance cautiously and judiciously, consulting with ethics experts and advocacy groups where needed.

As Winegard comments:

This is not at all reassuring. Asking ethicists to assess the wisdom of publishing a [scientific] journal article is as antithetical to the spirit of science as soliciting publication advice from a religious scholar. Who are these “ethics experts” and “advocacy groups” anyway? . . .

Imagine the outcry on the Left if a journal announced it would be consulting pro-life advocates before publishing an article about the effects of abortion on wellbeing. Or if it decided to consult conservative evangelicals when evaluating an article about the effects of adoption by homosexual couples.

There is one further danger that the advocates of ideological censorship in science would do well to ponder.

As John Stuart Mill observed long ago in his celebrated essay *On Liberty*,

The peculiar evil of silencing the expression of an opinion is, that it is robbing the human race; posterity as well as the existing generation; those who dissent from the opinion, still more than those who hold it. If the opinion is right, they are deprived of the opportunity of exchanging error for truth: if wrong, they lose, what is almost as great a benefit, the clearer perception and livelier impression of truth, produced by its collision with error.

The first side of this bifurcation is clear: though we all naturally think that our current opinions are correct (otherwise they wouldn’t be our opinions), we still ought to be willing to admit that we are not infallible. And that means, if you really care about truth, that you ought to be open to hearing arguments against your current opinions, and open to changing those opinions whenever the counterarguments turn out to be cogent. Perhaps the *Nature* editors are so utterly certain that their views — on a huge variety of disparate subjects — are all 100% correct that they are unable to imagine learning even a tiny bit from listening to reasoned criticisms; if that is the case, then they themselves are the losers (as are their readers who are prevented from hearing relevant evidence).

But the other side of Mill’s bifurcation is less obvious, so let me quote Mill again:

He who knows only his own side of the case, knows little of that. His reasons may be good, and no one may have been able to refute them. But if he is equally unable to refute the reasons on the opposite side; if he does not so much as know what they are, he has no ground for preferring either opinion.

Nor is it enough that he should hear the arguments of adversaries from his own teachers, presented as they state them, and accompanied by what they offer as refutations. That is not the way to do justice to the arguments, or bring them into real contact with his own mind. He must be able to hear them from persons who actually believe them; who defend them in earnest, and do their very utmost for them. He must know them in their most plausible and persuasive form . . .

Ninety-nine in a hundred of what are called educated men are in this condition; even of those who can argue fluently for their opinions. Their conclusion may be true, but it might be false for anything they know: they have never thrown themselves into the mental position of those who think differently from them, and considered what such persons may have to say; and consequently they do not, in any proper sense of the word, know the doctrine which they themselves profess.

Mill's two-pronged argument in favor of the freedom of debate is in fact a crucial ingredient in legitimizing knowledge in general, and scientific knowledge in particular; and it is striking that Mill himself used an example from science — namely, Newtonian mechanics — to explain why. Isaac Newton published his celebrated laws of motion in 1687; and by the time Mill was writing in 1859, scientists had accumulated overwhelming evidence, from both terrestrial and astronomical observations, that Newtonian physics is correct (even to the point of predicting accurately, in 1846, the existence and precise location of the hitherto-unknown planet Neptune). But, Mill points out, if at some point the government (or even just the scientific societies) had decided that, in view of the overwhelming evidence of the correctness of Newtonian mechanics, it would henceforth be forbidden to dispute it, then we would now have *much less reason* to believe in the correctness of Newtonian mechanics! It is precisely the fact that Newtonian mechanics has held up in the face of free and open debate that gives us such justified confidence in its correctness.

(There is an added twist to this story, which illustrates the *first* side of Mill's argument, though Mill unfortunately didn't live to see it: it turns out that Newtonian mechanics is *not* exactly correct (though it is an extremely accurate approximation in many circumstances); this was discovered in 1905, by Albert Einstein, more than 30 years after Mill's death. But this important fact might never have been discovered — or at the very least, its discovery would have been delayed — if criticism of Newton's theory had been forbidden.)

So even if the “progressives” are 100% correct on every subject and have nothing whatsoever to learn from their thoughtful critics, censorship of opposing views is *still* harmful *to their own cause*, as it undermines the good reasons for anyone else to adopt their ideas.²

²Of course, those “progressives” might well wager — probably unconsciously, of course — that the negative effect (from their point of view) of undermining the good reasons for people to adopt their

It would be a real positive step if the *Nature* editors were to reflect on this argument — which is, after all, Mill’s, not mine — and respond to it. But people with power are unfortunately not accustomed to acknowledging (much less addressing) reasoned critiques from lesser mortals. So don’t hold your breath.

Anyway, I’ve probably gone on now for much too long. So I’d like to thank you all for your patience in sitting through this long diatribe, and to open the floor to all the comments and criticisms that you’d care to throw at me.

ideas would be outweighed by the positive effect (again from their point of view) of giving people *bad* reasons to adopt their ideas: for instance, social pressure, or allowing oneself to feel (unreflectively) “on the right side of history”. That manipulative tactic is immoral, in my view, even when implemented unconsciously; but it could well be effective: that is an empirical question to which I don’t know the answer.