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# HIGH NOON OF AIR POWER

**By**

**Doctor Alan Stephens**

## About the Author

Dr Alan Stephens is the RAAF Historian, based at the Air Power Studies Centre in Canberra. Before joining the Centre he was a principal research officer in the Federal Parliament, specialising in foreign affairs and defence; prior to that he was a pilot in the RAAF, where his postings included the command of No. 2 Squadron in 1980-81.

Dr Stephens is the author and editor or numerous books and articles on security, military history, doctrine and air power. He has lectured extensively on those subjects throughout Australia, South-East Asia, Europe and North America. He was one of the principal authors of the third edition of the RAAF's Air Power Manual (1998), and is currently writing a history of the RAAF which will be published in 2001.

He is a graduate of the RAAF Staff College, and of the University of New England, the Australian National University, and the University of New South Wales.

# INTRODUCTION

We are now at the high noon of the era of 'traditional' or 'conventional' air power; that is, of air power delivered primarily by piloted, air-breathing platforms. The public and political voice of this era has been John Warden's book *The Air Campaign*, first published in 1988 and widely regarded as the most influential work on the subject since World War II. Notwithstanding the seemingly inevitable growing Greek chorus of critics, Warden has the rare distinction of having articulated a military concept and then having translated it into practice, an experience unknown to any of his detractors.[1] As General Norman Schwarzkopf has acknowledged, it was the broad ideas presented in *The Air Campaign* which provided the template for the most stunning application of air power in history, the Coalition victory in the 1991 Gulf War;[2] and it has been the subsequent refinement of those ideas, complemented by continuing improvements in aerospace technologies, concepts of operations, training, and campaign planning, which have made air power today's weapon of first choice for advanced nations. That is not to say it is the weapon of only choice, but it is to say that any joint commander who in the first instance does not seek to base any military campaign on air power's unique capabilities had better have some good answers ready if alternative options are tried and fail.

Tacit recognition of air power's emergence in the last decade as the preferred military option can be seen in the strategic planning and force structuring endeavours of surface forces. It has now become an imperative for army and navy commanders to try to replicate within their forces the inherent characteristics and, therefore, the military capabilities, which presently reside primarily in aerospace forces, and which are most likely to provide the springboard for victory. Two recent essays by prominent Australian army commentators perfectly illustrate this point.

'The Australian Army is in crisis', wrote retired Brigadier Brian H. Cooper in the *Canberra Times* in July 1998.[3] Better known for a series of reactionary articles on defence published elsewhere under the apt pseudonym of 'Genghis Khan', Cooper blamed an alleged army identity crisis on the combination of a flawed national defence strategy, which gives priority to air and sea forces over land forces,[4] and inadequate defence spending generally. Whether or not Brigadier Cooper's description of the Australian Army's psychological condition was accurate is a matter of opinion, but if a series of apparently troubled attempts to redefine the place of land forces in the defence of Australia can be taken as an indicator then, at the least, the

[1] Warden III, John A., *The Air Campaign*, Brassey's, Washington, 1989; see also Warden III, John A., 'Employing Air Power in the Twenty-first Century', in Schultz, Richard H. and Pfaltzgraff, Robert L., *The Future of Air Power in the Aftermath of the Gulf War*, Air University Press, Maxwell Air Force Base, 1992, pp 57-82; and Warden, John, 'Planning to Win', in Clarke, Shaun (ed) *Testing the Limits*, Air Power Studies Centre, Fairbairn, 1998, pp 77-97. There are overtones in the attacks on Warden of the 'tall poppy syndrome', an Australian phrase used to describe a predilection for cutting down the tallest, and therefore the most attractive, poppy in the field, although perhaps in Warden's case 'highest value target' would be a more appropriate metaphor.

[2] Schwarzkopf, H. Norman, *It Doesn't Take A Hero*, Bantam, 1992, pp 314-20. For another objective view, see Gordon, Michael R. and Trainor, Bernard E., *The Generals' War*, Little, Brown, Boston, 1995, pp 75-101.

[3] Cooper, Brian H., 'Constant reviews put army in crisis', in *The Canberra Times*, 21 July 1998, p 9.

[4] That strategy is described in Department of Defence, *Australia's Strategic Policy*, Canberra, 1997.

Army does seem to have been gripped by a degree of strategic and intellectual uncertainty in the recent past.[5]

Army historian and strategist Michael Evans unwittingly put his finger on his service's essential dilemma in a paper he wrote in February 1998 titled 'Manoeuvre Warfare and Operational Art'.[6] Dr Evans finished a section of his paper in which he argued that military (by which he meant 'army') thinking has become archaic, in comparison to the evolution of technology, by rhetorically posing his central question: 'How could twentieth century military practitioners direct the use of military power into a form which could meet political objectives without stalemate, attrition and huge casualties?' In the margin of the copy of his paper I saw, a previous reader had provided the answer in two words: 'Air Power'.

Please note, and let me emphatically stress, that the answer was not 'air forces', it was 'air power'. The distinction is critical, as the issue here is not the relentless, corrosive inter-service rivalry which has blighted Western defence forces since the rise of air power in World War I but, rather, the effective application of combat power by joint forces. While air power was the decisive element of combat power in the two operations which have best demonstrated its contemporary supremacy, *Desert Storm* in 1991 and *Deliberate Force* in 1995, coordinated surface force actions were essential to success in each case.

At the same time, 'joint' does not mean 'equal'; rather, it means a rational mix of capabilities in whatever balance produces the maximum combat effect. The development which commentators like Brigadier Cooper have failed either to comprehend or accept in the face of compelling evidence is that since 1914 there has been a continual shift in the kinds of combat capabilities preferred by advanced nations, with the trend being away from massive, attritional, slow-moving, slow-acting, largely one-dimensional forces towards their diametrical opposite. If that evolution has eluded Brigadier Cooper, it has been crystal clear to those admirals and generals who, for the past half-century, increasingly have sought to replicate within their navies and armies the kinds of capabilities which originally were the prime preserve of airmen: capabilities which commit relatively few combat forces to achieve such outcomes as fast broad area surveillance, real-time reconnaissance, rapid reaction, control of the air, deep strike and theatre control, all increasingly characterised by precision, high speed, parallel operations and strategic effect.

