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# Technology, culture and critical theory: an interview with Andrew Feenberg

Andrew Feenberg<sup>1</sup> · Daniel R. McCarthy<sup>1</sup> 

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## Abstract

Andrew Feenberg is a pioneer in the development of the philosophy of technology. Before his retirement, he was the Canada Research Chair in Philosophy of Technology in the School of Communication, Simon Fraser University, where he also directed the Applied Communication and Technology Laboratory (ACTL). He is the author or editor of thirteen books on Critical Theory, Western Marxism, and the philosophy of technology, including *Lukács, Marx, and the Sources of Critical Theory* (1981), *Critical Theory of Technology* (1991), *Technology and the Politics of Knowledge* (ed with Alastair Hannay) (1995), *Questioning Technology* (1999), *(Re)Inventing the Internet: Critical Case Studies* (ed with Norm Friesen) (2012) and *Technosystem: The Social Life of Reason* (2017).

**Keywords** Critical theory of technology · Science and technology studies · International relations theory · Frankfurt school · Ideology critique · Practice

## Interview transcript

Daniel R. McCarthy (DM): Your work has always been dialectical at its core, from *Lukács, Marx, and the Sources of Critical Theory* to *Technosystem: The Social Life of Reason*. By and large, however, Science and Technology Studies (STS) has not developed a sustained engagement with dialectical thought. In some ways that mirrors International Relations (IR). There is dialectical work in international relations, but it has historically been confined to the margins of the field. In your view, what is the substantive difference that the Western

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Marxist treatment of dialectical thought makes to our understanding of socio-technical orders in modernity?

Andrew Feenberg (AF):

There are many aspects on which we could focus. What has most interested me is the relationship between universality and particularity. This is a key question in both modernization theory and modernity theory. We have the impression that modernity is universal because it is rooted in science and technology which we consider universal. Culture then appears as the particular, which is gradually erased by a more universal form of knowledge. Is this ethnocentric? In seventeenth century Europe, Christianity was the universal and Turkish, Chinese and Aztec culture were the particular. So, have we progressed? We now have modern science as the universal and the culture of every country is the particular, except our own. How can we avoid ethnocentricity as the planet is increasingly modernising around our science and technology? It is easy for us to make fun of the Christians of the seventeenth century because they were obviously wrong, but it is harder to say that we are wrong to believe that modern science is valid universally. Dialectical thought gives us means for thinking about this interaction of universal and particular that are not available to common sense or to science. I have also found in science studies resources that make some headway in working out the relationship between universal and particular as they appear in the cultural sphere.

DM:

In *Technosystems* you talk about Eurocentrism and attempts to overcome Eurocentrism, and in laying out the benefits of a dialectical approach raise this again. Over the past 10 or 15 years, IR has grappled with the problem of Eurocentrism in some depth, including from scholars embracing dialectical social theory such as Kamran Matin. Could you to expand on the relationship between dialectical thought and the supersession of Eurocentrism in social theory.

AF:

There are two positions that I reject. One is the straight modernization theory position that was popular in the 60s and 70s according to which we in the



West had the right answer to everybody's questions. The other position that I reject is the notion that all knowledges are equal, that our sciences are simply another Indigenous knowledge. If that were the case, then it is incomprehensible that it has spread so widely and successfully. This is a real puzzle. We have to figure out what is it about Western science that has made it so successful. There are two sides to this: destruction and construction. Francis Bacon has the answer to the first: science is a method for destroying the idols of the mind, the idols of the tribe, that is, culture, in order to get at the truth. The power of modern science depends on a destructive strategy of demystification, and that applies in the West first of all. We may think that our culture triumphs over all others, but that is forgetting that our culture has already been destroyed by the same force that now reaches the entire globe.

The next question is, given that this apparently negative universality of science, what about the constructive aspect? Can we say that science and its related technology are universal given that they succeed in doing so many useful things for people everywhere? But what do we mean by "useful?" Clearly, there are contingent aspects to our science and technology. A number of features of our technology stem from the imperatives of capitalism, the economic system that has guided most invention for the last few hundred years. Our definitions of machines and work are relative to a certain organisation of production, which is quite different from the way that production was organised in the West prior to the emergence of modern manufacturing and industrialism. This suggests that the universality of science and technology is qualified by these features of capitalism.

That also explains the fact that our scientific-technical system is destroying the planet, at least as far as human life is concerned. That is a difference with other cultures that show more respect for nature and the future. The temporal structure of our own particular way of understanding the world differs from the temporal structure of other cultures. That is actually easily verified. We discount the future heavily but in many cultures, the future is considered a debt owed to the past. For example, ancestor worship demands that the name of the family be honoured and perpetuated. There is no question in such a culture of a difference in the value of times, past or future, and that makes people cautious in their actions towards nature.

