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Guest Editorial

Remembering Lysenko: when ideology and science meet

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Summary

Lysenko was a powerful Soviet pseudoscientist, whose theories cost millions of lives. He died 50 years ago, but his legacy is highly salient. Anti-science and ideology come together slowly, and UK pseudoscience has had unforeseen consequences. Pseudoscience must be challenged even when this has repercussions for those who speak up.

Keywords

Pseudoscience; Lysenko; scientific method; epistemology; ideology.

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It is timely to remember Lysenko. Trofim Denisovich Lysenko dominated Soviet agricultural science from the early 1930s until the mid-1960s.[1] He was almost certainly the most destructive pseudoscientific opponent of empiricism who has ever lived. Lysenko had Ukrainian peasant origins. This included minimal education, common among the rural population of the time. He had learned to read and write at the late age of 13. He had the good fortune to complete his two years of school education just as the Russian Revolution occurred. His background was then an advantage in gaining higher education, as was his commitment to the Bolshevik Party. What was more of a problem was his lack of basic education. One of his early presentations was criticised by Nikolai Maximov, head of his institute at the time, for basic mistakes in statistics. Instead of working to improve his understanding, Lysenko never used statistics again, stating that 'mathematics has no place in biology'. His pseudoscience[2,3] was based on ignorance and humiliation, becoming politically useful because ideology could replace knowledge. He started with conclusions and cherry-picked the evidence, ignored contrary evidence to support it or made things up. None of this prevented his meteoric rise, as his class origins and use of ideology suited the Bolshevik regime. His early work was on vernalisation, a well-established process whereby grain can be induced to ripen at different times of year by exposing it to different conditions of moisture and temperature. He claimed that his 'discoveries' would dramatically improve Soviet agricultural productivity, despite the evidence, available before Lysenko started his 'experiments', that vernalisation did not improve overall annual crop yields. Lysenko's unique contribution was to reject Darwin's ideas in their entirety. He believed that acquired characteristics would persist in subsequent generations. Vernalised grain would produce plants that generated more vernalised grain without further intervention. He was not naive but someone who ruthlessly eliminated those who contradicted him.

From before the Revolution, Russia was good at science, despite the economic difficulties of the country compared with other European states. For example, it was the Russian Mendeleev who first recognised the periodicity of elements and made the first attempt to construct a periodic table. Russia had a particular need for agricultural science, but during Lysenko's long stranglehold on the discipline Soviet agricultural science did not just stagnate. It went backwards. Although Russia is huge, it is not a fertile country, and it has very cold winters. Its peasants were subsistence farmers and had no surplus to give to the urban population. Famine has been a constant threat throughout Russia's history, which accounts for Russia's notorious food shortages and its historic dependence on Ukrainian agriculture. This dependence is one reason why Ukraine independence has been such a threat to Russian rulers. So Lysenko's claim to have solved the problem of improving grain production on the basis of socialist principles was music to Bolshevik ears. So too was his rejection of natural selection based on survival of the fittest, which to Lysenko was a bourgeois notion that reflected the competitive principle in capitalism. In its place he reified the concept that any organism could acquire any features and pass them on to their offspring. According to Lysenko, co-operation rather than competition was the governing principle of relations between plants. This was judged by him and the Bolsheviks to be a sound proletarian and egalitarian position. Leading scientists tried to point out that Lysenko's 'experiments' had no control condition and were conducted in an inadequate range of conditions. Without statistics, the authorities were easily persuaded by simple visual inspection of the crops Lysenko grew. His pseudoscientific ideas were implemented at scale, consistently leading to crop failure. His scientific critics were removed by the state security apparatus and were rarely seen again. It was not worth criticising Lysenko or his supposedly class-conscious science, so that other scientists learned to work within the pseudoscience framework he created. If he said that oranges could be grown in Siberia, as he did, it must be correct. The wealthier peasants, or *kulaks*, were blamed for the ensuing famines that are estimated to have killed millions in the Soviet Union. No official blame attached to Stalin's forced collectivisation, the negative impact of which it was said would be compensated for by the abundant crops promised by Lysenko's ideological pseudoscience. They never materialised. Lysenko's ideas were implemented in Communist China in the late 1950s with even more deaths in the 'Great Famine'. Tens of millions died.

It would be an over-simplification to blame Lysenko's dominance solely on Stalin. As a tyrant, Stalin attracts much blame, but Lysenko's rise started before he took full control of the Soviet Union and persisted long after his death. It is true that Khrushchev did express doubts about Lysenko on taking power, but he promptly rehabilitated him.[4] Khrushchev was a Russian, but he sympathised with Lysenko because he too came from peasant stock, and he had deep roots in Ukraine. He was that country's governor for many years. In fact, he fiercely defended Lysenko in the face of criticism by the Khrushchev offspring shortly before Brezhnev replaced him as General Secretary of the Communist Party of the Soviet Union in

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1964. It was Andrei Sakharov who led scientific criticism of Lysenko and, by discrediting him, provoked Lysenko's removal from the post of director of the Institute of Genetics at the Academy of Sciences in 1965. Lysenko died in 1976, and he cannot be regarded as a figure of the distant past. Although he was discredited, this did not eliminate his influence, as is often the case with pseudoscientists. It is said that there is still a cult around him among some Russian nationalists today. They believe his work predicted epigenetics, but even a cursory knowledge of modern genetics shows this to be entirely fallacious.[5] Apart from anything else, Lysenko did not believe that genes existed. He had never seen one, he said.

