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**DEFENSE BUDGETARY
CONSTRAINTS AND THE
FATE OF THE CARRIER
IN THE ROYAL NAVY**

Faced with continuing worldwide defense commitments, rising costs for military equipment and personnel, and tight budgetary constraints, British defense planners in the mid-1960's anxiously sought the best means of meeting standing obligations overseas and insuring security at home at a price the average taxpayer would find acceptable. It was within this highly charged political context that one of the most intense and insightful interservice struggles developed between the Royal Navy and the RAF—the debate which resulted in the demise of the attack aircraft carrier.

A research paper
prepared by

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From the close of World War II, British foreign and defense policies have been subjected to a series of reexaminations and subsequent revisions designed to bring them more closely into line with the changing economic and political power relationships operative in the world. One of the most significant of these occurred soon after the Labor Party's victory in 1964 when a series of defense reviews was undertaken in order to reappraise defense policy and, when necessary, bring defense policy into line with the limited economic resources available for defense expenditure. The Government further sought to bring defense policy into harmony with British foreign policy goals and objectives. The *First Labour Defence White Paper* issued in February 1965—a bare 4 months after the Labor Party had formed the new Government—aptly

summarized the new national leadership's view when it stated that:

The present Government has inherited defence forces which are seriously overstretched and in some respects dangerously under equipped . . . there has been no real attempt to match political commitments to military resources, still less to relate the resources made available for defence to the economic circumstances of the nation.¹

Harold Wilson, the new Prime Minister, told the House of Commons during a defense debate the previous December that:

We need to take a fresh look at the world around us, question the basic assumptions on which we have been operating for so long, decide what are the problems and

challenges of the second half of the 1960's and 1970's, formulate fresh policies when needed and start to re-deploy our resources so that we can meet them.²

Although the programs and their accompanying costs presented in the 1965 defense white paper were largely those worked out by the previous Conservative government, the promise of a whole new approach to defense policy was indicated. In introducing the white paper, Denis Healey, Minister of State for Defence in the new Labor government remarked ". . . this year's Defence White Paper is simply the first engagement in a long campaign to re-establish control of the nation's defence and to take a firm grip both on policy and expenditure."³

The first major Labor defense review was to take 3 years to complete, beginning in October 1964 and ending in July 1967. Political and economic circumstances were to make necessary a further series of short-term defense reviews, but the first defense review stands out as perhaps the most thoroughgoing review of British defense policy ever undertaken by a 20th century British Government—or any British Government, for that matter.

Assumptions and Emphasis in the First Defense Review. At the outset of the major defense review, a number of policy decisions and assumptions were made that formed the bases and guidelines along which the studies would be conducted and the conclusions drawn.

The first of these policy decisions was that Britain's role as a world power would continue, at least for the next decade or so. The new Labor government could not be described as coming into office with fixed notions or ideas of diminishing Britain's historic role as a world power—politically, economically, or even militarily. It was recognized that Britain's role would have to be re-examined and, in some cases, redirected;

but by no means was Britain's role outside the British Isles, or Europe, to be abandoned or even curtailed to any great extent. It was conceded that national economic interests overseas could no longer be realistically protected by armed forces stationed abroad nor would British forces be used to maintain overseas territories for Britain in an era of decolonization. The white paper nevertheless noted that:

In maintaining these interests in peace and stability, which our allies share with us, the British contribution is paramount in many areas East of Suez. Here, as elsewhere, we have facilities in our bases at Aden and Singapore. Our presence in these areas makes a substantial contribution to international peace keeping . . .

Our presence in these bases, our Commonwealth ties, and the mobility of our forces, permit us to make a contribution towards peace keeping in vast areas of the world where no other country is able to assume the same responsibility.⁴

Healey pointed out that "a major element in the foreign and defence policies of the Government is to ensure that responsibility for peace keeping outside Europe falls increasingly on the United Nations."⁵ However, until the peacekeeping capability of the United Nations was strengthened, in the political as well as in the military sense, Britain felt dutybound to shoulder a major portion of the responsibility for the peace and stability of areas of the Middle East, Indian Ocean, and Southern Pacific.

A further important consideration with regard to the British presence east of Suez was the fact that Britain was heavily engaged in assisting Malaysia in its confrontation with Indonesia. In the year and a half that the jungle guerrilla war had been fought in Brunei and Sarawak, 58,000 British soldiers, sailors,

and airmen, plus 14,000 Gurkha troops, had been assigned to Far East Command.⁶ By assuming a continuation of the traditional British presence east of Suez, British planners had to allow for a heavy demand on uniformed manpower and resources to fulfill Britain's commitments in the area while the Malaysian confrontation continued. It was necessary to withdraw some forces from the British Army of the Rhine (BAOR) in order to achieve this goal since virtually no readily deployable Strategic Reserve existed in Britain from which to draw combat forces.⁷ In fact, Britain considered a large portion of the 51,000 troops in BAOR as forming a Strategic Reserve that could be utilized for emergency service elsewhere, with prior notification given NATO authorities (SACEUR) and the signatories of the Brussels Treaty.⁸

