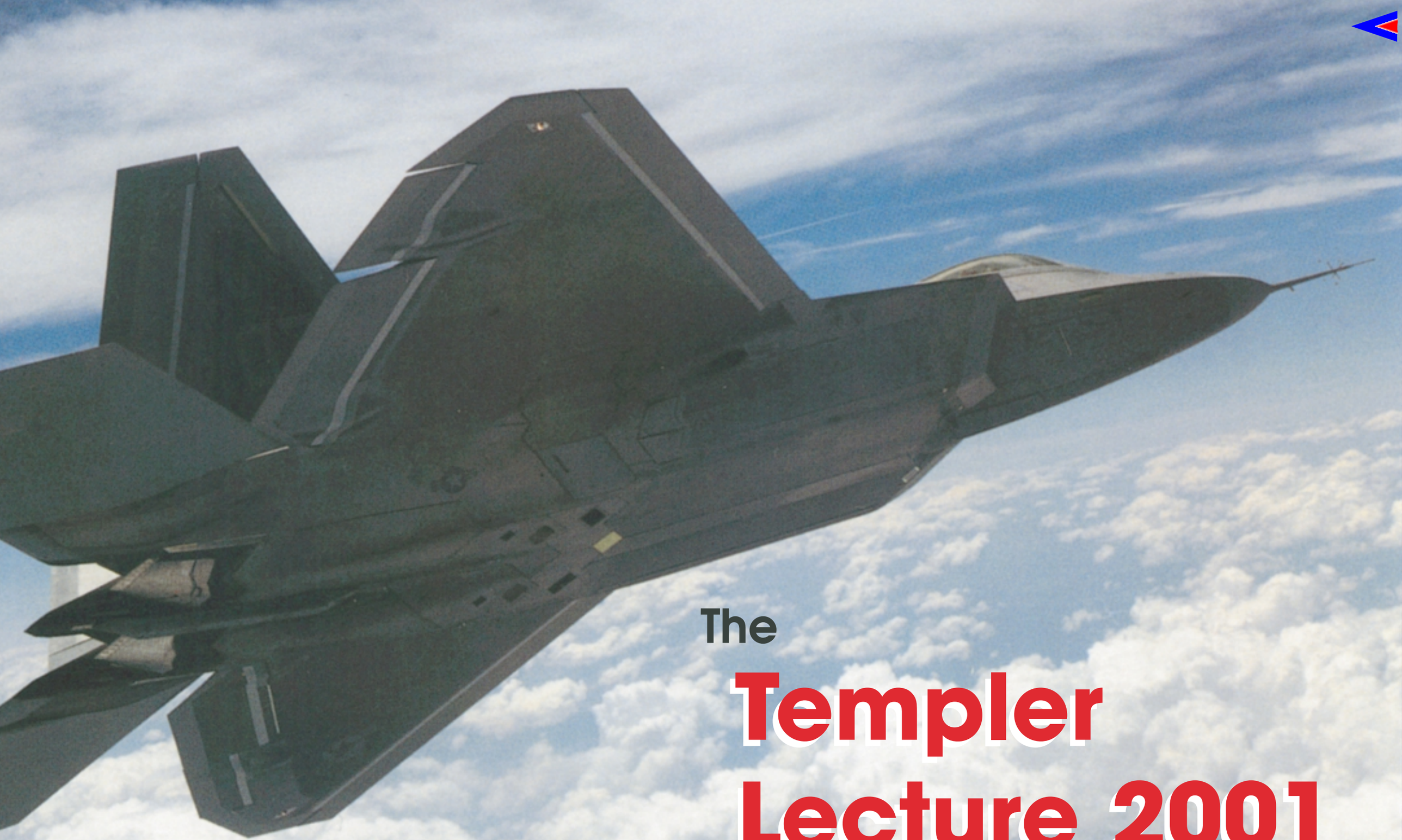

The

Templer Lecture 2001

Presented to members of the Farnborough Branch of the Royal Aeronautical Society on 16 January 2001

