

Art as Engineering: techno-art collectives and social change

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I. Introduction to Engineering

Social change does not simply result from resistance to the existing set of conditions but from adapting and transforming the apparatus itself. This statement sounds like a truism but evokes the somewhat outmoded desire to continually reorganise and redirect processes that are inherent to the dominant apparatus of rule (nothing short of a cultural revolution). This essay investigates how the contemporary practices of ‘techno-art’ collectives respond to the new conditions of production facilitated by new technologies, and examines whether social change is generated by the diverse strategies employed by these collectives. The central questions are how these contemporary practices respond to these changes in the mode of production, what strategies they employ, and to what effect? Indeed, how are they different from other practices that engage in similar areas of cultural production – both in terms of the many historical examples that come to mind and from activism itself? Do these contemporary practices represent a shift from resistance to social transformation or do they simply promise this and fall short of effecting meaningful change? In the 1930s, under particular conditions and against the backdrop of fascism,¹ a certain political optimism made change seem more possible (and arguably urgent) at every level of cultural operation. For example:

‘An author who has carefully thought about the conditions of production today... will never be concerned with the products alone, but always, at the same time, with the means of production. In other words, his [/her] products must possess an organising function besides and before their character as finished works.’
(Benjamin, 1983: 98)

¹ ‘The Author as Producer’ was first written as a lecture for the Institute for the Study of Fascism, in Paris, April 1934.

Thus, Walter Benjamin in his essay 'The Author as Producer' (written in 1934) recommends that the 'cultural producer' intervene in the production process, in order to transform the apparatus. This essay simply asks if this general line of thinking retains relevance for cultural production at this point in time – when activities of production, consumption and circulation operate through complex global networks served by information technologies. In particular, it focuses on the contemporary practices of 'techno-art collectives' that can be seen to broadly operate in this manner in developing strategies to engineer change.

The term 'engineer' is to be taken broadly to refer to technical activity, through the application of scientific and technical knowledge for the management, control and use of power. To act as an engineer in this sense, is to use power productively to bring about change and for public utility. In this, the traditional mechanical or electrical (hardware) engineer is evoked, but in addition for this essay, the software engineer (sometimes called 'software artist' in contemporary terminology). The essay attempts to draw together these hard and soft-wares, as well as technical and artistic activity with the desire for social change – something again that might be referred to as an activity of engineering (social engineering). In the context of socially-engaged cultural production in the 1930s, Benjamin stresses the point that it is simply not enough for artists to demonstrate political commitment without at the same time thinking through its relationship to the means of production and the technical apparatus. In other words, the artist must act in the manner of an engineer. This is not simply to be interpreted as a preference for technology or form over content, but a collapsing of the distinction between the two. For Benjamin (and Marxists in general), only in this way - through an engagement with the means of production and in turn the relations of production - can social change be made a possibility.

On the surface, it seems that many contemporary net.artists and/or net.activists operate in this spirit, reworking the simplistic separation of theory and activism that the essay opposes. Moreover, the separation of 'theorist' and

'activist' (and we might add 'artist' - although clearly there are difficulties with the term) makes no sense in an overall practice of cultural production that takes account of the cultural aspects of economics and the economic aspects of culture. A number of examples come to mind that appear to demonstrate new forms of 'immaterial subversion' in trendy catchphrases and neologisms like: infowar, cyber-terrorism, tactical media, hacktivism, and so on. On closer examination they arguably tend to repeat the (formalist) strategies and tactics of an earlier vanguard (and perhaps the Situationists in particular) and/or mirror the activities of the broad anti-corporate movement and interventionist protest actions (again, the Situationists are much cited). The need for negation is evident but there is a danger of simply making a parody about or illustrating corporate culture, in far too straightforward a fashion that can easily be recuperated. With some of these internal contradictions and paradoxes in mind, Brian Holmes simply asks: 'What chance does networked resistance have of being resistant in such a scenario?' If power is increasingly hard to grasp, how can it be resisted? What strategies do techno-art collectives employ and how effective are they in terms of engineering change? This essay addresses these questions and asks whether conclusions can be drawn from a parallel between the contemporary practice of 'techno-art collectives' and Benjamin's earlier proclamations.

