



ARMY

COVER SHEET

HUMAN ASPECTS OF COMMAND

Track: Network-Centric Applications

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Abstract

Warfare is a fundamentally human activity, dominated by aspects of human behaviour. Yet in considering the application of technology to support command and the conduct of war we find very little reference to those human phenomena. This paper offers a series of observations about human behaviour, human institutions, and human culture. Examples include the incidence of human failure observed on exercises; the prevalence of authoritarian behaviour amongst senior commanders, and instances of modern military myths. Such human phenomena are important, often unexpected, and almost never described in military doctrine. Reasons include the state of the sciences involved, and the knowledge of human behavioural sciences displayed by military men. In order to make really significant improvements to military capability through improvements in command we need to identify more precisely the human aspects of war, and particularly command, and engage the relevant scientific community in addressing them.

Paper

Network-Centric Warfare is perhaps the latest manifestation of series of initiatives or concepts that in some manner seek to harness the information revolution to the conduct of war. These concepts have sought to harness digital information technology to offer improved effectiveness through a series of vectors, including improved situational awareness, decision making and precision of effect. A consequent revolution in military affairs has been predicted or perhaps observed. This paper offers a number of observations relating to the application of digital technology to warfare. Those observations tend to be highly empirical. Some are the Author's own, others include experimental or historical data collected by others. It focuses on war on land; on the tactical level of war; and on war, as opposed to military operations other than war.

Warfare may be considered as the management of violence, yet one struggles to find a good general description of war, and fighting or combat in general. There are any number of graphic and dramatic first-hand accounts but few attempts at generalization^{1,2}. Perhaps the

¹ Keegan, John. *The Face of Battle*, London 1976 is a first-class synthesis of such accounts.

most general description is that that fighting battles is basically an assault on the enemy army as a human institution. Combat is an interaction between human organisations. It is adversarial, highly dynamic, complex and lethal. It is grounded in individual and collective human behaviour, and fought between organisations that are themselves complex. It is not determined, hence uncertain, and evolutionary. Critically, and to an extent in a way which is currently overlooked, combat is **fundamentally** a human activity³. To take an illustration from the Yom Kippur War of 1973, perhaps the first of the so-called ‘Hi-Tech’ Wars,

‘The evidence is overwhelming that behavioural considerations – such as combat effectiveness, leadership, and surprise – were considerably more important in 1973 than a purely material comparison of men, numbers, weapons and technology.

‘If the October War proved anything, it demonstrated that the human element in war remains as important as it ever was.’⁴

Conflict is an intensely human activity, and within conflict command⁵ is equally human. This paper will consider human aspects of command and the application of technology to support it, under four broad headings before making observations and drawing conclusions. The first heading is philosophy – a discussion of what intellectual approach is most suited to the consideration of military operations. The other headings reflect the major human behavioural sciences: psychology (the study of human behaviour), sociology (the study of human institutions) and anthropology (the study of human culture).

PHILOSOPHY

Since war, or particularly combat, is fundamentally human we have a major and largely unsuspected philosophical difficulty, which has very real, practical consequences. Much of the way that Western man views the world relies on determinism. Determinism requires events to occur according to fundamental laws, and thus in principle be predictable (even if the underlying laws have not yet been discovered). There is overwhelming evidence that the Universe is in fact determined⁶. However, war does not seem to be like that: it does not *appear* to be determined. ‘Every science has principles and rules’ wrote the Maréchal de Saxe; ‘only war has none.’⁷ Clausewitz agreed⁸. Furthermore, apparent adherence to fundamental laws is a major criticism of Jomini.⁹ As John Keegan put it, ‘Nothing in human affairs is predestinable, least of all in an exchange of energy as fluid and dynamic as a battle.’¹⁰

² Ellis, John. *The Sharp End of War. The Fighting Man in World War II*, Newton Abbot: David Charles, 1980, describes the practitioner’s view from the perspective of western soldiers in WW2.

³ Storr, J P. *The Nature of Military Thought*. PhD Thesis, Cranfield University 2002. P77.

⁴ Dupuy, Trevor N. *Elusive Victory. The Arab-Israeli Wars, 1947-74*. London: Macdonald and Janes, 1978 p601.

⁵ In British Army doctrine, control is considered to be a subset of command.

⁶ Popkin, Richard H and Stroll, Avrum. *Philosophy*, Oxford: Heinemann, 1989. P133.

⁷ Ibid, p12.

⁸ Von Clausewitz, Carl. *On War*, Anatol Rapoport (ed), London: Penguin Classics, 1982. P202.

⁹ Shy, John. *Jomini*. Chapter Six of *Makers of Modern Strategy*, P Paret (ed), Oxford University Press, 1986.

¹⁰ Keegan, John. *The First World War*, London: Hutchinson, 1998, p342.

The scientific approach- perhaps the cornerstone of western thought since roughly the time of Isaac Newton – relies fundamentally on determinism^{11,12}. If much of western thought, and hence western military thought, relies on determinism which is not strong in combat, how should we proceed¹³? A truly scientific approach is not suitable because of the lack of determinism. If science is disappointing, the fundamental tenets of Empiricism are more encouraging. The Empiricists’ quest was not for ultimate truth: Empiricism was intended only to develop *probable hypotheses* about the world about us¹⁴. This seems a reasonable approach in warfare, and introduces the germ of an intellectual approach. That approach should be based on a little empiricism, and a generous dose of pragmatism.

Limited Empiricism

Fundamentally, human knowledge can only proceed in two ways: by gathering new facts, or better organising those which are already available¹⁵. Gathering new facts is almost impossible for soldiers in peacetime. Little in peacetime resembles war sufficiently for us to be confident in its lessons. In the absence of new facts, armies seek to draw more and more knowledge from a declining base of knowledge. The base declines because outside major wars we collectively forget much of war’s complex detail.

Yet, in protracted periods of peace, there is relatively little to observe which may be relevant to future conflicts. There is a much richer seam of facts in military history. Naturally, since war is not determined, war will never repeat itself (even identical conditions would never bring about the identical results). Yet, given a deep knowledge of military history, it should be possible to construct some *hypotheses* about future war which are at least sufficiently valid to serve an Army until it has an opportunity to learn during a future conflict.

The scientific method then requires those hypotheses to be tested through experiment. This will ultimately fail. Not least because we cannot actually shoot people in peace, our experiments will not be realistic. In any case no such experiment would be truly repeatable. The best that such experiments can provide is general insight into ‘the sort of thing’ that may happen in war. Scientists will, and do, complain that the results are not valid because they are not repeatable. Soldiers will, and do, complain because the experiment will not give ‘the answer’. There probably is no single answer, and we must accept this.

This discussion of hypothesis and validation may sound very wishy-washy in connection with command and digitization. However, it reflects a perceptive and pragmatic remark about the true nature of doctrine. In the final analysis doctrine is only the ‘... organisation’s current best guess about the best way to fight a war.’¹⁶

¹¹ Bradley, J. Ascribed to Hume in *Mach’s Philosophy of Science*, London: The Athlone Press, University of 1991, p44.

¹² Contiguity, succession and the inference of causality were first enunciated by David Hume. Popkin and Stroll op cit, pp254-260.

¹³ This begs the question as to whether western military thought follows general western thought to that degree. See below.

¹⁴ Popkin and Stroll op cit, p268.

¹⁵ Frank, P. *The Laws of Causality and their Limits*, quoted in Popper, Karl. *The Logic of Scientific Discovery*, London: Hutchinson, 1959. P279.

¹⁶ Demchak, Chris C. *Military Organisations, Complex Machines. Modernisation in the US Armed Services*. London: Cornell University Press, 1991. P138.

Pragmatism

War is not for waging, but for winning. Useful theories are those that relate to winning. We want things that work; not merely things that are elegant or intellectually pleasing. This is pragmatism: an appeal to find ‘what works.’ Pragmatism developed from the works of William James into a sophisticated philosophy which is relevant here. It is primarily a method of solving or evaluating intellectual problems. It is, however, also a theory about the kinds of knowledge we are capable of acquiring¹⁷. It has several implications.

Firstly, it suggests that a theory is ‘true’ if it works: that is its value¹⁸. Thus ‘the truth’ is not an absolute, but changes and grows with time. This reflects war: things that were thought to be true in, say, 1917 are not held to be true today. That did not matter in 1917! Secondly, there is therefore no fixed world to be discovered: but rather a quest for workable solutions to our problems¹⁹. Thirdly, both our knowledge and the world have an evolutionary quality: they grow to meet new situations and needs²⁰. This suits us well. The world geopolitical situation and military technology change continuously; the warrior is perpetually faced with new situations and needs.

