The Scientist and the Church

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Introduction

Human society, one may argue, is propelled by a dynamic clash of two primordial drives: creativity and power. The urge to invent confronts the impulse to conserve, the desire to change contests the quest to impose, the will to transcend conflicts with the impetus to restrict, harness and sabotage. It seems that the ever-present need to create something new always stands against the itch to redistribute and appropriate.

Arthur Koestler described this clash, somewhat romantically, in his masterful history of cosmology, *The Sleepwalkers* (1959). His lone scientists grope in the dark. They search for cues, hints and leads. They often stumble, falling flat on their faces. Rarely do they know exactly what they are looking for. But they go on. And then, suddenly, comes a revelation. The scientist sees a spark. Many a time the spark fizzles out and dies. But sometimes it persists long enough to ignite a fire. Novel ideas, syllogisms, explanations, equations and theories start to emerge in quick succession. Before long, a whirlwind of light builds up in the middle of the darkness. The whirlwind twists and turns, drawing in other scientists, generating more light, more ideas, more findings. In rare cases, it even gives rise to a totally new cosmology.

But this creativity is never easy to manifest. Wherever they go, the scientists find themselves faced with a monolithic wall of resistance. Confronting them are the dominant power institutions of society, the opaque and seemingly impenetrable complex of church, academy, state, army and business organizations that control and leverage the prevailing beliefs, ideologies, dogmas and paradigms. Occasionally, a single scientist manages to break through the wall. Kepler, Galileo, Newton, Maxwell and Einstein, among others, were immortalized for doing so. But of those who try, the vast majority fail and sink into oblivion. The odds are overwhelmingly against them. To challenge power with creativity is to risk your life, job, reputation, family and future – as the heroic Cecilia Paine, the first to discover what stars are made of, was to learn the hard way (see Chapter 11). Those who contest the dogma – like the poet in George Orwell's *Keep the Aspidistra Flying* (1936) – face ridicule, poverty, life in the shadows. No wonder most people end up taking the safe route of consent, moving obediently with the herd.

The First Mode of Power

Many of those who examined the clash between creativity and power – from Socrates and Plato to Freud and Marcuse – searched for universal drives and inhibitions, for the eternal underpinnings of Eros and Civilization. But while the drives and inhibitions may be universal, their social manifestations are often unique. The clash of creativity and power is the engine of the social *creorder* – the ongoing creation of order that propels and transforms all historical societies. And so, whatever its sources, this clash is always specific to the mode of power in which it is manifested.[1]

The first mode of power we know of was born in Mesopotamia, about six thousand years ago. Although the conflict between the inventive creators and their imposing rulers was rarely if ever recorded, the *effects* of this conflict are amply documented.[2] The archaeological remnants and written tablets attest the invention of organized agriculture and planned irrigation – as well as the subjugation of large populations to a rigid palatial regime of canal digging and maintenance, field work and animal husbandry. We have evidence of innovative construction, including the invention of the 'building block' (mud brick) and advanced architecture – as well as the extensive use of hard labour to erect religious/statist monuments for the glory of the gods-rulers. And this record sits well with the Mesopotamian myth-of-creation-read-power-relations. According to this myth, the gods had invented human beings simply so that they . . . could work for them: 'Let him [man] be burdened with the toil of the gods, that they may freely breathe' (Frankfort *et al.* 1946: 185; see also Kramer 1956: Ch. 13)

The Mesopotamians are believed to be the first to have invented writing – and therefore the ability to articulate, develop and record complex ideas, art, poetry and literature. But the writing they invented was also kept deliberately complicated, accessible only to a narrow stratum of priests, palace officials and clerks. Along with Mesopotamia's complicated number system, writing became an effective means of exclusion, a way to organize the mode of power, control the dogma and hold the underlying population in line.

[1] The societal consequences of creativity and power were central to the works of Thorsten Veblen (1898, 1904, 1919, 1923) and Lewis Mumford (1934, 1961, 1967, 1970). On the concept of *creorder*, see Nitzan and Bichler (2009: 305-306 and Chapter 1 below).

[2] For classic accounts, see Jacobsen (1943), Frankfort *et al.* (1946), Frankfort (1948, 1951), Kramer (1956) and Evans (1958). For a comparative study of early civilizations, see Trigger (2003).

