Chaoplexity:

The science & the science fiction of modern conflict

A review-essay, by Lara Buckerton, of:

Antoine Bousquet's *The Scientific Way of Warfare* (2009)
Adam Robert's *New Model Army* (2010)

"I've died and gone to heaven and seen the first bit of net-centric warfare at work!" said General Tommy Franks, in the aftermath of the USA's lightning-quick war on Saddam's Iraq (quoted in Antoine Bousquet's *The Scientific Way of Warfare*, p. 1). What a funny man. Donald Rumsfeld said strange things too. "People are fungible." Of course, both were obliged to doff their ghoul masks to the commander-in-chief himself, whose gauche and bewildering gaffs were for a time gathered in gift books, stashed near the cashiers.

Is it possible that our appointed killing specialists know *least of any of us* the significance of life? Could, say, Adam off *The Adam and Joe Show* do a better job than Franks? Could literally *anyone* do a better job than Rumsfeld?

The steady contemplation, and implementation, of human death surely pickles any sympathetic faculty the Good Lord may have given these men. What's more, at the level of social function, routine killing selects in favour of the sociopathic and against the tender-hearted.

These factors seem to imply a necessary trade-off between military know-how and the wisdom to use it appropriately – a trade-off which in turn implies the traditional relationship between civic and military elite. The politicians keep the generals on leashes by setting high-level objectives and by drawing appropriate limits to destructiveness. "No, you can't have *that*. Put it down."

So perhaps we only feel uneasy at the emphatic tactlessness of a Rumsfeld because it reminds us that a Rumsfeld is a kind of *instrument*, with a generally nasty function?

In which case we should get over it. Rifles don't need Charisma 18+, and right now it is naive to think we can unilaterally dispense with them. The fact that Rumsfeld has terrible etiquette doesn't make him bad at what he *does*. He's the "gun" guy. He'll shoot himself in the foot, he'll put his foot in his mouth, but he's too savvy to blue-on-blue tragedy to combine those manoeuvres. Right?

Sensible as they sound, such explanations leave me unsatisfied. There's an aura of *creepiness* which attaches to chattery military personnel – and to chattery military scholars and enthusiasts – which is qualitatively distinct from the aura around a tank or a rifle. I can give two alternative reasons, both quite fuzzy.

> "There exists no rational purpose, no norm no matter how true, no program no matter how exemplary, no social ideal no matter how beautiful, no legitimacy nor legality which could justify men in killing each other for this reason" (Carl Schmitt, *The Concept of the Political* [1927]).

Schmitt argued that *nothing* justifies killing – that killing is properly outside of legitimacy [1]. For Schmitt, the political antithesis of friend and enemy, based on the possibility of killing, was its Own Thing, and could not be built out of antitheses which are social, economic, religious, moral, and so on.

If killing does possess this quality of existential irreducibility, perhaps that explains why we experience unease at the foibles of military men, even when these are irrelevant to their soldiering. There is *no* sociological fact, *no* ingredient of personality, which is the appropriate accompaniment to the power to kill. But when professional killers say memorable things, they drive it home that the power to kill *is* nevertheless *de facto* knit into specific sociological formations – that it's a power within reach of an arbitrary set of hands, which stir according to their individual compulsions, according to their arbitrary system of culture and personality.

It's quite natural to want mass killing to be entrusted to the most normal person there is. Yet there is no such person. Social types like the Gentleman Soldier, the Bland Professional, and the Reluctant Freedom Fighter, have a certain dodgy aura of neutrality. They almost suffice as conduits transmitting the socio-political manoeuvres and deliberations around violence to the violence itself. But the conduits are always fractured and cluttered. When Rumsfeld opens his mouth, we get to peer into the conduit, and see the mess. The mess is, of course, Rumsfeld himself.

Bleeding-heart liberals

That's one reason. If it's correct though, Robert Gates should be at least as creepy as Rumsfeld was, and I'm not sure that's the case. So here's another. Perhaps there are specialist knowledges corresponding with *peace-keeping*, just as there are those corresponding with *killing*. Perhaps the dismay of bleeding-heart liberals, when we are confronted with an elaborate military tract, is not directed at its masterful understanding of killing, but at its patent *ignorance* of peace-keeping.

In this view, the moments of self-loathing, hesitation, impassioned denunciation, confused hysteria, bleakness, wild heroic fantasy, knowing *grand guignol*, and vitriolic black humour, which typically are absent from creepy military tracts, are in fact enablers of deliberation. They are the spots at which the surface of the discourse about violence becomes semi-permeable, where different ideas and views can poke their noses in.

An old idea of Robert Frank's, about the role of emotions in facilitating collaboration, is pertinent here. In *Passions within Reason: the Strategic Role of Emotions* (1988), Frank argued that unreservedly rational entities would have trouble making alliances, since potential collaborators would rightly fear betrayal. Knowing with one's heart the right moments to vacillate, to exaggerate, to verge on tears or to break out hysterically – and thereby to demonstrate the caveats to one's rationality – is a vital skill of collaboration and of peaceful living.

Where would all this leave military science fiction?

> "The sword bit deep, nearly cleaving the arm from the body. It sent out an arterial spray of bright red that shot an impossible distance through the thin air, freezing in the low pressure and cold so quickly that it fell like scarlet sleet onto the sands" (Chris Roberson, "The Line of Dichotomy," *Solaris Book of New Science Fiction Vol. II* [2008]).

I can't let it off the hook entirely. Plenty of military sf – and plenty of the violent bits of space opera, cyberpunk, etc. – is every bit as creepy as Rumsfeld in a rabbit suit, or Bush in your airing cupboard. Moreover, plenty of military sf normalises, glorifies or otherwise misrepresents killing. As Kurt Cobain nearly sang, "It's okay to disintegrate mooks cuz they don't have any feelings."

But I *do* think that, inasmuch as military sf incorporates a quality of extravagant counterfacticity, it's implicated with both expertise in killing *and* expertise in peace-keeping. Dan Graeber, in a fascinating little pamphlet called *Fragments of an Anarchist Anthropology* (2004), points out that the imaginative lives of peaceable, quasi-anarchic peoples are frequently extraordinarily riven with bloodshed. Could the abstract resolution of violence, Graeber wonders, be the secret to their material serenity? Perhaps, although it's worth pointing out that not *all* the violence was abstract:

> "Markets were protected, and market rules enforced by charms which embodied diseases and were said to be powered by human body parts and blood. Enterprising men who managed to patch together some sort of fame, wealth, or clientele were by definition witches. Their hearts were coated by a substance called *tsav*, which could only be augmented by the eating of human flesh. Most tried to avoid doing so, but a secret society of witches was said to exist which would slip bits of flesh in their victims' food, thus incurring a 'flesh debt' and unnatural cravings that would eventually drive those affected to consume their entire families. This imaginary society of witches was seen as the invisible government of the country. Power was thus institutionalized evil, and every generation, a witch-finding movement would arise to expose the culprits, thus, effectively, destroying any emerging structures of state" (Dan Graeber, *Fragments of an Anarchist Anthropology* [2004]).

Cock-fighting etc.