Pragmatism has obvious application to warfare. A significant aspect of warfare is ‘... a process of trial and error; seeing what wins, and exploiting it’²¹. Furthermore, some of modern warfare’s more admired exponents show pragmatism in their methods: Rommel was ‘fundamentally a realist’²² and both von Manstein and Patton displayed a tendency to observe battle, and then teach their subordinates based on their personal experiences^{23,24}.

Limited Empiricism and Pragmatism

Empiricism is not mere trial and error: it is a logical process based on the structuring of observed facts. The empiricist ask ‘what can we observe?’; ‘what happens?’; or at least ‘what has happened in the past?’ Assuming some continuity, he can expect it to happen broadly similarly again. In war he cannot expect causality, but a little continuity taken with pragmatism (concentration on results) suggests a way ahead. We should search history for things that have worked in the past. We can make sensible, if restricted, deductions; and then check them by reference to observed facts. This puts great emphasis on observation and historical study. We should act in war in ways which history tells us ought to have some beneficial outcome – we cannot expect more than that. We should observe the results, and then act accordingly. We can find useful insight in theory, but only when it demonstrably accords with the known facts.

Critically, however, it is not a case of ‘this is the right course of action’, but rather ‘doing this will probably have beneficial outcome.’ We *must* talk in generalisations. There *will* be

¹⁷ Popkin & Stroll op cit, p320.

¹⁸ Ibid p321.

¹⁹ Ibid p322.

²⁰ Ibid p323.

²¹ Townshend, Charles (ed). *The Oxford Illustrated History of Modern War*, Oxford: Oxford University Press, 1997. P82. Although written in relation to colonial warfare, the Oxford text suggests that this process occurs ‘as in all warfare.’

²² Fraser, David. *Knights Cross. A Life of FM Erwin Rommel*, London: Harper Collins, 1993. P562.

²³ Patton Jr, George S. *Letter of Instruction for the Army in War as I knew it.*, Cambridge Massachusetts: Houghton Mifflin Co, 1947, pp403ff.

²⁴ Von Manstein, Field Marshall Erich. *Lost Victories*, London: Methuen, 1994, passim.

exceptions; categoric, determinist rules *will not* be found. Pedants *will* be able to cite exceptions, and thus undermine useful (insightful) theory. Their depredations must be firmly resisted by one simple test: does the theory *generally* aid understanding of useful military problems? If so, then exceptions are permissible. However, it is important to know when those conditions do not apply, and hence what the limitations of the theory are.

Pragmatism and its Limitations

The battlefield is complex and at times chaotic; causes do not lead simply to effects, except in trivial cases. Much doctrine can be no more than our current best estimate of how we should start to conduct the next operation. Persisting with practices and procedures which clearly do not work as intended is obviously flawed, and invites defeat. There is an obvious need to live and work in the real world: to find out what works on the battlefield, and do it. This is the essence of pragmatism. It is a major method of dealing with uncertainty. Pragmatism calls for simple but robust procedures, especially drills, that are common across an army but which can be adapted as the situation demands.

There is a risk with excessive pragmatism that actions which seem appropriate in the light of local circumstances are inappropriate in the wider context of operations. Pragmatism has its limitations. Its worst consequences can be avoided in two ways. Firstly, although practices and procedures can and should be changed where necessary, the higher levels of military doctrine (philosophy and principles) should be applied and indeed adhered to. Practices and procedures should be modified to better suit the application of principles in the light of circumstances pertaining at the time. Philosophy and principles should only be amended after mature reflection away from the immediate pressures of combat.

Summary and Deductions

Classic western philosophy, with its assumption of determinism is of limited value in war. In particular, western science and disciplines related to it will fail us if we attempt to apply them to the conduct of war. A better approach appears to be one based on limited empiricism coupled to a healthy dose of pragmatism. In practice this means a rigorous process of observation and historical analysis, to formulate hypotheses; a process of tactical experimentation; and a determination to apply the principles and practices that we develop in peacetime to the real conditions of the battlefield.

That may scarcely appear profound. However, some of the implications are far reaching, as shall be seen in the following sections. Not least, a quest for certainty in the chaotic conditions of the battlefield is simply inappropriate. ‘It is the mark of an educated mind to rest satisfied with the degree of precision that the nature of the subject admits, and not seek exactness when only an approximation is possible.’²⁵ More importantly, empiricism stresses the need to **seek evidence**. This paper itself presents evidence collected in order to develop and understanding of combat, command and digitization.

²⁵ Aristotle, *Nichomachian Ethics*, quoted in Czerwinski, Tom. *Coping with the Bounds: Speculations on Non-Linearity in Military Affairs*. Washington: Institute for National Strategic Studies, 1998. P41.

PSYCHOLOGY

This section makes some observations about psychology – the study of human behaviour - and its importance in the understanding of combat. Observations include discussion of what constitutes tactical success; battlefield decision making; and the personality of senior commanders.

Tactical Success

Battles are won when the loser, or losers, believes he is beaten. Commanders should understand what brings about the collective withdrawal of the enemy's participation, and how to bring it about swiftly and efficiently. Importantly, that is a mental, not a physical, condition. Believing oneself to be beaten may not be entirely rational, due to the presence of fear on the battlefield. Conversely it may be entirely rational: the loser can see that unless he desists he will both lose his objectives and his forces.

Will has two aspects - content and strength – and both can be attacked. The content of will is *intent*: what the individual intends to do. Strength of will is effectively *resolve*. An enemy's intent is defeated when he realises that his plan is neither relevant or achievable, and so desists. His resolve is defeated when he is effectively demoralised. At the end of the Battle of El Alamein Rommel knew that he could not persist with operations against Egypt. There is little evidence that he was demoralised, but his will to persist had been broken. Intent and resolve may, or may not, be related.

Of the two, an enemy's intent is perhaps the more easily attacked. If we can create certain effects, such as seizing terrain, destroying or defeating his forces, blocking routes and hence denying courses of action, his intent is thwarted or defeated. Perhaps more subtly, by the skilful manipulation of the information open to him (through the various techniques of Information Operations) we can get him to make decisions which he would not otherwise, and thereby influence his intent. A major component of the British understanding of 'Effects Based Operations' would fall under this banner.

Attacking the enemy's resolve is rather less obvious. There are perhaps three options. One is to promote the perception of failure, using the techniques discussed in the previous paragraph. The other two are the use of shock and surprise. British Historical Analysis, conducted in the early 1990s, indicates that shock and surprise are often the dominant aspects in determining tactical and operational outcome. Surprise alone can have the same effect as force ratio of 2,000 to one in some circumstances, and both shock and surprise have often been more effective than any force ratio likely to be found on the battlefield. Critically both surprise and shock are primarily psychological rather than physical phenomena. Both, like the perception of failure, are transient in their effect. They must be exploited rapidly if they are to lead to overall effect. All three aspects may have local effects which create opportunities for further and wider success. The realization of the importance of shock, surprise and demoralisation has had direct effect on the re-drafting of British high-level military doctrine²⁶. That realization has come entirely from the analysis of historical evidence.

²⁶ Army Doctrine Publication 'Land Operations', in draft. The Author of this paper is the primary author of that work.

Decision Making in Combat

Combat is highly dynamic, complex, and lethal; based on individual and collective human behaviour; waged between organisations which are complex themselves; and, fundamentally, not determined²⁷. This section examines each of those characteristics in turn and makes deductions.

- Firstly, combat is highly dynamic. Although actions take place over a range of timescales, battles seldom last more than a few days²⁸, engagements typically take no more than one day, and individual attacks seldom more than a few hours. The life of a soldier, the survival of a tank or the impact of a salvo of shells can turn (decisively and fatally) in a matter of seconds. It is clear that tactical decision making must be very quick - in an absolute sense.
- Secondly, combat is extremely complex. It appears complex to both the casual observer and the participant. Every soldier, tank, gun or commander interacts with the ground around him; with his near neighbours; with the enemy engaging him; with the weather; and with other aspects of the environment. Each one of those aspects adds complexity. Battlefield decision making must deal with a huge number of interrelated factors. The term 'deal with' is apposite. There are at least two distinct approaches. *Considering* every individual factor, in detail, if it is possible, is one option. An alternative is to attempt, in some way, to 'deal with' the complexity of the problem as a whole.
- Combat is mutually lethal to two opposing parties. This raises two implications. Firstly, commanders must continually seek to meet their assigned goals, and inflict (lethal) damage on the opponent, whilst protecting themselves and their own forces. This is normally a considerable constraint. Secondly, decision making will frequently take place under conditions of fear and stress. The result will often be less than strictly rational.
- Combat is based on individual and collective human behaviour. Anecdotally and historically, soldiers know that they must exploit the strengths of human behaviour, and avoid its weaknesses. Battlefield decision making must do the same.
- Armed forces are complex institutions, and no two are the same. Managing an organisation as complex as an armoured battlegroup, or even a platoon, requires that the whole organisation be motivated effectively to the immediate task - not least because the survival of the organisation, let alone the achievement of its goals, depend on it. This 'motivation to the task' requires effective communication of intent from the commander to all subordinates.
- Combat is not simply 'of' organisations which are themselves complex, but between them. Extremely complex interactions take place between opposing forces in combat. They will be examined in detail in Chapter Four. Some of those interactions will be

²⁷ See the first page of this paper.