II. The Author as Producer

Over the years, Benjamin's essay 'The Author as Producer' has been extensively reworked as the opposition of theory versus activism - reproduced in full as the first chapter of Victor Burgin's *Thinking Photography* (first published in 1982), and more recently reinscribed by Hal Foster as 'The Artist as Ethnographer' in *The Return of the Real* (1996). The suggestion here is that the essay might be further recoded to take account of the current mode of production - extending (but not rejecting) economic determinism for an additional recognition of issues related to culture and subjectivity - what Hardt and Negri would describe as the transformation of the new mode of

production into a 'self-validating, auto-poietic machine.' (2000: 34) Undoubtedly critical work on the nature of digital culture should remain in progress and be subject to continual upgrade - proposing 'technical innovation and revolutionary use-value over mere modishness' as Benjamin would put it. The significance of 'The Author as Producer' essay lies in requiring the author or artist to act as an active agent, to intervene in the production process, and property relations, to change 'technique' and transform the apparatus. This is the 'organising function' that Benjamin proposes demanding the author reflect upon the production process - setting the laboratory in opposition to the finished work of art (or commodity form). If this now sounds like an orthodoxy in contemporary arts practice after the incorporation of performance and conceptual arts practices, the crucial aspect for this argument is its use-value, and to what extent techno-art collectives represent a return to a focus on use-value.²

For Benjamin, the progressive writer (we can extend this to apply to the figure of the artist or cultural producer) acknowledges the choice of in whose service, or more particularly class interests, the writing (artwork) operates. This, Benjamin explains, is usually called 'pursuing a tendency', or expressing 'commitment' and he takes this to be a key term. (1983: 86) He explains that more often than not, commitment is seen in opposition to quality (for instance, think of the dubious artistic merit of much 'community arts') and suggests they might be synthesised to be one and the same - and sets out to prove it so using a dialectical method of argument. As a result, he argues that for a work to be 'politically correct', it must simultaneously be correct in the literary or artistic sense. The first principle he establishes is that the work is not autonomous in itself and must be inserted into the context of 'living social relations' themselves determined by production relations according to materialist criticism. Instead of making the usual opposition of whether a work is reactionary or revolutionary, he simply asks: what is its position *within* the production relations of its time – and this is a question of

² As Julian Stallabrass proposes, in his conference paper at *Marxism and the Visual Arts Now*, University College London, UK, April 2002.

'technique' for Benjamin. Technique has a particular sense in German derived from 'Technik' (a term that combines a sense of technology and skill in German) but serves the purpose here to collapse the false separation of form (or method) and content. It also allows for the synthesis of commitment and quality that Benjamin proposes.

Benjamin cites the Russian writer Tretyakov who as an 'operative' writer typifies suitable technique and lies outside the established canon of literary forms as a journalist. This is the part of the argument for Benjamin who suggests that the category of literature should evolve according to the energy of the time and include new forms and confusions – employing the new technology of the time (even old technology was clearly new at some stage). He calls this the 'melting-down process' of established forms – the temperature of which is determined by class struggle. It is in this way that new forms can be cast - which is the purpose of course in producing radical forms. However, it must be pointed out that at this point in time the very idea of change appears paradoxically stable (or solid rather than melting) and digital technology appears to be the engine for this approach. The phrase 'all that is solid melts into air' or what might be called the 'melting vision' for radical change begins to sound like a truism.³ In contrast in the 1930s, Benjamin's example of this regenerative process is the newspaper as it throws into question a number of established separations – of academic and popular modes, of descriptive and creative writing, but perhaps particularly the separation between writer and reader:

³ This is a reference to the following quote from *The Communist Manifesto*: 'All fixed, fast frozen relations, with their train of ancient and venerable prejudices and opinions, are swept away, all new-formed ones become antiquated before they can ossify. All that is solid melts into air, all that is holy is profaned, and man is at last compelled to face with sober senses, his real condition of life, and his relations with his kind. The need of a constantly expanding market for its products chases the bourgeoisie over the entire surface of the globe. It must nestle everywhere, settle everywhere, establish connections everywhere.'