Of course it is also the case that our science and technology owe a huge debt to other peoples and cultures in earlier times. When the Chinese rip



off American companies, I always wonder if they will ever be able to find a way to gain the intellectual property rights to gun powder and the printing press.

DM: Yes, and what would that do to the economic situation of the world if they were able to do so?

AF: How about the Indians, who invented the zero? So, the achievements of the West are rooted in earlier times and places and are not unique to the West. They could be easily overshadowed in the future by the achievements of some other people, if we survive long enough for anyone else to do science.

There is another way to think about this in terms of technology, which is more obviously culturally inflected than science. We have technologies that reflect to a large extent economic considerations and Western cultural traditions. But other countries have begun to be capable of contributing to the fund of world invention. I can think of one example in particular which is very striking. In the ninth or tenth century, the Japanese acquired flat fans from China. The Japanese quickly turned them into folding fans they could put in the sleeve of their kimonos, which you couldn't do with a flat fan. Miniaturisation seems to be a feature of Japanese culture. Think of bonsai, but also think of the fax machine. The fax machine was invented in the West. It started out as a large and expensive object that only industries and government agencies could afford. The Japanese turned it into a consumer good. Fax machines became little and cheap in Japan, like those bonsai trees and fans. This achievement enters the domain of world technical culture, where it is available to everyone, everywhere. The impulse to miniaturise affects many technologies, such as cameras and telephones. We are tributaries of a Japanese culture impulse in the same way that they are tributaries of many of our cultural impulses that have been installed in the technologies they use. There is a kind of cultural reciprocity in time and space, rather than a single dominant culture. Presumably, this will become ever more the case. The fund of world invention will rely more and more on places other than the United States and Europe. Already, it's clear that other countries are perfectly capable of producing geniuses in technology and science. This is especially obvious in high tech. The number of people of Indian descent in Silicon Valley is noteworthy. Will aspects of other cultures gradually enter into science and technology? It seems perfectly plausible that it will.

Theoretically, these reflections converge on a fundamental concept in science and technology studies, the concept of underdetermination. This is the notion that scientific-technical rationality cannot by itself select the dominant theory or technological design. There are alternatives and the



choice between them cannot rely exclusively on reasons drawn from science and technology. If this is not widely understood that is because people don't realize what every scientist or engineer knows, namely that there are always alternatives and at the beginning of a line of development, and it is not at all easy to determine which will turn out to be the most fruitful. Some excellent alternatives may be ignored because of commercial considerations or the prestige or power of an organisation. Take the competition between gas and electric refrigerators. In the beginning, they seemed pretty much equivalent, although gas had some advantages that made many people think it was the better design. But the electric refrigerator triumphed largely because of the institutional power of the electrical industry, which was much more concentrated than the gas industry, and more influential politically. When subdivisions were built, they were not built with gas lines. This said, I still believe that some ideas are better than others. We have to qualify our relativism.

DM: That's interesting. You have referred a couple of times to this tension between rejecting of theories of sociological development claiming universality for scientific and technological practices and rejecting relativist approaches as well. This tensions has pervaded STS throughout its history, as the attempt to embrace various forms of symmetry has been coupled with a thorough-going normative relativism.

AF: There has been a lot of complicated discussion about relativism, especially since the Republicans and Exxon have decided that everything is relative to their interest in power and money. That has of course been a shock to the system because science studies people thought that they were fighting technocracy, and actually they were inadvertently feeding business a new strategy very different from their original intent.

I grew up in a scientific family and I spent my whole childhood and adolescence studying science with great enthusiasm. My father took me to see the university cyclotron and a nuclear reactor when I was a kid. For me, it seems pretty clear how to evaluate the role of science in the public sphere. Forget fancy epistemology for this purpose. Think of science and technology as crafts. To be a scientist, you have to learn the craft skills of your discipline. It's the same If you want to be a plumber; you've got to learn the skills, otherwise, your drains will leak. Once you acquire those skills, then your product can be shown to other people in your craft, and they can judge whether you have applied the skills correctly. If you have, it is likely that you have done a good job and everyone will agree. Do you need more than that as a finite human being? Do you have to be like





of a prisoner. They came with the two books, the Chinese and the Dutch, and they watched the dissection, and it turned out that the Dutch book was more accurate. The craft skills of the Dutch anatomists were simply better than the skills of the Chinese ones, at least as far as anatomy was concerned. They spent years making woodblock prints of the Dutch book so that it could be published in Japan in 1774. But today Chinese medicine is widely practiced in Japan and even in Western countries. Evidently there are other reasons to practice it, reasons that were confounded with anatomy in earlier times but which are considered valid now on other grounds. Still, no one wants to look for the liver where it was positioned in those old Chinese texts.