²⁸ The exceptions are largely a function of terminology. For example, the Battle of the Somme can be considered as the British Army's *campaign* for the Summer of 1916, or a six-month siege. Similarly the Battle of Khe Sanh might be better considered as a siege.

particularly strong. Thus battlefield decision-making must cater for strong interaction on the battlefield.

- However, combat is not determined. Thus we know that here may well be strong interaction; but we cannot know with accuracy what that interaction will be. Anecdote, experience, history and heuristic can guide the decision-maker; but not tell him the outcome in advance. Since we cannot know what the outcome will be, we must guard against unexpected outcomes, be they undesirable or advantageous (and hence present opportunities to exploit).

In summary, tactical decision making should be very quick. It must 'deal with' many interrelated factors. It must aim to inflict damage, whilst avoiding damage to one's own forces. It must exploit the strengths and weaknesses of the human beings involved in combat, both friendly and enemy. It is often undertaken in highly stressful circumstances, not least the fear of death or dismemberment. It must initiate, and accommodate the outcomes of, strong interactions between forces on the battlefield; be robust against rogue outcomes of those interactions; and yet support the clear communication of intent from commanders to subordinates throughout the chain of command.

Not only is that a relatively long list of requirements, but some are mutually inconsistent. The need for speed mitigates against a careful consideration of the many factors involved. The strong interaction between some battlefield agents suggests detailed study and modelling, yet such models inevitably rely on (deterministic) rule sets. Instead of trying to specify precise activities and outcomes, we should specify general intents and desired outcomes; the 'sort of thing' we wish to result. Overall we can see this as a requirement for tactical decision making which is routinely 'about right, but very quick'. This has implications for the commanders required to make such decisions²⁹.

Different people think in different ways. Modern psychology can say much about how people think, and in particular the way they make decisions. Psychology can group people by type: groups of people who are inclined to think, decide and act in similar ways. Psychometric tests can be conducted to assign people into those various groups. Battlefield commanders must be capable of making decisions which are 'about right but very quick' under very stressful conditions. Some people cannot do that; others do it very well. They may, or may not, be the sort of people who are appointed to command units and formations in peacetime, or in war³⁰. This will be discussed below.

Making decisions which are 'about right but very quick' suggests a move away from structured decision-making processes towards recognitional or naturalistic methods. However, naturalistic decision-making should not be mandatory. It should be the preferred mode for experienced commanders and staffs when well appraised of the situation. They might conduct a formal, structured estimate at the beginning of a campaign, and thereafter only in major pauses between operations. Naturalistic decision making appears to be appropriate to warfighting, where a good decision is one that is 'about right, but very quick'. This needs further thought in relation to operations other than war, where the consequence of a decision which is wrong *in any particular*

²⁹ The issue of tactical decision making was considered in Storr, Major J P. Alternative Concepts for Battlefield Command and Control Organisations, *Proceedings of the Command and Control Research and Technology Symposium*, US Naval War College, Newport RI, June 1999, pp1045-61.

³⁰ 'The vesting of command does not guarantee the granting of competence to make decisions'. Major General Rupert Smith, Lecture to the British Army Staff College, June 1994. .

may be operationally critical. However, this does not necessarily invalidate the whole concept. It may be that the information pathologies inherent in large HQs render them *worse* at making large decisions, particularly where computers are harnessed to the decision-making process.

The Personality of Senior Commanders³¹

The remainder of this Section considers personality and personality type. It presents quantitative evidence of personality type in the British Army and elsewhere. It explores how some undesirable personality types might succeed in an Army in peacetime, and indeed may have done so.

Professor Norman Dixon identified two relatively distinct types amongst generals, which he described as authoritarians and autocrats³². Dixon identified many cases of apparent military incompetence as being caused by authoritarian commanders who had typically risen to senior rank in peacetime. Authoritarians are controlling, highly conformist, status-conscious, anti-intellectual and punitive (of others who do not conform as they do). At a deeper level they are inhumane: they tend not to consider humans as people, but as objects whose importance is connected to their status. Conversely autocrats also exercise tight control; but only when the situation demands it³³. They are forceful, driving and not particularly empathic personalities. However, they differ from authoritarians in two critical areas. The first is that they tend to be thoughtful and reflective³⁴. The second is that they demonstrate a deep humanity, even if only because they realise that the welfare of their forces is vital to their effectiveness³⁵.

'The Rules of the Game: Jutland and Naval High Command' by Andrew Gordon also identified a dichotomy between the characters of senior commanders³⁶. Gordon's cohort was senior Royal Naval commanders in the late Victorian and Edwardian eras. Gordon discriminated between 'Ratcatchers' and 'Regulators'. The term 'ratcatcher' is a direct quote from Admiral Sir David Beattie, probably the greatest autocrat of Royal Navy in the early Twentieth Century³⁷. 'Regulators' were seen as authoritarians, who in practice shared a fairly closely-defined social and professional background³⁸.

The authoritarian personality was first identified by British psychologists immediately after the Second World War, from studying the personalities of extreme Nazis³⁹. The landmark study into the area was 'The Authoritarian Personality' which developed a personality test to identify the type^{40,41}. The study was reviewed 46 years later: the broad conclusion is that

³¹ The Author is most grateful to Mrs Joanne Suddaby-Smith, organisational psychologist with the British Army's Adjutant General's human factors branch for her assistance with the material presented in this section.

³² Dixon, Norman F. *On The Psychology of Military Incompetence*, London: Jonathan Cape, 1977. P257.

³³ Ibid, p287.

³⁴ Ibid, p273.

³⁵ Ibid, p275.

³⁶ Gordon, Andrew. *The Rules of the Game. Jutland and British Naval Command*. London: John Murray, 1996. pp315-385.

³⁷ Ibid p383 and passim.

³⁸ Ibid p326ff.

³⁹ Dr Ken Chaplin, Principal Psychologist to the DERA Centre for Human Sciences, Personal Communication, November 2000.

⁴⁰ Adorno, T W et al. *The Authoritarian Personality*, New York: Harper and Row, 1950, in *The Authoritarian Personality: a Re-review 46 years later*. M Brewster Smith, *Political Psychology*, Volume 18 Number 1, 1997, pp159-163.

⁴¹ See also Dixon op cit, p257, citing the work of Adorno et al.

both the type and the test remains valid⁴². Fundamentally, authoritarians need to control their environment. They are very intolerant of uncertainty. They may *appear* charismatic, but not necessarily. Authoritarians will tend to thrive in highly organised hierarchies, such as armies in peacetime. They also tend to want to be loved and do not brook argument. Dixon considered their need to be loved to reflect emotional pressures in childhood, possibly at the hands of socially insecure and therefore strict parents⁴³. That need to be loved will be very deeply concealed and may be directed towards their military superiors, not least because authoritarians are highly status-conscious⁴⁴.

Authoritarians are often bullies. This has several effects. One is to damage working environments within HQs. Another is to discourage the bearing of bad news: 'would you, if you thought the boss wouldn't like it?'⁴⁵. This obviously skews the effectiveness of C2. Authoritarians also tend to be sackers. Since they are driven by status and the need to progress, they may feel the need to make a visible impact on their subordinates during their tour of duty and do so in the most immediate manner, such as through sackings⁴⁶.

The Author was a junior officer in the British Army of the Rhine (BAOR) in the 1980s, and remarked at the time on how many formation commanders had a reputation for being bad-tempered bullies and sackers. A former officer recalls a generation of formation commanders in the late 1970s and early 1980s who 'felt they had to rule by fear'⁴⁷. He pointed out that many of their immediate seniors had wartime experience, and were often charming. Conversely their immediate successors were often better educated. Their own education may have been disrupted by the War. A typical authoritarian response would be to feel challenged, and respond through sacking and bullying.

The generals of the 1980s would have joined the Army just after WW2, and spent much of their career in that stable, peacetime army. The Military Secretary's rules at the time meant that in practice to command BAOR, one had to have commanded 1st British Corps; hence an armoured division; hence an armoured brigade; hence an armoured, mechanised (or related combat support) unit *in BAOR*. It is difficult to envisage a more stable, formalised hierarchy existing and promoting from within for more than a generation.