It is no coincidence that in the Pentagon today one of the most bitter turf battles is being fought out between the United States Air Force, Navy and Army over who will own and operate the emerging missile capabilities associated with theatre deep strike and anti-missile defence – roles which in the past would have been regarded as the natural preserve of the Air Force and which we customarily have titled 'strategic

[5] See Wolfe, Kevan, 'Army 21 – A New Culture for the Australian Army', in *Asia-Pacific Defence Reporter*, May/June 1996, pp 8-10; Kevan Wolfe, 'Regular Army and its Reserves – A Cultural Change Needed', in *Asia-Pacific Defence Reporter*, July/August 1996, p 22; Dunn, Brigadier Peter J., 'Time x Technology x Tactics = RMA', in *Defence Force Journal*, January/February 1996, pp 11-18; and Evans, Michael, *The Role of the Australian Army in a Maritime Concept of Strategy*, Land Warfare Studies Centre, Duntroon, September 1998.

[6] Evans, Michael, *Manoeuvre Warfare and Operational Art*, Land Warfare Studies Centre, Canberra, February 1998.

strike' and 'control of the air'. More broadly, a review of force structure developments in the land and sea arms of advanced defence forces since World War II will show almost without exception enormous growth in air power capabilities.[7]

Thus far this discussion might sound encouraging for the current generation of air force professionals. Well, it shouldn't. 'High noon' not only represents the zenith of the earth's daily revolution around the sun, it also represents the onset of decline. The metaphor is applicable to all small- and medium-sized air forces - that is, to every air force in the world other than that of the United States. A confluence of forces, one of which is irresistible and the others nearly so, is already acting to hasten that decline, which will be certain, and in some cases terminal, unless today's air commanders respond successfully to the greatest intellectual and leadership challenge airmen have faced since the Italian Lieutenant Gavotti became the first man to make a strike from the sky ninety years ago.

The irresistible force is of course time, and its powerful attendants are technology and globalisation. And in addition to being subject to those compelling universal pressures, airmen must also deal with the singular and unexpected dilemma of trying to remain relevant within coalition operations, a situation which has arisen as a corollary of the sudden emergence of the United States as the world's only superpower. In combination, those pressures will demand radical changes to the way in which air forces think about, prepare for, and apply air power.

Time waits for no air force, and just as various other warfighting instruments have emerged, dominated, and then been consigned to the rubbish bin of history, air power based on manned platforms operating primarily in the troposphere assuredly has a use-by date. On best indications, the current era seems likely to last another two or three decades before the technologies and ideas on which it is founded are largely superseded.[8] The next tranche of war-winners is already evident: some, like cruise missiles, unmanned aerial vehicles and space-based information systems are already an established part of force structures; others, like unmanned combat air vehicles, micro air-vehicles, space-based weapons and knowledge-control systems, are in their early days. Their common denominator is that none has a pilot. Given that air services have from the very beginning defined themselves by the image of the man in the cockpit, the implications of this should not be under-estimated. It is a change which challenges the central ethos of air forces.

The essential catalyst for the current technological revolution is the microchip, which is making possible remarkable developments in miniaturisation and precision, and in data collection, computing and communications – that is, in our ability to package and

[7] See, for example, Vallance, Air Commodore Andrew, 'Purple Air Power – the future challenge', in *RAF, Air Power Review*, Vol 1, No 1, 1998, pp 17-26. It is more than a little ironic that the Australian Army regard helicopters as their 'most potent capability': see Jones, Colonel Trevor, quoted in Max Hawkins, 'Army Beefs Up its Most "Potent Capability"', in *The Australian*, Defence Update, 20 November 1998, p 2.

[8] Ryan, General Michael E., 'New World Vistas: USAF Air and Space Power for the 21st Century', in Clarke, *Testing the Limits*, pp 13-24. Taking Unmanned Aerial Combat Vehicles as an example, General Ryan has stated that any widespread replacement of manned combat aircraft with UCAVs is many years away, as there are substantial technical challenges still to be resolved in fields such as payloads, power plants and data-transmission bandwidths before those vehicles can carry weapons and assume the full range of air power roles.

power weapons systems; to achieve unitary levels of lethality; to look, share, analyse and understand; and, increasingly, to move the man out of the machine.

Just as this so-called 'revolution in military affairs' is changing concepts of national security, so too are the effects of globalisation. Also a phenomenon which rests on the microchip, in this case through its profound consequences for international communications and information transfers, 'globalisation' is: redefining the notion that we live in a world of states; radically altering the shape of elite and/or special interest groups; and transforming organisational behaviour.[9] In other words, it is fundamentally changing the way in which human beings do business and relate to each other. The application of air power is not immune from these extraordinary developments; on the contrary, it can continue to flourish only if it accommodates them.

And no less complex for the practitioners of air power are the implications of American conventional military supremacy. Following the collapse of the former Soviet Union there has been a general agreement that the United States is the sole remaining superpower. Curiously, however, there has been little analysis of exactly what this might mean.[10] For airmen, one thing it does mean is that, because of their overwhelming technological superiority, American air forces will be incontestable in conventional conflict for at least the next twenty, more likely forty, years. As Britain's senior operational airman, Air Chief Marshal Sir John Allison, has observed, at the global level American forces will do what they will, and the rest of us will do what we can.[11] If, as is widely believed, international coalition operations are likely to be the way of the future, this raises very difficult questions for every ally of the United States Air Force, the most pertinent of which is: how do they remain relevant?

To summarise, air power practitioners must realise that they are being confronted with an extraordinary set of challenges. On face value, there is no cause for confidence that many air forces will be capable of dealing with the shocks inherent in those challenges. Immense institutional barriers must be overcome: the inherently conservative nature of air forces; their thus far bureaucratic management style; the entrenched interests of a remarkably narrow leadership base; the sheer technological demands; and, by no means least, the cultural trauma. Air forces which either avoid or are incapable of making the necessary changes are likely to fall by the wayside, forfeit their current warfighting dominance, and risk eventually losing their independence.

The critical issue here is not so much the status of air forces but, rather, the concern that, if specialist air services ceased to exist, national security might be deprived of the full potential of modern aerospace capabilities.

[9] For an incisive examination of the forces of globalisation, see Kelly, Paul, 'Can Democracy Survive?', in *The Australian Magazine*, 30-31 May 1998, pp 24-26.
[10] For a discussion of this as yet largely ignored subject, see Bell, Coral, *The American Alliance and the Revolution in Military Affairs*, The Australian Centre for American Studies, Sydney, 1998. Dr Bell will shortly complement that work with her *World Out of Balance*, The Australian Centre for American Studies, Sydney (forthcoming).
[11] Allison, Air Chief Marshal Sir John, 'Future of Air Power – A European Perspective', in Clarke, *Testing the Limits*, p 99.