Democratic Writing

But the sabotage exerted by a mode of power, no matter how totalizing, is never complete. Force always invites and creates a transformative counterforce, and that is what eventually happened with writing. In due course, the elites' stranglehold over this complex symbolic technology was loosened. The key breakthrough might have occurred in the fifteenth or fourteenth century BCE, in the Egyptian turquoise mines of Serabit el-Khadim in the Sinai Peninsula. The walls of these mines reveal an-easy-to-read alphabetic script, the first radical departure from the complicated Egyptian hieroglyphs.[3]

We don't know who invented this ingenious script. Perhaps it was the western-Semitic Apiru, or Amurru, who worked as zapping labourers in the imperial mines. Being semi-nomadic and relatively independent, they probably weren't pulped into total submission by the Egyptian Sun-God king. And maybe, possibly as a consequence of disputes with their employer, they invented a new form of writing to contest and resist their harsh treatment. Whatever their identity and reasons, though, the alphabet they created set off a revolution: it started the democratization of knowledge, an open-ended process that seven centuries later would give rise to science and philosophy.

Autonomy

Science and philosophy were born in the Greek poleis of the fifth century BC.[4] Historically, it was a giant quantum leap. In the midst of an oriental world, controlled by despotism, tyranny and god-kings, there emerged, suddenly and without warning, a new culture based on democracy, science and philosophy. The roots of this transformation remain heatedly debated, partly because the character of the Greek polis was so special, if not entirely unique. For the first time in history, man no longer slaved for the gods and their earthly representatives.[5] From a lowly, subservient creature, he became the centre of the universe. The human being was now recognized as the creator of the *nomos* (society), while the human mind was made the final interpreter of the *physis* (nature). Gone was the heteronomous rule of kings and priests. Instead, there arose an autonomous society, conceived, created and regulated by its own members. And with open autonomy came explosive creativity. The art and science of philosophy, literature, dialogue, mathematics, logic, theatre and history all flourished. This burst of creativity owed much to the elimination of external power and arbitrary coercion: it was driven not by force and adulation, but by idle curiosity and the quest for

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[3] See for example Giveon (1978), Naveh (1987) and Nitzan and Bichler (2009: 267). The precise dating of this script remains debated. Recent discoveries date a similar script in Egypt's Western Desert to the nineteenth century BCE.

[4] For an enlightening analysis of this birth, see Castoriadis (1991).

[5] Although women and slaves were liberated only millennia later, the principles that emancipated them were the same as those that liberated Greek men.

truth; it throve not on obedience and dogma, but on scepticism and self-criticism; and it was fuelled not by conflict and violence, but by the love of life and the admiration of beauty.

In an autonomous society, where humans are neither subservient to nor in command of others, their agreement is predicated on common logic, broad dialogue and inclusive planning. And that is what happened in some of the poleis. Autonomy went hand in hand with the Pythagorean invention of the *proof* – the need to *convince* your equals using logical, agreed-upon principles. And there was more than pure logic here. The concept of proof was complemented and greatly enriched by the recognition of human limitations and the desire to transcend them – hence the critical bent of historical narrative, the bitterness of tragedy and the ridicule of comedy. In this way, the democratic quest for pure knowledge both implied and depended on the desire to understand the beauty of the universe and the urge to create a good society. This triangular model of philosophy-science-democracy is perhaps the greatest societal invention ever.

Science and Church

The third historical leap in the conflict between creativity and power happened in the sixteenth century, with the emergence of capitalism.[6] This emergence was accompanied by a deep political-scientific revolution. Cities and towns were growing in leaps and bounds, the printing press was spewing out new books, pamphlets and scientific articles, and more and more people were becoming mesmerized by novelty and hooked on change.

The crown achievement of this revolution was the mechanical worldview spearheaded by Kepler, Galileo and Newton. The introduction of this new cosmology exposed the inherent conflict between scientific *re*-search and static dogma. The new scientists still feared the authorities and were keen to avoid the wrath of the Holy Inquisition, and Galileo, whose open-ended explorations challenged the Church's Aristotelian dogma, was nearly executed by Pope Urban VIII. But the fault line of the *ancien régime* was now laid bare for all to see. The power of the monarchy, nobility and Church was increasingly viewed as dark and backward. And even if the people of that epoch hadn't quite realized it, we can say that, for the first time in history, the good of society was explicitly associated with forward-looking novelty and creativity, progressive education and political freedom.