Combat is essentially complex and verges on the chaotic; not usefully determined, and hence uncertain⁴⁸. The authoritarian cannot deal with uncertainty well⁴⁹. Several possibilities are open. In war, it may cause enormous stress, so he will not cope, and fail. Alternatively he will be demonstrably poor at his job, so he will be sacked. He may take decisions too early in an attempt to reduce the uncertainty⁵⁰. Lastly, his response may be to seek more and more information, to try to reduce his perceived uncertainty. This will result in bigger and bigger HQs, with more communications links and more staff. The latter tendency will be more visible in major peacetime exercises, and may explain some of the growth of HQs since World War Two.

⁴² Brewster Smith, *loc cit*.

⁴³ Dixon *op cit*, pp260 and 282.

⁴⁴ Joanne Suddaby-Smith, *loc cit*.

⁴⁵ Storr, *A Year Observing Command and Control*, *loc cit*.

⁴⁶ Joanne Suddaby-Smith, *loc cit*.

⁴⁷ Colonel (retired) Paul Lefever, personal communication.

⁴⁸ See first page of this paper.

⁴⁹ Dr George Brander, Principal Psychologist to the DERA Centre for Defence Analysis, Personal Communication.

⁵⁰ Joanne Suddaby Smith, *loc cit*.

Field Marshal Bill Slim read extensively into his profession⁵¹. This indicates that he is most unlikely to be an authoritarian personality. Authoritarians are markedly anti-intellectual: they dislike conceptual issues. This places Slim on a par with Wellington, Rommel and (perhaps surprisingly) Patton^{52, 53, 54, 55}. Patton's personality is interesting: he definitely displayed strong evidence of authoritarian behaviour. However, behaviour and personality are not the same, particularly in Patton's case⁵⁶. Blumenson's somewhat hagiographic biography of Patton reveals that he was a hugely driven character⁵⁷, but that that may be explained by well-documented learning difficulties as a child and youth⁵⁸. Overcoming those difficulties (which he clearly did) may explain authoritarian *behaviour* but a non-authoritarian *personality*, which helps understand Patton as a somewhat complex individual.

It is entirely possible to hold high office and yet have a significant personality disorder. Peter Mandelson was a British minister and an adviser to the British Prime Minister from 1997 until 2001. Just after he had been sacked for the second time⁵⁹, the medical correspondent of The (London) Times described him *in print* as having a textbook personality disorder. Such people 'are all too often those who succeed and who will later crowd together, not always amicably, on the green benches of the House of Commons, will dominate the senior messes in the Armed Forces, and control boardrooms.' They ... 'are prepared to exploit others, to plot and plan and to work all hours of the day and night to advance their chosen causes so that favoured institutions, and they with them, will become powerful, controlling and successful. They crave respect rather than love, and although often admired, few are personally popular.'⁶⁰ In short, there is actually something wrong with them, but that doesn't stop them achieving high positions. By extension, extreme authoritarians might therefore thrive in peacetime armies, and only be discovered in war.

SOCIOLOGY

Sociology is the study of human institutions. This section is not a typical piece of sociology: it looks at a series of fairly simple empirical observations about how armies, and in particular the British Army, operates as institutions.

Failure on Mobilisation

On his arrival to assume command of British forces in South Africa during the Boer War, Lord Roberts had to sack 5 generals, 6 brigade commanders and 20 colonels⁶¹. That must have been a major proportion of all commanders in theatre. As another example, the British

⁵¹ Lewin, Ronald. *Slim the Standard Bearer. A Biography of Field Marshal the Viscount Slim KG GCB GCMG GCVO DSO MC.*, London: Leo Cooper, 1976. p2 and passim.

⁵² Holmes, Richard (ed). *The Oxford Companion to Military History*, Oxford: Oxford University Press, 2001. Pp989-991.

⁵³ Griffith, Paddy et al. *Wellington: Commander. The Iron Duke's Generalship*. Chichester: Anthony Bird, undated, passim.

⁵⁴ Fraser, op cit, pp7, 8 and 561.

⁵⁵ Blumenson, Martin. *Patton - the Man Behind the Legend 1885-1945*, New York: William Morrow, 1988, pp123-6, 241, 288.

⁵⁶ Ken Chaplin, loc cit.

⁵⁷ Blumenson, op cit pp21-4, 61-3, 68, etc.

⁵⁸ Ibid, pp33-4 and 54-5.

⁵⁹ An all-time record. No other person has been sacked as a cabinet minister twice in British history.

⁶⁰ Stuttaford, Dr Thomas. *Telltale Signs of a Textbook Personality Disorder*. The Times, January 29, 2001.

⁶¹ Gordon op cit, p182.

Expeditionary Force in France in 1940 contained 17 general officers in command: the CinC, three corps commanders and thirteen divisional commanders⁶². Their subsequent careers have been traced through the Army Lists for (April) 1941, 1943 and 1945.

All were relatively distinguished. Of the 44 UK-based division commanders in the British Army in 1940, five held the Military Cross (MC), 17 had a Distinguished Service Order (DSO), and 16 had both the MC and DSO. One had a Victoria Cross *and* the MC and DSO! Only 5 had no decorations for valour or distinguished service⁶³. Yet five of the BEF commanders immediately disappeared without trace, and six never commanded field formations again. One was captured in the campaign. Of the remaining five (Alexander, Brooke, Montgomery, Holmes and Martel), three became Field Marshals (two of whom were eventually Chiefs of the Imperial General Staff), one commanded a corps and one another division. Thus in round terms one third disappeared, one third were re-employed away from the front line and one third went on.

Thus roughly two thirds of those who commanded formations in the BEF of 1940 were either sacked, retired immediately, or were never given another formation to command in the field. There is evidence of a similar process amongst more junior commanders. In the HQ of 21st Army Group, still in Britain just after D-Day, '...they talked *sotto voce* for a while about the crop of adverse reports which had come back from France, against hitherto successful battalion commanders and brigadiers who had lost their head when the guns begin to fire.'⁶⁴ Furthermore, the Army List for 1946 shows that most of the British Corps and Army commanders of 1945, and the very senior staff, were at most brigadiers in 1939. Almost the whole raft of British commanders from divisional command upwards in 1939 had been found wanting⁶⁵.

The statistics for WW1 are less dramatic, but that is probably because the huge expansion of the Army dictated that almost any senior officer would be re-employed, even if he 'blotted his copybook' early in the War. Overall, it appears that a major proportion of those senior officers appointed to command the British Army as a consequence of its peacetime promotion system during the Twentieth Century were found wanting in war.

Conversely it appears that the Wehrmacht produced large numbers of good generals, from a peacetime base of only 3,000 officers before 1933 (of which 180 were in the Luftwaffe⁶⁶). They continued to produce them as casualties occurred⁶⁷. 2,344 generals served in the Wehrmacht between 1939 and 1945⁶⁸. About 15% (perhaps 350) had served in the Police before 1933, but virtually all of those had probably served in the Army in WW1⁶⁹. It is significant the Wehrmacht continued to produce capable generals during the War: few were particularly young, even in 1945⁷⁰.

⁶² Jackson, Robert. *The Fall of France. May-June 1940*. London: Weidenfeld, 1975, Appendix Three.

⁶³ Taken from The Army List for April 1940.

⁶⁴ Lindsay op cit, p3.

⁶⁵ The Army List, February 1946.

⁶⁶ Corum, James S. *From Biplanes to Blitzkrieg: The Development of German Air Doctrine Between the Wars*. War in History, Volume 3, Number 1, 1996, pp85-101.

⁶⁷ Dupuy, *A Genius for War*, p286.

⁶⁸ The number includes 19 Field Marshals.

⁶⁹ 2,500 officers from the Landespolizei transferred into the Wehrmacht after 1933. Seaton, Albert, *The German Army 1933-45*. London: Weidenfeld and Nicholson, 1982, p69.

⁷⁰ Only 84 of the 2,344 were born after 1900 (and so would have been 45 or younger in 1945). Similarly, very few would not have fought in WW1. *Die Wehrmacht-Elite. Rang- und Herkunftsstruktur der Deutschen*

About 500 were killed in action⁷¹. This is vastly different from the western Armies: allegedly only one US general died due to enemy action⁷² although Lieutenant General McNair also died in an (American) air raid during the Normandy campaign⁷³. The difference is statistically significant. The German army of about 3-400 divisions (on average) fought for about 6 years, a total of about 2000 'division years'; whereas the US Army of at most 100 divisions fought for at most 2 years, so say 200 'division years'. The experience difference is 10-fold, the mortality difference about 250-fold. The US Army in 1944-5 *knew* that the German Army was superior to the US Army in terms of combat performance⁷⁴. Relative casualty rates, and other Operational Research data, support this⁷⁵. Relative mortality amongst Generals indicates a very different style of command which may well be a significant factor. Thus there are very significant differences in the way generals performed in different armies in the Second World War. Promotion to high command in peacetime very much reflects the values of existing senior commanders, themselves largely the products of a peacetime promotion system. To that extent it reflects deeply held values, and has a considerable impact on operational effectiveness in war.