'For as literature gains in breadth what it loses in depth, so the distinction between author and public, which the bourgeois press maintains by artificial means, is beginning to disappear in the Soviet press. The reader is always prepared to become a writer, in the sense of being one who describes or prescribes. As an expert - not in any particular trade, perhaps, but anyway an expert on the subject of the job he happens to be in - [s]he gains access to authorship. Work itself puts in a word. And writing about work makes up part of the skill necessary to perform it. Authority to write is no longer founded in a specialist training but in a polytechnical one, and so becomes common property.' (1983: 90)

This all sounds very familiar in the context of the current 'new' technologies that allegedly draw together the activities of production and consumption but a closer analysis is required to get a sense of what Benjamin argues. There is political potential in Benjamin's line of reasoning. He is keen to criticise the intelligentsia's attitude of mind as having little practical use in itself: 'the important thing in politics is not private thinking but, as Brecht once put it, the art of thinking inside other people's heads.' (1983:92) He further stresses the important distinction between theory and activism: that it is simply not enough to have political commitment however revolutionary it may seem, 'without at the same time being able to think through in a really revolutionary way the question of their own work, its relationship to the means of production and its technique.' (1983: 91) This is what Benjamin defines as a producer: 'Technical progress is, for the author as producer, the basis of his [/her] political progress' (1983: 95) and what this essay tries to recast in terms of engineering. He continues that to be merely at the side of the proletariat is no place to be: 'the place of a well-wisher, an ideological patron. An impossible place. What is required is "functional transformation", Brecht's phrase to describe the 'transformation of forms and instruments of production.' (1983: 93) In other words, what is required is a practice that not merely engages with the apparatus or is satisfied with finished works but one that seeks to transform the apparatus – and as previously stated demonstrate a practice that proposes technical innovation and revolutionary use-value over mere 'modishness'. By this Benjamin is thinking of photographers who depict

poverty as spectacle – ‘human misery as an object of consumption’ in his words. (1983: 96) It is not difficult to think of contemporary examples of this dubious sentiment as well as the ‘naïve optimism’ or ‘techno-utopianism’ of new media practices.

The problem of course, now and then, is that technical innovation and social engagement happens all the time but without putting into serious question ruling interests. Improvement of the production apparatus for Benjamin, necessarily means in terms of Socialism – the combination of commitment and quality in technique, so to speak. A further example of good technique in the essay is that of Dadaism, that sought to test art for its authenticity by ideas such as the ‘readymade’ and montage. He describes this as follows:

‘You put a frame round the whole thing. And in this way you said to the public: look, your picture frame destroys time; the smallest authentic fragment of everyday life says more than a painting. Just as a murderer’s bloody fingerprint on a page says more than the words printed on it.’ (1983: 94)

Might code be considered in much the same way as a relatively hidden but fundamental part of the picture?

Benjamin further suggests that cultural production requires a pedagogic function. It must have the function of a model turning consumers and readers alike into collaborators:

‘The crucial point, therefore, is that a writer’s production must have the character of a model: it must be able to instruct other writers in their production and, secondly it must be able to place an improved apparatus at their disposal. This apparatus will be the better, the more consumers it bring in contact with the production process - in short, the more readers or spectators it turns into collaborators.’ (1983: 98)

In this context Benjamin refers to Brecht who uses the apparatus of epic theatre to reveal the ‘functional relationship between stage and audience, text and

production, producer and actor. Epic theatre, he declared, must not develop actions but represent conditions. As we shall see it obtains its 'conditions' by allowing the actions to be interrupted.' (1983:99) The infamous Brechtian 'alienation' technique (with the emphasis on 'technique' in this context) works against the illusion of theatre, allowing the audience to recognise real and present conditions. Thus the mediated (ideological) artifice is uncovered through a process of testing and observing through practice and dramatic actions the alienation of the audience – hopefully in a lasting manner. It is Brecht who exemplifies the opposition of 'the dramatic laboratory to the finished work of art.' (1983: 100)

The model of cultural production proposed by Benjamin is to regard the product as a process, equipped with an instructive or educational function and providing an improved apparatus. It also emphasises the collaborative nature of cultural production and collective work undermining the orthodox relationship between producer and consumer. What contemporary models are there to demonstrate these principles, and that would allow for an understanding of the contemporary conditions in which producers produce?

III. Upgrade

The conditions and means of production have changed enormously since the 1930s – although perhaps not so much in the laboratories and mausoleums of contemporary art that remains notoriously 'behind the times'.⁴ Capitalism has undergone dramatic transformations, characterised by flexibility, decentralisation and networking. With information technology, you might say automation has come of age, and labour is transformed by the need for the required knowledge

⁴ This is a reference to Eric Hobsbawm's essay that argues that contemporary visual art has not embraced reproduction in the way that other art forms such as music has demonstrated, Eric Hobsbawm (1998) *Behind The Times: The Decline and Fall of the Twentieth-Century Avant-Gardes*, London: Thames and Hudson.

to operate it, offering new relational patterns in the performing of work. Is it simply that Marx's view of labour-power is outmoded?