Air commanders who wish to move forward positively from the high noon of traditional air power to the future of exotic aerospace power must find answers to the following four key issues: first, the dilemma of American air power (a topic which brings as a corollary the notion of the 'niche' air force); second, the role of the vanguard party ('the problem with the pilots' club'); third, the need for a revolution in the organisation; and fourth, future doctrine. How they go about addressing those issues will, in a sense, constitute the next air campaign.

## THE DILEMMA OF AMERICAN AIR POWER

There are now two kinds of air powers in the world: the United States and everyone else. In the wake of the collapse of the Soviet Union and the demonstrations of the past fifteen years of overwhelming American aerospace power, it is clear that the US has an incontestable advantage which it will retain for several decades.[12] That is likely to be a good thing for global stability and, on balance, for American allies. But at the same time it raises a major dilemma for those allies. Ironically, the irresistible rise of American air power as the world's dominant warfighting instrument is marginalising the USAF's friends, none of whom will be able to apply anything more than a limited range of advanced aerospace capabilities without American patronage.

At modest levels of patronage that dependency is simply another example of Realpolitik and should not be of any special concern, but at higher levels it is likely to involve a de facto surrender of sovereignty. The two extremes of patronage are defined at the low end by the routine supply of hardware, at the high end by privileged access to exotic weapons systems and information.

Most air forces acquire their equipment from foreign sources and so become reliant to some extent on those sources for logistical support. Despite that reliance, once aircraft and/or systems have been delivered the new owner has recourse to such well-practiced techniques as reverse engineering and cannibalisation to keep them operational.[13] Further, the owner alone decides how, when and where he will use his equipment. The Islamic Republic of Iran Air Force, for example, has inherited large numbers of modern aircraft by default in the past twenty years, some from the 1979 revolution against the shah, and others which fled to Iran from Iraq during the Gulf War and which have not been returned. While the IRIAF is not especially well-regarded, it has nevertheless been able to sustain limited operations with complex aircraft like the F-14 and F-4 despite receiving no direct assistance from the original manufacturers.[14]

The real question, though, is how effectively organisations like the IRIAF can employ advanced weapons systems and, in the age of knowledge warfare, the answer is, 'not

[12] In addition to Operations *El Dorado Canyon*, *Desert Storm* and *Deliberate Force*, the sustained enforcement of 'no fly' zones over Iraq and central Europe illustrates the current dominance of American aerospace power. There is little doubt that, if US commanders wished to extend those zones to include surface movement, they could do so.

[13] The term 'cannibalisation' is used in aerospace circles to describe the practice of removing equipment from one aircraft which either already is, or then becomes, unserviceable to keep one or more other aircraft flying.

[14] Noush, Kian, 'Iranian Air Power', in *Air Forces Monthly*, June 1998, pp 36-45.

very'. Many factors contribute to American air power supremacy but none is more important than knowledge dominance, for it is that dominance which empowers other qualities such as precision, speed, lethality and high quality training. In other words, defence forces seeking the maximum leverage from air power must look to the United States for more than mere platforms - they need *knowledge* capabilities. Only the US has the constellations of satellites, the fleets of data collection aircraft, the global data integration systems, the libraries of targeting information, the banks of computers, the ranks of analysts, and so on. To again refer to Air Chief Marshal Allison, allies who wish to operate advanced systems must rely on the Americans being very generous with information.[15]

The already vast gap between American aerospace power and everyone else's will become even wider in the coming decades. Perspective has always been one of the fundamental characteristics which have made air power special and, in the future, it will increasingly be exploited from space, from where it will confer an even more potent advantage. Speaking to this subject recently, the commander of the world's pre-eminent air power, USAF general Michael Ryan, stated that his service now officially describes itself as an 'air and space force' and sometime in the future may reverse that order to become a 'space and air force'.[16] General Ryan did caution that any such transition will not happen for a long time. By the same token, a period of, say, three decades, is not an inordinate period in the equipment acquisition process, and there should be no doubt that the transition is underway.

Under recently endorsed plans, the USAF's Research Laboratory will reorient its advanced technology work much more aggressively towards space and less towards aircraft, with the intention of building 'a new foundation for USAF space operations early in the 21st century'.[17] USAF technology funding for space research is to double; significantly, much of the additional funding will be taken out of the aircraft technology research allocation, which will shrink from today's 61 per cent to 41 per cent by 2005. In total, more than 50 per cent of the USAF's research budget will be focused on space. This is a change of near-revolutionary proportions as far as the future of air power is concerned, because it is the Air Force's research laboratories which lay the technological groundwork for future systems and, therefore, operations.[18]

The expansion of space-based capabilities beyond the existing data collection and communications roles is inevitable. One of, if not the, greatest threats to civilised people in the first quarter of the 21st century will come from ballistic and/or cruise missiles armed with warheads of mass destruction, in the possession of the international community's fringe-dwellers. The pressure to counter that threat with

[15] Allison, in Clarke, *Testing the Limits*, pp 101-102.
[16] Ryan, in Clarke, *Testing the Limits*, pp 21-22. For other expert opinions on this estimate, see '21st Century Fighters' in *Aviation Week & Space Technology*, 3 August 1998, pp 38-74; and Crawford, Natalie, 'The Impact of Technology in the Next Quarter Century', in Clarke, *Testing the Limits*, pp 25-38.
[17] Covault, Craig, 'USAF Shifts Technology for New Future in Space', in *Aviation Week & Space Technology*, August 17, 1998, p 40; Gaffrey, Timothy R., 'US Air Force to Boost Research on Space Systems', in *Defense News*, July 27-August 2 1998, p 10; and Covault, Craig and Anselmo, Joseph C., 'Technology Leaps Signal Dawn of New Space Era', in *Aviation Week & Space Technology*, 7 September 1998, pp 132-160.
[18] Covault, 'USAF Shifts Technology for New Future in Space', p 40.

space-based systems, firstly for defensive operations, and then for offensive action, is likely to be irresistible, as the current efforts of at-risk countries like the United States, Israel, Japan and South Korea to develop missile defence systems demonstrates. Those programs, incidentally, again illustrate the extent of American aerospace superiority, as there is not the remotest possibility that the latter three states could construct a credible system without massive American assistance. A weekly subscription to *Aviation Week & Space Technology* and the occasional well-placed spy may be good investments but they are nowhere near enough.