I started with Antoine Bousquet's retweet of @donaldrumsfeld, from his fascinating 2009 study, *The Scientific Way of Warfare*. Now, it is with trepidation that I open any book that takes actual warfare for its theme, specifically the trepidation which prefigures all unpleasant but necessary social engagements. But for a blood geek Bousquet is not, it turns out, bad company. His exposition is lucid and forceful, yet flexible and cosmopolitan. As well as knowing about killing and science, Bousquet knows about literature, art, architecture, philosophy and so on, and he draws judiciously from these fields, without lapsing into dilettantism or implying implausible causal connections. Here and there he perhaps permits himself, in the spirit of free indirect discourse, a "spectacular"

where I'd have preferred a "terrible," or an "eternal" where I would have purred to hear a "transhistorical." But for the most part he's the sort of author from whom you could quite happily pick up a Freecycle pink sofa, and perhaps sip a cup of peppermint tea on it first. Above all, Bousquet is sensitive to the ways in which local and transient conventions can appear to participants as "natural" – as universally and transhistorically rational. He thereby skirts this terrain's most hazardous pitfall, namely the inclusion of killing within the God-given order of things.

The Scientific Way of Warfare is organised according to the changing character of military-scientific rationality. It is divided into four historical regimes, each organised by a distinct metaphor: clockwork, engine, computer, and network. In Bousquet's use, a "metaphor" is quite similar to a "paradigm," though without its bulky philosophical baggage [2]. The tone turns appropriately to and fro from the definite to the suggestive. We are never tempted to think of the regimes as sharply circumscribed, or to consider a regime fully explanatory over its respective era. It is clear too that the distinctive techniques developed under each regime are never fully retired.

From mechanic to thermodynamic killing

I'll focus on the final of the four regimes, gambling that *Vector* readers take particular interest in the future. I think I once heard science fiction defined as impatience where the appropriate emotion is anxiety. But first let's quickly run through the three antecedent regimes. The first regime discussed is the mechanistic, exemplified by clockwork, Newtonian cosmology, Hobbesian materialism and Cartesian philosophy of mind.

The clockwork armies of early modernity were expected to precisely conform to minutely-scripted movement patterns. Organic forms could be deconstructed into functional components. Muscles and nerves were analogous to springs and cogs. Aptitude for combat was "no longer an opaque quality only to be revealed in battle" (58f), but cultivated through intensive drilling. In particular, the Prussian army expressed an obsession with neatness and regularity which, though a decisive factor in its considerable military successes, was sometimes also a fetter.

If I have one complaint about this chapter, it's that I should have liked to have heard a few more words about Smith and Darwin. Darwin and Marx are touched upon (76-77) in the context of conflict acting as the engine of human progress. But there could be more. *The Adam and Charles Show* features spontaneous self-organisation and a cosmology radically incompatible with the Deist faith in a Watchmaker. Smith and Darwin are rather important grit in the cogs of the clockwork metaphor [3].

The steam engine and the industrial revolution inaugurate Bousquet's second technoscientific regime. The rigid choreographies of enlightenment killing were gradually replaced by more flexible deployments, closely attending to the transmission, concentration and release of energy.

Bousquet succinctly suggests how the engine metaphor or fragments thereof came to permeate diverse intellectual practices. Even Freud's model of the mind, for example, "echoes the abstract diagram of the engine with a circulation diagram between conscious

and unconscious" (75). Is Dan Graeber (q.v.), in his emphasis on sublimated coercion, still stuck in the engine metaphor?

World War I was notoriously understood as a "war of attrition." Ernst Jünger, a veteran of that war, describes how it reduced soldiers to fuel, "just like charcoal, which is hurled under the glowing cauldron of war so as to keep the work going" (81).

By World War II, the killing had become industrialised and motorised. "Previously, armies essentially depended on the resources they could find in the territory they were occupying whereas increasingly they could and had to be supported by agriculture and industries located hundreds of kilometres away from the front" (79-80). The horrifying engine rapidly accelerated to "total war" as nations assimilated their entire economies to their war efforts, mustering every last spark of destructive energy to hurl at their enemies' armies, infrastructure and civilian populations.

A culmination of sorts occurred in the indiscriminate slaughters of Hiroshima and Nagasaki. Bousquet quotes John Schaar: "we have finally made the engine that can smash all engines, the power that can destroy all power" (84).

Cybernetic killing

Bousquet's book is subtitled "Order and Chaos on the Battlefields of Modernity." Beneath the four regimes, entire epochs of killers have darted back and forth, like fervent blood-shot eyes, between two poles – one, the desire for perfect control of warfare, and two, the recognition of its inherent disarray and unpredictability. Mechanistic killing, with its balletic tin soldiers and timeless ballistic equations, was driven by the desire for order. Unlike mechanistic processes, in principle reversible, thermodynamic processes were characterised by entropy, the inevitable ratcheting disorder of closed systems. Thermodynamic killing thus tilted the balance towards accommodating ineradicable chaos. "Clausewitz's emphasis on chance is to be contrasted with eighteenth-century general Maurice de Saxe's belief that 'war can be made without leaving anything to chance'" (88).

With the rise of cybernetic killing, the dread seesaw flopped once more towards the desire for perfect order. Command and control infrastructures "brought with them the hope that disorder of the battlefield could be overcome through information flows in the same way cybernetic systems stave off entropy" (129).

This regime's prototypical technology is the computer. "We may distinguish devices by the type of media content they produce or transmit or by the interface with which we interact with them, but ultimately they are all increasingly being brought together under a common architecture of digital information-processing. This is seen in the current collapsing of devices: emails can be sent through a television, photographs taken with a mobile telephone, and films viewed on a handheld computer" (101). So the computer enables technological commensurability and convergence. The computer itself is an "abstract machine" (ibid.) with in principle limitless physical realisations – in microchips, in abacus beads, in Conway's Game of Life, etc.

There is a strong conceptual affinity between such abstract machines and the idea of homeostasis or autopoiesis – the way in which a self-correcting system maintains its integrity in a fluctuating environment. This seems to be at the heart of the cybernetic metaphor. It first became manifest in the pursuit of a rationalised and self-equilibrating balance of power between the US and the USSR. With the collapse of the Soviet Union, defence wonks shifted their emphasis to total permanent control of the battle-field, through enhanced surveillance and the total integration of all intelligence and military systems. American military omnipotence was to comprise a single computerised and integrated whole, supervenient on a vast array of physical intelligence-gathering and killing machinery. Simply click and drag your prey to the recycle bin.

In its rise within the American defence analysis establishment, the cybernetic regime was articulating the relationship of part and whole in two distinct, and somewhat divergent, aspects. On the one hand, the whole was definitely considered "more than the sum of its parts," inasmuch as the emergent properties of vast interconnected systems were waaay beyond human cognition, and demonstrated the need for computer modelling. On the other, there was no feature of these complicated wholes that was not reducible, in principle, to some definite mathematical interaction. So "that which cannot be assigned a number or expressed in terms of logical relationships is necessarily excluded" (139). Bousquet admirably captures this equivocal relationship.

The success of this way of thinking was tied to the imperative that military defence become an auditable public good, amenable to economic analysis and justification. Early on, it was also shaped by the Cold War context. As the US and the USSR accumulated nukes, with "common sense" but the smurf's squeak from the candle snuffer, the vital conflict was one which could *never* be learned from, which could *only* be known from computer models because if it ever actually happened we'd all be dead – the apocalyptic "Wargasm" a.k.a. the realisation of Mutually Assured Destruction ("MAD"). So a potent scientistic discourse, with powerful institutional support, could pooh-pooh "common sense" with regard to killing, whilst simultaneously relying on various intuitions and unexamined conventional wisdoms: "the outcome of systems analysis studies or war games was heavily dependent on the assumptions underpinning their models, some acknowledged by the analysts, others largely concealed or unquestioned" (152).

