

Taking sides in the science wars

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Jack Tully makes sense of the science wars that have gripped the USA, and argues that socialists must be at the forefront of a critical defence of science

The class struggle is, as well as strikes and protests, a battle of ideas. And a battle is currently raging between post-modernist "radicals" and scientific defenders of the status quo.

For the last five years, colleges in the USA have been gripped by what the press has dubbed the "science wars". Social scientists, feminists and left wingers have slugged it out with scientists over the value of the different approaches to the study of culture, and in particular towards science.

The debate raises fundamental questions that only Marxism can fully answer. It began in 1994, with the publication of an irritable, cynical and overly-polemical book, *Higher Superstition: The academic left and its quarrels with science*. The aim of the authors, Paul Gross (a biologist) and Norman Levitt (a mathematician), was simple: to ridicule left wing academics for their post-modernist and anti-materialist "science studies" and for the political positions that explicitly motivate these studies: feminism, ecology and what passes for "Marxism" in American universities.

"Science studies" is a growing part of the college curriculum in the USA. Generally concentrated in sociology or cultural studies departments, it tries to analyse science as a social phenomenon. It tries to overcome the limitations of the more traditional "history and philosophy of science" approaches.

Despite the fact that Gross is a self-proclaimed member of the "Democratic Socialists of America", the book is heavily marked by its criticisms of left politics, and contains several reactionary rants against positive discrimination in the US education system. However, the fundamental problem identified by Gross and Levitt is that of post-modernism and its vision of science. They catalogue some appalling scholarship (and even worse academic gobbledygook) and show that, in studying science, post-modernism is as useless as in other domains.

Post-modernism, largely based on a set of French thinkers, sociologists (Foucault), philosophers (such as Lyotard and Derrida) and psychoanalysts (such as Lacan and Deleuze), argues that all knowledge is culturally determined and is thus relative. Curiously enough, many post-modern critics of science regularly appeal to some of the weirder results of physics, in particular the bizarre findings of quantum physics and the alleged "unpredictability" of chaos theory, in order to buttress their claim that there is no absolute knowledge. The only exception they make to this blanket dismissal of all certainty is the certainty that the eighteenth century revolution in politics, science and culture, the Enlightenment, was a bad idea.

For post-modernism, with its dense mixture of badly-translated French, rampant idealism and deliberately obscure terminology, science is fundamentally a social construct. As post-modernist Bruno Latour has put it: "Reality is the consequence rather than the cause of the social construction of facts.". This idealistic position can give rise to the craziest mumbo-jumbo: for example, the strange argument that Newton's

Principia Mathematica can be considered as a "rape manual" to bizarre fantasies about African tribes having discovered quantum physics centuries ago. All this formed the main target of Gross and Levitt's scorn and fury.

Gross and Levitt were all the more concerned because, for many US students, their only contact with science is through the growing number of post-modernist science studies courses. Many apparently sane US citizens believe that space aliens regularly kidnap humans; that there is a statue of Elvis on Mars; that evolution is a "myth" and that the universe was created in seven days. "Science studies" says their "truth" is no less valid than ours.

As intended, Gross and Levitt's book provoked a huge row amongst US intellectuals. In May 1995, one year after publication, the New York Academy of Sciences organised a conference on the theme "The Flight from Science and Reason", which also resulted in the publication of a massive report, edited by Gross and Levitt

The Sokal hoax

The matter would probably have remained at the level of a mutually profitable academic gravy-train, were it not for a celebrated hoax perpetrated by Alan Sokal, a physicist and left-wing activist. The Sokal hoax launched the science wars onto the front pages of newspapers the world over.

Sokal was dismayed by the fact that many science studies scholars were producing intellectually shoddy work in the name of left policies that he agreed with, in particular by citing scientific results that had little to do with the question at hand, and which they clearly did not understand.

Sokal submitted a spoof academic paper to the post-modern journal *Social Text* that denounced science as being merely a social construct. He peppered the article with scientific rubbish that any A-level physics student would have spotted and wrote it in an obscure and pompous style, devoid of content. Here is an example: "Just as liberal feminists are frequently content with a minimal agenda of legal and social equality for women and are 'pro-choice', so liberal (and even some socialist) mathematicians are often content to work within the hegemonic Zermelo-Fraenkel framework (which, reflecting its nineteenth-century origins, already incorporates the axiom of equality) supplemented only by the axiom of choice. But this framework is grossly insufficient for a liberatory mathematics, as was proven long ago by Cohen 1966".