In preparing for tonight's address, I was given the broadest possible canvas – the future of the Royal Air Force and the future of Air Power. As the two are so closely inter-linked, I plan to cover elements of both. The future development of Air Power is subject to many variables and many diverse challenges. Some of the challenges are as old as aviation itself and would have been evident to the pioneers who flew from the airfield at Farnborough. Other challenges are of more recent origin and have arrived with the changes and rapid progress in technology, factors that have been more evident in aviation than in any other sphere of warfare – except perhaps space – but more of that later. The United States has long been at the forefront of many, but not all, of the advances in technology. Their stealth programmes with the F117A and B2 aircraft, as well as earlier black programmes, are obvious examples; USAF leadership in space is another. Reading Malcolm Pemberry's excellent booklet on Templer, I was reminded that Black programmes have not always been the prerogative of the US. In developing "Goldbeater's skin", possibly with RAM characteristics, but certainly impervious to hydrogen, Templer was in the van of balloon technology. However, if in 1882 it was possible to lead the field in this and many other areas, it is quite evident that the United Kingdom can no longer match US defence spending on a pound for pound basis.

Nor is it likely in the immediate future that Europe will have the stomach to do so on a Euro for Euro basis. According to some scholars, the Soviet Union attempted this feat in the 70s and 80s, and the rest as they say is history. This does not mean, however, that British or European scientists cannot still match their American colleagues in some key areas. At a centre of excellence such as Farnborough, it would be presumptuous to say otherwise; as it happens, I actually believe it. Nevertheless, I feel on fairly safe ground in suggesting that some here many covet the research budgets of their colleagues across the Atlantic.

It behoves us all to remember that dominance in the field of technology does not bring ex officio *primacy in theory, doctrine or conceptual thinking*

I have already intimated that the future of my own Service is inextricably linked to future developments in Air Power. The two paths are certainly not coincident and it is one of the greatest challenges facing the Royal Air Force to ensure that we not only respond quickly and sensibly to changes in conceptual Air Power thinking, but where it is appropriate, we should aim to be – to steal John Terraine's title – *The Right of the Line*. It behoves us all to remember that dominance in the field of technology does not bring *ex officio* primacy in theory, doctrine or conceptual thinking.

The historical legacy in this field is considerable. In contemplating the original 'prophets of Air Power' – Douhet, Trenchard, Mitchell and de Seversky – it is one thing for academics and their students to pore over the writings and speeches of these eminent thinkers. For them it may be an interesting exercise to see whether or not their predictions were in tune with the realities of technological advances and actually came to pass in the crucible of air fighting. However, it may be more relevant to look at their contemporary influence – who actually read their works, who referred to them and what messages were drawn from them. It may sound cynical to suggest that Douhet (the author of *Command of the Air* and incarcerated by his fellow countrymen for the extreme nature of his views) is far more frequently cited in footnotes than actually studied. Similarly, de Seversky is possibly better known for his World War II Disney film *Victory through Air Power,* than the book of the same name. Tony Mason in his book *Air Power, A Centennial Appraisal,* has suggested that Trenchard had never read Douhet's work. Neither Douhet nor de Seversky were required Staff College reading.

The same cannot be said of Trenchard whose work was widely studied on both sides of the Atlantic. Likewise, some of Mitchell's writing assumed the status of almost 'holy writ' proportions. Similarly, Jack Slessor's work – *Air Power and Armies* published in 1936 – was highly influential at the time and remains a valuable contribution to thinking about the air/land battle. Our contemporary response to these challenges is vigorous and varied. I have continued the initiative started by my predecessors in sponsoring the Chief of the Air Staff's Air Power workshop. This was set up by Mike Graydon in 1994, and the resulting book – *The Dynamics of Air Power* – was published in 1996. It was followed by *Perspectives on Air Power* in 1998 and in December last year I had the pleasure to launch *Air Power 21 – Challenges for the New Century*. The Air Power

…Air Power in Air Clues *and has been transformed into a full Journal. It is also widely distributed and is available, in full, on the World Wide Web*