[6] The seeds of this leap are beautifully narrated in Umberto Eco's Middle-Age thriller, *The Name of the Rose* (1983).

The Science of Society

The mechanical-bourgeois revolution gave rise to the first science of society – the study of 'political economy'. Adam Smith and David Ricardo, the key founders of this new discipline, were social scientists: they searched for the natural laws of society; they looked for the rules that governed production, consumption and exchange; and they developed the first theories of prices. Their science was deeply revolutionary. It contested the old regime and offered a totally new framework to understand and benefit from the new. But their innovative achievements were soon arrested and eclipsed by the rising academic church of neoclassical political economy, later to be renamed and scientifically suffixed as 'econom*ics*'.

Headed by Stanley Jevons, Leon Walras, Carl Menger, Alfred Marshall and John Bates Clark, the neoclassicists abandoned the open-ended intellectual inquiry of their classical predecessors, replacing it with a narrow, rigid dogma. By the late nineteenth century, capitalism was clearly victorious, and the role of bourgeois theorists was no longer to attack, but defend. There was a pressing need for a new, secular religion, and the neoclassical economists rose to the occasion. They articulated a new faith and nominated themselves its principal gatekeepers. To ward off outsiders, they erected insurmountable disciplinary walls and replaced plain text with indecipherable mathematical scriptures. To extinguish free thinking, they imposed impossible-to-believe assumptions. To eliminate open dialogue, they carefully restricted the questions economists were allowed to ask. And they triumphed.

A century later, their neoclassical faith reigns supreme. Having more followers than all of the world's religions combined, their dogma dominates the mindset of rulers and subjects alike. It justifies and regulates the capitalist mode of power. And faced with no real competitors, it seems almost unassailable. But then, that is often what hubris looks like when a regime approaches its peak power, just a short moment before it falters.

Marxism

Whereas the neoclassicists sought to defend the victory of capitalism, Marx and his followers tried to annul it. A man of his time, Marx was deeply influenced by the scientific-mechanical revolution. But whereas the bourgeois theorists of society used their science to tie humanity to the machine, Marx's goal was to liberate it from it. He wanted to develop an alternative, *universal* social science, an emancipatory, rational framework for a new social order born out of the contradictions of the old.

Eventually, though, Marxism went into retreat. Its liberatory impulse was fatally wounded by the totalitarian record of Soviet regimes, its autonomy was compromised by frequent realignments with Communist Party shifts and changing political fashions and its scientific vitality was drained by attempts to reconcile Marx's scriptures with the rapidly changing reality.

The consequences of these developments were dire. Like bourgeois political economy, Marxism also disintegrated. But whereas bourgeois political economists eagerly endorsed and hastened this disintegration by creating mutually exclusive 'social sciences', Marxists tried to hold onto the former universality of Marx's theory – even when that universality was no longer there. Since the late nineteenth century, Marxism was gradually fractured into many different and often contradictory sub-disciplines. Its original totality gave rise to irreconcilable diversity, and its scientific research programme gradually succumbed to increasingly rigid dogmas and anti-scientific, postist sentiments. By the second half of the twentieth century, it no longer offered a cohesive theoretical and empirical account of capitalism, let alone a convincing alternative to it.

Value Theory

Perhaps the most important – and paradoxically least recognized – consequence of these developments is the collapse of value theory. Capitalism is a commodified social order. Everything in this order – including the central process of capital accumulation – is related to everything else through prices. This is why the classical cosmology of capitalism – both bourgeois or Marxist – started from and was based on a theory of value.

But that is no longer the case: nowadays, there is *no viable theory of value*.

Marx's labour theory of value rests on the elementary particle of socially necessary abstract labour time – but that particle, while perhaps intuitively appealing in Marx's time when the joule was first invented, can no longer be identified and quantified in today's capitalism. And the situation is even worse with neoclassical value theory: the elementary particle of this theory – the 'util' – was already deemed quantitatively meaningless by the theory's own founding fathers, and no neoclassicist has managed to prove them wrong since.

The net result is that neoclassical and Marxist theories now hang on the thread of cognitive dissonance. They conceive capitalism as a quantitative mode of consumption and production, but the material/productive units on which their theories depend – the util and socially necessary abstract labour time – are entirely fictitious. They think of capital as if it were a quantifiable economic entity, but the way in which they 'measure' this supposedly real entity is, in fact, completely arbitrary and forever irrefutable.

