

L. D. Landau: the freak genius and the ‘scientist slave’

Lev Davidovich Landau (1908-1968) was one among the great adventurer physicists of the twentieth century – one of those few who can be said to have left an indelible mark on the course of human history.

Landau was a freak genius of a rare breed and was a person possessed of great intellectual honesty. He was of a passionately rebellious nature and had deeply held commitments lasting through his life – a life that can be described as a tragic drama of epic proportions.

This is no place to try to summarize the stupendous contributions of Landau to almost all areas in physics, especially to condensed matter theory, in which he was a towering pioneer. Of no less relevance, however, are the social and political issues that he faced and addressed. While considered so far as something in the nature of footnotes to his illustrious scientific career, these are bound to draw much more serious attention in days to come.

Lev Davidovich was a deeply patriotic person who developed a passionate commitment to the cause of socialism and Marxism early in his life, with a fervent wish to contribute to the socialist construction in the Soviet Republic, for which he engaged himself in the area he excelled in, namely, theoretical physics.

Ironically, however, he came to be a victim to the manic paranoia and the policy of brutal repression of the Stalinist soviet regime, and was arrested in the year 1938 by the soviet police on charges that included spying for the Germans. A year before that, he had left his academic position at Kharkov so as to avoid persecution for his open and passionate criticism of the soviet regime, and had been offered a position at Moscow by Kapitza, the father figure of soviet science who was to play a seminal role throughout Landau’s career.

It now appears to be the case that Lev was partly responsible for the publication and distribution of a political pamphlet. Beginning with a bitter denigration of the soviet regime, it ended with the call, “Long live the May day, the day of struggle for socialism!” Another participant in the publication of the document, a close friend of Landau’s, had to spend twenty long years in the Gulag.

Landau's tortured days in prison took a heavy toll on his mind and body. While visiting him there Kapitza was convinced that Lev was facing imminent death. Risking his own liberty and life, he wrote to Stalin that he, Kapitza, would be terminating his research programs unless Landau was released immediately (Kapitza was to remain under a kind of house arrest later). At the same time, he stressed that only Landau, of all people, had the ability to come out with a theoretical explanation of a number of astounding experimental findings observed in his laboratory.

With Stalin at last yielding to Kapitza's pressure, Landau was released and, within a few months, brilliantly vindicated Kapitza's faith in him when he gave the world the theory of superfluidity.

While in prison, Landau wrote a 'confession' which is thought to possess little relevance since it was written under great duress. After his release, Landau was understandably reticent about his prison days but, while engaged in epoch making research work, he continued to nurture his socialist beliefs when his acute mind searched for the root causes of the process that led to the emergence of the grotesque face of the soviet regime. In this, he did not spare even the first phase of the socialist process directed by Lenin.

Landau's critique of the soviet socialist process went deeper than many others' before him and since. On one occasion, Landau commented to a friend that Lenin's repressions were not different in nature than Stalin's. He was deeply critical of the way the Kronstadt rebellion had been repressed in 1921, and whatever remained of his faith in the soviet process was irrevocably lost with the suppression of the Hungarian revolution of 1956.

During the late nineteen forties, Landau was made a reluctant participant in the soviet atomic and hydrogen bomb projects, in which he described himself as a "scientist slave". His role in the project was crucial but did not involve the development of new theoretical ideas. Instead, his work was confined to numerical mathematics though here again he left his unmistakable stamp of genius. Simultaneously, he spared time to build up the Landau-Ginzburg theory in phase transitions – a contribution of far-reaching and enormous importance in theoretical physics.

Landau made it clear that his involvement in the bomb project was nothing more than an occupation aimed at survival, and he quit the project as soon as he learnt of Stalin's death. At the

same time, he contributed crucially to the success of the project since his brilliant mind simply could not stop halfway in a scientific pursuit. The freak genius and the scientist slave perhaps remained locked in combat in him till his very last days.

But those last days were tragic, since he was crippled in the aftermath of a car accident, and was prevented from engaging in physical or intellectual activity.

Source:

1. J J O'Connor and E F Robertson: *Lev Davidovich Landau*, at http://www-history.mcs.st-andrews.ac.uk/Biographies/Landau_Lev.html
2. Gennady Gorelik: *The top-secret life of Lev Landau*, at <http://academic.evergreen.edu/z/zita/articles/History/landau.pdf>

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