If you don't understand that paragraph, don't worry: there's nothing there to understand. Quite simply, it is gibberish. *Social Text* was preparing a special issue (entitled "Science Wars"), rebutting Gross and Levitt's arguments and defending post-modernism. The editors, only too pleased to have a prestigious scientist on board, assumed he knew what he was talking about, and published the article. A few weeks later Sokal revealed all, and the formaldehyde hit the fan.

Since then, an increasingly petulant debate has raged in the pages of the major scientific journals, and more books have been published. Sokal has ridiculed French thinkers for their ignorant abuse of mathematics and physics in support of their arguments, while the French post-modernists have fought back with a collection of piqued essays attacking his ignorant abuse of their philosophy.

Finally, in an unpleasant chauvinist twist, Bruno Latour wrote an article in the leading French daily *Le Monde*, linking the dispute to the Anglo-Saxon domination of science and the rejection of French "discoveries", in particular the ludicrous claim that water molecules can be imprinted with information that can be disseminated via the Internet.

Despite all this, the questions raised by the science wars are of fundamental importance, for two reasons.

First, Marxists have a vital contribution to make to debates over the relation between the structure of society and human consciousness (including scientific knowledge). The nature of this relationship is fundamental to Marxism's understanding not only of the world in general, but of the class struggle in particular, and it guides our struggle to change the world.

Second, revolutionaries would be sympathetic to some of the political questions that motivate the post-modernist side in the science wars. However we would insist that those political stances should not blind us to the results of science: post-modernism's rejection of materialism and its adoption of a profoundly sceptical approach ultimately undermines any attempt to change the world.

To provide some answers to the questions raised by the science wars, we first need to understand science as a branch of knowledge. Many scientists believe they are engaged in a value-free search to understand the natural world, and that the terms of scientific debate, and the way in which scientific knowledge progresses, can be understood from a strictly "internalist" stance, i.e. from within science itself. According to this view, science constitutes an inexorable march towards the truth, with only the facts determining the outcome of scientific debates.

This is clearly one-sided. As Sokal put it in a recent article:

"Which research problems count as important, how research funds are distributed, who gets prestige and power, what role scientific expertise plays in public-policy debates, in what form scientific knowledge becomes embodied in technology, and for whose benefit, all these issues are strongly affected by political, economic, and, to some extent, ideological considerations, as well as by the internal logic of scientific inquiry."

Furthermore, scientists themselves, overwhelmingly white, middle-class and male, are subject to a process of selection and training that is yet another expression of the racial, gender and class oppression that dominates in capitalism (and which dominated in the Stalinist states, too). It would be unusual if this selection had no effect on the way science is practised.

Determining exactly how these ideological factors interact in the choice of scientific problems is clearly a legitimate subject for study by social scientists, and should produce fascinating findings about how knowledge is organised under capitalism.

But despite the reality of these social factors, the vision of science as a progressively true account of the universe is correct. This is what makes science unique. Its findings are checked, corrected and enriched on the basis of experience. The same cannot be said of, for example, literary criticism. Do today's post-modern critics understand Shakespeare's sonnets better than, say nineteenth century "romantic" critics? They may think so, but they cannot prove it to the satisfaction of everyone else.

On the other hand, today's understanding of genetics is demonstrably superior to that of the 1960s. Such is the pace of scientific discovery that the gap between a discovery being awarded the Nobel Prize and being taught at undergraduate level has been reduced to around 10 years.

Unlike literary criticism (or cultural studies, or philosophy or any other branch of knowledge), science works. Its fruits surround us, they have changed the lives of everyone on the planet. That is not bad for something that is allegedly just a "social construct".

The post-modern view of science is a caricature of Marxism. The post-modernists in general reject the fact that subjective human actions can alter circumstances. Translated into the debate on science, this becomes a crude one way model of society "dictating" ideas to science.

At one level it is true that science is socially determined. The state-directed planning during the Second World War played a fundamental role in forcing decisive advances in computing, radar and, of course, nuclear weaponry. This also shows that the choice of scientific subjects can be determined by society rather than springing spontaneously from scientists' heads.