Workshop takes the product and ideas of civilian academics as well as serving officers from all three Services. It not only reflects the changing nature of Air Power, but ensures that our conceptual thinking is widely available throughout the Services in UK; in academia; and around the world. In parallel we seek a similar exposure, but on a more routine basis, with the *Royal Air Force Air Power Review*. This has taken what used to be a short monthly article on Air Power in *Air Clues* and has been transformed into a full Journal. It is also widely distributed and is available, in full, on the World Wide Web. I am also very pleased that members of the recently formed Air Power Study Group of the Aeronautical Society have been added to the distribution. Hopefully their deliberations will be available to the Management Board. Existing contributors range from flight lieutenants serving on operational tours, through senior officers in NATO, to eminent academics and historians.

In a lecture to RUSI in 1973, one of this country's most eminent military historians – Professor Michael Howard – stated: *'I am tempted to declare that whatever doctrine the Armed Forces are working on, they have got it wrong. I am also tempted to declare that it does not matter that they have got it wrong. What does matter is their capacity to get it right quickly when the moment arrives'*. I suggest to you that, at the height of the Cold War, we could probably afford to 'get it right' on the day; options were limited, operational flexibility constrained. The changing nature of warfare is now such that our doctrinal thinking – and our force structures – need to be sufficiently elastic to be able to cope with rapid transitions from low key peace keeping operations to war fighting. Doctrine in its simplest format is 'that which is taught'. In a more meaningful form it represents the fundamental principles by which military forces guide their actions. In the United Kingdom, as in America, this often reflects what has usually worked best. However, doctrine is not new. The Royal Air Force's first doctrine manual CD22 *'Operations'* and its successor AP 1300, the *RAF War Manual*, published in 1922 and 1928 respectively, are a far cry from the shelves of national and NATO manuals now dedicated to the subject.

The popular conception of that inter-war period is that the Royal Air Force had been totally fixated on strategic bombing. The reality was that conceptual thinking, and the implicit formulation of doctrine, went far beyond this. Much work was done in preparing the doctrine for the defence of the United Kingdom and laying down the operational requirements for fighter aircraft such as the Hurricane and Spitfire. The British aircraft industry revelled in the challenge, as did the manufacturers of engines. As government finance became increasingly available, so industry spooled up for what was going to be a longer struggle than just the Battle of Britain.

Of the many lessons than can be learned from history, by warriors of whatever colour cloth, the enduring lesson that came from the events of 1940 was the vital importance of control of the air. This flows through the veins of every aviator: but it is also close to the hearts of soldiers and sailors. The message was reinforced in every subsequent campaign in the Second World War no

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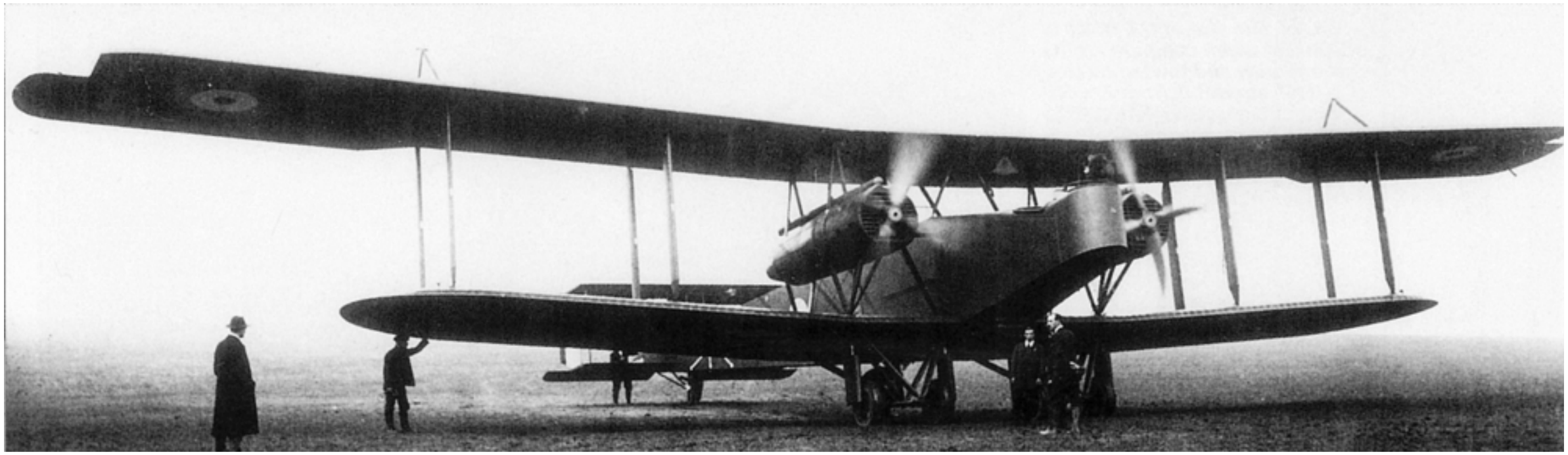