DM: Do you mind if we circle back just a minute to the Latour and political economy question? When I look at STS, I see a relative neglect of political economy, a relative neglect of Marxist political economy, and a relative neglect of dialectical ways of thinking. In your view, does STS neglect political economy and, if so, why?

AF: Science and technology studies is not new. In the 1920s and 30s, Nikolai Bukharin came with a group of Russian scholars to England for an international conference on science and technology. This inspired Marxist science and technology studies in England. The most famous scholars include Joseph Needham and John [J.D.] Bernal. Needham showed that science was not confined to the West and Bernal showed that modern science had emerged along with capitalism and in relation to capitalism. Some connections are quite evident, like mechanism in science and the development of machine industry. This trend was still influential in the 1950s and 60s among radical scientists but the McCarthy era in the United States pretty much erased it. Even so, in the 60s, in the wake of the student movement, there was an organisation called Science for the People which was a quasi-Marxist version of science studies. At some point, in the early 1980s, a number of people who had been interested in science and had been influenced by these ideas decided to change tack. Wiebe Biker explains that he and his colleagues took the “academic detour” in order to bring their studies into the university.

DM: Given his prominence in STS, established by work like *The Social Construction of Technology* (ed



with Thomas Hughes and Trevor Pinch) (1987) and *Of Bicycles, Bakelites and Bulbs* (1995), that is an intriguing comment. What did Bijker mean by that?

AF:

He and his friends were interested in contesting nuclear weapons, nuclear power, and pollution. At some point, they engaged with new ideas and concepts which didn't really fit with a Marxist approach as they understood it. Instead, they worked out the method of case studies based on the concepts of underdetermination and interpretive flexibility which made science and technology studies the discipline it is today. This allowed it to be established in universities the 1980s and 90s on a scale that the earlier version of science studies never attained. However, they didn't completely give up on politics. Although a lot of their work looks apolitical, there was an underlying intent to subvert technocratic rationality, which by the 1960s and 1970s was much more significant in the eyes of the left than the older worries about capitalism. We were headed for a technocratic dystopia, as Herbert Marcuse argued in *One Dimensional Man* in 1964. The fear of domination by science and technology had taken over from earlier Marxist concerns. Science and technology studies were tailored from the outset to subvert technocratic ideology. But we have entered a new era in the 2000s, in which environmental issues come to the fore and again indicate the importance of political economy.

A materialist sociology of knowledge accounts for the success of STS. It is not that STS scholars were so much smarter than their predecessors, but rather that contestation of science and technology in the public sphere has become an important factor in the political life of Western societies. There were problems with toxic waste, water and air pollution, lead, and eventually of course climate change, the biggest problem of them all. The contestation of science and technology in the public sphere created an atmosphere in which the study of science and technology made sense to many people. Industry defended itself with technocratic arrogance against environmentalism and various medical controversies around, for example, HIV/AIDS or childbirth procedures. The answer was always "we know and you don't," or to put it in my terms, our craft skills are better than yours. But the products were being sent out into the real world where they had bad consequences that were not anticipated by those that created them, and those consequences were known to ordinary people who protested. Plato in *The Republic* says that the person who really knows the



product of the artisan is the one who uses it. Not the maker, but the user knows the truth about the product. I would argue that these are complementary knowledges. There are the craft knowledges of the disciplines, and there are the knowledges that emerge in the life world of ordinary people, users and victims of the products. This complementary knowledge of the public is valid in many cases and is useful for rectifying the direction of development of the products.

Now, it is true that the lack of proper craft skills means that people are easily fooled, and so you have phenomena such as the anti-vax movement. But this is a complicated subject. For example, the public demanded cleaner air in the city. The auto industry initially rejected this demand but then eventually came around once legislation made it unavoidable. Now we can see that the public was right. Its concerns are in the revised textbooks of automotive engineering. But that means that the public no longer needs to interact with the industry around the question of pollution. Its concerns has been assimilated into the discipline and have disappeared as an issue. Meanwhile, the anti-vaxers can't get their ideas assimilated into medical science, so their protest goes on and on and on. It started long ago, with aids and autism, and could continue forever because it will never be taken up by medicine and will always be controversial. There will still be people complaining about vaccinations in 50 years. But that makes for the illusion that the public is really stupid. On the whole, the public has had significant positive impacts on science, and especially on technology in fields such as medicine and the environment.