Britain's 393,000 men and women in uniform formed a small manpower pool from which the necessary forces to fulfill Britain's commitments had to be drawn. A serious overstretch in manpower resources had to be dealt with. The army numbered 176,000 men against an authorized strength of 180,000 (a figure, which even if met, seemed certain to prove inadequate to all Britain's tasks). The RAF had been cut from 127,000 to 123,000 during 1964-65, and the Royal Navy increased slightly to 91,000 men. Serious deficiencies existed in technically trained men, and the rate of reenlistment of seasoned, trained soldiers, sailors, and airmen was dropping due to long and frequent deployments overseas, often without dependents. Higher paying jobs in industry also served to attract highly trained personnel away from the services. Only 52 percent of those completing a 12-year enlistment in the Royal Navy were reenlisting in 1964.

Thus it was fairly clear from the outset that overseas commitments would change little during the course of the policy review. Britain had an ac-

knowledged responsibility to defend former colonies that were newly independent and to sustain as far as possible the order and stability of geographic areas that had formerly been British spheres of influence—especially areas east of Suez. Britain could do little to reorder her commitments east of Suez as long as the battle raged in Malaysia and could do little initially to ease the burdens placed on service manpower.

A second major policy decision was that Britain would no longer act militarily independently of her allies. Denis Healey told the House of Commons: "The most important decision that we have taken is that Britain cannot go it alone in a nuclear age . . . Until disarmament can be achieved, Britain's survival and our national security must depend on the strength and solidarity of her alliance with the United States and Western Europe."⁹ Future British ventures on the order of Suez in 1956 seemed to be ruled out in that sentence. It was evident that Britain would not attempt a major confrontation with the Soviet Union in Europe or elsewhere without the full prior approval and backing of the United States and NATO. East of Suez, British help would be readily available to former colonial states; but if a major confrontation with China or the Soviet Union were involved, then the full backing of the United States or concerted action within the framework of SEATO or CENTO would be necessary for Britain to commit herself to military action.

The major emphasis on the defense review initiated in late 1964 was economy. The Prime Minister had decided that annual defense expenditure must be held to £2,000 million by 1969-70. In achieving this goal, the percentage of GNP to be spent on defense would drop from the Conservatives' fixed rate of 7 percent to 6 percent or even less, given an annual growth rate of 4 percent. The large balance of payments deficit of £800

million disclosed when Labor entered office in October necessitated severe belt tightening in terms of Government expenditure. Defense would have to exercise a greater measure of financial prudence since troops abroad accounted for an expenditure in foreign exchange of almost £300 million a year—over one-third the balance of payments deficit.

The Conservative government had committed itself to a major reequipping of all three services. The army was to receive a new battle tank, the Chief-tain; new 105 mm. and 107 mm. self-propelled guns; the Vigilant antitank missile; the Wombat personnel carrier, and new 81 mm. mortars. Army equipment was to cost £97 million in the 1964-65 estimates and £114 million in the 1965-66 estimates. The Royal Navy, in addition to building its Polaris submarine force, had a second nuclear attack submarine on order as well as four *Leander*-class frigates, three survey vessels, and two amphibious commando ships. Conversions of *Tiger*-class cruisers for the accommodation of ASW helicopters and the procurement of more sophisticated electronic equipment were also undertaken. Naval construction expenditure rose from £103 million in 1964-65 to £133 million in 1965-66.

Perhaps the most awesome cost figures of all were those projected for the RAF aircraft reequipping program: a new multipurpose attack fighter, the P-1154; a close-support VTOL aircraft, the Kestrel (P-1127); a giant STOL air transport, the HS-681; and finally, a new supersonic, tactical-strike reconnaissance aircraft capable of nuclear or conventional weapons delivery. The total aircraft program was to place what Healey termed an "unacceptable burden on the Defence Budget."¹⁰ Moreover, the new aircraft would not enter service for a period of years, and interim purchases of aircraft to replace those in service pending arrival of the new models would be necessary "if the

Royal Air Force was not to become incapable of carrying out its tasks for a period of years."¹¹

As for overall defense expenditure, the 1965 defense white paper noted:

The 1963-64 estimates provided for £1,998 million, an increase of 8.7 per cent or more than 5.5 per cent in real terms. The plans for 1965-66 which we have inherited would have made necessary estimates of £2,175 million, a further increase of 8.9 per cent or 5.1 per cent in real terms. Yet the previous Government's White Paper on Government Expenditure [published December 1963—CMND 2235] envisaged an annual increase in the defence expenditure of only 3½ per cent on the assumption, not so far fulfilled, that the national wealth could not rise 4 per cent each year.¹²

The costs of the reequipping programs for the services were estimated to raise defense expenditure to a figure of £2,400 million by 1969-70. With an inflationary set in the economic tide and the continuing pressure brought to bear on the pound, it could be safely estimated that the 1969-70 expenditure level would be far higher than that projected in 1964. Healey, however, cautioned the House of Commons that:

... there is a limit to the degree to which the problem of defence expenditure can be solved by savings on equipment. Nearly half of our defence budget goes on pay, allowances, housing, movement, and so on. . . . This means that the manpower costs which represent nearly half of our defence budget tend to rise automatically at least as fast as our national wealth.¹³

Harold Wilson had pledged that defense expenditure would be reduced to £2,000 million by 1969-70 and held constant thereafter. To reach this goal,

at least £400 million would have to be pruned from the projected defense budget over the next 5 years.