matter whether it was maritime, land or air. The same message was again evident ten years later when United Nations forces were involved in the skies over Korea. Anyone who was closely involved in the military operations to retake the Falkland Islands, or in subsequent operations, will have no doubt of the continuing veracity of Montgomery's dictum – that loss of control of the air results in an early loss of the war.

Air operations during the Gulf War and subsequently in the Balkans have shown graphically what can be done with air superiority or, better still, air supremacy. And no one should be in any doubt that air superiority was not ceded in the face of overwhelming Coalition or NATO firepower. It had to be fought for, established, and then maintained – exactly as was the case over Normandy and then Korea. Control of the air can never be taken for granted. Investment in the design, development and deployment of aircraft such as the Eurofighter is neither done on a whim, nor merely to look good at air shows. These aircraft, their weapons systems and crews must be ready to fight for air dominance in every potential conflict scenario.

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While control of the air denies the enemy scope to utilise his own air assets in the way that he would wish, the benefits extend much further than limitation or denial. They also go beyond allowing friendly forces to prosecute their own campaign free from interference. Control of the air, most importantly, allows the Joint Force Commander to shape the battlespace – ranging from space itself, through the conventional battlefield to the depths of the oceans – in order that he can maximise his own strengths to the discomfiture of the foe. This shaping of the battlespace is fundamental to the doctrine of manoeuvre warfare which lies at the heart of British defence doctrine and thinking.

But air power clearly contributes far more than just the potential to establish control of the air. It is self-evident that a commander must have access to relevant and timely information and this is invariably best gathered by air or space based

platforms. The assets involved may come from any of our own Services, or from those of our allies. They must, however, be co-ordinated if the synergy required in manoeuvre warfare is to be achieved. The benefits are, however, at their greatest when air dominance allows untrammelled access to the air and space medium.

It is equally important that the information gathered by the array of platforms, that are likely to be deployed, is assessed and then distributed in as timely a manner as possible. In the ideal world we will then be able to reduce the operational decision making cycle (or the sensor to shooter time) to close to real time. This is a challenge facing all armed forces – internationally – and I am confident that the RAF, in concert with our colleagues in industry and in the research and trials world, is well placed to play a leading role in the quest for information dominance. Air and information dominance are the key foundations for the subsequent battle.

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Having achieved control of the air and found the enemy, we must then attack him, either to destroy his assets outright, or more likely to shatter his will and cohesion. Air power is in its element in this area with its speed of response, reach and versatility – particularly as it remains an inherently offensive means of warfighting. Moreover, it has the ability easily to raise and lower the tempo of operations to match the political scenario, and it can be effected without getting one's fingers too enmeshed in the mangle. Operations may be in direct support of ground troops who are engaged with the enemy, but are more likely to be mounted against more distant targets. Delivery platforms themselves should no longer be designated strategic or tactical – it is the nature of the task being carried out that dictates the level of warfare. Strategic bombing does not now imply the massive area bombing raids associated with the strategic offensives of the last World War and of Vietnam. A single weapon dropped from a tactical aircraft can now achieve a strategic effect, while traditional strategic assets, such as the B52 with its massive payload, can have a devastating effect on massed troops or armour – very much a tactical role. Air power will continue to have great utility in both direct and indirect air operations to enable joint or combined warfare. Indirect operations will continue to shape and prepare the battlespace for the arrival of surface forces. Meanwhile direct air operations can prove decisive in concentrating force and allowing freedom in the air to complement maritime or surface force manoeuvre. Neither will this use of air power for strategic effect be limited to bombardment or attack, as it is likely to encompass the whole spectrum of roles and mission types.