The Cohorts of the 1990s

Some quantitative analysis of the personalities of peacetime British Army officers has been conducted. It suggests a dichotomy amongst senior officers between authoritarians and autocrats. Further evidence indicates a possible basis for that dichotomy. Richard Sale, a former British Army officer who later taught at Lancaster University, gained his Master's degree in Defence Administration (MDA) with a thesis related to a psychometric study of senior British Army officers, taken in 1989 or 1990. Sale conducted a battery of eight tests, which provides scores on 36 separate personal characteristics. Perhaps the most important finding is that authoritarian tendencies are strongly prevalent. The evidence shows that authoritarianism is more marked in the Army groups than any civilian comparator⁷⁶.

Very few of Sale's senior army officers scored highly on 'original thinking': on average, senior army officers scored lowest of all comparators⁷⁷. They are relatively unimaginative. This is perhaps surprising, given the Army's supposed valuing of initiative. Alternatively, it may suggest why it is so highly prized: it seems to be rare. However, there was a very wide spread of Army scores; the widest for any characteristic. Scores for verbal reasoning (akin to IQ) were consistently very low: the lowest of any group of comparators⁷⁸. This is surprising, since the Army has the most stringently-applied entry qualifications⁷⁹. It seems the Army

Generale und Admirale, 1933-45. Stumpf, Reinhard, Boppard am Rhein: Harald Boldt Verlag, 1982, p289. Author's Translation.

⁷¹ Westphal, General Siegfried. *The German Army in the West*, London: Cassell, 1951, pp63-4.

⁷² On the Hellweg near Paderborn in late April or May 1945. It was largely due to a mapreading error. He was in the wrong place.

⁷³ D'Este, Carlo. *Decision in Normandy*, London: Robson Books, 2000. P401.

⁷⁴ Dupuy, *A Genius for War*, p4. Dupuy was surprised that when he presented his operational effectiveness results to veteran US commanders, they were entirely *unsurprised*.

⁷⁵ Van Creveld, *Fighting Power*, p6.

⁷⁶ Sale, Richard. Towards a Profile of the Successful Army Officer. *Defence Analysis*, Volume 8 Number 1, 1992. P18

⁷⁷ Sale op cit, p16 and p20.

⁷⁸ Sale op cit, p16. The statistics presented included the smallest standard deviation of the 36 characteristics and 6 groups.

⁷⁹ Joanne Suddaby-Smith, loc cit.

does not retain the brightest brains, despite the fact that 80% of all majors and above are graded 'Excellent' for intelligence on their confidential reports⁸⁰. Nevertheless, two of the group obtained outstanding scores for verbal reasoning. These statistics reinforce the perception that senior British Army officers are split between authoritarian and autocratic personalities. It also appears that authoritarian behaviour 'might be a mask for low levels of intellectual ability.'⁸¹ However, it should be noted that Sale's data exposed the presence of some truly outstanding individuals amongst his subjects.

The British Colonel Philip Barry studied typology amongst British Army staff college students for his MDA. The Defence Technology MA course at RMCS Shrivenham is attended by about 80% of staff college students prior to attending the main Staff College course. The remaining 20% attend MSc courses. The latter tend to come from technical corps and largely move into technical appointments, such as equipment procurement. Hence the MA graduates probably contain most of the Army's future generals. Barry employed the widely-known Myers-Briggs Type Indicator (MBTI)⁸². This test ascribes personality into one of 16 personality types, each identified by a four-letter identifier and typified by a noun, such as ISFP 'Composer' or ENFJ 'Teacher'. Those 16 types were grouped into 4 'Temperaments' by David Keirsey⁸³. Barry obtained MBTI results from 50.3% of all RMCS MA graduates over two years⁸⁴.

Perhaps the most striking observation from Barry's data is the apparent emergence of leaders. ESTJ 'Supervisors' and ENTJ 'Field Marshals' are the commonest types present, and are strongly over-represented. Both types are described as 'natural leaders'⁸⁵. However, they are quite different. ESTJs tend to be decisive, direct, efficient, responsible and task focussed⁸⁶. Their world is one of structure and plans⁸⁷. ENTJs also tend to be decisive, but are also challenging, energetic, strategic and tough-minded⁸⁸. Barry's data appears to show signs of polarization analogous to Sale's. If we cautiously suggest that authoritarianism is an extreme form of behaviour displayed by some ESTJs, and that autocrats are extreme examples of ENTJs, we can see amongst the Staff College majors and captains the beginnings of a process: a process of polarization between autocrats and authoritarians amongst colonels and generals, typically about ten years their senior.

Dixon's and Gordon's work both postulate two types of senior commanders: authoritarians and autocrats, regulators and ratcatchers. Combat is dynamic, stressful, complex and

⁸⁰ Brigadier (now Major General) M A Charlton-Weedy CBE, personal communication. The Brigadier was at the time conducting the MoD's Senior Officers' Personnel Study. His staff had examined all CRs for lieutenant colonels and above for the British Army for the previous 30 years. The irony, he said, was that intelligence was the most easily measurable characteristics on the CR form, and the one for which the gradings were the most patently false.

⁸¹ Sale, op cit p21.

⁸² Keirsey, David. *Please Understand Me II: Temperament, Character and Intelligence*. Del Mar, California : Prometheus Nemesis Company, 1998, p20.

⁸³ Ibid, passim.

⁸⁴ Barry, Colonel P G. MDA Thesis. *The Head or the Heart - an Assessment of the Value of Psychometric Testing in the Selection of Army Officers Following Technical Staff Training*. Cranfield University 2001, p59.

⁸⁵ Myers, Katherine D, and Kirby, Linda K. *Introduction to Type Dynamics and Development. Exploring the Next Level of Type*. Oxford: Oxford Psychologists Press, 2000, pp16-17. Note that Katherine Myers is the co-founder of MBTI.

⁸⁶ Hirsch, Sandra Krebs, and Kunnerow, Jean M. *Introduction to Type in Organisations*. Oxford: Oxford Psychological Press, 2000, p9.

⁸⁷ Myers and Kirby, loc cit.

⁸⁸ Hirsch and Kimmerow, loc cit.

confusing. A commander's likely response to that environment is a significant issue. Dixon and Gordon suggest that authoritarians or regulators will tend to fail spectacularly in war, whilst autocrats or ratcatchers will tend to thrive. Sale's and Barry's work suggest that authoritarians and autocrats are both successful in ascending the hierarchy of the British Army in peacetime, to the exclusion of most other types. The conclusions are quite obvious.

Structure and Behaviour

The nature and structure of an organisation can have quite simple and seemingly obvious effects on the way the individuals within it behave and hence the organisation performs, as a simple illustration suggests. Consider three armies with different rank and promotion systems. In Army A, companies are normally commanded by captains, on promotion to the rank after about 10 years service. Typically they will have served in battalion headquarters as lieutenants prior to promotion. In Army B, companies are commanded by captains on promotion after about six years' service, and normally progress to battalion staff appointments after company command. In Army C, companies are commanded by majors on or after promotion, at some point after 12 years' service. All will have served in battalion and often brigade staff appointments, and up to half will already have attended staff college.

It is reasonable to suggest that in comparison with Army A, Army B will tend to be more centralised at this level. Orders will flow from the battalion CO through relatively senior battalion staff, who will be senior to company commanders. The latter will be relatively inexperienced and tend to rely on formal taught knowledge rather than experience. However, in being centralised the battalion will tend to be efficient and streamlined, and perform largely as described in manuals.

By comparison the battalions of Army C will tend to be decentralised. Authority is less formal, as battalion staff are junior to company commanders and rely on indirect authority. Company commanders may be extremely experienced, but may sometimes think like the staff officers they have been trained to be. They may at times try to outguess battalion staff rather than get on with their own jobs. Some will be astonishingly careerist, as they may in practice be only one step away from battalion command and with it the opportunity for early promotion to brigade command. This may be to the detriment of their commands, and they may be approaching middle age.