The Capitalist Mode of Power

Our own work, which started when we were students in the 1980s, seeks to break this impasse. It calls for a new cosmology of capitalism: one that sees capital not as a productive economic category but as capitalized power, and that conceives and researches capitalism not as a mode of production and consumption but as a mode of power. The articles collected in this volume outline the general contours of our approach and flesh out some of our recent research. The first ten papers were written during the period of 2012-2015, while the last one – *The Scientist and the Church* – was posted on our website in 2005. All are reproduced here in their original form.

The book is divided into five thematic sections. The first section (Chapters 1-3) sketches our notion of the capitalist mode of power. Chapter 1 takes on the common foundations of liberal and Marxist political economy. It dissects the conventional dualities of politics/economics, real/nominal, productive/unproductive and base/superstructure; it examines the mechanical assumptions underlying both the neoclassical utilitarianism of supply, demand and equilibrium and the Marxist materialism of exploitation and accumulation; and it shows how the rise of new power institutions, organizations and processes during the late nineteenth century made both approaches decreasingly relevant and increasingly dogmatic.

The alternative, we argue, is to bring power back in: to conceive power not as an extra-economic entity that distorts or supports capital from the 'outside', but as the basic relationship that *defines* what capital is in the first place. We should think of accumulation not as the amassment of utils or dead labour, but as the capitalization of power writ large. And to be able to do so, we need a new, *power* theory of value. We need a theory that is based not on production as such, but on the conflict between creativity and power; that focuses not on capital in general, but on dominant capital in particular; and that deals not with absolute accumulation, but with differential accumulation. Such a theory, we believe, can help us better understand the capitalist mode of power – as well as what needs to be done in order to undo it.

Of course, in order to develop such a theory, we need to restart from scratch, to go to the Cartesian roots, so to speak. A power theory of value requires a new political anthropology of capital as power; it needs to identify, articulate and analyse the foundational elements of the capitalist mode of power; and it has to create new methods to decode the logic, triumphs and crises of capitalized sabotage. The remainder of this book offers a sample of such endeavours.

We begin in Chapter 2 with the 'Asymptotes of Power'. No power, including capitalist power, is ever compete. Since power is always exerted against opposition, it is inherently bounded, so the first thing we need to examine is the asymptotes, or limits, that this opposition creates. Using the United States as our case study, the chapter offers an analytical framework for such an inquiry. By progressively decomposing the redistribution of U.S. national income – and the forces that this redistribution reflects

– we show how the ongoing systemic crisis has been tightly linked to U.S. capitalism approaching its multiple asymptotes of power.

Chapter 3 reflects on Robert Harris' financial thriller, *The Fear Index*. The popular perception, mirrored in the novel, is of a system running amok. According to this conventional creed, finance has now taken over production, speculators have substituted for investors and automated investment algorithms have replaced human discretion. It is as if the unchecked processes of financialization have totally 'distorted' capitalism.

Or have they? From the viewpoint of capital as power, there has been no distortion at all. Capital is finance, and only finance – or, in our terminology, capitalization. And capitalization is not an addendum to a mode of production and consumption, but the regulator of a mode of power. A symbolic representation of power, finance-read-capitalization measures the ability of owners to overcome resistance and automate society, to create a differential megamachine whose *raison d'être* is to beat the average and exceed the normal rate of return. In this sense, the capitalized rituals of 'finance', 'speculation' and 'automated trading' – along with the strategic sabotage they engender – represent not a muted form of capitalism, but the purest.

Crisis

The second section of the book (Chapters 4-5) deals with crisis. In Chapter 4, we disaggregate the processes of growth and stagnation. Conventional political economy, both liberal and Marxist, associates accumulation with overall economic growth and prosperity and *de*cumulation with overall stagnation, unemployment and crisis. From the viewpoint of capital as power, though, this association need not hold. Capital here represents not the accumulation of 'things', whether counted in utils or labour hours, but a differential measure of redistributional power. And since capitalized power operates through strategic sabotage, there is good reason to expect differential accumulation and aggregate prosperity to move in *opposite* directions – which is exactly what has happened in the United States since the Second World War.