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No military campaign will succeed without combat support air operations. Such assets are pervasive in the prosecution of all joint and multinational operations, and can be used to enhance and multiply various forms of combat power. Suppression of enemy air defences is the precursor of almost any campaign and while the work of the tanker force goes largely unsung, their contribution is simply vital to the conduct of modern air operations. As you know, we will be expanding our combat support air assets with the introduction of the Airborne Stand-Off Radar (ASTOR) system. This radar surveillance system will provide day/night, all weather imagery of the ground over a large area – both static and mobile targets – and will give the UK's armed forces a powerful and immensely capable intelligence gathering tool. It will transform the way we do business in all phases of conflict and will offer a step change in our overall capability. The planned in service date for these 5 aircraft, based on the Global Express business jet, is 2005 and some 400 Army and RAF personnel will support the new ASTOR Unit at RAF Waddington. ASTOR is a cornerstone of our evolving doctrine for Joint and Coalition operations, and will – I believe – keep the UK at the forefront of developing surveillance technology.

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Assuming an opponent retaliates, then the force protection of all air and ground elements also takes on a crucial importance. This is not a new revelation but resources are limited and we are increasingly restricted to fighting with what we have. Consequently, a full programme of active and passive defence and recuperation measures will be required to preserve our limited assets. In the Royal Air Force, that role has been adopted and developed by the Royal Air Force Regiment. They have demonstrated an expertise second to none and we will see their employment increasingly in a joint environment.

The final task of air power is sustainment. Sustainability is an all embracing concept which includes manpower, equipment and logistics. Combat power forms the physical component of our "fighting power". While sustainability forms an integral part of that physical component, it can also have a marked effect on the other two, namely the conceptual component and the moral component. To put it in simple terms, a perfect plan is not worth the paper that it is written on if it cannot be sustained, and the fastest way to undermine the morale of a fighting force is to fail to sustain it properly.

The utility of air power in combat operations is now beyond doubt. But in the difficult and uncertain circumstances of the world today, air power has much to offer to help preserve and strengthen international security. The Royal Air Force takes considerable pride in its many contributions to disaster relief and, by its very existence, air power also offers a most useful contribution to the preservation of peace – first through the promotion of international relations and secondly through the provision of reassurance that should help avert threats to peace, both real or imagined.

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Our ability to carry out the roles I have outlined will remain inextricably linked to our platforms and weapons and so to the speed of technological change. Hence we need to be prudent in developing our future systems, and carefully balance the military needs of the new operating environment with the art of the possible. Given sufficient money, some will tell you that almost anything is technologically feasible. We are not, nor likely to be, in that fortunate position and so the traditional balancing act will continue. Incremental improvement will play a major part in our procurement of capability. I am, of course, delighted that the RAF will benefit immediately from the modest but real increase in Defence monies and the announcement that we will take forward the highest priority programmes – all weather precision guided munitions, Maverick and secure communications – which emerged from an analysis of the Kosovo Air War.