In Benjamin's terms, cultural production must be inserted into the context of lived social relations determined by production relations. Even Hardt and Negri more recently remain convinced that the realm of production is still where 'social inequalities are clearly revealed and, moreover, where the most effective resistances and alternatives' arise. (2000: xvii) However, Hardt and Negri replace a conventional understanding of class conflict wherein the proletariat are cast as the agents of change with the following upgrade:

'We understand the concept "proletariat," however, to refer not just to the industrial working class but to all those who subordinated to, exploited by, and produce under the rule of capital.' (2000: 256)

As a consequence of globalisation, they claim the 'proletariat' has transformed and correspondingly so does an understanding of it – both redefined as the subject of labour and agents of change, under new conditions of production (that has always separated the producer from the means of production and thus creates proletarians and capitalists). They employ the term 'proletariat' as a broad category to include 'all those whose labour is directly or indirectly exploited by and subjected to capitalist norms of production and reproduction.' (2000: 52) Although they are clearly broadening the category beyond the industrial working class, they also recognise class differences and stratifications, and its central importance in terms of engineering change. Whereas Benjamin might say 'work itself puts in a word', they claim: 'The proletariat is not what it used to be, but that does not mean it has vanished.' (2000: 53)

Indeed, it has not vanished but become more 'immaterial'. The increasingly immaterial form of social relations, communications networks, information systems, has also been extended to the new type of production of 'immaterial goods' and cast as 'immaterial labour' (after Maurizio Lazzarato's definition,

1996). This can partly be recognised in relation to the computer, in the way it has redefined labour as well as social practices and relations. Immaterial labour figures here in their redefinition of the proletariat as a class – as both within and sustaining capital. Correspondingly, Hardt and Negri see new forms of proletarian resistance, solidarity and militancy as ever more possible through an understanding of these processes. They argue that we increasingly think like computers, ordering our thoughts, practices and productive activities like networked communications technologies and their model of interaction. The reverse applies too in that: 'one novel aspect of the computer is that it can continually modify its own operation through its use.' (2000: 291) Like the communications industries that underpin it, Hardt and Negri describe the contemporary form of dominant power structure (Empire) as 'governance without government' to describe how capitalism is 'everywhere and nowhere'. They say:

'[Empire is the] *decentered* and *detrterritorializing* apparatus of rule that progressively incorporates the entire global realm within its open, expanding frontiers. Empire manages hybrid identities, flexible hierarchies, and plural exchanges through modulating networks of command.' [...] 'Our political task [...] is not simply to resist these processes but to reorganise them and redirect them towards new ends. The creative forces of the multitude that sustain Empire are also capable of autonomously constructing a counter-Empire, an alternative political organisation of global flows and exchanges.' (Hardt & Negri, 2000: 202, xii-xv)

This position is decidedly materialist yet non-dialectical as it argues that modern power, itself dialectical, is over, and has been replaced by Empire's 'network power'. To define this power base more closely as plural and multiple (not centred), they draw upon network and rhizomic metaphors that privilege flows and mutability - in the tradition of Deleuze, wherein resistance is disrupted - no longer marginal, but active in the centre and expressed in networks, chaotic and indeterminable.

Unsurprisingly, many commentators have problems with this analysis. Alain Joxe sees Hardt and Negri's 'Empire' as lacking crucial analytical questions, in not

taking sufficient account of the military question and of seeing globality as only answerable in kind (hence 'globalise resistance'). More precisely, according to Joxe, the 'empire of disorder' that claims to order everything through disorder is the global marketplace.

'In the absence of a declared enemy, the most formidable enemy one must face in politics is disorder. [...] Disorder is present everywhere, like liberty, and this type of threat is never lacking as long as an elite brings it to the fore. This is the case today, although only because neo-liberal ideology [...] paradoxically considers disorder to be positive and order negative, the equivalent to an abuse of power. Yet the representation of disorder as something harmful was the original source of the political desire for order.' (Joxe, 2002: 118)

So how is resistance to be characterised? It is as if power has taken the form of resistance itself - that order is expressed through disorder if you like. In such a scenario, the strategic standpoint of resistance seems powerless to resist power. Political action perhaps requires new forms, perhaps by basing resistance on the structure of chaos itself?⁵ Despite these undeniable confusions (or complexities) what appears certain is that the site of production remains crucial to an understanding of culture at large and to the development of appropriate cultural production that seeks to provide critical commentary of that culture.