With the benefit of hind legs, it's obvious that the cybernetic regime's hubristic swagger would be shown up by the Vietnam War. Bousquet notes: "It is true that because of the ebb and flow of the conflict, the absence of a clear front, and the guerrilla tactics of the Vietcong, it was extremely difficult to gain any insight into the conflict without statistical means. Nevertheless, what manifested itself in Vietnam was an obsession with statistical evaluations and directing the war from the top, perceived as the point of omniscience. Endless statistics of enemy bodycounts, bomber sorties, and 'pacified' hamlets were circulated among policymakers and Pentagon officials and presented to the media and public as proof of progress in the war. The production of these statistics required that a regular flow of information be collected and recorded by troops before being centrally processed and aggregated for the consumption of the war managers. The pressure on troops to produce detailed reports of their operations and particularly to match their

'production' targets in terms of enemy casualties led to wildly inaccurate and overblown estimates that masked the extent to which the US strategy was failing" (155).

Chaoplexic killing

Nonetheless, the cybernetic regime persists today, in a set of only moderately chastised formulae, and the computer metaphor still captures the imagination of policy wonks at the Pentagon and sundry international Killing HQs.

We are, however, perhaps on the cusp of a new regime – a regime of chaoplexic theory (the overlapping theories of chaos theory and complexity science), whose organisational metaphor is "the network" (and by "we" I *always* mean me, my best friends Posie and Melody, and the American military-industrial complex).

Bousquet distinguishes between the Revolution in Military Affairs ("RMA") and Network-Centric Warfare ("NCW"). Very summarily, the cybernetic regime, with its phantasm of perfect control, still presides over RMA, whereas NCW – although a development of RMA, and generally under its managerial aegis – is again emphasising war's ineradicable chaos.

But this is a chaos that can be *nudged*. "While chaos control is still largely at an experimental stage, it demonstrates that chaos theory does not stand against or outside the technoscientific project of control but rather recasts it so that order is not so much imposed against chaos as made to emerge from disorder by utilising the latter's properties" (173).

Chaoplexic phenomena are still deterministic. But because of sensitivity to initial conditions, arbitrarily small causes can have arbitrarily large effects. As measurement cannot be perfectly precise – you have to round off a decimal point somewhere – this means chaoplexic phenomena are *inherently unpredictable in the long-term*. You can never be sure you didn't just round down the butterfly who'll cause the storm.

John Boyd's OODA Loop

The chapter on chaoplexity's relevance to killing starts with a discussion of John Boyd's Observe-Orient-Decide-Act Loop ("OODA Loop"). The OODA Loop is a very abstract and broadly applicable action model, distinguished from traditional cybernetic homeostatic cycles by virtue of non-linear connectivity among its "phases" (it is "not truly a cycle and is presented sequentially only for convenience" (189)), and by its open-ended anticipation of changes in its agent's analytic framework (the OODA Loop points to "the irreducibly incomplete and evanescent character of any theoretical framework seeking to encapsulate reality" (ibid.). The Oompa Loompa points to the chocolate Nile).

Another way of putting the distinction is that cybernetic homeostasis is characterised by *negative* feedback and oriented to equilibrium, whereas the OODA Loop is characterised by *positive* feedback and oriented to metamorphosis. "Positive feedback is present when disturbances are amplified and thus move the system further away from its point of origin" (165).

The distinction, although half-way persuasive, kicks up a little cloud of Common Spotted Question Marks. The "Orientation" part of the OODA Loop embraces a lot of taken-for-granted factors ("Cultural Traditions" etc.) – stuff which is only occasionally accessible in consciousness. So I wonder, can an agent ever know that a re-orientation, however subjectively radical, has crossed the threshold from "cybernetic tinkering" into "chaoplexic metamorphosis"? [4]

So can the distinction be firmed up? Bousquet refers to Boyd's "focus on the conditions of emergence and transformation of systems through information" (195), but we don't get a lot of detail. We *do* get a supplementary distinction between two practical attitudes. The cybernetic-friendly attitude anticipates a kind of linear progress, with its models hugging reality, like my cycle shorts ("not truly cycle shorts and only presented as such for convenience"), in an ever-tighter fit. It hopes to reduce ambiguity and unpredictability, which are viewed as "a function of our analytic blindness" (198). The chaoplexic-friendly attitude, by contrast, *revels* in ambiguity and unpredictability, considering them the indispensable adjuncts of true creativity.

Specifically, to do justice to chaoplexity "the components within a system should be loosely connected together with a built in redundancy and ability to reconfigure their positions within the network when necessary, allowing for the emergence of new behaviour and organisational arrangements. In other words, the military must be a complex adaptive system operating at the edge of chaos" (202).

Bousquet emphasises the embryonic and oft-misunderstood character of the chaoplexic concepts like the OODA Loop. We should expect to find cybernetic and chaoplexic ideas and practices tangled together, and in many cases will need to wait until the dust settles before we can discern whether a particular action was governed by a cybernetic or a chaoplexic logic.

Remember how much dust there was, that day in New York? One of Bousquet's most striking arguments is that terrorist networks have been far quicker to implement chaoplexic killing than the US military, despite the latter's NCW agenda. "Even in the case of a single operation such as September 11, it has become increasingly clear that its planning and execution were far more decentralised than initially supposed. The different cells in the plot, although tightly coupled internally, functioned quasi-autonomously, and although they received some financial, logistical and training support from other parts of the organisation, were not exclusively dependent on them" (207).

Of ants and men

The OODA Loop clattering around his ankles, his hips still frantically gyrating, Bousquet turns to a re-examination of Clausewitz through a chaoplexic lens, further developing the themes of predictability-unpredictability, fluidity and transformation. Then we get to a cherished concept of military sf – *swarming*.

> "And the enemy was not stupid. There was no formation that Ender could study and attack. Instead the vast swarms of ships were constantly moving, constantly

> shifting from one momentary formation to another, so that a space that for one moment was empty was immediately filled with a formidable enemy force" (Orson Scott Card, "Ender's Game" [1977]).

There are two different kinds of swarming. First, there's the kind where hundreds or trillions of swarm members execute bewilderingly elegant and complicated manoeuvres, coalescing to make an attack, dispersing before a counter-assault can be launched, all by virtue of bespoke information received from a centralised intelligence or "topsight," which constantly receives and processes the statuses of all members of the swarm in real-time. Then there is the kind where each swarm member acts autonomously, communicating only with his or her immediate neighbours. The organisation of such a swarm is an emergent property, although on the surface its may resemble a painstakingly-designed choreography. Bousquet takes some care in uncovering how, in defence circles, advocates of the first kind of swarming often helps themselves inappropriately to the vocabulary of the second. "Antoine" is an anagram of "I, Neo-Ant!", so.