This illustration is based very loosely on observation of three major NATO Armies. It is intended to suggest that structural and organisational factors are significant. In real life organisations show many more differences of detail, and such a simplistic comparison should not be taken to imply more than is intended, and particularly not that one system is better than another.

Observed Behaviour

Armies recruit, train and educate their people. Those people naturally reflect the way they are selected and trained, and the evidence presented above indicates that some quite effective selection processes do in fact occur. One can argue whether, or not, it produces the right people; but occur it does. Since some general selection and development process does in fact

take place we can make some generalisations about the results. The following observations apply to the British Army. Similar observations seem to apply to other Western Armies⁸⁹.

Firstly, officers aren't particularly rational or perhaps logical in their thought processes. As an illustration, there is a valley south of the British Infantry School which is about 2.5km wide. The range of the current in-service (Milan) antitank guided missile system is limited to 1950m, because it is wire-guided and it literally runs out of wire. Students on a tactics course are routinely presented with a problem of defending the valley against tanks. A significant number will site the missiles on one side *or* the other. When pointed out that logically they must be either in the middle of the valley or on *both* sides, they tend to be bemused.

Similarly, they are not particularly mathematical. A typical problem for young captains is to plan the movement of armoured formations. A given number of vehicles, moving at a given speed with a given spacing between vehicles, always takes the same time to pass a point on one route. The time is halved if two routes are used, or reduced to a third if three. These fairly simple arithmetic ratios can be used fairly easily for generating planning options. Yet even these relationships appear to escape those officers in practice.

Perhaps surprisingly, there is very little quest for and use of evidence in military thinking. In the mid 1990s, British military discussion embraced the term 'the Rule of Four' as a 'structural principle'. Put simply, at each level a tactical commander requires four manoeuvre elements in order to give appropriate tactical flexibility. It was originally described in print in the Army Force Development Handbook⁹⁰. As described there, a commander needs one subordinate to fix the enemy and another to strike; a third as an echelon force to sustain the tempo of the advance, and a fourth as a true reserve.

The Rule or Principle⁹¹ of Four revealed a lack of rigour, and showed signs of being forced to fit the actual situation, rather than being applied to support force design. It was only in August 2000 that any methodical study was initiated to investigate the principle⁹². That was *after* it had been taught as endorsed doctrine at the Joint Services Command and Staff College⁹³ and used as one of the tenets supporting the Strategic Defence Review of 1998. Importantly, it was accommodated into military thought with almost no evidence as to its validity.

When evidence is sought, it can be quite surprising. For example, in one rotation at the British Army's Training Unit at Suffield, Canada in 2000, a total of six cases of C3 failure

⁸⁹ Author's experience. He is a member of an ABCA Armies Quadrilateral Working Group and a similar NATO group. In a previous appointment he worked with the (multinational) staff of the Allied Command Europe Mobile Force (Land) for a week every month for six months. He is the UK lead for an Anglo-French General Staff collaboration programme. He has been attached to the German Army, and lectured to the German Army Staff Course. He has interviewed French, German, Italian and US Army liaison officers to the British Army. In his experience the details vary between armies, but similar issues apply to most if not all of those he has worked with.

⁹⁰ *The Army Force Development Handbook*, D/DGD+D/124/12/LW4 dated March 1996, paragraph 0227.

⁹¹ *A Force Development Yellow*. Letter D/DGD7D/ [sic] 1/124/LW4 dated 19 December 1997.

⁹² In August 2000 the staff of DLW invited the DERA Centre for Defence Analysis (CDA) to investigate the Principle as one of a number of issues under the 'Army Analysis' package. The Author served at CDA at the time.

⁹³ Colleagues arriving at CDA from Staff College in August 1999 did not believe the Author when he explained the genesis of the idea.

was observed in nine missions. One was a technical failure in which communications equipment did not work, in conditions which were well within the performance envelope for that equipment. The other 5 were instances of information pathology: mistakes being made despite information which was available, or which reasonably should have been available, to relevant decision makers. In all those five cases the solution was human, and typically organisational or procedural. This suggests very strongly that C3 failures are more prominent than we suspect, and that solutions to them are human rather than technical. In fact even the supposedly 'technical' communications failure had human aspects: a helicopter crew chief excluded a communications mast when flying a CP forward, because he did not understand the relevance of the mast in the overall tactical picture.

When observing headquarters deployed in field settings, you sometimes observe some very strange things. When observing a battlegroup CP in 2000 the Author observed the Battlegroup Engineer and Gunner clearly competing with each other. Both were recent staff college graduates, and the Author knew (and was senior to) both. His initial reaction was to intervene to stop this negative behaviour. Then he realised that it would be more informative to continue to observe, and finally he came to understand their actions. Both were detached from their parent units, and the field deployment would form the major opportunity for the battlegroup commander to report on them to their own COs. Clearly they saw themselves as being in competition. To them, in those circumstances, their behaviour was entirely sensible, and any possible consequences (in terms of degraded collective performance) of secondary importance.

The perception of military men being members of highly structured, disciplined hierarchies, accepting direction from above and executing it, is flawed on even the most cursory examination. There are at least two aspects. The first is an odd attitude towards orders. Although armies pride themselves on their habit of obedience and few would suggest that orders are knowingly ignored, there is an observable tendency (at least in the British Army) to regard orders as a basis for discussion. The Author has observed this many times. It is subtle and understated, but nonetheless occurs. A typical instance is in formal, tactical orders where a subordinate commander seeks 'clarification' of aspects of his mission in a manner which in practice opens negotiation. Few superior commanders seem capable or willing to stamp this practice out.

It may, or may not, be a bad thing. Certainly Montgomery stamped on the practice when taking over command of 8th Army in the Western Desert. It may be a way of introducing appropriate flexibility and pragmatism into what could be an excessively centralised process. Alternatively it could be a cover for a lack of subordination and discipline. A second, linked aspect is a surprising requirement for consensus. Although perhaps more notable in the circulation of policy papers in peacetime, there is an element of coming to consensus with peers and subordinates which can in practice result in agreeing on the lowest common denominator, rather than seeking what would objectively be best, but which might be contentious. One example is the withdrawal of the 1st British Airborne Division from Arnhem in September 1944. In practice the decision to do so appears to have emerged from a meeting of three generals on a church rooftop, several kilometres south of the river, rather than being the result of a conscious decision taken by a single commander. Again, that is not to suggest that consensus-seeking is good or bad, but it is more prevalent than the casual observer would expect. This tells us much about the way that military organisations actually function.

Summary

When we look at Armies as human institutions we observe some quite surprising things. We see marked differences between armies in the wartime success of generals promoted during peacetime. We see marked differences between the behaviour of generals of different armies in war. We find a polarization of an officer corps as it ages, into a group of highly effective autocrats and another group of authoritarians who are likely to fail in wartime. We find several surprising observations about the way that officers think and act. We can begin to deduce that there is much about the way that armies function which we do not know, and probably do not even suspect.

ANTHROPOLOGY

Anthropology can be considered in terms of human symbols, myths, values and beliefs. This Section will focus on military beliefs, and particularly paradigms relating to command. Certain ideas become fashionable, persist for a period, and then disappear. Such ideas often do not withstand rational analysis, but that is no indicator of the prominence they achieve.

The Myth of the OODA Loop

Lind's OODA Loop, based on the Boyd Cycle, is a prime example of conceptual military thought⁹⁴. The OODA Loop suggests that the basic process of command and control (C2), described as Observation, Orientation, Decision and Action, is circular and iterative process. Military advantage accrues from being able to go around the loop faster than one's opponent.

However, the C2 process is not circular. It apparently takes 24 hours to execute a divisional operation⁹⁵. Planning takes a further 12 hours at least. Thus a divisional OODA loop would have to be at least 36 hours long. Allowing a reasonable time for action to take place and be observed suggests an even longer loop. Yet recent operations show divisions reacting far faster. Commanders and staffs do not in practice wait to observe until after they have acted. They observe continuously, and act when required. The relevant action is not the action of the command element: the HQ's action is largely limited to preparing and giving orders. In reality Observation, Orientation and Action are continuous processes. Action is continuous in the sense that, from the HQ's perspective, some action is taking place in the external world, which the HQ can observe. Decisions are made occasionally, as a result of those observations.

The key fallacy in the OODA Loop is that the C2 process is not iterative in the sense that Lind suggested. There is considerable advantage in reacting faster than one's opponent⁹⁶, but the OODA Loop does not adequately describe the process. Lind's concept was based on fighter combat in Korea. He based his ideas on Boyd's observations about USAF F86 Sabre Jets and their pilots. The Sabre had a better cockpit canopy than the opposing MiG 15. This gave the Sabre pilot better situational awareness in dogfighting. The Sabre had powered flight controls, which the MiG lacked, hence the Sabre could turn inside the turning circle of the MiG. Lind extrapolates from there to command and control in general. This is an exercise in induction (the generation of general statements from particular ones). Induction is

⁹⁴ Lind, W S. *Manoeuvre Warfare Handbook*, London: Westview Press, 1985, pp4-5.