IV. Production of Social Change

What Benjamin and later Hardt and Negri seem to be suggesting is that the generation of radical change (whether it is political, social or cultural) does not simply result from a mere resistance to existing set of conditions but from 'adapting and transforming' the apparatus. Although clearly representing different positions and responding to the mode of production at particular points in time, they have in common the desire to effect change precisely through an engagement with the mode of production. But perhaps change itself is no longer

what it once was. There is a paradox at work. To return to Marx's 'melting vision' - what appears as in flux is simultaneously stable – leaving the capitalist mode of production as solid as ever at its core.

To Zizek, neo-liberal capitalism manifests as the 'real' and remains solid despite the fact that everything around it is described in terms of fundamental technological change or scientific paradigm shifts.

'It seems easier to imagine the 'end of the world' than a far more modest change in the mode of production, as if liberal capitalism is the 'real' that will somehow survive even under ecological catastrophe.... One can thus categorically assert the existence of ideology *qua* generative matrix that regulates the relationship between visible and invisible, between imaginable and non-imaginable, as well as changes in this relationship.'

'How we are to reformulate a leftist, anti-capitalist political project in our era of global capitalism and its ideological supplement, liberal-democratic multi-culturalism.' (Zizek, 1994:1 & 1999:4)

This is what Zizek calls the 'failure of identity politics' - the hybrid, fluid, subject identifications that reflect the processes of globalisation itself.

How might resistant creative subjectivities be conceived in the new global disorder – the proletariat or 'multitude' (Hardt and Negri's term), the activist, the hacktivist? There are uncomfortable contradictions here (for instance, whether the 'no borders movement' disregards the misery of migrant labour). Ideology exerts itself in the continuation of and rupture from old ideas and strategies of resistance. Yesterday's strategy of resistance becomes a new orthodoxy unless change is constantly invoked.

Tim Jordan in his book *Activism* (2002) provides an extensive analysis of strategies that stem from historical forms of activism but which currently adapt

⁵ This is the argument made in an earlier paper, 'Generator: the dialectics of orderly disorder', conference paper, *Creativity & Cognition*, Loughborough University, UK, October 2002, proceedings published by ACM Press, pp. 45-49.

new technologies to generate change in political, social and cultural context. In making a clear distinction between what can be described as change (as-if) and *radical* change, he proposes to look at strategies which facilitate generation of a specific type of change: 'snowdrop' and 'transgression'. Using these terms, he explains the way change takes place: snowdrop generates change within the existing structures where change reaffirms the current conditions, whereas transgression seeks social change that radically redefines social structures. In Jordan's view the first one embodies commitment to change but with social conservatism, which in effect 'enhances the authority of the existing social institutions'. A good example of such a strategy is The Snowdrop Campaign for gun-law change described at length by Jordan:

'[...] the success or failure of campaigns like Snowdrop is defined from within the same system that allows the identification of the object of the campaign. The demand for change and the means of change exist within one coherent social and institutional framework. If we articulate this in terms of time, we can say that Snowdrop relied on the present and, in doing so, reinforced the institutions of the present. [...] By definition, nothing fundamentally new can come from such processes, whatever good they may do. The desires of these popular movements are formed within the same logics as the cultural, economic or political systems that create the desire for change in the first place.' (2002: 35-36)

The strategy of transgression on the other hand is employed to generate social change that redefines structures by rejecting existing ones and proposing new ones instead. Such a radical change however cannot be achieved from within the existing system therefore the system has to be replaced (his example is the Zapatista movement in Mexico):

'So transgression, in the context of current political activism, is the contradiction of existing social structures, institutions and ethics. The ethics of the future can only come from transgression, from reaching beyond current ways of negotiating social conflict and resolving differences. The opposite end to transgression, on the continuum of political activism, always reinforces what exists; it reforms, but it does not change. Transgression reaches out for a different future; reforming moulds the future to the present.' (Jordan, 2002: 37)

So how do we move beyond resistance to social transformation? Are artists and hackers merely locked in resistance mode only - as a kind of rhetorical action, or nostalgically repeating the tactics of the previous artistic vanguard (Mavor, 2002)? What models are there left to aspire to, or to re-invent?