As previously noted, existing commitments, including Malaysia, had caused a serious overstretch in the manpower resources of the British Armed Forces. They could little afford to be cut in 1964-65. The precarious world situation would not allow it. As Healey further noted: "... the number of men in the Services cannot be cut unless the jobs they have to do are cut."¹⁴ Thus, Healey's preferred solution of cutting manpower costs through cuts in force levels with tandem cuts in equipment procurement could not be implemented until such time as the burden of military responsibilities throughout the world, particularly east of Suez, could be eased from Britain's shoulders.

Initially then, the blade of the budgetary ax would have to fall on equipment expenditures. The equipment procurement programs for all three services underwent the closest scrutiny during the course of the defense reviews. Again, Healey defined the problem and offered the guidelines along which solutions would have to be found:

The basic problem is to choose the weapons system which is best and cheapest for the job in hand and then to ensure that it is produced at the time and price required.

... It means aiming at the maximum inter-operability of weapons and equipment.

... above all, it means avoiding unnecessary sophistication.¹⁵

Although Britain's responsibilities in a troubled world would not permit an even partial disengagement from overseas commitments in 1964-65, some economies might be made after a careful study of commitments and resources had been completed. The House Committee on Estimates found that "when British military commitments had increased or diminished, there had not

necessarily been a re-deployment of men and materials. It was in the field of the relationship of commitments to cost that a review was most urgently required and in which economies could be most fruitfully sought."¹⁶ Building works in progress at overseas bases in 1964-65 alone accounted for over £11 million.

Having discussed in some measure Labor's dilemma in being caught between extended commitments and rising costs on the one hand and limited funds which could be earmarked for defense on the other, we turn now to consider one aspect of the Government's attempt to reconcile perceived defense needs with available resources. The debate over the future of the carrier in the Royal Navy provides an interesting case study inasmuch as it was both a central and emotion-filled issue for the military as well as playing a key role in the Government's endeavor to construct a more cost-effective military for British needs in the 1970's and beyond.

The Aircraft Carrier Issue—CVA-01. The Royal Navy had long planned the construction of new aircraft carriers to replace some of those that had been in service since World War II and were now approaching the end of their useful lives—both in terms of hull fatigue and systems obsolescence in the face of new technology and techniques in the field of naval aviation. Five carriers were in commission in 1964 when Labor entered office. Three of them, the *Ark Royal*, *Victorious*, and *Eagle*, were of 50,000 tons displacement; the *Centaur* and *Hermes* were of only 27,000 tons displacement and thus were better characterized as light carriers. The carriers in service all had angled flight decks, but the largest carriers would have to undergo conversion in order to add new catapult and arresting gear equipment necessary for the operation of the American F-4, already on order. The cost of refits and conversions was

estimated at £30 million or more per carrier.

The Navy also planned to begin construction of a new carrier (CVA-01) in the mid-1960's that would replace the *Ark Royal* and *Victorious* in the early 1970's. The *Eagle* was scheduled to be refitted to handle the new Phantoms, while *Ark Royal* and *Victorious* would continue to operate the Sea Vixen aircraft as fighters for fleet air defense. The new carrier would be constructed to operate the Phantom aircraft while the *Ark Royal* and *Victorious* would not be converted for operation of the Phantoms, and the funds saved could be shunted into the CVA-01 project fund. The construction of the CVA-01 to replace *Victorious* and *Ark Royal* and the retirement of the small, obsolescent *Centaur* would leave the fleet with a three-carrier force in the 1970's: CVA-01, *Eagle* and *Hermes*. Based on these assumptions, authorization was granted by the Conservative government in mid-1963 for design studies to be initiated for the construction of CVA-01. By 1965 these plans were fairly well formalized, and funding authorization for the beginning of actual construction would soon be requested from the Treasury.

The initiation of a thoroughgoing defense review, when the Labor Party entered office in October 1964, brought the navy's plans for a new carrier under the critical eye of Denis Healey and his closest advisers. Studies were initiated almost at once to look into the actual costs of the new carrier itself and the larger aggregate costs of maintaining a carrier force in the fleet. The operational environments in which carrier forces might one day be used were hypothesized, and the concepts of conventional and nuclear warfare at sea were examined to determine what role the carrier would play, if any, in each.

Numerous joint Royal Navy and RAF committees, as well as intraservice study groups, were established to study

various aspects of the questions put forth by the office of the Secretary of State for Defence. The result was perhaps the bitterest, most protracted interservice struggle that Whitehall had experienced for many years. Certainly it was the most parochial conflict in the corridors of Whitehall since the First World War and the early 1920's. Those years saw the RAF fighting for its existence as an independent service against the more entrenched and traditional senior service and the army. The major cause of the ferocity that developed in the interservice bureaucratic wrangling over the carrier issue in the mid-1960's was the fear that, with a £2,000 million defense expenditure ceiling goal set for 1969-70, only one project—the navy's carrier or the RAF's TSR-2/F-111—could survive the struggle for funding.