From the 1940s onwards, the distributive income share of capitalists has moved positively with the rate of unemployment, while the share of the top 1% has moved inversely with the growth of employment. No wonder capitalists have learned to stop worrying and love the crisis.

Chapter 5 extends the analysis of crisis to the global arena, examining the historical links between differential accumulation, the corporations and governments of the Weapondollar-Petrodollar Coalition and Middle East 'energy conflicts'. According to the pundits, Middle East wars are hopelessly complex, often irrational and almost always unique. Regardless of how we approach them – whether we use the conventional or radical viewpoints of international relations, the idiosyncratic perspectives of culture and religion, or the economic standpoint of resource 'scarcity' – these wars are difficult to understand and reason, let alone generalize about. In short, they are, by and large, *sui generis*.

But as we show in this chapter, these specificities and irrationalities could all be enfolded into the universal logic of modern capitalism – the differential accumulation of capital. Using our notion of capital as power, we find remarkably stable regularities linking the eruption of Middle East energy conflicts, the differential performance of the Weapondollar-Petrodollar Coalition and global shifts in the nature of differential accumulation. Over the years, our research has shown these regularities to have remained more or less unaltered since the late 1960s, and that stability has allowed us to predict – in writing and, in the first two conflicts, *ahead* of time – the three episodes of the Gulf Wars series.

***Re*-searching**

The third section of the book (Chapters 6-7) emphasizes the need to constantly reexamine our convictions and research our findings. In Chapter 6, we zero in on a basic constant of Marxist political economy – the nexus between imperialism and financialism. For many Marxists, this nexus is central to understanding the transformation of capitalism – yet the historical role they ascribe to that nexus has changed dramatically over time. The main change concerns the nature and direction of surplus and liquidity flows. In the early twentieth-century version of the nexus, the surplus was said to be exported to the colonies; in the neo-imperial theory of Monopoly Capital, it was domestically absorbed by the core countries themselves; in the World Systems version, it was imported from the dependent periphery; and in the more recent thesis of hegemonic transition, it has taken the form of global liquidity that U.S.-led financialization sucks in from the rest of the world.

Now, using the very same concepts to explain very different and often opposing processes is already confusing enough – particularly when nobody knows exactly what the surplus is, let alone how to measure it. And the confusion is only amplified when theorists advance arguments for which they furnish little or no evidence. This latter point is illustrated by empirically examining the hegemonic transition thesis. According to this thesis, the United States has been leading the global process of financialization – yet the facts show the exact opposite: based on its differential profitability, the U.S. financial sector appears to have been the *lagger*, not the leader in this process!

Chapter 7 explores the role of crime and punishment in the capitalist mode of power. The starting point is the 'Rusche thesis': the argument, made by George Rusche in the 1930s, that the ebb and flow of crime and punishment are closely related to the tightening and loosening of the labour market. The thesis never gained many followers: mainstream criminologists have tended to ignore it, while their Marxist counterparts, although often sympathetic, have been unable to empirically substantiate it. But, as the chapter shows, this wholesale rejection may very well be the result of a simple misreading. Much like the early twentieth-century astrophysicists who misread the spectrometer measurements of solar radiation, today's criminologists have been misreading the connection between unemployment and crime: they have been looking at the right data, but in the wrong way.

A proper *re*-reading of U.S. statistics shows that Rusche was right on the mark: over the past century, the ups and downs of crime and punishment have been positively correlated with variations in unemployment, exactly as he predicted. Moreover, the correlation is so tight that there is almost no need for any other explanation!

But the nearly perfect fit contains two glaring exceptions. While the thesis holds under the normal circumstances of 'business as usual', it breaks down in periods of systemic crisis: during the 1930s and the 2000s, unemployment increased sharply, but crime and the severity of punishment, instead of rising, dropped perceptibly. This anomaly, we suggest, might be related to the nature of capitalist power and resistance to that power. Under normal circumstances, the counterforce to the capitalist sabotage of unemployment is largely personal and often criminal, hence the positive correlation; whereas during a systemic crisis the counterforce becomes more collective and political, hence the negative correlation.

Interviews

The fourth section of the book contains two wide-ranging interviews (Chapters 8-9). Nowadays, interviews are commonly seen as second-rate means of communication, a way to simplify difficult ideas for quick consumption by the impatient masses. Our interviews here, though, are different: they are long and thorough, and they don't cut corners.