This then leads back to the central dilemma. Unlike hardware, knowledge cannot be reverse engineered or cannibalised. A nation which pursues a defence strategy and/or a force structure which depend fundamentally on externally-sourced information leaves itself wholly vulnerable to the continuing goodwill of its mentor, and goodwill is an infinitely more difficult commodity to manage than a squadron of F-16s (or for that matter an Aegis class destroyer or a troop of main battle tanks). A key question here is the reliability of alliances generally and of the United States as a mentor or hegemon specifically.

Ultimately, all treaties are the outcome of self-interest and opportunism. States sign pacts solely for what they think they can get out of them. When there is nothing to be gained or interests have changed, then treaties inevitably wither. The Seato pact is a good case in point. And for what is perhaps the definitive example of the proposition that opportunism is the main currency of international relations, look no further than the German-Soviet Non-Aggression Pact of August 1939. That agreement, concluded between implacable ideological foes, opened the door for the start of World War II eleven days later. Less than two years later, when the pact had served its profoundly cynical purpose, the Nazis invaded the USSR.

For the forty years of the Cold War would-be participants in world affairs had a choice of two global mentors, the United States and the Soviet Union. Now that choice has been narrowed, and international affairs have become less certain. Power vacuums are by definition unstable and there is merit in having a relatively benevolent hegemon who is prepared to pay the price of acting as the world's policeman. Doubtless the role attracts benefits, but it also incurs expensive and often traumatic costs. The eagerness of legitimate governments in Europe, South-East Asia, North Asia, the Pacific and South America to keep the United States engaged in their respective regions indicates that the Americans are widely regarded as generous and loyal friends, which they are. For another slant on this topic which surely will lead to the same conclusion, consider a world dominated by one of the possible future alternative hegemons.

By the same token, the United States has shown it can treat its allies ruthlessly. The exclusion of New Zealand from the Anzus Treaty in 1986 following the adoption of an anti-nuclear policy by that most constant and long-standing member of the Western alliance was peremptory and harsh.[19] But American leaders had decided that an

[19] ANZUS is the 'Australia, New Zealand and United States' treaty, concluded in 1951. While the pact is just one of many to which the US is signatory, it has been the centrepiece of Australian and New Zealand security planning.

important message had to be sent to its other partners and so the essential nature of alliance politics was invoked.

There is no comfortable conclusion to be drawn regarding this matter. Perhaps the most useful observation is to repeat an earlier caution: any nation wishing to seek maximum leverage from advanced, knowledge-based defence strategies will be reliant to a greater, rather than a lesser, extent on American patronage. That is neither a criticism nor a value judgment but simply a statement of fact.

A second caution must also be made, this time concerning force structuring. The mystique of US air power is based on a range of capabilities which, for technological and financial reasons, no other nation can aspire to. What that means in practical terms is that in high-intensity conflict, the main contribution the United States needs from its allies is political legitimacy and access to suitable real estate. Sir John Allison has even suggested that in future the Americans might have to operate at sub-optimal levels to ensure the participation of partners.[20]

The same possibility has been raised on different occasions by General Ryan and Marine Corps commandant General Charles Krulak.[21] Doubtless their sentiments were sincere, but they are gravely misplaced. In an age where casualties have become a centre of gravity for civilised states, the suggestion that American forces might fight with one hand tied behind their back could most charitably be described as ingenuous. Any commander who does not pursue the desired political outcome of any clash of arms with the utmost expediency and with the optimum force at his disposal will properly be held culpable for unnecessary losses.

There may be some comfort for America's allies in the recent acknowledgment from the US secretary of defence and the chairman of the joint chiefs of staff that the widening technological gap is a cause for concern, and that they are examining ways of closing that gap.[22] But the issue here surely is one of America's allies accepting responsibility for a problem which is, after all, ultimately theirs. The question those allies need to ask themselves is: if they wish to be good global citizens and contribute to international coalition operations, do they merely want to make up the numbers, or do they want to be genuinely valued? If the answer to the latter question is 'yes', one approach they might profitably pursue is the concept of the 'niche' air force.

At surface level the niche concept is straightforward. Because it simply is no longer possible for anyone else to build a balanced air force to 'first-tier', American standards, a single niche capability is selected, developed and maintained to those standards. Defined in terms of weapons systems, that might mean something like a fifth-generation fighter, or a leading-edge airlift, air-to-air refuelling or airborne early

[20] Allison, in Clarke, *Testing the Limits*, pp 101-102.
[21] Ryan, in Clarke, *Testing the Limits*, p 19. General Ryan acknowledged the concern felt by the United States' allies that the USAF is leaving them behind technologically, a development which might inhibit future coalition operations. He stated that interoperability remains a priority for his service, and that the USAF 'will not outrun' its close allies.
[22] This initiative by Secretary Cohen and Chairman Shelton was reported in *Defense News*, 5-11 October 1998, pp 1, 34. According to that article, currently the US is examining this issue only in relation to its Nato allies. See also Garran, Robert, 'Defending Need to Spend', in *The Australian*, 5 August 1998, p 5; Sheridan, Greg, 'US Warns of Risk to Defence Ties', in *The Australian*, 31 July 1998.

warning and control capability. Other worthwhile areas of investment might include innovative software or a regionally-based, ready-to-go, command and control system. It is axiomatic that any niche system will be incomplete unless it is operated by quality people and backed up by a quality infrastructure which includes excellent training, advanced information systems and a capable research and development organisation.

Beneath the surface level, the concept is complex. It allows no room for half-measures. 'First-tier' means exactly that – a silver bullet capability which could confidently be used in the opening volley on the opening day of any campaign. There seems to be a tendency for allies to let the United States take the brunt; for example, in the fight to control the air which is likely to be the first objective of most campaigns, to let the USAF and the United States Navy do the hard work on the first few days and then join in. Allies who subscribe to the niche concept will be signalling their willingness to do their fair share; that if, say, they have chosen to specialise in air superiority, they will be good enough to fight alongside F-22s when the first shots are exchanged.

And platforms are merely the visible component of the equation. Because the concept very clearly defines 'interoperability' as meaning 'capable of operating with the USAF, on their terms, on day one', any platform which is going to qualify as 'first-tier' must be fitted with all of the leading-edge systems applicable to its role/s. The expense and difficulty involved should not be underestimated.