DM:

That brings us to a question around the 'hermeneutics of suspicion' or what you have called, in *Transforming Technology: A Critical Theory Revisited*, a logic of suspicion. For some critical IR scholars interested in developing a 'post-critical' IR, ideology critique, as traditionally developed by the Frankfurt School, represents a paternalistic approach to social theory. In this account, ideology critique demands scholars sit in removed judgement of ordinary public beliefs, or, as you've just said, "Look at these idiots, look at these anti-vaxers, they don't know what they're talking about". By contrast, post-critical scholars are arguing that you mustn't treat the public in that paternalistic way, that you listen and value their accounts. As a result, they reject this notion of critique as developed by the Frankfurt School and ideology critique as such. In his 2006 article, *Has Critique Run out of Steam? From Matters of Fact to Matters of Concern*, Bruno Latour developed a relatively lengthy argument about the paternalism of ideology critique, which has been



favourably received in IR. He calls ideology critique the fairy position, as opposed to the fact position he prefers. In the fairy position, there is this kind of intellectual God that says to the people, 'This is what you should think', whereas the fact position goes down and looks for what people actually think and actually do. Does ideology critique remain important? Does it still have a place in critical social theory?

AF:

When Latour wrote that essay it was already out of date. It belongs to a period in which the public appeared to be relatively reasonable. That made it plausible to apply the STS notion of symmetry between the professional participants in scientific-technical controversies to society as a whole. But once a QAnon public emerges can you take seriously the notion that there is symmetry between the beliefs that are perpetuated by scientists and responsible journalists on the one hand, and the conspiracy theories that millions of people get from some crazy nut on the internet whose main interest is selling t-shirts? The world has simply moved on, and some of these ideas which seemed so bright 20 or 50 years ago now look ridiculous. The notion that calling out ideology is elitist makes no sense today. Of course, there are people who are manipulating the public, and of course there are people who are easily manipulated, who have an ideology and lack the education and the critical approach to the media that would enable them to make good decisions. And if you don't believe that, I have a bridge to sell you.

How can we fail to acknowledge that there are bad people tricking and manipulating the public? And making a lot of money doing it. In saying this are you putting yourself on a pedestal? Back again to the craft skills; there are people who know how to gather information. When they work in the public domain, they're called journalists, when they study nature they are called scientists. They can tell you whether to worry about Q, or whether vaccines are good or bad. You should have at least a methodological trust in these people and not the guy on the internet who tells you that murdered children are "crisis actors!"

On the other hand, Latour's article proposes an important idea which is still of interest. He argues that many of the current controversies are not about facts versus ideology, but about different facts. We do need a method that is different from traditional ideology critique to deal with



issues where there's serious underdetermination and bias in all the choices. We have to learn to deal with what the "Trumpians" call "alternative facts." Sometimes these alternative facts have plausibility because they stem from serious controversies. But normally controversies are resolved at some point and life goes on. The question is, at what point do you end the controversy? If you're in business, and you can make money by prolonging the controversy, maybe you will keep it going long after it would normally end. From a real issue about valid but conflicting facts, it becomes real facts vs. fake facts, alternative facts. This is difficult for ordinary people to deal with because they don't have the skills required to know that the controversy is essentially over.

DM: That's a nice road into thinking about your attempt to capture a way of re-configuring STS methodologies to meet these challenges. You have proposed that the philosophy of technology and STS develop a methodological symmetry of program and anti-program. While David Bloor's methodology of symmetry and Latour's ontology of symmetry are known in IR the symmetry of program and anti-program has received less attention. Can you give an account of it?

AF: The first symmetry, introduced by social constructivists, called for an even-handed treatment of the two sides in scientific controversies, such as the controversy over oxygen and phlogiston between Antoine Lavoisier and Joseph Priestley. If you overlook all of the complicated arguments that Priestley was able to muster for phlogiston you don't really have an accurate picture of the controversy. Lavoisier's eventual victory cannot be used to show that Priestley was not just wrong but irrational. We need to treat Priestley and Lavoisier symmetrically, that is as equal participants in the controversy. The second symmetry, introduced by actor network theory, holds that things "act" as well as people, and that both have effects on the networks of "actants" that constitute the world. This symmetry makes sense in literary terms. In a text, a gun lying on the floor is just as much an "actor" provoking the next scene in the story as is the character who reaches for the gun. In a literary context, things make things happen and are just as "active" as people. If you transpose this to the world of actual material objects and human beings, you could argue that the same thing is going. True, guns don't act intentionally as do people, but on the other hand, guns do "make



things happen.” The gun is obviously a part of the process. I don’t actually think this works but it is an interesting idea.