For the RAF the struggle involved the whole *raison d'être* of an independent role for the RAF. Without the TSR-2/F-111, the RAF would not have a manned bomber capable of strategic strike missions. In this eventuality the RAF would be a service whose sole mission would be to provide support for army and naval forces. The Royal Air Force would cease to be able to justify its existence as an independent service. It would mean the very end of the RAF that had been so carefully constructed by Lord Trenchard in the interwar years and nurtured on the theories of strategic airpower put forward by Douhet and Mitchell.

For the navy, the demise of the carrier would have spelled the end of the Royal Navy as a front rank sea-power—a bitter pill for those taking pride in Britain's many achievements at sea and her tradition as one of the world's foremost naval powers. The defeat of CVA-01 would mean the doom of the Fleet Air Arm. All naval and maritime aviation would become the sole province of the RAF except for a few helicopters carried aboard cruisers

and destroyers.

The interservice squabble was intense, to say the least. It was a fight that was to conclude with no quarter given to the loser. There could be no compromise. Years after its conclusion, bitterness still clouds relations between the RAF and the Royal Navy. For years the carrier had been a strong partisan issue within Whitehall. In the 1920's Lord Trenchard proclaimed the aircraft carrier to be "out of date."¹⁷ Forty years later the question was to be decided. For Healey it was a hard decision to make. He later remarked that it was perhaps his "most controversial decision in the equipment field."¹⁸

Strategic Justification of the Carrier Force. The Royal Navy had long prized their carriers as versatile floating airfields that added greatly to fleet strength and tactical flexibility—especially east of Suez. Critics of the carrier, however, limited the usefulness to limited war situations. The carrier had been written off by many naval theorists as being too vulnerable to attack and thus having no major role to play in a nuclear war at sea. Although strike aircraft operating from British carriers were fully capable of delivering nuclear weapons on a target, naval aircraft never figured into British plans as strategic nuclear delivery vehicles as American naval aircraft had been during the 1950's and 1960's. Aircraft operating from carriers were assigned to tactical nuclear missions only, but prime emphasis was placed on the delivery of conventional ordnance. Any nuclear role or mission was secondary in nature. A respected naval strategist, Vice Adm. Sir Peter Gretton, went even further toward theoretically removing the carrier from a nuclear role when he wrote: ". . . in a general nuclear war, it is most unlikely that the carrier will have a role to play . . . Ballistic missiles have made the protection of carriers more difficult, reconnaissance satellites will make their

concealment impossible."¹⁹ The carrier was thus predominantly viewed in Britain as a limited war weapon with particular usefulness in peacekeeping operations and in "brush-fire" wars.

Carriers were also defended by some naval strategists as being central to the defense of merchant convoys from attack from the air, the surface, or under the sea. The carrier's aircraft and helicopters could fulfill long-range anti-submarine surveillance missions as well as those for close convoy defense in conjunction with screening destroyers against submarines. Fighter aircraft would provide air defense against hostile aircraft and long-range missiles, while attack aircraft could strike at long range against detected hostile surface raiders. With the advent of long-range, surface-to-surface missiles in the Soviet Navy, this latter capability assumed even greater importance since the Royal Navy was not equipped with similar weapons. Some defenders of the carrier even referred to carrier aircraft as manned surface-to-surface missiles. The task of convoy defense was one that the carrier had assumed well in the Battle of the Atlantic during World War II. Land- and sea-based aircraft accounted for over half the German submarines sunk in the Atlantic in World War II. But Britain had far more carriers of all sizes in the period after 1943 than the mere five in service in 1964. In the mid-1970's, when the Royal Navy would claim only three carriers, the maximum number that would be ready for duty in home waters or the Atlantic would be only two. The third carrier would be deployed east of Suez. The United States, with its large fleet of 16 or more attack carriers and six to eight ASW carriers, was heavily relied upon by the Naval Staff to supply the vast bulk of naval air forces that would be necessary for Atlantic convoy defense and striking group operations should the need ever arise. Any British carriers operating in the Atlantic in a contingency or general

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war situation were considered to be only a bonus or contribution to the naval airpower that would be provided by the United States.²⁰ Any major provocation or contingency in the Atlantic NATO area was perceived as automatically being countered by NATO naval forces, thereby heavily involving the U.S. Navy from the outset.