As far as organisational arrangements are concerned, a niche force is by definition intended to operate within a coalition. Here, it is noteworthy that the USAF has recently been reorganised into a number of Expeditionary Aerospace Forces which can be deployed rapidly to trouble spots around the world.[23] Consequently the USAF will be ideally structured to accept 'niche' contributions, which should simply be able to 'plug in' to the parent organisation.

Because investment in a niche capability would represent in part a response to budgets which can no longer support a full complement of advanced systems, other force elements would either have to function at a reduced standard or be cut from the order of battle altogether. This is an issue which is guaranteed to raise inter-service temperatures to white-heat, particularly if, say, the most rational way of paying for a required niche aerospace capability was by retiring tanks and/or destroyers. If the question does become one of foregoing second- and third-tier capabilities, which can only continue to degrade relatively and absolutely, in favour of a first-tier niche capability, decision-makers should bear in mind Sir John Allison's astute observation that it is advanced technology which 'confer[s] a seat at the coalition table'.[24]

[23] Interview, Ryan, General Michael, *Jane's Defence Weekly*, 4 November 1998, p 32; see also 'Air Force Chief Emphasizes Expeditionary Force for Post-Cold War Contingencies', *excite news*, 14 September 1998, http://nt.excite.com/news/pr/908914/va-air-force-chief. Reflecting that fundamental shift, in recent years the USAF has deployed in one form or another to 177 of the world's 188 countries.

[24] Allison, in Clarke, *Testing the Limits*, p 105.

## THE ROLE OF THE VANGUARD PARTY ('THE PROBLEM WITH THE PILOTS' CLUB')

Shortly after being awarded his wings in the early 1950s, Sergeant Pilot Jake Newham (later to become chief of staff of the RAAF) was told by a very senior officer in a bar one night, 'You're in the pilots' club now mate, and don't you forget it!'[25] Other services may find it difficult to appreciate the extent to which air forces have been and are dominated by their pilots, who generally comprise no more than about twenty per cent of the officer corps, and who enjoy a status far above that of, say, the infantry in armies and seamen in navies. Whereas armies and navies tend to regard their aviators merely as common artisans who are employed solely for the reach and perspective they add to the battalion and the warship, in air forces fliers constitute a lofty ruling class who, in their vice-like control over all affairs, could not unreasonably be likened to the vanguard party of Lenin's Bolsheviks.

At one level it is difficult to dispute the dominance pilots have enjoyed. Air forces are fundamentally different to armies and navies as to date their warrior class has been restricted to a very small group, namely, those who fly. Combat experience has been almost exclusively the preserve of that small group, which is why operational units almost invariably have been commanded by pilots. However, whether the extension of that operational-level dominance through to all other activities has served air forces well is another matter. Denying eighty per cent of an organisation genuine opportunities to achieve and to influence the highest decision-making processes must by definition place an intellectual straightjacket on institutional creativity. It was noteworthy, for example, that in a recent *Aviation Week & Space Technology* article speculating on the future of strike/fighter aircraft, the establishment pilots who were canvassed subscribed without exception to the continuing dominance for some decades of the manned fast jet, whereas thinkers from outside the circle like Burt Rutan and John Warden saw a future in which unmanned vehicles and other exotic systems were likely to assume priority sooner rather than later.[26]

Prudent air services will be planning right now how they will absorb growing numbers of unmanned weapons systems into their order of battle and, in particular, what kind of people they will need to command, control and operate those systems, given that the workforce which has traditionally performed that task (aircrew) not only will be smaller (because there will be fewer piloted aircraft), but also may not necessarily be the most suitable. Commentators like Warden and Richard Szafranski have argued that, as we move from the industrial age to the information age, success in conflict is likely to depend more on the rapid and precise use of knowledge than on sheer firepower.[27] In their judgment, combat platforms and weapons systems, and therefore their crews, while retaining a vital role, are likely to become secondary in importance to 'information radicals' in the new aerospace power order of merit.

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[25] Quoted in Stephens, Alan, *Going Solo: The Royal Australian Air Force 1946-1971*, Australian Government Publishing Service, Canberra, 1995, p 81.
[26] Scott, William B. et al, '21st Century Fighters', in *Aviation Week & Space Technology*, 3 August 1998, pp 38-74.
[27] Warden, in Clarke, *Testing the Limits*; Szafranski, Richard, 'Things May Play Out Differently – The Infosphere Defence Force', in Clarke, *Testing the Limits*, pp 123-143. See also Seffers, George I., 'Joint Chiefs Inaugurate Information Combat Era', in *Defense News*, 9-15 November 1998, pp 1, 44.

A glimpse of some early-generation information radicals may have been presented in another recent *Aviation Week & Space Technology* item, this time one reporting on a 'Cope Thunder' air exercise in Alaska.[28] These prototype new-age leaders were a (British) Royal Air Force Airborne Warning and Control System crew who, reportedly unlike their American counterparts, did not see themselves simply as somewhat passive collectors and distributors of information, but rather as innovative warfighters who both possessed and could apply the knowledge skills needed to dominate their battlespace. For example, on one occasion, by establishing a comprehensive picture of who was where and doing what, the AWACS crew was able to use unexpectedly aggressive tactics to 'bottle up' their opposing air forces in a corner of the exercise area, where they were then, to quote from the article, 'slaughtered' by F-15 fighters. Note that the F-15s were simply supporting assets which were called into action by the AWACS crew. In other circumstances or other times, their role might just as well have been performed by surface-to-air missiles, UCAVs, or space-based weapons.

It is time for air services vigorously to scrutinise the entry requirements for their vanguard party. Perhaps as they start to search for their information radicals, they might in the first instance defer less to people whose prime talent is the ability to physically manipulate a high-performance aircraft, and more to those who have acute situational awareness skills, an expert knowledge of tactics, strategy, weapons effects and information technology, and strong leadership qualities. And if the traditional composition of the ruling class is to come into question then, logically, so too must traditional notions of decision-making, authority, discipline, education, recruitment, promotion and reward. In other words, it may be time for a revolution in the organisation.

## REVOLUTION IN THE ORGANISATION

The human qualities of intellect, resourcefulness, leadership, trust, and so on have always been the essence of success in combat, and will remain so. Thus, one of the great challenges facing military leaders today is how best to bring man and machine together - how best to construct an organisation which will accommodate the discipline in action and flexibility in thought which a fighting force must have, while at the same time fully exploiting the enormous potential of the new technologies. The implication here is that in some circumstances there may be an inherent tension between those two most basic elements of warfighting.[29] In other words, it may be the case that near-revolutionary changes are needed in traditional approaches to command and control and personnel management.