But the post-modern explanation of social determination, precisely because it rejects class society as a key idea, and rejects objective truth in general, is much cruder than this. For example, Einstein's theory of relativity and subsequent discoveries in twentieth century physics have been "explained" by sociologist Harvie Ferguson in terms of the psychological consequences of changes in property relations:

"The inner collapse of the bourgeois ego signalled an end to fixity and systematic structure of the bourgeois cosmos. One privileged point of observation was replaced by a complex interaction of viewpoints. The new relativistic viewpoint was not itself a product of scientific 'advances' but was part, rather, of a general cultural and social transformation which expressed itself in a variety of 'modern' movements. It was no longer conceivable that nature could be reconstructed as a logical whole. The incompleteness, indeterminacy, and arbitrariness of the subject now reappeared in the natural world. Nature, that is, like personal existence, makes itself known only in fragmented images."

Leaving aside the fact that Ferguson has got hold of the wrong end of the stick (modern science precisely enables us to understand nature as a "logical whole" rather than as a series of "fragmented images"), the key point here is that he in no way proves his thesis: he simply states it.

A Marxist might also suspect that there is some relation between various forms of cultural development that could be understood in terms of deep changes in the economic base of society. For example, it is probable the development of the scientific method was linked in a dialectical chain of cause and effect to the rise of industrial capitalism. But that would have to be demonstrated. Alternative hypotheses, including strictly internalist explanations (could science have evolved without capitalism, or vice versa?), would have to be taken seriously and tested. In other words, the study of science, like the study of all phenomena, requires a materialist, scientific approach.

Post-modernism, Stalinism and "Empirio-criticism"

The post-modernists' caricature of science, and their calls for a "post-modern" or "feminist" science, echo the intellectual absurdities of Stalinism in its heyday. In one of the most tragic episodes of twentieth century science, Stalin's cronies decreed that there was "bourgeois science" and "proletarian science".

In the late 1940s a series of purges took place among Soviet scientists in which the "bourgeois science of genetics" was effectively eradicated in the USSR, at the behest of T. D. Lyssenko, Stalin's fraudulent scientific yes-man. The reality of genetics, "bourgeois" or not, was denied in the name of a terrifying bureaucratic vision of culture in general and science in particular. The consequences for Soviet science, and indeed for Soviet agriculture, which could have enormously profited from the application of genetics to crops and animals, were catastrophic and are still being felt.

Despite the warning provided by Lyssenko, pure post-modernism adopts a stance that is barely different from his. This is the heart of post-modernism's understanding of epistemology (how we know what we know) in general and of science in particular.

According to Shapin and Schaffer, two of the more literate (and moderate) practitioners of post-modern science studies

"As we come to recognise the conventional and artificial status of our forms of knowing, we put ourselves

in a position to realise that it is ourselves and not reality that is responsible for what we know."

In other words, our knowledge of the universe does not stem from reality itself, but from the social context within which that reality is interpreted

Or as Stanley Aronowitz, one of the leading post-modern critics of science has put it: "The point is that neither logic nor mathematics escapes the contamination of the social." This is rubbish, Stanley: $2 + 2 = 4$, whether you are a worker or a boss

As well as mirroring some of Stalinism's worst excesses, this position also reflects another tendency in the history of the workers' movement: "Empirio-criticism". In 1909, in one of the more obscure episodes in the history of the Bolshevik Party, Lenin launched a lengthy polemic in defence of materialism and against a tendency within the Party led by Bogdanov that followed the philosophy of the physicist Ernest Mach, who denied the existence of objective reality.

Lenin took issue with Bogdanov's attempt to blend Marxism and Machism:

"The basis of 'objectivity', wrote Bogdanov, must lie in the sphere of collective experience...In general the physical world is this: socially agreed-upon, socially harmonised, in a word, socially organised experience."

In other words, a social construct. Sounds familiar? Gross and Levitt, who snigger at Lenin's scientific ignorance, would no doubt be surprised to find that, on this question at least, they are on the same side of the philosophical barricades.

Lenin's long offensive against Bogdanov, and his detailed defence of materialism, puzzled many Bolsheviks. Pokrovsky, a historian of the Bolshevik party, writes:

"When Lenin began to quarrel with Bogdanov on the issue of empirio-monism, we threw up our hands and decided Lenin had gone slightly out of his mind. The moment was critical. The revolution was subsiding. We were confronted by the need for a radical change in our tactics; yet, at that time Ilyich immersed himself in the Bibliothèque Nationale [in Paris], sitting there for whole days, and wrote a philosophical book as a result. The scoffing was endless."

And yet Lenin was right to take the argument to Bogdanov and to attack his rejection of materialism and, more specifically of dialectical materialism. At the heart of the matter was the fundamental question of the nature of human knowledge, of science, and thus of Marxism itself.