Another important factor is the constructive working relationship we enjoy with our defence industries, while the effective use of limited research and development funds has often allowed us to respond quickly to new requirements. Indeed, in recent times, much of the development and testing of specialist new systems has been conducted during live operations. The introduction of our Thermal Imaging and Airborne Laser Designation pod during the Gulf War and the development of our LOROP and VICON reconnaissance pods during policing operations over Iraq are good examples. As a result, the United Kingdom remains a world leader in certain key military technologies such as airborne reconnaissance, the development of

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RAF Jaguar with ventral Thermal Imaging and Laser Designation (TIALD) pod

designation capabilities and our skills in collecting and fusing passive electronic warfare and signals intelligence data. A key ingredient to this type of technological development and aircraft integration is the role that DERA plays. I look forward with interest to see how New-DERA emerges; we will most certainly need it to be every bit as effective and innovative as our current arrangements – without, of course, any downturn in value for money.

The future use of space offers enormous potential but, for many, affordability will be difficult. Current military operations already rely heavily on space-based support systems and the US are considering migrating several roles, in particular their Warning and Control System, into space. The cost of such programmes is likely to remain beyond most, but however limited our ability to contribute and participate in the American space programme, we should persist with our modest involvement and offer our support. The benefits that accrue from being involved, albeit only in a small way, in the development of these leading edge technologies are substantial.

The 20th Century saw the birth of air power; it has also been the preserve of manned aircraft and these have proved to be the prime and most flexible means of delivering air power. However, technology is now advancing at such a pace that Unmanned Air Vehicles may be ideally suited to the new hostile environment of high density threat, precision strikes and minimum human losses. In most future conflicts, offensive air action will be paramount and represent an essential

element of the overall military campaign. Modern aircraft, with their fire-power, range and accuracy will strive to destroy, or at least neutralise, our opponent's war-fighting assets in the early days or even hours of a conflict.

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Such abilities are undoubtedly the key to victory or survival. Therefore, the primary mission of the Unmanned Combat Air Vehicles of the future will be to strike effectively and quickly at our opponent on the ground, at sea and in the air. Yet whilst cruise missiles can, to a certain extent, fulfil this offensive role against static ground targets, limitations of cost, payload and accuracy suggest the need for a complementary system, similar in size and method of launch, but re-usable, dropping its warhead and coming back for a quick turnaround for another mission.

Presently, Unmanned Air Vehicles are able to scan wide areas and provide high quality imagery. The next logical step will not only be to locate potential targets, but to also engage and destroy them. But these highly advanced technologies are still under development and I believe that the use of Unmanned Combat Air Vehicles, at least in the United Kingdom, is still some time away. One cannot always predict the types of military operations of the future but the 'fog of war', uncertainty and friction of conflict would always require the presence of a human brain in the loop, to make the right decisions at the right time. Therefore, manned aircraft will continue to offer the best compromise in terms of flexibility and efficiency to deliver air power in the next decades. Unmanned Combat Air Vehicles will, I believe, play a significant future role as a force multiplier, by replacing and supporting manned aircraft in specific missions such as SEAD and other attacks on heavily defended targets. Acting in this role as a 'first day of conflict enabler', Unmanned Combat Air Vehicles would enhance greatly the capabilities of air forces.

I have covered, in the last few moments, several areas of our thinking that could be potentially divisive – the exploitation of space, deployment of UAVs, and reconnaissance assets such as ASTOR. If I add Attack Helicopter into the equation you will immediately be able to comprehend the dangers of our conceptual thinking, and our doctrine, descending into a morass of dogma centred on the ownership of assets. I cannot over-emphasise the dangers of reams of so-called 'emerging doctrine' being written by Services competing like tribal elders for the ownership of the 'new toys'. The reality is that these assets have unique capabilities and their entrance into service has come at considerable cost. They are all elements of the Air Power debate irrespective of cap badge and colour of cloth. In low intensity conflict or peace support operations they will have their roles to play. In anything resembling a medium scale operation, or greater, these assets and platforms will be allocated to the Joint Force Commander who will use them to best effect. In practical terms, the more expensive, or capable, the platform, the more carefully controlled its employment will be through Air Tasking Orders, Airspace Control Orders and the like.