Bousquet also quotes Yaneer Bar-Yam distinguishing these two approaches to networked operations. One "involves networked decision makers receiving information from a set of sensors and controlling coherent large scale effectors. Analogous organisational structures can be identified in the physiological neuro-muscular system." The other "involves networked action agents capable of individual action but coordinated for effective collective function through self-organised patterns. Analogous behaviours can be identified in swarming insects and the immune system." Bar-Yam adds that "there are many intermediate cases that can be considered" (227).

Bousquet states that as to the former approach, "there is no sense in which a true network has replaced a hierarchical structure" (227). Perhaps so, but what about the "intermediate cases" Bar-Yam raises? Where do Islamist terrorist networks fit in? Presumably closer to the latter, though Islamism itself could be considered a synchronising dynamic, operating along ideological channels.

Bousquet quotes Arquilla and Rofeld: "Moving to networked structures may require some decentralisation of command and control [...] But decentralisation is only part of the picture; the new technology may also provide greater 'topsight' – a central understanding of the big picture that enhances the management of complexity. Many treatments of organisational redesign laud decentralisation; yet decentralisation alone is not the key issue. The pairing of decentralisation with topsight brings the real gains" (227).

Hearts and minds

It's time to depart somewhat from Bousquet's suggestive but prudent discourse. For the following rich imagining of chaoplexic warfare, involving the "pairing of decentralisation with topsight," we'll be drawing on the resources of science fiction.

Earlier I gave two possible reasons why it creeps us out to glimpse the personalities of military men. Intriguing albeit subtle parallels exist between reason number two – that

these glimpses reveal a lack of peace-keeping knowledge – and the proposal to surf on the "edge of chaos."

In Michael Moorcock's utterly luminous *Dancers at the End of Time* trilogy, Jherek Carnelian, an agreeable neo-dandy of the very final *fins-de-siècle*, sets out to acquire an obsolete oddity called "virtue." Soon after he announces his intention Jherek's mother, aka the Iron Orchid, muses:

> "Ah, I now begin to understand the meaning. If you have an impulse to do something – you do the opposite. You want to be a man, so you become a woman. You wish to fly somewhere, so you go underground. You wish to drink, but instead you emit fluid. And so on. Yes, that's splendid. You'll set a fashion, mark my words. In a month, blood of my blood, *everyone* will be virtuous." (*An Alien Heat* [1971]).

The Iron Orchid is (forgive me, "most devastating of minerals, most enchanting of flowers" (9)) wrong – but it's difficult to put our finger on just *why* she's wrong. Her misapprehension demonstrates how hard it is to convert moral knowledge into transmissible propositional form.

Jherek points his nose squarely at "virtue" and, with the aid of his side-kick and love-interest Mrs Amelia Underwood (a wonderful and kidnapped Victorian), misses it completely. At least, the transformation and deepening he undergoes never quite conforms to a template of objectives settled upon and afterwards achieved – a template of "means-end rationality," if you will. His moral education is rather inherently unpredictable and inimitable, and in many ways a by-product of his striving.

Let's say, for the sake of argument, that peace-keeping, like Jherek's moral education, involves certain specialist knowledges that you can't gain by directly aiming at them, but have to acquire haphazardly whilst struggling for something else [5].

This would harmonize with the idea that the expert peace-keeper is someone who sometimes tries to do one thing, but breaks down and does another (*a la* Frank's reasonable passions). It also harmonizes with the intuition that there is something virtuous about keeping the peace, that it is mixed up with moral knowledge.

There is a flourishing descendancy to the sociologist Max Weber's distinction between "means-end rationality" and "value rationality" [6]. Bousquet tends to wave these dichotomies away from his story, and I think wisely. The fact is, the concept-cluster around "value rationality" – for all its importance in understanding the world in which we live – is the barely-contested property of the humanities and the social sciences. These concepts are shaped by their institutional ownership. While we use them to think, we are continually seduced by the attitude that *whatever* turns out to be ultimately inassimilable by technocratic control, it's probably something the humanities and the social sciences busy themselves with on a regular basis (moral knowledge, for example, or Proust or something).

Putting that fruitful distraction on ice, we can take an ambitious look at competencies traditionally considered inherently social, communicative and intuitive, and ruthlessly explore the extent to which they might be technocratically administered.

Chaoplexity gives us an alternative way of thinking about matters which must be met with a certain indirectness. We can take the long-term perspective that killers take. You know, the ones who look at a delicate social *faux pas* and think: "How could I ruggedize this?". The Rumsfelds, all those who won't be content with Classicists' and Social Anthropologists reiterating the irreducibility of their specialisms – not if the alternative hides a military edge.

The problems dogging our lads in Iraq and Afghanistan often involve a want of proper tools. I don't just mean APCs and bullet-proof vests. I mean that, observing those theatres from afar, misgivings begin to grow that our whole edifice of military personnel and equipment, all its organisation and capacities, is fundamentally ill-suited to its objectives. The "government in a box" which was supposed to support recent offensives in Afghanistan – well, in future, that box is gonna get labelled "FRAGILE HANDLE WITH CARE."

> "And yet, and yet . . . Alpha feels that something is missing. / / QUESTION: Can he calculate it?" (Gregory Benford, "Calibrations and Exercises," in *Matter's End* [1996]).

The idea of a "battle for hearts and minds" encapsulates this incongruity very well. Petrarch and Sidney and their mincing ramifications may have accustomed our ears to a goulash of martial and amorous terminology, but it takes only a second of pure attention to discover how inappropriate the mixture is. Hearts and minds are not "won" by anything a soldier is specialised to do.

But is it necessarily so? Could some chaoplexic successor to contemporary Systems Analysis eventually learn to process cultural, psychological, and ideological activity? Could a military system perceive and respond in real-time to goings-on in these dimensions? Could a heart or a mind crystallise, hovering at the "edge of chaos," as a concrete objective, to be pursued with a mix of policy and pragmatism?

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> "A giant has brought WAR to England's heartland!" (Adam Roberts, *New Model Army* [2010], blurb).

About time, too! Roberts's novel envisions an army without any chain of command. All soldiers of the New Model Army ("NMA") vote on tactical plans, which can be proposed by any soldier. There are no specialists. The soldiers are all generalists, with specific knowledge pulled from Google as they need it. They're in constant communication with each other, and likened to a single organism. The narrator insists that his NMA, Pantegral, is the novel's real protagonist:

> "The British army has tried to destroy him but each time he has beaten them. When they bring in air support and deploy heavy weapons he simply melts away, only to form again somewhere else and deliver another devastating blow." (blurb)

What kind of blood geek is Roberts? Embedding with Pantegral on his campaign, it's not long before we're engaged by – oh, a dead child and trembling civilians:

> "It was really pretty upsetting. That is to say: I was aware of it was going to *be* upsetting, at that point in the future when I would have time to think about it properly. It wasn't upsetting there and then. I was too busy to be upset, there and then. You understand." (18)

You understand, General Reader. Or should that be Gentle Reader? Lara *does* understand, little soldier man – you're saying *you* don't have time to be upset, and so neither should I. We're not bad people, just doing our jobs.

New Model Army is canny, pellucid, and very *now.* I don't mean that synthetic, extended-shelf-life *now*-ness pioneered by William Gibson. I mean a deliberately and unapologetically contemporary frame of reference – Roberts won't make up futuristic nicknames for stuff like Google or wikis (I was kinda surprised "duplo" wasn't "Digg"); flames from rubble are likened to Bart Simpson's haircut; the Troubles are evoked with an allusion to the Cranberries; there's a long paragraph that only really makes sense if you've seen or read *300*. (Although "This! Is! Basingstoke!" doesn't have quite the same ring.) Anyway, the tongue knows when to take cover in the cheek. That tactic slakes, as required, the bloodthirst.