The Naval Staff and Whitehall strategists further theorized that any clash at sea involving the Soviet Navy east of Suez or elsewhere outside the North Atlantic Treaty area would more than likely involve the United States as well. The far stronger American naval power could thus be depended upon to augment the Royal Navy in its defense of the maritime communications so necessary to Britain's survival.²¹ Even in circumstances in which American naval power was allied with that of the Royal Navy, however, carriers were not considered adequate to protect Britain's maritime lifelines fully. Although Gretton conceded that carriers would acquit themselves well in a conventional war at sea, he concluded that: "... a force of three ships, [British carriers in the mid-1970's] even added to those of our allies, would be inadequate for any serious threat to sea communications."²²

The Naval Staff emphasized the view that the primary role of Britain's carrier force was east of Suez in support of amphibious operations in limited wars, police actions, or in pursuit of peace-keeping actions. In this context the aircraft carrier was considered to make its most vital contribution to British and Commonwealth defense. The carrier was a highly mobile airfield that could be brought to bear in a myriad of conceivable contingencies in localities east of Suez where British land bases or airfields were either nonexistent or too far removed from the scene of the action to bring land-based airpower to bear.

carrier as that of being essential to amphibious forces east of Suez, the Royal Navy placed its primary justification for the need and retention of a carrier force on the fulfillment of that role. Admiral Hazlet added the following observation: "One wonders whether there was not some truth in the suggestion that it was not the survival of the amphibious task force which depended upon aircraft carriers so much as the survival of aircraft carriers which depended upon the concept of the amphibious task force."²³

By placing the strength of their argument for the retention of the carrier force on its use in limited war alone—a war in which the carriers would neither conduct nuclear strikes nor face an enemy employing nuclear weapons—the Royal Navy pictured carriers as being a secondary requirement for overall fleet strength. Thus, the carrier was rendered vulnerable to criticism that it was by no means a vital component of the fleet necessary to ensure fleet offensive or defensive powers in both nuclear and conventional warfare environments. It was this facet of the Admiralty's rationale for the maintenance of the carrier in the Royal Navy that proved to be crucial to the final outcome of the Whitehall battle for the carrier which ensued in late 1964 through 1966.

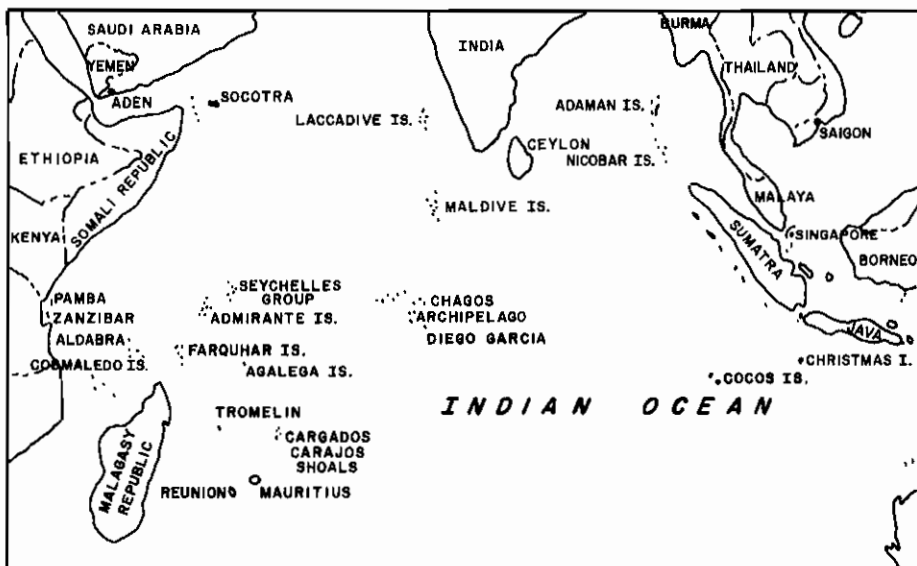
The Whitehall Battle for the Carrier. For over 16 months the corridors of Whitehall were to witness what must have seemed to many one of the most curious, at times comic, yet most deadly earnest battles ever fought by the British services. Battlegrounds were formed, both within the navy and against the RAF. The navy chose to fight the battle for the carrier within the context of scenario studies set east of Suez. The navy proposed this scenario setting for several reasons. First, the Naval Staff had for a number of years justified carrier forces primarily for their usefulness east of Suez. Second, by pitting the

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highly mobile carrier and its embarked aircraft against the land-based aircraft of the RAF east of Suez in various study scenarios set by the office of the Secretary of State, the navy thought it had chosen the geographic setting most difficult for the RAF and most advantageous to the Royal Navy.

A quick glance at a map of the Indian Ocean and Southeast Asia demonstrates how vast the distances are between the various major British bases east of Suez. Given the great distances between the airbases East of Suez, the

vide important island airbases for RAF operations stretching from east Africa to Australia through the Indian Ocean area. But even in the BIOT, great distances separated the islands. From Aldabra to Victoria in the Seychelles is over 800 miles; from Victoria to Diego Garcia in the Chagos group is 1,100, and from Diego Garcia to Cocos Island is 1,700 miles. The Royal Navy felt assured of victory in pitting the carrier's capabilities to patrol and police the Indian Ocean area in defense of British interests there against any claims the



navy thought it impossible for the RAF to build a strong case for land-based air to displace the carrier as policeman of the vast ocean areas involved. Singapore lies 4,500 miles from Aden and 2,400 miles north of Darwin, Australia. The Australian airstrip at Cocos Island in the Indian Ocean is 1,100 miles distant from Singapore and 2,300 miles from Darwin. The British Indian Ocean Territory (BIOT), incorporated as a British colony in 1965, formed a strategic island arch from Aldabra Island (500 miles east of Dar es Salaam) through the Seychelles and Chagos Archipelagoes. With Cocos Island at the Eastern end of the Indian Ocean, the BIOT could pro-

RAF might put forward that the task could be assumed by maritime reconnaissance aircraft and long-range F-111's or TSR-2 aircraft.