Command and Control ($C^2$) is the 'exercise of authority and direction by a purposely designated commander over assigned forces in the accomplishment of a mission'. $C^2$ should not be confused with Command, Control, Communications, Computers and

[28] 'British AWACS Shines in Alaskan Air Combat', in *Aviation Week & Space Technology*, 21 September 1998, pp 57-60. Cope Thunder is described as a 'realistic, 10-day, multi-unit, multi-national, air combat training exercise'.

[29] For a thoughtful analysis of this subject, see Roman, Gregory A., *The Command* or *Control Dilemma: When Technology and Organizational Orientation Collide*, Air War College, Maxwell Paper Number 8, 1997.

Intelligence ($C^4I$), which describes the equipment, facilities and procedures used to exercise command and control (while noting, however, that a defence force's access to and skill in exploiting advanced $C^4I$ capabilities can greatly affect the ability of its leaders to do their job).

In plain language, the term 'command and control' describes a system for getting military forces to do the jobs we want done, when, where and how we want them done, as effectively as possible. It follows, therefore, that the characteristics of a good command and control system will include clarity of intent, and the rapid and precise transmission of that intent from the decision-maker to the workers. That process of rapid and precise transmission can, incidentally, start and end at any two points along the continuum of the chain of command; that is, depending on circumstances, it might start at the very top and end at the very bottom, or it might start and end at intermediate levels. A flight leader directing a section of four aircraft during air combat manoeuvres needs an effective system of command and control just as much as does an air marshal directing a campaign.

The qualities of 'rapid' and 'precise' are both relative and conditional. For example, there are few better instances of a single 'precise' act of command and control than the mobilisation of the German Army at the start of World War I. Based on a plan devised by Count Alfred von Schlieffen and subsequently modified by General Helmuth von Moltke the younger, the plan was a minor masterpiece of organisational precision.

The general mobilisation of the German Army was authorised by Kaiser Wilhelm on 1st August 1914, a date which, in the event, preceded his declaration of war against France by two days. The General Staff had spent years planning for this moment and, as Barbara Tuchman has written:

> Once the mobilisation button was pushed, the whole vast machinery for calling up, equipping and transporting two million men began turning automatically. Reservists went to their designated depots, were issued uniforms, equipment, and arms, formed into companies and companies into battalions, were joined by cavalry, cyclists, artillery, medical units, cook wagons, blacksmith wagons, even postal wagons, moved according to prepared railway timetables to concentration points near the frontier where they would be formed into divisions, divisions into corps, and corps into armies ready to advance and fight. [Each] Army corps alone - out of the total of forty in the German forces - required six hundred and ten railway cars ... grouped in one hundred and forty trains and an equal number for their supplies. From the moment the order was given, everything was to move at fixed times according to a schedule precise down to the number of train axles that would pass over a given bridge within a given time.[30]

Precision indeed.

However, regrettably for General Moltke, while he unquestionably was still in command of his forces, as the mobilisation proceeded, he lost control. After ordering the mobilisation but before declaring war, the Kaiser had a change of heart and decided that his armies should invade Russia, not France. Moltke, aghast, would have

[30] Tuchman, Barbara T., *The Guns of August*, Macmillan, New York, 1962, pp 74-75.

none of that, telling the Kaiser that the complexity and internal momentum of his plan meant that, once put into effect, it could not be reversed. In a sense, therefore, World War I started where it did because the German military commander could not or would not control the movement of his forces.

The initial deployment of the German Army proved irresistible, not only to the Kaiser, but also to the French Army. In a remarkable achievement, the pre-planned phase of the Schlieffen Plan saw almost 1.5 million German troops moved to the front against Belgium and France within seventeen days. But Moltke then proved incapable of directing his troops effectively; that is, he could neither command nor control them. Communications were difficult and, remote from the front, Moltke often had little idea where his forces were. Out of touch and confused, he was relieved of his responsibilities only six weeks after the start of the war.

Lest anyone thinks that modern communications might have been the answer to Moltke's problems, Saddam Hussein's experience in the 1991 Gulf War suggests otherwise. Saddam commanded his forces with the original iron fist, and he had access to advanced communications. But within days of the start of the Coalition campaign, the combination of air strikes against his national command system and his refusal to delegate control seriously undermined the chain of command and, therefore, his force's fighting effectiveness. The critical point to note here is the refusal to delegate.

Saddam's experience provides a graphic illustration of the human dimension of command and control, a dimension which is assuming ever-increasing importance in the age of information warfare. If the full potential of modern technologies is to be reached, then a command and control system must permit the free and unfettered flow of information up and down the chain of command, the delegation of full authority to the appropriate level, and an environment which encourages intellectual flexibility. None of those features is present in Saddam's Iraq. Nor indeed are they present to anything like the extent they might be in most modern defence forces. If the air commanders of the 21st century wish to exploit to the maximum the extraordinary information capabilities already available to them, fundamental change is needed.

Military forces traditionally have been organised along hierarchical lines. A hierarchy is characterised by rigidly defined chains of command through which strictly controlled authority and information flow down from top to bottom, and obedience flows back up from bottom to top. The hierarchical system is centralised, certain and controlled, which means that over the years it has suited the needs of the military, who, given the lethal nature of their business, properly place a high value on those qualities. Equally, however, a hierarchy is bureaucratic, slow and inflexible.

Within a hierarchy, a commander's authority rests to a considerable extent on his privileged access to information, which he guards and releases down the line as he sees fit. Because of the limitations of communications services as they existed until about five years ago, it was extremely difficult, if not impossible, for individuals working at the middle and lower levels of the command chain to circumvent the knowledge monopoly claimed by the senior staff; that is, it was either technically impossible or too expensive for them to access alternative sources of information.

The communications revolution has irrevocably changed that. Today, anyone almost anywhere in the world with access to a lap-top computer and a cellular telephone can, through the Internet, make real-time contact with anyone else similarly equipped; and, through the world wide web, he can also access a data base of astonishing diversity and depth (and, it must be admitted, variable quality).