Pantegral's military performance is on the whole pretty convincing. Like Pantegral's modern partisan forebears – the Viet Cong, al-Qaida – the giant punches significantly above his weight (punches *to death*, obv.!). The British army can't cope with a highly-networked (albeit numerically inferior) opponent who materialises in densely-populated urban areas. Really, what *are* they to do? They can't be everywhere at once. Pantegral *can*. Here's a scene from early in the novel:

> '[They're making passes from the east,]' said a trooper called Patel whom I'd never met in person, although I knew him well enough. '[We're on the library hill, and you can see them coming in, settling into attack flightpaths. They're aiming at the ring road.]'
>
> '[They've got four cars coming in, down here,]' interrupted Capa, on priority. Cars, meaning tanks. He had two dozen comrades with him, and every one of them duploed this. The consensus was that our cars were the targets.
>
> '[We're moving them,]' said Capa, the sounds of the detonations around him scuzzing his transmission.
>
> '[What were they in the fucking *open* for?]' prioritized a trooper called Thirlwell. This was poor form. He was immediately blanked by twenty men for misusing priority: cut from the wiki for ten minutes: his contribution not being constructive, a ten-minute sinbinning was the usual sanction.
>
> Four priorities jammed the wiki, and the system ranked them and rattled through them: three from soldiers in the west and one from Patel on library hill:
>
> '[They're sending in shock troops.]'

> ‘[Eighty runners, give or take, crossing the ring road now.]’
> ‘Riders?’ Tucker put in.
> ‘[All runners no riders. Wait a mo.]’
> ‘[They are bringing up their own cars.]’
> ‘[Why *yes* they are.]’
> ‘[Helicopters, behind the planes.]’ This last from Patel.
> ‘[I propose we group in Mall plaza,]’ said Moffett. ‘[Good terrain for defensive combat.]’
> ‘[I counterpropose,]’ said a breathless sounding trooper whose tag flickered before resolving – presumably a symptom of electromagnetic interference attendant upon rapid arms fire near his position. Crowley, his tag said; and he was in the west. ‘[We divide by location, west to fight the western incursion, those near library hill counter the helicopter drop troops.]’
> A trooper would have to have an outstandingly brilliant third notion, or to have something pretty deadly urgent to report, to insert a third proposal at this point. It sometimes happened, but rarely. So we all voted. I was halfway up the second, winding stair, when I keyed in my vote. It was pretty clear, on this occasion, which way to cast. Simic and Tucker were standing beside me, voting.”
> (15-16)

Great! I much prefer the narrator’s personality in this early phase, by the way – pert, iconoclaustic and polemical. He’s less appealing later on, as a war-toasted marshmallow. The fine line between delicious and delirious! Nonetheless, *New Model Army* remains compelling till the last gasp, partly because (in the spirit of democratic transparency) it’s very frank with its ideas. You don’t need to coax them out. They sit there calmly, awaiting comment and critique.

The story about a successful army relies on a tacit story about a successful democracy, and *that* I find less persuasive. Alexis de Tocqueville’s *Democracy in America* supplies one of the novel’s two epigraphs. That’s fitting, since Tocqueville is just the thinker to poke holes in the operation of Pantegral’s democracy (the other epigraph is from the Hives. Their latest album is Democratic Peace Theory in the vein of Francis Fukayama, so). Whilst Tocqueville gave some pretty deep attention to laws and institutions, he also understood that democracy must go even deeper. American democracy, Tocqueville saw, was intricately inwoven with an American way of life. It was distinctive at every level of analysis, never simply recapitulating legal and institutional forms as a substructure of veneration and support.

Pantegral’s democracy doesn’t go deep enough. Instead Roberts posits, with a flick of the wand and a pinch of wiki dust, near-perfect republican citizens. They are intelligent, steadfast, fiercely loyal, unprejudiced (“we don’t care about your age, or your religious convictions, or your *lack* of religious convictions, or your ethnicity, or your sexual orientation, or sexual *re*orientation, or your gender, or those things the outside world considers handicaps” (87)). They are averse to disproportionate personal power or gain.

They are independent-minded whilst ever-ready to subordinate their individual wills to the (Brigadier) General Will.

Where could such goodie-two-boots killers come from? It's suggested that Pantegral self-selects for suitable hearts and minds. I guess that's plausible (on the other hand, remember Rumsfeld *q.v.*). It's further suggested that the raw recruits are tempered by the battlefield (Thirlwell *q.v.* has learned his lesson, and so on). That's plausible too.

The question then becomes, how are these near-perfect republican citizens preserved against ambient antibodies? After the battles of Basingstoke and Reading, the narrator soon is having sleep-overs with his non-NMA buddies. "We all went back to our various lives" (73). In those lives, Pantegral's "off-duty" killers either cultivate various connections – emotional, intellectual, ideological, institutional, economic, cultural, religious, familial, *etc*. – or they become completely pathological, and probably go nuts. The hearts and minds which comprise the giant are necessarily shaped by circumstances external to him.

A fully plausible Pantegral would have to internalise all such decisively formative states of affairs. I can't imagine what infrastructure would keep Pantegral's citizens oriented towards the virtuous direct democracy we see throughout the novel [7]. Whatever form it took, it would certainly be irreducible to Web 2.0 architectures – which often have more to do with liberty than they do with (for example) deliberation or civic virtue [8].

Godzilla vs. King Kong

It's interesting that Roberts named his composite giant "Pantegral." It's a Continental allusion, to Rabelais's Pantagruel, perhaps with a pun on "integrated" (or on "Holy Grail of Panto horses"? Bagsie hindquarters!). Yet the English countryside has been more accustomed to another giant's shade.

Thomas Hobbes's Leviathan pops his big head up briefly:

> "[...] Hobbes had a feudal mind, and could not help but imagine that his giant would have a royal head, a guiding and directing organ. Somebody explain to him that this is not needful. The next stage in human evolution is *necessarily* away form the restrictions of feudalism. The next stage is the land of the headless giants: for without eyes their eyes cannot play them tricks, and without ears they cannot be lied to, and without a mouth they cannot be fed poisoned food, and without a nose they cannot smell the stink of mortality [...]" (241-2).

Roberts is right that Leviathan is anything but democratic. In Hobbes' version, obedience to the "guiding and directing organ" – the Sovereign – must be total. Obedience in return for security, that's how it goes.

But there is also a robust, if weird, strain of liberalism in Hobbes. He drops some pretty heavy hints that the Sovereign should leave people to do whatever they want, so long as their activity doesn't pose a security threat. The thing is, he is unwilling to posit a private sphere within which any activity is definitely harmless (that's what makes his liberalism

weird). Responsibility for security includes total discretion over what counts as a security matter. Which *could* mean, you know. No gays.

Very roughly speaking, this organising principle can be characterised as authoritarian liberalism, cardinally opposed to the democratic totalitarianism which organises Pantegral. Authoritarian is opposed to democratic, liberal is opposed to totalitarian.