Studying social controversies over technology, I concluded that we needed a third symmetry to explain conflicts in the networks. Actor networks are constructed around programs which incorporate and simplify people and things to form a coherent system. Often several programs co-exist and conflict within a larger network. In accordance with the second symmetry, Latour argues that things have programs as well as people. He would say that the rust on your roof is an effect of a program that you did not anticipate, a program constituted by iron and oxygen. Latour calls this an “anti-program.” The anti-program looks very much like the conflicting public programs that arise in controversies over science and technology. The concept can help us to understand these conflicts without privileging the official actors and dismissing the public. This is a third symmetry, a symmetry of program and anti-program. But I do not agree with Latour that things have programs in a meaningful sense. It is enough to apply this idea to humans.

The notion of anti-program helps to avoid over-valuing the social legitimacy of programs that are back by political or legal authority. The owner of the factory, for example, is the legitimate source of all the commands and orders that go out to the workers of the factory. But what about the union leader? He has a program too, and his program encompasses the factory too, and issues orders and commands. Should he be considered illegitimate, and therefore, his program dismissed as irrelevant? Let’s consider all programs to be equal. They are factors in the situation, and they should be considered symmetrically, like Priestley and Lavoisier. This is important for understanding the interaction of the public with science, for overcoming the technocratic impulse to argue that the scientists know it all and the public is simply ignorant. We can invoke this third symmetry to validate the right of the public, the users rather than the makers, as Plato would say.

DM:

Is it the case that program and anti-program allow you to develop your normative critique? One of the things that I find when I read your work, or the work of somebody like Sheila Jassanoff, is that I can firmly identify the normative stance you have developed. From your earliest work it seems to be rooted in a particular Enlightenment understanding, linked to the socialist movement. From this position a normative critique of science and technology practices—a critique of technocracy and technocratic capitalism—emerges from a dissatisfaction with its anti-democratic



and authoritarian impulses. Does that normative critique emerge then from this program anti-program symmetry?

AF: We need the third symmetry in order to validate democratic interventions into technology and science and to refute technocratic notions. Capitalism rests now largely on those technocratic grounds because people don't have much respect any more for private property. The main concern now is effectiveness, and the capitalists say, "we can get it done, we have the skills." You need the third symmetry if you are going to argue for a more democratic organisation of society in opposition to this technocratic rationale.

My normative stance is related to enlightenment ideas about human fulfilment and human rights. There are philosophers who want some sort of absolute foundation for ethics, but I've never really found the need for that. It always fails when you get to cases. If you're not for the flourishing of life, democracy and human rights, and can't identify them when you see them, there's a problem. Herbert Marcuse once said any healthy person should be able to figure this out.

DM: On this issue of democracy and technical citizenship: In International Relations, when we conceptualize international democracy or global democracy the issue of scale arises—critics of notions of global democracy highlight the material limits preventing the expansion of democratic politics to all of humanity. We can have local kinds of democracy in comparison to democracy at a national level, but anything beyond that becomes a bit more problematic. I have two questions related to this issue of scale and scope and the relationship between democracy and the governance of technology: Can technological citizenship be institutionalised? And, alongside this, are there limits to the scale or scope of technological citizenship?

AF: I am not convinced that democratic interventions should be institutionalized. The justice system and government must be institutionalised or terrible things happen. In the case of technology and science, it is much less clear because of the nature of the work that people do in these fields, the high levels of specialisation, and complexity, and the long-time spans of



development are not suited to democratic institutionalisation in the same way as law.

The most important way in which the public intervenes is not through some formal institutionalised mechanism like citizen juries, but through protests, lawsuits, and boycotts. This is not democratic in the electoral sense, but public action can influence the political agenda and have an impact. As I said earlier, on the whole, that impact has been positive. The answer to problems like QAnon or conspiracy theorizing is not to insulate science and technology so completely from the public that all the mistakes of scientists and technologists go unnoticed and uncorrected. We are in a phase where it is especially necessary to allow contestation of science and technology. I think that for the most part, interventions will be post-hoc because it is only after the fact that people are sufficiently concerned about what is done to have an opinion.

The reason for the current active role of the public is rooted in history. The initiators of scientific-technical projects over the last few hundred years have worked for capitalist enterprise. This introduces a bias toward profit, and that can show up in harmful notions about control over the labour force, marketing, externalities. Regulation of business has emerged to counter t those biases. For instance, food safety problems that were common in 1900 in the US but have long since been mitigated by regulations that oblige companies to meet certain standards. You can imagine going much further in this regard, which is what socialism is supposed to be about.