I have briefly covered our conceptual and doctrinal thinking process along with the roles and capabilities of air power that flow from them. I would be remiss if I did not finish by saying something about the people – the practitioners – that actually produce this air power. Since the Cold War, the demands we place on our personnel and their expectations have changed considerably; their training and retention now represents the single biggest challenge that we face as a Service. The pull of commercial aviation and the defence industry more widely has ensured a steady exodus of high quality people. This flow has been exacerbated by successive reviews and studies that have reduced our uniformed manpower by over 40% since 1990. Add to this insecurity and its associated turbulence, – the redeployment of Harrier and Tornado units back from Germany will have involved inter-unit moves for more than 14,000 servicemen and their families – the pressures of current operations, where many are regularly experiencing 4 months or more per year away from home, and the Armed Forces present a less attractive proposition to potential recruits. Now more than ever before we must ensure that our terms and

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conditions of service reflect the aspirations and concerns of our existing people and of those we hope will join us. No longer can we assume an unlimited queue of quality people committed to a full career and who regard the service of their country as a vocation. We are competing against an ever more voracious and enticing civilian job market where incentives abound and stability is taken as read.

To this end, we are urgently researching and monitoring sensitive areas in order that we can deregulate wherever possible. While it would be foolhardy to try and cater for every individual moan and groan, we must go as far as we can to remove systematic obstructions and adopt a more flexible approach to personnel management. In the first instance, we are looking at ways by which we can spread the load of operational deployments as widely as possible across the whole of the Royal Air Force, but this will take time and the options are limited. In the meantime, the underlying requirement is for our people to feel that their contribution to the generation of air power is important and is valued by those in command. It is the contribution of the men and women in the air power loop that make it so flexible and provides the free-thinking and innovative approach that our chosen medium demands. Yes, technology can and will provide invaluable assistance, but it is the air and ground crews who refine and fuse the information, and ultimately arrive at the decisions that make the difference.

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The continuing success of the Royal Air Force will depend on recruiting and retaining highly trained and motivated men and women all capable of operating in a joint environment, but imbued with the ethos, history and pride of their parent Service.

Commanders of all of the Services in this country and throughout NATO have been faced with huge challenges over the last decade in responding to sudden and drastic changes to the world order. Force structures and equipment programmes could not be radically changed overnight, and it is probably fair to say with hindsight that effective change was impeded by the race for ‘peace dividends’

and that a more rational approach has only come about through measured reflection – processes such as the Strategic Defence Review. The expeditionary nature of warfare has emerged, not surprisingly, as a common theme from these deliberations. Furthermore, the nature of the process has allowed us, and our allies on both sides of the Atlantic, more easily to quantify the scale of likely involvement and the resultant force structures that we will need. The decision to enhance our strategic lift capability, in the short term with C17s and subsequently with A400Ms, is evidence of determination and commitment in this area. Further work is being done in the vital area of air-to-air refuelling and we are also looking at improving our capabilities in the suppression of enemy air defences. No matter how desirable, or even essential, these improvements and enhancements may seem, particularly by those closest to the coal-face – whether they be in industry or on the frontline – *it is unlikely that we will get everything that we regard as a priority. Some acquisitions will be funded through more effective procurement processes*. For other additions to our overall capability, we may have to look to greater co-operation with our allies.

There is little doubt in my mind that not only will the world remain unstable well into this new century, but the pressure on us all to act as a force for good will also increase. That said, to be a force for good requires a credible warfighting capability, and I am equally certain that air power, ranging from Tomahawk Land Attack Missile to Attack Helicopter, will increasingly be the weapon of first political choice in anything but a benign environment. As experience of real air campaigns continues to increase – as opposed to traditional stovepipe-style exercises – I am confident that air power will also be at the forefront of all military commanders' minds. This does not mean that air power can solve all ills, and we must guard against making such claims. But the ability of air power to strike at the complete range of targets from those of the utmost strategic value down to the smallest tactical levels will guarantee its place in the vanguard of any offensive operation. Equally, the range and required speed of response in humanitarian and peace support operations will mean that air power will inevitably be required as an essential enabler. Balancing these often-competing priorities will be one of the great challenges facing the Royal Air Force in the next decade. It is a challenge in which I am confident that we have the people and equipment to meet.

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