So what would a Leviathan New Model Army look like? It's one of Roberts's masterstrokes to make Pantegral so low-tech. The giant's carnage is not planned according to sophisticated composite topsight, drained from the data-streams of spy satellites. Nope, just maps.google.co.uk, together with some webcams duct-taped to toy gliders. In this respect, Pantegral resonates with Bousquet's remarks on al-Qaida. Leviathan would go to the opposite extreme. Leviathan would encourage the proliferation of technology, of expertise, and of continually finer-grained divisions of labour and of knowledge. He would encourage the proliferation of representations of specialisms, of standards and licenses, and the escalation of their interdependence and reflexivity. Security (mainly making money and killing people) would be his overriding imperative, but his centralised topsight function – his Sovereign – would fulfil it by nudging decentralised chaoplexic processes.

Could competencies traditionally considered inherently social, communicative and intuitive, which have proved resilient to traditional technical control, yet be susceptible to manipulation as chaoplexic phenomena? Could LULZ become a standard unit of measurement? The hearts and minds of his constituent killers would certainly be within the Sovereign's purview. But he wouldn't necessarily be concerned with deliberative wisdom or civic virtue, as the citizens of Pantegral are. He would be focussed narrowly on their instrumental value within the security agenda. In this respect, they would not be essentially different from the hearts of minds of the enemy, and the entire continuum of hearts and minds between.

Putting the "ap" in "apocalypse"

The squad makes a ballistic breach and storms the structure, peeling off to secure every room within twenty seconds. It's a home. There are three frightened-looking young men lying on the ground with their hands behind their heads, an older woman screaming at the commanding officer, a boy of about nine and a girl of about four wide-eyed in the door way. The killers bristle with sensors, and harvesting their transmissions, and HQ is subjecting the battlespace to psychological, emotional, cultural and rhetorical analysis. The woman's now saying that the person whom the soldiers are looking for isn't here. The CO whispers, "Line!" and in his head-set, a script begins to kindle.

Consider a "system of systems" which learns to ID enemy "signatures" with unparalleled accuracy, once those signatures are liberated from compulsory incarnation as troops or assets, and allowed to incorporate ethical, psychological, cultural and other "soft" info. No more problems with swelling the enemy's ranks with newly radicalised recruits – or at least, such problems would appear as normal problems of a military nature, susceptible to intelligence and resource commitment.

In Neal Stephenson and George Jewsbury's novel *Interface* (1994), a biochip stuck in a political candidate hooks him up to real-time polling information, so that he can effectively "feel" the effect of his actions on the electorate. Similarly, bespoke derivatives of topsight could be piped directly to the consciousness of killers on the ground.

There's a marvellous short story by Greg Egan exploiting the fact that our visual fields are largely confabulated, a patchwork of guesswork. You can prove this to yourself by finding your anatomical blind spot [9]. In Egan's "Seeing" (1995), the protagonist's perspective is rearranged, following a bit of smart brain-damage, so that his POV hovers above his own head. The top surfaces of things, and the stuff behind him, that he can't "really" see, get filled in automatically by memories and expectations.

Francis Crot's novelette *Hax* (2010) bounces off Egan's and Stephenson's and Jewsbury's ideas, proposing a technology that integrates the perceptual phenomenology of soldiers with events in the top-level system of command-and-control. "Enemies," "allies" and "civilians" are definitively colour-coded in the individual soldier's vision, although negotiations by the top brass – and market fluctuations – mean that a particular status can be reassigned at any moment. Soldiers moreover see statistical threats as tangible figures, translucent banshees squatting in bushes, aiming ectoplasmic cannons, to be banished with the sweep of a searchlight.

Have your chaoplexity and eat it

> "Within five minutes there were twenty-three of us outside, our suits bulked out with armour and antiquated weapons. There were at least thirty incoming pirates from the *Cockatrice*, and they had better gear. But they'd lost the support of their mother ship [...] They fought as well as they could, which was with a terrible individual determination, but no overall coordination. Afterwards, we concluded that their suit-to-suit communications, even their spatial-orientation systems, must have been reliant on signals routed through their ship. Without her they were deaf and blind" (Alaistar Reynolds, "Weather" in *Galactic North* [2006]).

Back for a second to Bousquet, who is suspicious of prodigiously expanded topsight capability. He interprets the ever-deferred promise of an over-aching "system of systems" as an excess of the still-dominant cybernetic regime, and notes that "reliance on this elaborate infrastructure and the skills and habits it will likely breed may in fact prevent troops from ever operating autonomously where only local or partial awareness is available. This point is all the more crucial when it becomes clear the information infrastructure will be the Achilles heel of any such army and that there exists a number of means to effectively disrupt both the hardware and software of electromagnetic equipment" (230).

Certainly the "heart-swarming" topsight just imagined is hardly plausible unless soldiers on the ground are treated as users receiving instruments, not instruments receiving instruction – and even then the problem remains that they may develop over-reliance. (A problem for *them*, though by then it will probably be me and Melody vs. Posie and the American military-industrial complex).

But what if the "system of systems," or certain of its features, could *also* be developed along non-hierarchical, chaoplexic lines? After all, swarming is most effective where the components are *cheap*. Human life is not, except proverbially, cheap. But once the underlying hardware is in place, virtual components – an algorithm, a speculative bit of code – are extremely cheap.

In place of a bureaucracy and hierarchical command structure overseeing a swarm of assets, let's envisage the various computer systems synthesising and analysing intelligence *literally evolving* as they do so. The over-arching "system of systems" is then not an end-point, but a complex adaptive system in constant flux, promoting its best techniques to subsequent generations of itself, and constantly experimenting with "breeding" new recombinant techniques.

Let's imagine too, in a cyberpunk vein, that topsight becomes commodified and marketized [10]. Different "central understandings of the big picture" become available for subscription, each purchasing and synthesizing intelligence from killers on the ground, various private surveillance firms and one-another. These complex adaptive systems split and merge, compete with and cannibalize each other, learn from their experience and try to trick one-another into learning the wrong things.

People, machines and systems on the ground bargain for different kinds of access to and mediation of these services. Potentially the same complex adaptive system even serves opposed forces, through the elegant use of "Chinese Walls" to separate information-holders and decision-makers. If some auxiliary contractor becomes sufficiently vital to, say, air superiority, then for either side the only access to air superiority might be through exhausting its enemy's credit rating with the contractor, via an onslaught of micro-financial pressures.

Who are we fighting for?

When an item of information moves on the net, it is split into conveniently-sized packets, and flows across multiple paths to its destination. All Net business is multiply-realisable. It's like watching a swarm of bees, except each bee can fly apart into a further miniscule swarm. If our intrepid info packet finds her first route obstructed, she has recourse to a thicket of thitherwards.

Taking things another step, what if not just intelligence and other operational support but also *mission objectives* were governed by the logic of swarms?

The level 36 liberal John Rawls (200,000 XP, blood geeks, if you think you can take him) describes an "overlapping consensus" as a situation where all parties can agree, though with diverse motives. We can contemplate the technization and militarization of consensus itself.

Taking a cue from certain once-arcane financial products, now celebrities for their part in the sub-prime mortgage crisis, we can imagine missions or entire wars which have been "bundled" together from the marginal military desiderata of diverse parties.