DM: Are you suggesting that part of the way in which that science and technology works, and processes of design and innovation work, is a destructiveness of democratic inputs, and that that's necessary?

AF: Scientific and technological work requires a certain autonomy. As Bacon says, common sense is the enemy. But the autonomy can't be absolute. Take the case of computers. User interface design has to move between the technical discipline that invents it and the common sense of ordinary people who must use it. It is necessary to find compromises that work at both levels. Such compromises are less evident in the case of natural science, but even there may be some cases where they are significant. They are however certainly significant in the case of technologies that enter the lifeworld.



DM: It is clear again a dialectical approach playing out, as even in discussing the possibility of progressive governance of science and technology practice you see its destructive elements being necessarily present, although at different perhaps temporal moments. Perhaps it is non-democratic in the development of these craft skills, and the creation of different objects, but it becomes more democratic in the translation of these things or in the way in which users take them on. Attempting to maintain these contradictory thoughts in unity is a tricky task for social theorists.

AF: It is tricky because we are crossing boundaries that you're not supposed to cross. It's a kind of Hegelian dance. The boundaries have validity and at the same time, they need to be violated. You can't have modernity without boundaries, but at the same time, modernity doesn't work well if you never violate the boundaries. You end up like the Russians who left no possibility for the users to protest the makers and so suffered tremendous contamination of the environment. In medicine very inhumane relations between the medical community and patients result if there no feedback is allowed.

DM: Where does 'the International' sit in relation to your work? It is clear in terms of our discussion already that international is present throughout, at least in the background. You have noted dialectic as a means to avoid Eurocentrism, the use of comparative method to understand alternative paths of modernity, which cannot be reduced to Western universalism or its relativist opposite, and in the idea that human social development writ large is shaped by the condition of inter-societal multiplicity.

in International Relations, one process understood to drive forward technological innovation is inter-state competition. The classic example is the Cold War competition between the United States and the Soviet Union, with the massive impact on technological innovation as filtered through their large military-industrial sectors. Your work has a lot of relevance for thinking through the politics of technology and international relations, and you've done some of that work yourself, as in your 2014 paper 'The Insecurity of Innovation: A Critical Analysis of Cybersecurity in the United States', written with Catherine Hart and Dal Yong Jin. But overall, IR in general, and a focus on issues of inter-state competition and national



security in particular, have received less attention. So, I just wondered, is there a particular reason why that would be the case? And is there a value that you would see in engaging with the discipline?

AF:

My approach has always been in terms of the relationship between universality and particularity as I explained in the beginning of our conversation. Some of my earliest work on Marxism was an attempt to think through the possibility of an alternative modernity. How would technology evolve in society based on a different organisation of production? Back in the 70s when I first started to think about the possibility of a different form of modernity, I imagined different inventions, different roles for workers, education, and so on. I worked this out in the first book on technology that I wrote in the 1980s, *Critical Theory of Technology*.

There's a chapter in which I try and imagine what a transitional regime would look like and how it would change opportunities and incentives for personal and technical development. After the fall of the Soviet Union, I became more interested in a different type of alternative modernity that would emerge from a national cultural base. Since I had a long-standing interest in Japan, I began to work on what had happened in Japan in the encounter with the West in the nineteenth and early twentieth century. Japanese philosophers in the period leading up to and during World War Two had the notion that different nations could form a peaceful family once freed from British and American hegemony. Those Western nations had a competitive mentality that made for conflict, whereas Japan could bring everyone together in a harmonious world in which each people would contribute to a single fund of world culture.

This obviously didn't work. The scheme rested on a notion that the world system is based on a dominant power. The dominant power could be the world market, as it was with the British, or it could be a military power, as it is with the US, or it could be a spiritual dominant, and that's what they thought Japan could offer to the world despite the obvious fact that Japan was engaged in an imperialist struggle for domination. There is one positive idea I take from the Japanese thinkers of this period. The most important of these thinkers, Nishida Kitaro, argued that the world cannot be understood in terms of a temporal order. The West is not "advanced" and Asia "backward." Different temporalities co-exist. The world, Nishida says, is not temporal but spatial. It is a co-existence of spatial units rather than a temporal hierarchy of the more or less advanced. This is a powerful idea. It came of course directly out of the humiliation of Japan by the West, the refusal to be seen as a backward country.