As Engels put it in his monumental work, *Anti-Duhring*, human understanding "can never be created and derived by thought out of itself, but only from the external world. The principles [of knowledge] are not the starting point of the investigation, but its final result; they are not applied to nature and human history, but abstracted from them; it is not nature and the realm of humanity which conform to these principles, but the principles are only valid in so far as they are in conformity with nature and history. That is the materialistic conception of matter."

It is also the materialist conception of science, including of Marxism, which is currently our best approximation to social reality, and which, like all sciences, continually evolves and changes to meet the challenge of changing reality and better methods of investigation.

This relationship with the objective world is consciously placed at the heart of Marxism and, implicitly, in the natural sciences. It is a dialectical approach, which seeks to understand matter as it changes, as it moves (including humanity itself, which is part of matter), and to develop and change theory in response to

new discoveries. Post-modernism, on the other hand, offers nothing more than recycled idealism, a philosophical dead-end that, in fact, pre-dates modernism. Far from being the new vanguard of human thought, the post-modernists are intellectual throwbacks with nothing new to say, but who make a great deal of noise saying it. And they are not even on the right side of the social struggle.

On one of the key intellectual debates in the USA, the struggle against the teaching of "creationist science" in US schools, post-modernism lines up with the religious reactionaries. If Darwinian evolution is merely another "story", another social construct like the myth of creation, how can you possibly argue against giving the religious bigots equal time?

Post-modernism and the left

Apart from the resurgence of obsolete idealist arguments, the science wars have revealed the striking inadequacy of the left. Post-modernism, with both its philosophical scepticism and its spurious claims to radicalism, dominates social sciences and the arts, both in US and British colleges. The revolutionary Marxist voice has been virtually silenced.

But things need not be this way. In France, for example, post-modernists do not pose as "left": the influence of an unbroken working class movement means that young left intellectuals are rarely attracted by it. Any doubts as to the reality of the class struggle have been dispelled by some of the biggest strike waves to rock the continent for decades. Animal rights have not replaced struggles in the workplace: Marxists are not intellectual lepers. For different variants of the same reason, the absence of crushing working class defeat, post-modernism has likewise failed to sweep southern Europe or the third world.

The ideological impact of defeat provides us with an explanation for why post-modernism has become so dominant in the USA and Britain - and it goes far beyond Gross and Levitt's crude sociological explanation that the ex-student radicals of the 1960s and 1970s have simply grown up and got jobs in universities.

The resistible rise of post-modernism on campuses in both the USA and Britain, and the explicit links that are often drawn between this idealistic stance and avowedly "radical" positions, even if these are often reactionary, such as New Age flim-flam, conservative ecologism or animal rights, have closely paralleled a series of blows against the working class, the collapse of Stalinism and the inexorable right-ward evolution of the reformist left. Post-modernism and its associated "radical" ideologies are the fruits of major defeats.

But if post-modernism has filled the gap left by various reformist versions of socialism, part of the responsibility for this lies with the revolutionary Marxists and their own weakness.

The sea-change in the world situation that took place from the middle of the 1980s with the collapse of Stalinism should have produced a revitalised Marxism that would use the class struggle to provide a real and lasting answer to the real problems of racial and sexual oppression and the threat of ecological disaster

Outside of very small circles of revolutionary militants this did not occur. But the class struggle is not dead, and it will only take a minor resurgence in workers' resistance to reveal post-modernism as a hollow, pretentious sham.

The turn to recession in the USA and Britain will undoubtedly reinforce inward-looking and pessimistic ideologies amongst the less adventurous. But the first clashes between bosses and workers will awaken the most determined and intellectually curious and will push them to rediscover and redevelop the analytical and programmatic tools of Marxism.

A precondition for this revitalisation of Marxism is that we are ready to meet the political, programmatic and

intellectual challenge and that we have ceded nothing to post-modern scepticism. The new generation of workers needs a clear answer to the question: how to change the world and drive out poverty and exploitation. Linking Stalinism and Fascism with socialist revolution, post-modernism argues that all such "grand narratives" lead to worse oppression than if we stick to liberal capitalism. It is, effectively, the reflection in the world of ideas of a capitalist system that no longer believes in itself, but cannot stomach the socialist alternative.

Marxists take sides in the current science wars: with science, against post-modernism, but armed with a materialist critique of the ideologies and social structures that bend science to the will of the bourgeoisie. The humans of the future will live in eco-friendly hi-technology homes of their choosing, not tepees and mud. That is why they have to clean-up science and put it to the service of humanity, and reject post-modernism.

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