Capitalising on the quantum advance in the speed and flexibility of decision-making made possible by such technologies, many successful businesses now function as networks rather than hierarchies.[31] The organisational features could scarcely be more different, with the rigidity of the hierarchy replaced by decentralisation, maximum devolved authority, a 'flat' management structure, and a rapid and free flow of information across all levels of the organisation. Military commanders cannot ignore the implications of that profound change. While the fearful nature of war has traditionally induced a cautious approach to organisational change, it may nevertheless be the case that the rigid, bureaucratic hierarchy which has characterised the Western military for two hundred years has outlived its usefulness, as it is through free-wheeling networks rather than constipated command chains that information is most rapidly and effectively transmitted.[32]

When American forces conducted Operation *Just Cause* in Panama in 1989, some soldiers reportedly took cellular telephones with them, thus theoretically acquiring a capacity to circumvent the formal chain of command probably unequalled in the history of warfare. Two years later, during the Gulf War, soldiers took commercially-purchased GPS receivers into the theatre. Accessing the Internet and the world wide web while on operations, either with or without permission, with its enormous ramifications for command and control, is simply the next and inevitable step in the process.

Any revolution in the organisation must also encompass the way in which people are treated and used. Air power practitioners would seem to represent a special case. The point was made previously that air forces are fundamentally different from armies and navies, as the warrior caste is very small and does not lead its troops into battle; indeed, the alleged remoteness of air combat has sometimes attracted disdain bordering on contempt from front-line soldiers.[33] Precisely why, then, air forces have by and large tried to emulate the disciplinary methods of surface forces is not clear.[34] It is noteworthy, for example, that airline pilots are no less disciplined or professional in the workplace than their military counterparts, without being subject to anything like the same regime of statutory socialisation.

There are good reasons for the sometimes mindless, even brutal, inculcation within armies of unquestioning obedience: it is neither the time nor the place for a debate when a second lieutenant orders his troops to 'follow me' over the top. By contrast, advanced air powers thrive on discussion and disagreement, as the 'troop' who is

[31] For one of the most popular early texts on this, see Semler, Ricardo, *Maverick!*, Arrow Books, London, 1993.
[32] For more on this see Espeland, Air Commodore B.J., 'The RAAF and the Information Revolution', in Clarke, *Testing the Limits*, pp 165-179.
[33] See, for example, Hackworth David, *About Face*, Macmillan, South Melbourne, 1989, p 54; McAulay, Lex, *The Battle of Long Tan*, Arrow Books, Milsons Point, 1992, pp 159-60, 166-170.
[34] Szafranski, in Clarke, *Testing the Limits*, pp 130-131.

valued is likely to be the one who, through the process of questioning and exploring, devises an innovative way of repairing a weapons system, or of making a bomb more effective, or of generating more sorties per platform, and so on.

Nor is it clear why the great majority of air services continue to separate their workforce into commissioned and enlisted ranks, and then further divide people through a complex, cascading system of ranks. To start with, as noted above, the disciplinary rationale for doing so is at the least questionable. Additionally, one comprehensive study into the subject has found instances where the reasons for identifying particular positions as either 'commissioned' or 'enlisted' can be arbitrary; that officers and enlisted ranks frequently sit alongside each other doing the same work; and that it is not uncommon for enlisted people to be better qualified than their commanders.[35] There is also evidence from experiments such as the 'Prisoner and Guard' charade to show that individuals quickly adopt the culture of the group to which they are assigned, an outcome which is contrary to the objective of a networked organisation.[36] Similarly, a lengthy, inflexible rank structure through which progress can be made only one step at a time, and which for most air forces is now imposed on a shrinking personnel base, would seem inimical both to innovation and the rapid exchange of information.

Swiftness and sureness of decision have always been central to victory in combat, as has the ability to anticipate change rather than wait for it to happen. Networking based on the information revolution cannot be stopped, and nor should it be. The great workplace challenge facing today's air commanders is how to construct an organisation which can best exploit the extraordinary potential of the information revolution, while at the same time retaining whatever components of traditional military practice an aerospace power genuinely needs. In today's joint environment, their most difficult task may well be convincing their senior army and navy colleagues why aerospace forces should adopt a distinctive organisational model.

## FUTURE DOCTRINE

Aerospace forces may have emerged as the weapon of first choice in modern conflict, but they have done so within an environment which increasingly emphasises joint operations. There are good reasons for this. First, while air power dominates the battlespace, it does so in cooperation with surface forces. And second, air forces do not have a monopoly on air power. The United States Navy, for example, possesses one of the world's most powerful air forces; while a number of armies already operate more aircraft than their peer air force. It is also the case, as noted previously, that armies and navies generally are seeking to replicate capabilities which until now have largely been the preserve of air forces. It follows, therefore, that in order to maximise combat power, facilitate inter-service cultural change and recognise reality, future iterations of air power doctrine must become inclusive. Regardless of whether a particular aerospace capability is nominally owned by people wearing blue, green or

[35] McKinnon, Walter, *In the Dark: The Future Role of Airmen in Air Defence*, Air Power Studies Centre, Fairbairn, 1998.
[36] RAAF, Chief of Air Force's 1998 Strategic Planning Conference, Key Issue Paper Number 1, 'The Case for a Consolidated Service Rank Structure'.

white, its contribution to joint operations must be reflected in a unified aerospace power doctrine.

There are few more valuable tools for transforming military culture than doctrine. However one may wish to describe doctrine's institutional purpose - philosophy, education, politics - properly used it can be a powerful instrument. A rational, coherent and forceful doctrinal statement provides the start-point for informing people what air power practitioners believe in, and what they can bring to the joint planning table.

From the 1920s to the mid-1990s there was a fair degree of commonality in the doctrine of services like the RAF, the USAF and the RAAF. At the risk of over-generalising, that doctrine was primarily concerned with defining the nature of air power by describing its employment; that is, by listing air power roles and missions and then explaining in broad terms how to conduct those activities. Attention was also given to the organisational characteristics of air forces.[37] In short, basic doctrine manuals focused on the 'how to' component of the air power equation, and they were concerned exclusively with air power generated by air forces. Notwithstanding tremendous technological and warfighting developments such as jet propulsion, supersonic and stratospheric flight, nuclear weapons, and precision guided munitions, that approach remained relatively constant.