The answer to "Who are we fighting for?" has often been given, somewhat disingenuously, not as a *who* but as a *what* – "Freedom," for example, or "Honour" or "Empire" or "Love." Of course, every abstract noun also picks out a *who*, inasmuch as it

represents a certain half-hidden constellation of interests. Very crudely, "Love" represents the interests of Lovers and so forth. But with intense and appropriately-disposed networking, battles could be fought on behalf of constellations which do not correspond to any discrete idea in language or ideology.

Shareholders, the collective owners of publicly-listed corporations, typically never meet one-another and often take only a perfunctory interest in the activities of their possessions. Pension funds and other institutional investors create even greater distance between corporations and their ultimate owners. A similar relationship could exist between a war and the coalitions funding and legitimating it.

Moreover, just as the trade in derivatives dwarfs the trade in concrete commodities, so a great deal of military activity could be determined not by *actual* conflicts, but by the multifarious and delicate interactions of speculative conflicts. Somewhere in the Urals, a missile defence system amends its emphasis. Why? Its rationale synthesises probabilistic outputs from dozens of quasi-local conflicts and millions of potential conflicts. In Scotland, a fireteam make a breach and secure a structure even before it is determined for whose "side" they act. But they are not exactly mercenaries. They just know they most effectively practice loyalty by offering a nuanced pattern of discounts, not by dogmatically yielding their bodies and equipment to some particular command-and-control locus.

"It's Aryan men, Hallelujah it's Aryan men"

Indeed, we can imagine a distributed and chaoplexic constitution of "sides" in a conflict. Let's imagine that individual soldiers must make decisions which have significance at the tactical level, at the strategic level, and at an even higher level – at the level of the socio-political framework containing the conflict. The parameters of war would be constantly negotiated by those who fought it.

I'm not talking about Pantegral enfranchising soldiers in the management of those institutions which organise their day-to-day killing. I'm talking about the extinction of those "bright-lined" defence institutions themselves. No longer would control be exercised from identifiable blocs combining strategic, technocratic, ideological, economic and legitimacy functions. The most recognisable inheritors of such blocs would be the temporary equilibriums of a mercurial network of capital, politico-military leadership, popular violence and third-party assurance. Under these conditions, "Whose side are you on?" becomes as multifaceted a question as "Who are you?".

Protocols, of course, are of the utmost importance. The choice of common language is always to the benefit of some set of material interests. My mech's an Atari. Moreover, the distinction between soldier and civilian, never the most convincing artifice, all but collapses. Standing in Wal*Mart, weighing up brands of peanut butter, you view on your phone screen how your options integrate into the funding streams of various corporate clusters and their associated ongoing military campaigns. Watching the trends, you choose Black Cat Chunky, and your inbox clogs with a message of thanks from a downed NATO chopper crew extracted by a Somali pirate drone.

In fact it's fake – this entire milieu is of course contaminated with its own terrible versions of viruses, worms, Trojan horses, spyware and spam. The dust never settles. The blood never dries.

It's worth mentioning Carl Schmitt again. There is a tension between this apparition of the future and Schmitt's work (and the Realist tradition generally) – a tension which I suspect is irresolvable. One or the other must give way.

In what we've imagined, chaoplexic warfare has been pushed to a point where it is superlatively commensurable with social and economic activity. *Every* asset, *every* territory, is "compromised" – in that its status is determined by qualitative and quantitative bargaining, as well as qualitative force. Contracts and conflicts thoroughly interpenetrate and mediate one another. Neither the contractual nor the conflictual principle has the upper hand.

For Schmitt, such a world was a highly implausible fantasy – or, the stuff of science fiction – and it promises the absurdity of people who, according to contractual obligation, go willingly to their deaths. The intricate tubes and membranes of exchange, delegation and sub-contract are brushed aside, Schmitt thought, when survival is at stake.

It's not something I can hope to answer here. The relative explanatory powers of "rational / existential self-interest" and "conventions, institutions and regimes" is a key question for International Relations, one which largely defines its dominant Realist and Liberal branches. To argue with Schmitt, you might bring up existing informal conventions which embrace mixtures of friends and enemies. Neither al-Qaida nor the US military can really "opt out" of the use of money. Arguably, both also partake in a single global regime of circulating ideologies. There are certain protocols which it is too risky to ignore, and perhaps there could some day be others, with greater and more detailed clout.

All this speculation pulls chaoplexic warfare, and the network metaphor, farther along their implicit trajectory. If we were in the business of prediction, and not the game of extrapolation, we might instead anticipate a clean break – and the emergence of entirely new type of warfare.

Flip those pink sofas over, they make pretty good fortresses. *Is fortress* the feminine of *fort*? I've gone light-headed again. What's the masculine of *tresses*? I've gone light-haired again.

There are plenty of us, who hope – intelligently hope, for all we can tell – that a future regime warfare could be so exotic, so different from everything that has gone before, that it need not even be *killing* any more.

Carl Schmitt would disagree. But then, he was a Nazi.

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Endnotes:

[1] In fact, Schmitt believed that killing can be "justified" in a sense – *politically* justified, though never legally or ethically justified, which are how we usually think of justification and the *jus belli*. In this review-essay I elide Schmitt's existential idea of "the political" with killing plain and simple, and I underplay the degree to which he entertains the possibility of an a-political world. It's all for the sake of convenience and doesn't, I think, lose *too* much of his thought. But check out the horse's mouth, especially his celebrated molar, *The Concept of the Political.*

[2] The key difference, as far as I can tell, is that "paradigms" by default supplant one another, whereas "metaphors" by default compromise and hybridise with their antecedents. In many areas – applied engineering for one! – Newtonian physics are still used, even though they are "obsolete."

[3] Perhaps Bernard de Mandeville deserves a name-check too, for his 1705 tract on the emergent properties of swarming bee myrmidons? It is clear, at any rate, that sf swarms, and the modern-day BattleSwarm doctrine, bear some kind of durable relationship with economic *laissez faire*, but the details of the relationship are opaque. I suspect they are *not* all part of a single smoothly-operating region of ideology. As Frederic Jameson puts it, "the apparent realism, or representationality, of sf has concealed another, far more complex

temporal structure: not to give us 'images' of the future – whatever such images might mean for a reader who will necessarily predecease their 'materialization' – but rather to defamiliarize and restructure our experience of our own *present*, and to do so in specific ways distinct from all other forms of defamiliarization" (286). Whatevs. "It is not from the benevolence of the fire-ant, the nanite, or the nano-sniper that we expect our killzone, but from their regard to their own self-interest." Perhaps the easy conflation of the two kinds of swarming (q.v. "Of ants and men") is ideologically connected with the suppression, by free market fundamentalists, of various institutional prerequisites (think, "hierarchical command structure") of the price mechanism. People like Adam Smith knew all about these prerequisites, but the folks at the free-market think tank, the Adam Smith Institute, are apparently in the dark. Cf. Adam Smith's famous hand: does it become visible in the rain?

[4] When some discrepancy between what is observed and what is modelled leads an agent to amend part of her model, can she confidently categorise the discrepancy as either negative or positive feedback? The agent's judgements on these matters must be supported by criteria which are *also part of her analytic framework*. We're left with old epistemological puzzle about whether an eye can gaze upon itself. Of course, reflexive knowledge in these matters *may* be possible, but we shouldn't take it for granted.