DM:

It seems like almost a case of simultaneous independent invention—Leon Trotsky developed the same kind of notion, in his theory of Uneven and Combined Development (UCD), with its fullest expression in his *History of the Russian Revolution* (1932). Trotsky argued against orthodox Marxism that there were no stagist ladders of civilisation through which societies or peoples move. Rather, human development is uneven and combined. Political communities develop technologies of different kinds to meet their material needs and in the context of their unique ecological niches. As their innovations diffuse geographically, picked up by other communities, they generate socio-technical combination which results in new ‘hybrid’ social orders. As UCD has been employed in IR, this has been understood to recreate the multiplicity of the International as such. It is a universal process that nevertheless maintains particularity between political communities levels.

In Nishida’s idea, this seems to have some resonance with theories of globalisation developed in the 1990s and with some contemporary IR scholarship, there seems to be the suggestion that actually what we are going to see is the development of a global machine-based civilisation that will more and more erase national-based particularities. What you will get to see is a singular world system, I guess in the way that Nishida was talking about, though not as you say because there is that spiritual idea. What do you think the prospects are for either of those directions?

AF:

The idea of a global machine-based civilization makes sense as long as you include the notion that contributions will be made that are biased by different cultures. Again, go back to what I said before. Technology will spread, eroding many of the cultural traditions of peoples around the world, but the fund of world invention will become more complex as more countries contribute to it. It is not just the West that is going to create this machinic culture, it will be a combination, a hybrid, of many different cultural biases as those biases are translated into machinic terms.

Despite this qualification, what’s worrisome about the idea of a global machine-based civilization is the thought that the future of culture is exclusively mechanical. But this culture will be full of mistakes because of the limitations of the scientific and technical disciplines and so it will



evoke protest and contestation and be forced to reform itself continuously. The public plays a role in this universalization of modern technology. It will carry cultural values, which may be quite different from Western values, into science and technology. This too is a dialectical process. There are certain values that are as universal as modern science. Everywhere people want to live rather than die, they can tell the difference between comfort and discomfort, between hunger and having enough to eat. There is a kind of logical necessity about the relation of fundamental human meaning and the means of satisfaction of human needs that will appear everywhere as a factor in public contestation of technical achievements. These contestations will be inflected by locally specific concerns and cultural biases. It is going to be much more complex and much more varied than you might think. Perhaps that complexity will address our fear of a technological culture.

DM:

It is an interesting question. If I look at the Internet as an example, it's a technology that is universal, in some sense but, nevertheless, we see states competing to develop different kinds of Internet or to establish specific global norms around what the technology is and should be. We see the 'balkanisation' of the Internet. To me, technological changes cannot create political communities that will have less exclusivity in terms of their political claims. States will still engage in security competition, and this will include inter-state war and political conflict. States will continue to compete with each other to shape technology in different directions and for different purposes.

AF:

Of course. The Japanese got Westerners to tell them how to make a bicycle, then they got Westerners to tell them how to make a piano, then a tank, an aeroplane. This was all completely imitative but far from bringing people together, it ended up used for war. The Internet will take advantage of discoveries made by talented people, no matter where they are, but it is quite possible that some countries use the Internet to whip up nationalist ferment that leads to war.

DC:

One last question. You mentioned previously that in *Critical Theory of Technology* a socialist future was something that you saw as a viable political option, a potentially realizable project. The ambivalence of socio-technical order was such that societies could develop socialism even in a place traditionally hostile to these ideas, such as the United States. Are there still



prospects for that kind of techno-socialist future, the kind imagined by Nick Srnicek and Alex Williams in *Inventing the Future* (2015) or Aaron Bastani in *Fully Automated Luxury Communism* (2019)? Or has that prospect receded into the background?

AF: I don't really know how to answer that question. It is certainly clear that it is not a live option today. We are not sitting around waiting for a revolution. On the other hand, things could go very badly in the next few years. When things go badly, you can expect big changes, and some of those changes might in fact have to do with the role of capitalism, government and democracy in confronting environmental problems. It would be science fiction to talk about what might happen. On the other hand, the idea that nothing new will happen seems implausible given what we know about the past. It could be worse, that is also real. It could be a lot worse. I don't see a way for it to get better without much stronger input from the public, and much weaker capitalist institutions, weaker if only because of the problems of corruption that are associated with all this unequal wealth. If we survive, it may be because we have decided that capitalism is not after all the final system. I would not want to guess what would happen in the future.

DM: You are pessimistic about any tendency to develop that kind of movement?

AF: Not pessimistic exactly, I just don't see the things happening that would give me confidence. When I was a part of the anti-war movement in the 1960s and early 70s, there seemed to be a dynamic that could lead to big changes. We thought those changes might be far in the future, but they were at least thinkable. Whereas now I don't see that dynamic.

DM: It is interesting to hear that you view those alternatives as unthinkable now.