⁹⁵ *The Staff Officer's Handbook* (SOHB), Army Code 71038, July 2001, Page 3-1-1.

⁹⁶ Kiszely, Major General John. *The Meaning of Manoeuvre*, Journal of the Royal United Services Institute for Defence Studies (RUSI) (hereinafter JRUSI), December 1998, pp36-40.

philosophically unsafe⁹⁷. To generalise about formation-level C2 from aircraft design is tenuous, to say the least.

The epitome of fighter combat is the performance of the tiny core of ace pilots. An Ace is defined as a fighter pilot who has shot down 5 or more enemy aircraft. Historically Aces constitute a very small proportion of all pilots, but account for a very high proportion of all aircraft shot down. For example, half of the 25,000 western aircraft shot down by the Luftwaffe were shot down by less than 500 of a total of at least 20,000 German pilots⁹⁸. Biographies of Aces such as General Robin Olds, who was an Ace in Korea but also in both the Second World War and Vietnam, show almost no trace of iterative behaviour in combat.⁹⁹

Critically, Aces scarcely ever dogfight. They usually destroy enemy aircraft with a single pass, and expend phenomenally little ammunition per aircraft shot down. Their effectiveness centres on rapid, decisive decision and action; based on superlative, largely intuitive, situational awareness. They do display some critical ‘control’ characteristics – their eyesight is usually exceptional (thus their situational awareness is very good) and their shooting is usually phenomenal (thus their ‘fire control’ is outstanding). They also have catlike reactions (hence very quick decision-action times)¹⁰⁰. However expert fighter combat is fundamentally not iterative: it is sudden, dramatic and decisive. Thus Lind’s concept of an OODA Loop does not adequately describe the observed facts for the activity under study (fighter combat) – let alone any extrapolation from them. This excursion into fighter tactics is useful. It exposes a myth: something with a kernel of truth, which men believe and indeed want to believe. There is a time-competitive element to war and combat, and something iterative about C2, but the OODA Loop is a simplistic representation of observed facts.

The Myth of the Principle of Four

The history of the Principle of Four was discussed above. A subsequent DERA study rejected the concept of numerical ratios as a basis for force design; noted that the Principle of Four was not based on any reliable historical evidence; and presented illustrative modelling and simulation results. Those results demonstrated that the Principle was inefficient when applied to more than two levels of command simultaneously. This was *not* what the research customer wanted to hear, and the report was rejected. In practice the Principle of Four had entered the British Army’s beliefs, and the Army had difficulty in understanding that it was not valid. A key issue was that the Staff College had translated a very limited reference to the Principle of Four into a major piece of teaching without further investigation. Bright, educated and capable Staff College graduates then themselves became part of the belief set. This illustrates one of the organisational mechanisms by which anthropological issues (in this case, myths) are actually propagated.

Another issue which the Principle of Four illustrates is self-belief. Having entered the military credo, issues are defended with astonishing vigour by the simple assertion of

⁹⁷ Popper, Karl, op cit, p27.

⁹⁸ Sims, Edward H. *The Fighter Pilots*, London: Corgi, 1970, p144.

⁹⁹ General Olds flew P51 Mustangs in WW2, F86 Sabre Jets in Korea and F4 Phantoms in Vietnam. Although the only fighter pilot to qualify as an ace in 3 separate wars, he is by no means the most successful fighter pilot of all time. Spick, Mike. *The Ace Factor: Air Combat and the Role of Situational Awareness*, Shrewsbury: Air Life Publishing Ltd, 1988, pp 147ff.

¹⁰⁰ Spick, op cit, passim.

‘military judgement’. Put simply, since we are the Military, and we know what we are doing, we do not *need* to justify our beliefs. In fact, this Author’s observation is:

- that generally, we are *incapable of* justifying those beliefs.
- that often, our beliefs are based on many years of hard-learned experience and that we would be unwise to discard those items of belief.
- but that we extrapolate beyond the foregoing in an unquestioning and at times arrogant manner, and
- that on balance such self-belief may be a good thing, *as long as we recognise some limitations to it.*

Engineering Approaches

There is also strong evidence of an engineering approach to military problems, particularly among Anglo-Saxon armies. Perhaps the epitome of this is the ‘invention’ of the tank. A British Royal Engineer, Major Ernest Swinton, first conceived of what would become the Tank on 19 October 1914. It was seen primarily as a mechanism for breaking the deadlock of the trenches. His idea was accepted reasonably rapidly, and tanks first appeared on the battlefield in September 1916. However, ‘the deadlock of the trenches’ did not become a reality until at least February 1915! On 19 October 1914 the British Army was engaged in the last battle of the initial, mobile phase of the First World War: the *defensive* First Battle of Ypres¹⁰¹. Hence Swinton could either be seen as a visionary genius or, more realistically, a mechanically-minded staff officer who imagined a technical solution and then adapted the problem to fit it. Furthermore, despite Swinton’s continued involvement in tanks until well into the 1920s¹⁰², the tactics for trench assault were only perfected in July 1918 – almost 2 years after their first use - by Fuller (an infantryman)¹⁰³.

Engineering is the practical application of the physical sciences. An engineering approach fails if the basis of the underpinning science is flawed. In much of the conduct of war that is precisely the case, because war and combat are dominated by human behaviour which is not demonstrably determined. Since an engineering paradigm prevails, we do not consider the essentially human problem of C2 in the right way. Two further illustrations support the view that soldiers tend to be dominated by an engineering paradigm. Firstly, *all* British Army Staff College students attend graduate-level instruction in military technology. Its duration has historically varied from 3 months for non-graduates, to a year’s Master of Science course for existing science graduates. Furthermore, every graduate of the United States Military Academy obtains an engineering degree. And the case can be made for the suggestion that the formative period of the United States Army (between the War of 1812 and the First World War) was not dominated by occasional untidy Indian Wars; but rather more by a protracted, sophisticated and hugely expensive programme of fortification of the eastern seaboard by the Corps of Engineers¹⁰⁴. These considerations must have had some impact on the outlook and beliefs of the respective officer corps.

¹⁰¹ Keegan, John. *The First World War*, London: Hutchinson, 1998. P143.

¹⁰² Trythall, Anthony John. ‘Boney’ Fuller - *The Intellectual General*. London: Cassell, 1977. Pp 76-9

¹⁰³ Ibid, p65.

¹⁰⁴ Knowledge, Interest and the Limits of Military Professionalism: The Discourse on American Coastal Defence, 1815-60.’ Samuel J. Watson, in ‘War in History’, Volume 5 Number 3, 1998. Pp 280-307’.

An engineering approach to military problems has some advantages, but should never be seen as the sole or necessarily preferred option. The ‘deadlock of the trenches’ was convincingly broken in the first instance by the German Army, no later than March 1918, by a *tactical* approach that owes much to the intellectual legacy of Clausewitz and von Moltke the Elder^{105,106}. They achieved that almost entirely without tanks. They did harness modern technology, but the interesting aspect is that they harnessed the technology to *support* their doctrine: a key distinction.

More Information, Please!

Where a single intellectual approach predominates, practitioners are predisposed to see problems in a certain way, and that conditions their response. Nowhere is this more apparent in the sphere of Command. This area is one in which the provision, handling, management, use and re-transmission of large quantities of information is seen as a good thing, with relatively little analysis as to why that may be so, and indeed to what extent (if any) it is so. In fact, there is little if any convincing evidence that it is, and such evidence as exists tends to paint a rather different picture.

There is considerable evidence, accumulated over a number of years, that handling more information tends to make organisations larger, more bureaucratic, and take longer to make decisions that are qualitatively worse^{107, 108, 109, 110}. In particular, if combat is adversarial and dynamic, any decision that takes longer is by definition worse. Tactical decision making should be ‘about right but very quick’. Timeliness, and particularly the ability to make decisions and act faster than the enemy, are key indicators of decision quality in combat. Furthermore, there is evidence that:

- Differences between the performance of different command posts equipped to the same state of C3IS are normally greater than the benefit of improvements in C3IS to any of them¹¹¹.
- Differences between individual tactical decision makers appear to be at least as important in terms of tactical outcome as any improvement in the quality of information likely to be supplied in the near-term equipment programme¹¹².

¹⁰⁵ Samuels, Martin. *Doctrine and Dogma*, New York: Greenwood, 1992. Pp34-56.