[5] These thought, by the way, are quite directly suggested by two side-by-side essays in *The Cambridge Literary Review*, vol. 1 no. 1, Michaelmas 2009. The one is Raymond Geuss's "Vix intellegitur," the other Stefan Collini's "Never Mind the Width: Understanding and Judgement in the Humanities." Both essays, and the journal, which is mostly filled with weird futuristic poetry, come highly recommended. You may also feel like comparing Geuss's admiration for poetry which "hovers on the edge of meaning" with Bousquet's preference for military systems which "hover on the edge of chaos."

[6] Jürgen Habermas's "strategic action" and "communicative action" is the most impressive example. Habermas is also influenced by the marxist distinction between reified and dialectic thought. Of course, the distinction is older than Weber or even Marx. Quite a few of the same intuitions play out, for example, in Descartes' dualism. What's more, to even talk of "the" distinction gives an extremely rude and abridged version, which necessarily bowdlerizes every impulse and every controversy which determined the concept-cluster's structure in the first place. All such shtick surfs of the edge of intellectually unforgivable. I only do it because here we're talking about habits of thought, rather than scrupulously elaborated arguments or theories, but I'm certainly woozy and probably projecting a little.

[7] How many participants in the distributed polity of Wikipedia, if tested, would put Wikipedia above the various other communities in which they are embedded? "Join me, Inclusionsists, I'm invading Slovenia!" "Buffy Fen! The Inclusionists are invading! We must come to Slovenia's aid!"

The twin principles of constitutional liberal democracy are rights and popular sovereignty, corresponding respectively to the liberal and to the democratic ingredients.

(Those are the *principles* – *actual* constitutional liberal democracies make a hash of them, mainly because of two things: expert knowledge, and capital. But, as we like to say in the Forces of Counterrevolution, "anyhoo!").

Pantegral seems to practice direct e-democracy along with something like the old Bolshevik doctrine of democratic centralism. Democratic centralism means that every soldier is free to propose, discuss and criticise in the decision-making phase, but the decision, once made, is absolutely binding on every soldier. If the decision is to mass murder thousands of prisoners, then each member of the NMA, however he voted, must "pick a prisoner, dispatch him, such that it would all be over with a single boomingly multi-tracked gunshot" (42). The security of the polity, after all, is at stake.

Does Pantegral possess popular sovereignty? Probably. How about rights? Probably not. On this basis, I'm tentatively identifying Pantegral as a totalitarian democratic republic. But there are plenty of counter-indications and complexities.

For example, where does expert knowledge fit in? The narrator is ex-British army. Early in the novel, he gets picked for a team to negotiate with the British top brass. But doesn't expert knowledge have a corrosive effect on popular sovereignty? What if the narrator tried to claim he should *always* be the negotiator? Or opt out of the binding force of a collective decision on the basis that he has specialised insight into the decision's mistakenness?

Roberts gets round the problem of expert knowledge with an oblique appeal to deliberative democracy. If somebody really does have expert knowledge, he or she should be able to articulate it in the decision-making phase. He or she should be able to *generalise* it, either by making it comprehensible, or by convincing the polity of a comprehensible (and typically extravagantly disproportionate) accountability mechanism. The soldiers are all generalists, but that generalism isn't just a default state they can chillax into. They have to *work* at that generalism. Those who cannot explain their specialist knowledge must strenuously renounce its implicit claim to power, by staking their reputations or their lives upon it. And as a whole, the polity must be ever-vigilant against specialist knowledge embodying in forms which could circumvent deliberation. Through this deliberative work, the polity can manufacture its General Will, without outlawing anything suspiciously specialist.

One problem with democratic centralism (and with the republican solidarity which the book more explicitly evokes) is that any individual can find him- or herself in a permanent minority. *Every* vote goes against you. Everything *you* do is decided by others. Never mind, for a minute, if it is *fair*. That's popular sovereignty. Do you think that it is democratic?

Well, maybe it is. Arguably, what's violated in such cases is liberty more than it is democracy. Tocqueville was deeply troubled by democracy. He saw its rise as inevitable, something to be apprehended in historical and sociological modes, rather than tinkered with in institutional modes. For Tocqueville, question was, how were *liberties* to be guarded against democracy's ascendancy?

The French liberal Emmanuel Joseph Sieyès is probably the earliest thinker to give a robust account of popular sovereignty *founded* in the exercise of private liberties, in conditions of engineered pluralist interdependence. As well as threatening their citizens' liberties, direct democracies suffer from problems you could call "inalienable *self-*

representation." That is, the citizens of the polity are unequal rhetoricians and reasoners, voting and deliberating under a fiction of equality that is supremely available to special interest manipulation.

It's hard to boot the poets from Plato's Republic when we all have a poet inside us. What's to do, kick everyone's stomachs shrieking, "BEGONE, TINY POET!"? Sometimes appeals to deliberation and civic virtue are but shrieks and boots.

Representative government, Sieyès argued, can avail itself of elections as a kind of universal solvent, in which citizen's differentials dissolve as they are temporarily homogenised as electors. By such an abstraction, representative government is reasoned to *exceed* the capabilities of direct democracy as regards the maximal promotion of relevant civic minutiae into an aggregated policy form. The French liberal Benjamin Constant might emphasise another advantage of representative government: with a reduced burden of civic participation, liberties (at least, "the liberties of the moderns") are safeguarded.

Flip forward to the present day. Liberty and democracy are glued together in an uneasy *de facto* coalition, which we call constitutional liberal democracy. On a good day, liberty and democracy are complementary. But on other days, liberty and democracy want nothing more than to rip each other's eyes out – that's something Tocqueville understood well (and something Nick Clegg must gradually be learning). The value of thought experiments like Pantegral (and Leviathan, for that matter) is not that they provide an *alternative* to the maddening, messy and hypocrisy-strewn problematic of constitutional liberal democracy, but that they provide us a few more tools with which to attack that very problematic. And of course they're cool.

[8] A Wikipedia article accumulates quickly by virtue of its open invite. We're all at liberty to chip in with very little insight into one-another's methods or motives. One of the things about an edit war is that nobody dies.

To be fair, Pantegral is drawing a draught from a quite conventional description of mass online collaboration, a description which uses the language of direct democracy and republicanism. One thing which good sf does is function as a *reductio ad absurdum* of contemporary descriptions which, however conventional, are fundamentally mistaken. The way I'm see it, Web 2.0 technologies allow collaboration to become decoupled from communicative cohesion. This point is obscured by the fact that online collaboration often organises materials which traditionally have presupposed communicative cohesion.

[9] There's a demonstration on the Wikipedia page – <en.wikipedia.org/wiki/Blind_spot_(vision)>.

[10] The problem which Bousquet raises, that true horizontal organisation is elusive, because enhanced connectivity tempts remote commanders to "micro-managing" killing, could be unravelled by just a little flex in the hierarchy – Chinese Walls and some redundancy at the top, far short of true chaoplexity. Imagine that identical topsight capacity was given to two different double-blind remote command hierarchies, each overseeing the activities of a randomly distributed 50% of the forces. Commanders in HQ A and HQ B

would be unable to micro-manage a given unit, since half the head sets would be filled with the voices of the other HQ. This would *force* decentralisation and horizontal organisation. Don't let it ever be said that I didn't give world militaries lots of good ideas for how to kill us!

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