V. Techno-Art Collectives

With the recent developments in new technologies and globalisation a new range of cultural practices have emerged. These 'techno-art collectives' (as they are fashionably known) may be seen to stem from historical activism - for instance, in terms of their structural formation based on non-hierarchical networks. In the current context, these loosely connected groups of specialised activists adapt digital technologies in their aspirations for knowledge-production and knowledge-contribution as well as in providing a framework for a wider social participation in what can be described as 'technological culture' - addressing the apparatus at a fundamental level of operation.

In this way, the digital artist-activist might be described as an 'engineer' - software artist or engineer, artist programmer, design engineer or social engineer - operating on the cultural outskirts from within collaborative structures and specialising in political and cultural transgression. While questioning the corporate bureaucratic structures and working with governments, universities, research labs and educational institutions, techno-collectives such as the Bureau of Inverse Technology (B.I.T), Central Bureau for Technological Culture (C.U.K.T), Etoy, ®™ark, Redundant Technology Initiative (RTI), Mongrel, or The Institute of Applied Autonomy (IAA), to name only a few, aim to provide 'services', facilitate 'processes' and supply 'knowledge' instead of producing traditionally recognised art objects appropriate to wider culture and immaterial production.

Some collectives, like Etoy or ®™ark (Global), adapt models of corporate structures for 'cultural profit' not by rejecting the economic system itself but **they claim** to infect it with subversive components to define new rules within this system. In doing so, Etoy resorts to what Jordan would describe as 'semiotic terrorism' (2002:104) – relying on corporate branding and exploiting corporate codes of practice its strategy remains entirely within 'symbolic terrain of struggle'.⁶ In a similar way, the techno-collective CUKT (Poland) works from within social, political and cultural institutions with the intention of adjusting the current system. A recent example was a presidential campaign of a virtual candidate called 'Victoria CUKT' proposing to introduce electronic democracy and the idea of a virtual president. The Redundant Technology Initiative (UK) takes a techno-ecological approach and proposes to transgress existing mechanisms of the over-production of technology and demand the change of consumption patterns from the use of open source software to recycling old

⁶ On their website Etoy describe their activities in the following way: 'Etoy operates as a global player online since 1994 to maximize cultural value. For etoy the dramatic problems of globalization are not to be solved by simply rejecting global markets, economic exchange, or multinational corporations. Instead etoy concentrates on the values which drive companies, culture, individuals and politics. By sharing risk, resources, maintaining a strong brand and maximizing the shareholder value, the etoy.CORPORATION seeks to explore social, cultural and financial value. etoy.SHAREHOLDERS invest time, knowledge, and ideas (or simply finance) etoy.OPERATIONS which focus on the overlap of entertainment, cultural, social and economic values. etoy.SHAREHOLDERS participate in a dynamic artwork that takes place 24 hours a day in the middle of society - on and offline. Etoy invests human resources, knowledge, and ideas into the construction of a global corporate sculpture and finances high-risk ventures that focus on the experimental overlap of value systems. Etoy does not reject economic reality, but infects it with subversive components (the etoy.VIRUS). historical etoy.OPERATIONS such as the digital hijack(1996), etoy.TIMEZONE(1998), TOYWAR(1999/2000), etoy.DAY-CARE(2002) and the etoy.TANKS(1998-2003) reflect the corporation's intention to expand the limits of life & art. Effective interventions depend on capital and other resources such as labor. By defining new rules within the frame of the established corporate model Etoy seeks to obtain operating funds to research and distribute radical cultural code. Instead of running away Etoy takes an aggressive position, negotiating

hardware, and then training people to use it. The existing economic system does little to support such initiatives for obvious reasons. Mongrel (UK) points to other inequalities built into the system and engineer their own software – both in material terms and as a metaphor for an alternative social structure. Both IAA (USA) and BIT (Global) supply tools through the development of innovative uses of technology - perhaps combining technique and quality in Benjamin's sense. For instance, the design engineer and techno-artist Natalie Jeremijenko (BIT) has produced the project 'Feral Robot Dogs' to adapt the behaviour of toy robot dogs (such as Sony's AIBO) with self-directed sensors of toxic waste and pollution.⁷ In a similar way, IAA as an anonymous collective of artists, engineers, and activists appropriate the tools, techniques, and terminologies of the military-industrial complex in designing and making transgressive electronic and robotic systems. The most recent project 'Contestational Robotics/Robotic Objectors' is a research initiative which inverts the traditional relationship between robots and authoritarian power structures by developing robots to meet **the** needs and budgets of culturally resistant forces.⁸ The improved apparatus allows more consumers to be brought into contact with the production process and allows for more collaborative possibilities between people as well as between people and machines.