The Royal Navy also thought that the carrier would emerge the victor in comparative cost studies since the bases proposed by the RAF for Aldabra, Diego Garcia, and Victoria had not as yet been constructed. Nor had the long-range, strike reconnaissance aircraft needed to police the wide ocean area effectively been acquired. Surely, the acquisition of one more carrier and F-4 fighters would prove cheaper in detailed cost-analysis studies. Denis Healey readily agreed to the navy's proposal

that the merits of the carrier be put to the test against land-based air in a series of contingency studies employing various scenarios in the east of Suez context. Thus the carrier was never really studied in its role of fleet defense or strike operations in the Atlantic or elsewhere. The navy thought the carrier on much firmer ground east of Suez where the RAF would be hard put to prove that land-based aircraft could effectively perform the many functions of the carrier with equal flexibility and at less cost. The Naval Staff did not particularly want the carrier evaluated competitively in other geographic settings.

The scenarios for the many studies conducted were drafted in the office of the Secretary of State for Defence and then given to the Air Staff and the Naval Staff for solution. Other parallel studies were instituted at the Defence Operations Research Establishment at Byfleet. Yet others were set before joint navy-RAF committees for solution.

The navy was not as well prepared or organized as the RAF for the bureaucratic infighting that ensued. The Chief of the Air Staff, Sir Charles Elworthy, was a trained barrister whose legal polish and eloquent delivery made no little difference in the presentation of the RAF case. His subordinate directly in charge of defending the TSR-2/F-111, Air Marshal Sir Peter Fletcher, was also trained as a barrister and possessed a quick, legal turn of mind. Navy admirals were later to remark that, given the proper brief for a case, Elworthy and Fletcher could probably win cases even against Divine Providence.²⁴

Part of the problem the Royal Navy had to contend with was a lack of agreed support for the carrier within the navy hierarchy. The navy's house was indeed divided on the issue of the carrier. The First Sea Lord, Sir David Luce, defended the carrier as a matter of principle against the onslaught of the

RAF, but other admirals were not so certain that the carrier should be defended at all. Some believed the resources required to build CVA-01 would seriously detract from other naval construction programs—especially a new generation of modern ASW and AAW frigates and destroyers, as well as the nuclear attack, hunter-killer submarines, already delayed once under the Conservative government.²⁵ As one admiral put it, "To have built CVA-01 and maintained the carrier force into the 1980's might well have destroyed the fleet as a balanced force—and the key to everything is balance."²⁶ The Third Sea Lord, responsible for naval personnel, was quoted publicly several times during the carrier battle as saying that even if CVA-01 were built, he did not know where the manpower resources to operate her would come from. Even with the added burden of manning a new carrier, however, many in the Naval Staff thought it could be done, with a few economies elsewhere.²⁷ The fact that the Navy Board (formerly the Board of Admiralty) was not united in its support of the carrier was only one of many reasons for the failure to save the carrier for the Royal Navy and to ensure the future of the Fleet Air Arm.

The major spokesman for the navy became Adm. Sir Frank Hopkins, Deputy Chief of the Naval Staff, who was a naval aviator and carrier commander as well as a former destroyer commander. Hopkins was a plain-spoken, blunt, at times irascible, naval officer who lacked the debating talents of his skilled RAF opponents, but perhaps his greatest handicap was that he was not solely in charge of the carrier's defense. Various naval officers spoke for the carrier with varying shades of enthusiasm. Admiral Hopkins, however, bore the brunt of the burden, even though he lacked complete command over the navy effort, unlike his RAF opposite number, Air Marshal Fletcher.

The Royal Air Force adopted the

tactic of staging a massive offensive against the carrier from the start. The Air Staff sought to prove land-based airpower to be not only capable of assuming the role of the carrier east of Suez, but at a cheaper price as well. The RAF argued that of three carriers in the fleet, only one would be available for service east of Suez at any given time due to overhaul and maintenance schedules and the 2 weeks it took a carrier to travel to and from the Far Eastern station. Denis Healey was quoted as saying: "We could never have had more than one carrier in one place at a time with a three carrier force. Five carriers would have made sense, but still this would have been too expensive."²⁸ The navy countered with the argument that even with only one carrier east of Suez it could hit surface targets with impunity within 1,000 miles of its position, give air cover continuously over a radius of over 400 miles, and provide protection against submarines out to 100 miles. Moreover, the carrier was mobile and could proceed from hot spot to hot spot on fairly short notice—48 to 96 hours in most cases. The navy argued that fixed land bases were vulnerable to attack, especially east of Suez. The open sea afforded the carrier a large degree of protection such as the U.S. carriers off Vietnam enjoyed as opposed to land bases. The carriers had performed well in the Kuwait crisis of 1961, the east African mutinies of 1964, and in support of the army in Malaysia. Still, one carrier could not be everywhere at once. If more than one serious confrontation erupted or was in progress at the same time east of Suez, one carrier could not cover both.