¹⁰⁶ Gudmundsson, Bruce I. *Stormtroop Tactics: Innovation in the German Army 1914-18*, New York: Praeger, 1989. Pp139-52.

¹⁰⁷ Storr, Major J P. *Command and Control within the Land Component* Journal of Battlefield Technology, Volume 3 Number 1, March 2000, pp18-28.

¹⁰⁸ Storr, Major J P. *Real People, Real Decisions: Designing HQs to Win Wars*. British Army Review 125, Winter 2000.

¹⁰⁹ Storr, Major J P. *The Impact of Human Factors on Command and Control* Battlefield Digitization, the Human Factors, RUSI, 6-11 November 2000.

¹¹⁰ Storr, Major J P. *Emergent Themes in Human Aspects of Command and Control* RMCS Symposium on People in Digitised C2, 6-8 December 2000.

¹¹¹ Henderson S M, *Human Pitfalls in the Automation of Command*, publishing details to follow.

¹¹² Mathieson Graham et al, DSTL, Unpublished MoD Paper. These findings relate to experimental results for both Royal Navy and Army officers.

- The only statistically significant evidence available to the UK MoD of a positive advantage of battlefield digitization relies on a level of situational awareness that will not be provided within the current equipment programme.

These findings indicate that the skill, experience and teamwork of the individuals and groups is more of a factor in effectiveness than likely benefits of technology, and therefore merit much greater attention. However, such findings are not common knowledge, and tend to be overlooked. This appears to suggest an engineering, systems approach to C3 which does not recognise evidence that does not fit with the paradigm of information provision on which it is implicitly based.

Synchronisation

By extension, close coordination – synchronization – is commonly believed to be the solution to managing complex and at times seemingly chaotic military situations. This is at odds with other aspects of endorsed doctrine, and this discrepancy highlights a strong disconnect between espoused and enacted behaviour. The potential consequences of that discrepancy are considerable. We must discriminate between coordination – the correlation of relevant activities with each other – with synchronisation, the correlation of relevant activities at a nominated time. Although not necessarily explicit, synchronisation is often taken to be synonymous with the imposition of coordinating detail in advance from a superior headquarters. Adherents of this view stress the need to achieve synergy through coordination of effect in time and place. They also stress the considerable amount of detail and hence information required. They reflect a continuing quest for certainty which is simply inappropriate.

However this whole paradigm runs contrary to the views that combat is dynamic, adversarial, complex and at times seemingly chaotic. If combat is chaotic, one simply cannot expect that degree of control. To use a pair of graphic analogies, it is like shovelling fog, or herding cats. Similarly, since combat is adversarial (and the other protagonist has an opportunity to act as well), one simply cannot seek to manage violence by control measures imposed in advance: we do not have the monopoly of choice once combat is initiated.

There may be three reasons for the belief in the requirement for synchronisation. One is that the recent experience of Western nations in fighting significantly less-capable enemies has blinded them to the possibilities available to a more capable enemy. The second, which is far more worrying in the long run, is that in practice some western armies have not accepted the doctrine of Mission Command, although they publicly claim to do so. We still try to plan extensively in advance, but we mask this by the apparently elegant and sophisticated notion of ‘synchronisation’. The wish to plan extensively in advance is one symptom of an excessive engineering approach to military endeavour. It has also been noted that in the British Army it is the staff college graduates who talk most about, but practice least, the doctrine of Mission Command¹¹³. In practice they may be too concerned about the career implications of possible failure to allow their subordinates freedom of action. The third reason may be the presence of authoritarian characters, who simply cannot cope with uncertainty.

¹¹³ Dermot Rooney, QinetiQ Warfighting Experiments, personal communication.

Myths and Beliefs

There is a common pattern among modern military myths. Firstly, like the OODA Loop or the Principle of four, they must contain something superficially simple to grasp. Secondly, there must be some underlying logic, albeit sometimes very little, and normally so little as to stand no rational exploration or analysis. For example, a continuing quest for more information has led repeatedly to information overload, and there is no hard evidence that improved information provision leads to improved operational effectiveness. Thirdly, belief in the myths must bring some obvious advantage. That advantage may be in fulfilment of some wider agenda. For example, the Principle of Four seemed to justify the existence of large force structures in peace and war at the time of the British Strategic Defence Review of 1998. Issues relating to information provision suit the predispositions of the technocrats amongst the signals community, and also the purposes of large sectors of defence industry.

OBSERVATIONS

This paper has made a number of observations relating to human aspects of command, and yet it is notable that the behavioural human sciences, and their practitioners, do not figure prominently in the development of concepts and systems for command and control. There are at least two major reasons for this.

Firstly, it appears that the behavioural human sciences are insufficiently mature to be exploited in a way akin to the physical sciences. Senior academics differ considerably over their understanding of basic human behaviour. Thus although military men intuitively know that human behaviour is an important aspect of combat, the ability of the human sciences to materially improve operational effectiveness in this area may be limited. Some of the reasons are:

- research findings are mostly ‘atheoretical’ and take the form of ‘empirical generalisations’ that have no defined scope.
- such theories and models as exist are rudimentary, incomplete and are not explicitly tied to issues of a defined scope.
- all research tends to be contaminated by the failure to discriminate between technical and non-technical use of terms. The technical language is consequently poorly developed, which causes confusion¹¹⁴.
- Little of the behavioural human sciences are yet at the predictive state, so even their practitioners rarely demonstrate confidence in the suitability of their findings as a basis for intervention¹¹⁵.

This is not to criticise researchers working hard in their chosen field, who often display an insight and knowledge which military men find surprising. It is, perhaps, and honest appraisal of the (primarily psychological) field of study today. However, those limitations make the field less useful to senior commanders, and tends to present an appearance of amateurism, eccentricity or even ignorance (which, it is stressed, is not deserved).

¹¹⁴ John Champion, BAE Systems Type 45 Project, informal note dated 8 January 2001.

¹¹⁵ Graham Mathieson, DSTL, personal communication.

However, military communities themselves have insufficient explicit knowledge of the behavioural human sciences. They think they understand the issues, but often do *not* at any explicit level, and use the relevant technical language naively. They are therefore poorly equipped to engage the relevant scientific community¹¹⁶. It might be that, for example, the prevalence of an engineering approach to military problems (and particularly command) reflects a lack of understanding of what would constitute a better approach. To illustrate that point, the British Army does not employ a single officer with any formal knowledge of the behavioural human sciences in the area of command and control research. It has very few officers who are qualified in those areas, and they tend to be employed either in training development or in psychological and information operations. That should be contrasted with over a hundred officers trained to postgraduate level *every year* in engineering, of which a significant proportion study aspects of information technology. In simple terms the British Army, probably much like most Western armies, knows very little about the human behavioural sciences, does little to inform itself, and contents itself with an engineering, hard-science view of a problem which requires at the very least the exploration of other views.

In his landmark work on the history of science, Thomas Kuhn observed that paradigms tend to persist despite initial evidence that they are flawed¹¹⁷. In some cases the body of contrary evidence becomes overwhelming; the old paradigm is discarded, and a new one accommodated. Our present view of C2 is information-centred, and related problems are thought to be best handled by an engineering systems view of the world. This paper has presented some evidence that that paradigm is flawed. It may have presented sufficient evidence to prompt people to look at these issues in a more human-centred way. If not, Kuhn's work suggests that researchers and practitioners in this field will read, accept and ignore it.

CONCLUSIONS

This paper has presented a number of observations, broadly in the fields of philosophy, psychology, sociology and anthropology. Those observations relate to warfare, command, and digital technology; hence battlefield digitization, network-centric warfare, and a possible revolution in military affairs. It has repeatedly reported human phenomena of importance, often unexpected, and almost never described in military doctrine. Our understanding of these human issues is limited due to 2 main factors: the state of the sciences involved, and the explicit knowledge of those subjects by military men.

Two related recommendations can be made. Firstly, that the human sciences community be actively engaged in the area of command and control to a much greater extent than at present. This would include symposia, military studies, exchange of research students, etc. Secondly, that significant numbers of serving officers receive formal education in aspects of the behavioural human sciences, even to the detriment of the number of engineers currently trained. Only when numbers of officers understand the subject at the level of understanding of the practitioner will significant developments begin to occur.

The future of military endeavour is not digital, although digital electronics will help. Warfare will be, as it has always been, human. In order to make really significant improvements to

¹¹⁶ Ibid.

¹¹⁷ Kuhn, Thomas. *The Nature of Scientific Revolutions*, London: University of Chicago Press, 1996. P18 and passim.

military capability through improvements in command we need to identify more precisely the human aspects of war, and particularly command, and engage the relevant scientific community in addressing them.