AF: Suppose that young people who are completely alienated from the political system and very disturbed about climate change became active in the way that we were in the anti-war and civil rights movement. Then you would see that dynamic reappearing and



the prospects of radical change would no longer be unthinkable. It doesn't mean that radical change is going to happen, but at least you could reasonably envision it in the future. I don't think that's impossible. It could happen next year, it could happen in five years. That's why I'm hesitant to make any predictions: either it will happen, or it won't. If it doesn't, things are like to go very badly. But if it does happen, perhaps that will lead to major changes in the institutions.

The problem is that business investment is made according to plans that discount the future very heavily. If you discount the future enough, there is no future. To change that would be in effect to change the nature of the system. It might make sense to retain many aspects of the current system, entrepreneurialism, certain forms of competition, robust research and development, and so on. But the most important investment decisions can't be made as they are today.

Too many things are going on in nature that require attention and capitalism is not able to address the problems with sufficient urgency. Just as science and technology are based on a kind of destructive elimination, the same is true of capitalism, which is why they get along so well. That destructiveness means that if I am running a company, I am not responsible for what happens to the community where the company is located, I am not responsible for the lives and wellbeing of the workers who work for the company, I am only responsible for making a profit for the stockholders. Of course, today there are regulations that force me to pay some attention, but the basis of industrial capitalism is elimination. By its nature, capitalism generates externalities right and left and now they are coming home to roost.

DM: Does that tie into this notion of de-differentiation that you've mentioned in a couple of places?

AF: Yes. What is happening is a partial de-differentiation. The differentiation associated with capitalism created separate "value spheres," as Max Weber called them. Science, technology, business, religion, and politics, no longer overlap as they did in pre-capitalist society, where the land-owner is also the judge, also a leading religious figure and so on. Because our whole lifeworld has been invested in technology, the externalities that result from these differentiations have become so salient that they cannot be ignored. This leads to the de-differentiating impact of contestation.



Ordinary people protest, and businesses respond by incorporating their demands. This partial de-differentiation doesn't destroy the modern system, but instead makes it more fluid, more subject to correction. That is essential to its survival now.

We have to imagine a solution to the problems we now confront. But the imagination of that solution is frustrated by the fact that we don't have any models. We don't know how to create another form of modern society. People used to think that the Soviet Union could solve the problem with suitable reforms, but no. Sir Stafford Beer, a system theorist, was invited by Salvador Allende when he was president to come to Chile to create a planning system that would be more efficient than the Russian one. The idea was to call on local businesses to constantly update their condition so that the plan was responsive to local conditions. Beer worked in the 70s with very primitive technology according to our standards, but he did create a computer network to link planners with companies. I think about things like that as a possible solution but I don't know how to devise an alternative. I guess somebody with more imagination than me will have to figure this out. It will become a big issue in the future.

DM:

Increasingly in International Relations the attempt to try and imagine what futures are going to look like has become a pressing task, with calls to develop our future imaginaries found across a range of approaches, from the work of Philip Tetlock and Richard Ned Lebow to that of Audra Mitchell, Shannon Brincat, or Luke Cooper in his work on the science fiction of Kim Stanley Robinson's *Mars* trilogy, and others among a younger generation of critical scholars. There is renewed interest in ideas related to model building, identifying immanent tendencies, certainly, almost linked to the classical picture of futurist model building yet still hesitant. From your remarks it seems you would not view that as a useful exercise to undertake. I find it interesting that you are reluctant to do that. Is this the continued presence of the Frankfurt School in your work?

AF:

Marcuse was cautious about imagining the future. I am not against science fiction coming up with big ideas. Of course, the public has to gradually gain confidence that there could be a different future. Fredric Jameson famously said that it is easier to imagine the end of the world than the end of capitalism. Maybe the idea of an alternative will take off sooner



than we think because the environmental problems are so threatening. This is an incredible situation. I don't know how young people can put up with what is going on.

DM: I tend to get three different reactions from students when talking about climate change when I teach that topic. Reaction one is we have to do something, reaction two is apathy, and reaction three is that technology is going to come up with the solution. The third one is the easiest one, because it means that you don't actually have to disrupt their everyday lives.

AF: Had they started out seriously dealing with the climate in the 1980s or 90s maybe the easy way would have worked. It might have been enough to wait for renewables to come in gradually and for the oil companies to turn into renewable energy companies. But right now, that is not happening. It's too slow, it's too late. I think it's very unlikely that technological solutions will be found before disaster strikes. You would have to talk to engineers to find out what they think. Things like carbon capture are just so far out, so expensive, and so hard. This will not be easy.

DM: Thank you for your time and engagement.

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