The RAF further contended that at least two-thirds of the carrier's aircraft were needed in defense of the carrier itself. This proved to be a telling argument. The smaller *Hermes* carried 12 fighters to the seven attack-strike aircraft. Denis Healey remarked more than once that "even if she [*Hermes*] carried

seven Buccaneer Two-Double Stars, they'd have the capability of only three land-based F-111's."²⁹ While the larger carriers could afford to carry greater numbers of Buccaneer attack aircraft, the Air Staff hammered home the point that the carrier's limited number of strike aircraft could give only limited air cover to amphibious troops ashore even though naval aircraft could be recycled for four to six sorties per day. The RAF claimed that its aircraft anywhere in the world could be rushed to airfields east of Suez in less than 48 hours, while a second carrier would take 10 to 15 days to arrive.

The Air Staff also emphasized the argument that land-based aircraft had a better range and ordnance payload capability than did naval aircraft. The RAF air marshals argued that 25 F-111's based at Singapore would be able to equal the Royal Navy's strike capabilities in a vast oceanic area bordered by Aden, Capetown, and Perth—an area enclosing more than 4 million square miles. Land-based Phantoms, said the Air Staff, could provide the necessary cover for surface naval units and convoys operating within a thousand miles or more of their air bases—including those to be constructed in the British Indian Ocean Territory.

The navy had long been skeptical of the RAF's ability to provide air cover for the fleet. Many naval officers, remembering the interwar period when the RAF had been responsible for naval airpower and fleet air defense, doubted that the RAF could be trusted with the responsibilities of providing air support to the fleet. During the 1920's and 1930's when the Fleet Air Arm had been incorporated into the RAF, air force funds and attention were largely devoted to the strategic bomber force, and little was spent on developing naval aircraft or providing modern aircraft in numbers suitable to the task of fleet support. The navy consequently entered World War II flying the Swordfish bi-

plane as its primary attack aircraft instead of the faster, more agile aircraft found in other navies. Once the Fleet Air Arm was again firmly in navy hands, the navy was loath to ever again entrust its mission to the air marshals who had proven to have little regard for the requirements of the fleet in the past.

The navy was quick to point out that the F-111's were perhaps too sophisticated for a maritime policeman's role and that the F-4's providing air cover for the fleet would need in-flight refueling—an added expense since long-range tankers would have to be based east of Suez in numbers. The F-4 pilots would have to fly 6 to 8 hour sorties in order to reach the fleet units and provide air cover continuously on station. Perhaps even more worrisome was the dread that air cover provided by the RAF would not be on station when required for fleet defense.³⁰

The navy never did—and still does not—trust the RAF to provide adequate air support to the fleet.³¹ Only the carriers and the Fleet Air Arm were viewed as being able to discharge effectively the air support requirements of the fleet. On that point the navy was adamant.

At one point in the carrier battle in Whitehall, moderate elements from both the navy and the RAF attempted to reach a compromise solution. It was proposed that the navy be allowed to proceed with construction of CVA-01 but that RAF squadrons in the future would fill part or all of the air groups flying from the carrier decks. This would preserve the carriers in the fleet while granting the RAF responsibilities for the aircraft. This proposal came to naught for two reasons. Senior navy admirals were totally against the RAF's assumption of any responsibility for naval aviation duties under any guise. Secondly, Air Marshal Fletcher and others were determined that the carrier must be sunk at all costs.³² To have allowed the carrier to survive would

have meant the cancellation of TSR-2/F-111 for budgetary reasons. Both could not be funded under a £2,000 million defense expenditure ceiling as laid down for 1969-70. The Labor government was bent on reaching this expenditure target at any material cost. Moreover, even if the RAF piloted the carrier's embarked aircraft, those aircraft would necessarily be of naval design and procurement—primarily, the Buccaneer, Phantom, and Scimitar. The survival of the Buccaneer—a certainty with the survival of the carrier—would doom the TSR-2 or F-111. The Buccaneer, rather than the TSR-2 or the F-111, would become the RAF's reconnaissance-strike aircraft. The RAF had repeatedly rejected the Buccaneer as inadequate for the RAF mission in a sophisticated wartime environment such as in central Europe, and they did not want it now. Thus, in the minds of many RAF marshals, the carrier had to be defeated to ensure that the TSR-2 program or the F-111 would be free of both financial and aircraft competitors.