In our books and articles, we have often found ourselves evading important issues whose elaboration would have taken us far afield and off topic. Although important, somehow these issues were deemed less urgent than the subject we ended up working on. And so they remained largely unaddressed, accumulating dust at the bottom of the still-to-deal-with heap.

And then came the systemic crisis. The calamity opened up a Pandora's Box of unanswered – and often unasked – questions, and it offered us the opportunity to deal with many of those bottom-of-the heap issues. So when Tim Di Muzio and Piotr Dutkiewicz suggested that we conduct lengthy, open-ended interviews, we gladly agreed.

The interviews deal with a variety of related topics and questions. They include, among issues, the notion of 'the market' and how it relates to our concept of capitalized power; the question of whether 'capitalism' is still the appropriate term to describe the world we live in; the fundamental difference between capital and wealth; the crucial significance of theory and research for political action; similarities and differences between Marxism and our own theory of capital as power; the role of labour and production in the power theory of value; how the labour theory of value misinforms the class struggle; and the historical link between productive and unproductive labour on the one hand and mass murder on the other. The list goes on.

The Scientist and the Church

The final section returns to the theme of the book (Chapters 10-11). It begins with a eulogy to a scientist who enlightened us, the late Akiva (Aki) Orr. In Hebrew, his family name, 'Orr' (אור), means 'light', and we would like to suggest that this is not a mere coincidence. Aki Orr was a true path-breaker. As co-founder of the first radical political movement in Israel, the Marxist-Trotskyite MATZPEN, he and his friends were the first to shed new light on the Palestinian-Israeli conflict. As a universal activist, he was associated with numerous revolutionary movements around the world. And as an autonomous intellectual, he befriended and was close to many innovative scientists, thinkers and artists. His books and activism touched the lives and transformed the thinking of many.

Aki charted his own independent path. He never held an official position; he never drew a salary from any academic or political organization, established or contrarian; he never received any research funding. He was keen on understanding the world, and he explored it not in order to gain fame or earn a profit, but to better society. As a universalist, he loathed intellectual property rights and distributed his writing for free and without any legal protection. Many of his path-breaking ideas were later lifted, nonchalantly, by academics who, as it turned out, had 'known it all along'.

Chapter 11, titled 'The Scientist and the Church', deals with this type of appropriation. The concrete focus of the piece, originally written in 2005, is the UC Berkeley group 'Retort', but the lesson to be drawn from it is a general one. Retort here represents the dark forces of intellectual sabotage, the anti-scientific stance of the academic church. Dressed as a radical, 'Marxist' collective of professors-activists, the group plagiarized our broad theories, historical narratives and concrete arguments, along with our concepts, methods and research results. The uplifted material – massaged and calibrated to look and feel like novel-yet-legitimate Marxism (no less) – was neatly packed into a timely, politically-correct book on the second 'Gulf War'. The book was quickly printed by a politically-correct publisher, promoted by politically-correct journals and distributed to the unsuspecting, politically-correct laity. It looked like a real gem, certainly on the authors' CVs.

Unlike the venturing scientist Akiva Orr, Retort was steadfastly guarding the academic gates. Whereas Aki was interested in open-ended inquiry, creativity and novelty, Retort was keen on keeping the (Marxist) faith intact and the dogma unchallenged. Aki encouraged research in directions that might end up contradicting his own

– indeed, once convinced, he didn't hesitate to abandon the dogmatic aspects of Marxism in favour of Castoriadis' approach. By contrast, Retort was quick to disarm the innovators, dispossessing their insights as if they were theirs all along. Unsurprisingly, the radical UC Berkeley – which, incidentally, invented the first computerized tool to detect plagiarism – refused to expose its distinguished professors, while those who published-promoted the Retort fraud in the first place declined to print our contestations. But, then, these are the ways of the Church.

And that must be a sign of hope. The violence of the academic church is evidence of an underlying counterforce, a sign that creativity, novelty and the quest for truth are lurking under the surface. Wherever we find people such as Aki and his friends, we find light. Despite the Retort squads, the rigid academic dogmas and the mind-numbing Facebooks, there are always free-spirited creators, scientists and artists who look for a spark. Like any other mode of power, capitalism too creates its own negation – the quest for the light, the search for the 'Orr'.

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