The clash between ideology and science is most destructive when powerful leaders or autocrats are involved, as is currently the case in the USA, but this is the outcome of a much longer and insidious process. Its origins can appear trivial, as pseudoscience and anti-empiricism do not require an overt ideological objective to cause real harm and to be adopted post-hoc. The Wakefield debacle[6] had nothing to do with politics at first, but it created a climate of opinion internationally that is now affecting US Government policy on vaccines and, arguably, on science generally. It became obvious that there were problems with his 1998 *Lancet* paper by 2004, but the journal only fully retracted the paper in 2010, shortly before he was struck off by General Medical Council for research misconduct. We cannot reassure ourselves that Lysenko was the product of the almost forgotten doctrine of Communism, nor that events across the Atlantic are a quarrel in a faraway country, between people of whom we know nothing. By the time autocratic rulers become involved, it is too late.

I believe that the Power-Threat-Meaning Framework (PTMF), promoted but not endorsed by the British Psychological Society,[7] is pseudoscience. If it is not challenged on scientific grounds, it is likely to be used politically. As is common with pseudoscience, it mixes evidence with ideology. It has split British psychology.[8] It draws upon Foucault's doctrines about power, some of which are correct and some fallacious. Power imbalances are important, and a given situation can appear different depending on the observer's stance. Neither means that objective truth does not exist. They just mean that it is complicated and best understood from multiple perspectives. PMTF's exclusive focus on the causal effects of power differentials cannot explain the psychological sequelae of brain insults, no matter how convoluted the argument. The PMFT has four more cardinal features of pseudoscience:

(a) it claims to explain everything, despite a lack of empirical evidence;
(b) its conclusions were decided before it was devised;
(c) it has ideological implications that are probably unintentional; these support a political agenda that mental illnesses do not exist and are only understandable reactions, justifying withdrawal of welfare benefits;
(d) its adherents do not modify their ideas in the face of contrary evidence; instead they seek to silence critics through ad hominem attacks.

What Lysenko and PMTF share is a failure to acknowledge that having an embedded and particular epistemology does not mean that empirical evidence is wrong. There is truth out there and empiricism must triumph over all else, otherwise all we are left with is the ideology of the strong. There are current examples that wilfully ignore empirical evidence within British psychiatry. Tom Burns advocated Community Treatment Orders (CTOs), and his views fell on fertile soil in a Blair government with a commitment to increasing compulsion for people with mental illness as a means of responding to the shortcomings of mental health services. Once they became available in British law, they increased consultants' sense of control in an environment where psychiatrists are vulnerable to criticism if anything goes wrong after the patient's discharge. Burns and his colleagues managed to complete the OCTET (Oxford Community Treatment Order Evaluation Trial) Randomised Controlled Trial (RCT),[9] which conclusively showed that CTOs have no advantage over existing measures in preventing relapse, a finding that has been shown in similar studies elsewhere in the world. Burns went on to acknowledge that he had been wrong (surely the defining characteristic of all good scientists) and said that CTOs should be abandoned or that another RCT should be mounted to confirm or refute the results. Neither occurred. Instead a proportion of psychiatrists continued to argue in support of CTOs, which was based on their *a priori* beliefs, not the findings of the RCT. They complained that OCTET had measured the wrong thing, that the RCT had methodological flaws, that OCTET was not long enough for advantages to show up and so forth. All RCTs have flaws. Such is the nature of empiricism, distinguishing it from the certainties of ideology. When the OCTET paper was published, such criticisms were a normal part of the scientific process. However, 12 years after the findings of OCTET were reported, there has been no further research, CTOs are still in place, and they have been applied to many more patients than was ever anticipated when they were introduced. This suits the current government's stance, but at this stage it is a triumph of ideology over evidence, inadvertently supported by spurious criticisms.

There are many more examples of the devastating effects of pseudoscience. They can only be countered by a fundamental attachment to empiricism. Expedience can have unpredictable long-term effects. If psychiatry is to be true to itself, it has to speak up for the scientific method when it is most difficult to do so, which is when autocratic ideology is most influential. We must also speak early in the process, before pseudoscience is taken up politically. We are almost certain to experience another pandemic eventually, and even more people will die next time if the current climate of opinion prevails. The harms caused by the distortions of ideology are avoidable, but only if we continually oppose anti-science in all its forms, including its clamour within psychiatry.

As scientists, we must remember Lysenko, not as a distant historical figure but as a dire lesson of contemporary relevance. We must embrace qualitative research, because patients' lived experience matters, but we cannot allow empiricism to be usurped. We cannot not be tempted to bow to the demands of ideology. If science's findings are sometimes uncomfortable and inconvenient, so be it. I am a social psychiatrist, but I do not look to a time when social perspectives overthrow biological perspectives. I look to reconciliation of the social and the biological evidence. Those two bodies of knowledge only seem incompatible because of the way we choose to fund and administer science. Now more than ever we need sophisticated and empirical science to lead, not mere ideology.

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