Significant changes which have been made to basic (or 'strategic') doctrine in the past two years should facilitate progression towards a more inclusive approach. The major change has been a sharp turn away from describing the 'how to' of air power application to explaining *what* air power can do and *why* it is the decisive force in modern combat. Thus, the centrepiece of the revised approach to doctrine, as articulated in contemporary USAF and RAAF manuals, is not platform-specific roles and missions but, rather, generic core 'competencies' (USAF) and 'capabilities' (RAAF).[38] Six core competencies have been identified by the USAF (air and space superiority, global attack, rapid global mobility, precision engagement, information superiority, and agile combat support); and five core capabilities by the RAAF (control of the air, precision strike, precision engagement, rapid force projection, and information exploitation).

By shifting their emphasis from the 'how to' to the 'what' and 'why', the RAAF and the USAF have cast a considerably wider doctrinal net. Stressing generic rather than platform-specific (and, therefore, service-specific) capabilities encourages all air power practitioners to relate to that doctrine. As a former RAAF chief of staff has noted, it would be a strange army or navy which did not seek professional mastery in,

[37] See, for example, RAF War Manual, *Operations*, 1928; RAF Manual AP 1300, *Operations, Fourth Edition*, 1957; Stephens, Alan and O'Loghlin, Brendan (eds), *The Decisive Factor: Air Power Doctrine by Air Vice-Marshal H.N. Wrigley*, Australian Government Publishing Service, Canberra, 1990; RAF, AP 3000, *Air Power Doctrine*, 1991; RAF, AP 3000, *Air Power Doctrine, Second Edition*, 1993; Jones, Johnny R., *Development of Air Force Basic Doctrine 1947-1992*, Maxwell AFB, AU Press, 1997; AFM 1-1, *Basic Aerospace Doctrine of the USAF*, 1984; AFM 1-1, *Basic Aerospace Doctrine of the USAF*, 1992; RAAF, AAP 1000, *The Air Power Manual*, Air Power Studies Centre, Fairbairn, 1990; RAAF, AAP 1000, *The Air Power Manual, Second Edition*, Air Power Studies Centre, Fairbairn, 1994.
[38] RAAF, AAP 1000, *The Air Power Manual, Third Edition*, Air Power Studies Centre, Fairbairn, 1998; USAF, AFDD-1, *Air Force Basic Doctrine*, 1997.

say, precision engagement and information exploitation.[39] That approach now needs to be extended to incorporate, among other things, organisational arrangements and practices.

That latter course of action sounds disarmingly simple, when it is, of course, painfully complex. It is no easy matter to overcome decades of inter-service rivalry. And enough so-called joint doctrine manuals have been written to demonstrate that 'consensus' does not mean 'truth', and that the pursuit of a lowest common denominator of agreement can lead to a loss of meaning.[40] To repeat, 'joint' does not mean 'equal'. It will be a major challenge for the authors of the next iteration of aerospace doctrine to achieve an inclusive outcome while simultaneously protecting the legitimacy of their product.

Before concluding this section, a brief caution on the interpretation and use of air power history is warranted.

In combination with technology and theory, history is one of the key ingredients of good doctrine. Further, the study of history is an integral element of professional military education. Good commanders can be made, and even those who claim that their leadership skills are more intuitive than learned can still only benefit from reading the classics. But there are dangers in looking only backward - in applying too literally the injunction that we study the past to prepare for the future. The fact is that the past contains just as many dead ends as it does signposts; that one era's truisms can be another's falsehoods.

Air power capabilities have been particularly subject to wrong-headed conclusions drawn from so-called 'lessons' of history. The most obvious example is the persistent attempt of some critics to impose the characteristics of past bombing campaigns (notably those against Germany in World War II and North Vietnam twenty-five years later) onto present-day air strike capabilities, a classic case of trying to compare apples with oranges. A conspicuous contemporary example of this misuse of historical example is Earl H. Tilford's critique of the concept of 'halt-phase' warfare.[41] Despite periodic disclaimers to the effect that he appreciates that 1998 is not 1968, let alone 1938, Tilford repeatedly jumps back and forward from Berlin to Baghdad, Linebacker to Libya, and Suez to Sarajevo, as he attempts to 'prove' his case against air power in an exegesis which denies both logic and progress.

The point here is that only in the relatively recent past has offensive air power's performance begun fully to match its promise, a development which warfighters, strategists, doctrine authors and, by no means least, military educators, must clearly understand. Who better to clarify this implied warning than that odd couple of German intellectuals, the Karls Clausewitz and Marx. In his famous opus on the nature of war, Clausewitz saw little merit in looking back any further than the wars of Austrian Succession, for to do so could, in his opinion, lead strategists to dangerously

[39] Fisher, Air Marshal L.B., 'Official Release: The Air Power Manual, Third Edition', in Clarke, *Testing the Limits*, pp 3-5.
[40] See, for example, Australian Defence Force Publications, Operations Series, ADFP6, *Operations*, 1996.
[41] Tilford Jr., Earl H., *Halt Phase Strategy: New Wine in Old Skins … With Powerpoint*, Strategic Studies Institute, US Army War College, Carlisle, 1998.

false conclusions. Similarly, it can be inferred from selections of Marx's voluminous analysis of history that the ideas, technologies and social consequences of the industrial revolution rendered irrelevant all previous experience of human relations.[42]

Clausewitz and Marx might have concluded that a similar logic should be applied to the air power era. While the thoughtful study of air power's brief history will remain a necessary component of any doctrine manual and professional military education, perhaps experiences prior to the 1991 Gulf War should be treated with caution, especially as they might apply to the future.

## CONCLUSION

Air power's ability to dominate the battlespace is no longer questioned by informed observers. In that sense, the first air campaign has been won. At the same time, we have reached the high noon of conventional or traditional aerospace power - of power delivered primarily from piloted, air breathing platforms. If high noon is not to be followed immediately by decline, defence forces must change, perhaps radically, the organisational arrangements and institutional culture through which they seek to exploit aerospace capabilities. That is, it is time now to wage and win the next air campaign.

[42] Clausewitz, Carl von, *On War* (A. Rapoport, ed), Penguin, Harmondsworth, 1982, pp 236-268; Marx, Karl and Engels, Friedrich, *The Communist Manifesto*, Penguin Books, Harmondsworth, 1967, pp 82-85; Marx, Karl, 'Capital*:* A Critique of Political Economy', in Feuer, Lewis S. (ed), *Marx and Engels: Basic Writings on Politics and Philosophy*, New York, Fontana, 1978, p 195. See also McLellan, David, *Karl Marx: His Lift and Thoughts*, Macmillan, London, 1979, esp. pp 144-165, 308-309. Lieutenant Colonel Peter Faber, USAF, made this insightful observation in an e-mail message.