All these examples operate between the contradictory tensions between the reaffirmation and redefinition of social structures. The question remains as to how effective these strategies are in terms of engineering change at this point in time? In other words, do these examples remain in negation mode only and stop short of the project of social transformation? Do they simply demonstrate

conditions that promise the maximum production potential and artistic freedom under current market stipulations.'

⁷ This has been utilised to send dogs with depleted uranium sensing to Iraq in 2003.

⁸ Other IAA projects include 'Graffiti-Writer', a programmable robot that carries out spray-can missions at a remote distance, and 'Little Brother' aka 'the pamphleteer', a propaganda robot designed to bypass the social conditioning that inhibits activists' ability to distribute propaganda.

corporate pastiche or do they suggest alternative models in the sense that Benjamin proposes in supplying an improved apparatus for the disposal of further collaborators? Conclusions cannot be drawn easily nor should these admirable practices be unduly criticised, but it remains productive to introduce some history to the debate. The above examples clearly include new forms and confusions as well as evolve according to the energy of the time in a way that Benjamin would approve as long as the ruling interests are challenged at the same time. In his argument, the cultural producer simply *must* reflect upon their position within the production process like a technician, demonstrating expertise alongside solidarity. This remains crucial to an understanding of how change comes about perhaps particularly in a culture that is increasingly technologised. To engineer change and believe in the possibility of social transformation, it remains necessary to transform the artist 'from a supplier of the production apparatus, into an engineer who sees his task in adapting that apparatus'. (1983: 102) Undoubtedly, techno-art collectives hold this potential to use power productively to bring about change but the nature of the change is rather more difficult to perceive in terms of effect.

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Slavoj Zizek (1999), 'Introduction: A Spectre Is Haunting Western Academia...' in *The Ticklish Subject: the absent centre of political ontology*, London: Verso, pp. 1-123.

Techno-Art Collectives (examples cited):

<http://www.appliedautonomy.com>

<http://www.bureauit.org>

<http://www.critical-art.net/>

<http://cukt.art.pl>

<http://www.etoym.com>

<http://www.lowtech.org>

<http://mongrelx.org>

<http://www.rtmark.com>

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Abstract:

This essay investigates issues around the production of social change in the context of the emerging practices of techno-art collectives operating under new

conditions of cultural production facilitated by digital technologies. In this context, the term 'engineering' is applied in an attempt to draw together - what seems to be specific for current mode of production - hard and soft-wares, as well as technical and artistic activity with the desire for social change. Making reference to historical material (Benjamin, 1934) and current arguments (Hardt & Negri, 2000), the essay proposes that the generation of change does not simply result from a mere resistance to existing set of conditions but from adapting and transforming the apparatus. The central question remains how techno-art collectives respond to these ideas and what strategies they employ to facilitate the shift from resistance to social transformation, if at all.

This essay expands upon an introduction first written for the 'Artist as Engineer' symposium, organised by Geoff Cox & Joasia Krysa (i-DAT), as part of *Interrupt: artists in socially-engaged practice*, in partnership with Arts Council England, University of Plymouth, June 2003. <http://www.interrupt-symposia.org>

The authors are engaged in teaching and research as part of i-DAT (institute of digital art and technology) and STAR (science technology art research). Both these institutional identities express the combinations of creativity and technology - art and engineering if you like - that allow for the collapse of subject matter and the context in which they practice - artists and curators working in a school of computing, communications and electronics, in a department of technology. This apparent paradox is entirely in keeping with the title of the essay 'Art as Engineering'.

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Biographical Information:

Geoff Cox is an artist, teacher and projects organiser as well as currently Senior Lecturer in Computing at University of Plymouth, UK, where he is a member of the CAiiA-STAR (Science Technology Art Research) research group. He recently co-curated the touring exhibition 'Generator' (2002-3) with Spacex Gallery and with support from the Arts Council of England

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