The Royal Navy had also sent a team of naval officers and engineers to the United States to look into the possibility of buying several *Essex*-class carriers from the U.S. reserve fleet. The Navy Board thought that this option, if feasible, might prove a cheaper means of augmenting the carrier force without building CVA-01. The United States was willing to sell several of their *Essex*-class carriers for little more than the cost of taking them out of mothballs, but the cost of modernizing and converting the carriers to British specifications proved to be excessive. Moreover, the age of the American carrier hulls limited their useful lives to far less than that of a new carrier. The *Essex*-class carriers would not be seaworthy beyond the early 1980's, even with extensive refitting and conversion. The Royal Navy turned away from this promising option with regret.³³

The navy spokesmen made one major

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concession during the course of one study that posed the scenario of a carrier task force sailing from Australia via Sumatra to Singapore over a period of 3 months against sophisticated air attacks. The Navy Board readily admitted that land-based air would have to provide continuous air cover for the task force operating for such an extended period. The carrier aircraft could not work at full pitch for 90 days on end in the face of continuous air attack. Ten to 15 days was about the limit of a carrier's endurance without rest for flight crews and major replenishments. The Navy Board had always accepted the rationale for purchasing the F-111 for use east of Suez and recognized the importance of the aircraft to British commitments east of Suez.³⁴ Part of this justification was to augment and support the fleet in hostile waters. The RAF, however, never admitted to the necessity of the carrier. This admission by the Navy Board that the F-111 was sorely needed east of Suez further sealed the fate of the carrier in a hostile budgetary environment where only the F-111 or the carrier could survive. Thus, the carrier appeared to augment land-based airpower rather than vice versa. Moreover, in this particular study, land-based F-111's emerged as being cheaper than the carrier task group.

Of all the studies undertaken with regard to land-based air versus the carrier, the comparative cost studies proved perhaps the most crucial to the final decision that was taken. An attempt was made to cost the carrier task force and the equivalent land-based airpower necessary to Britain's tasks east of Suez functionally. As those who are familiar with various attempts to compare the costs of land-based versus sea-based airpower in the United States in recent years, the results of such studies are largely determined from the initial assumptions as to what is to be included in the functional system to be costed.

On the naval side, inclusion of the costs

of the protective destroyer screen defending the carrier, the necessary replenishment ships, naval aircraft R. & D. and procurement costs, pilot training costs, and shore support bases costs would all be totaled together as the systems cost of a carrier task force on station. There are as many different ways of costing a carrier task group as there are analysts to pose the problem, but in Britain a full systems approach was used to cost out a carrier task group on station east of Suez. In 1966 naval aviation support and operating costs were put at £150 million annually, of which £45 million was for operations, £70 million for aircraft, and £18 million for carriers in commission.³⁵ In the next 10 years, it was assumed that the Navy would spend £480 million on new aircraft and missiles, while the Ministry of Aviation might spend as much as £130 million on research for naval aviation programs.³⁶ Thus the complete naval aviation program, including the £60 million building costs of CVA-01, the maintenance and necessary conversion of *Ark Royal* and *Hermes*, was put at £1,400 million over 10 years' time.

On the RAF side of the equation, a formula was devised to cost out not only the F-111's and F-4's the RAF would need to replace the carrier east of Suez, but to provide for costs of building airbases on Aldabra, Gann, and other islands. Included were costs of lengthening runways, building additional revetments, installing increased POL storage facilities, and troop accommodations at those airfields already in existence.

The result of the study proclaimed by Healey was that the carrier force had proven 2.5 times as costly as did land-based air stationed east of Suez.³⁷ In the Pentagon, similar studies in cost-benefit analysis, pitting land-based air against carrier-borne aircraft, resulted in findings that differed markedly. One study found carrier forces to be 2.5 times more expensive than land-based

air; another concluded that the costs were equal; yet a third decided that seaborne airpower was cheaper by a small margin.³⁸ These varying cost comparisons were largely the result of the initial assumptions concerning what was to be included in the costing of each competing weapons system. Thus, the results could most often be inferred from the initial parameters of the cost-benefit study. As one astute researcher wrote:

Because analyses directed at comparative sea-based/land-based tactical air power costs and effectiveness are generally viewed as inconclusive, the factor of absolute cost may become predominant. Thus carrier force level determinations, ostensibly driven by evaluations of threat and risk, may be substantially affected by the factor of high unit investment cost in a background of budgetary constraints.³⁹

In late 1965 the time for decision had come. Top-level discussions of the carrier's fate took place in November and December of 1965. With the publication of the Defence Review in February 1966 came the public announcement that:

The present carrier force will continue well into the 1970's; but we shall not build a new carrier (CVA-01). This ship could not come into service before 1973. By then, our remaining commitments will not require her, and the functions for which we might otherwise have needed a carrier will be performed in another way. . . .

We believe that the tasks, for which carrier-borne aircraft might be required in the later 1970's, can be more cheaply performed in other ways. Our plan is that, in the future, aircraft operating from land bases should take over the strike-reconnaissance and air defence functions of the carrier on a

reduced scale which we envisage that our commitments will require after the mid-1970's. Close anti-submarine protection of the naval force will be given by helicopters operating from ships other than carriers. Airborne early-warning aircraft will continue to be operated from existing carriers, and subsequently from land bases. Strike capability against enemy ships will be provided by the surface to surface guided missile.⁴⁰

But the decision to end the carrier as an effective fleet unit in the mid-1970's was not taken without one final political and military bid to reverse the decision. When Denis Healey's decision to forego the building of CVA-01 was made known within the Ministry of Defence, Christopher Mayhew, Minister of State for the Navy, asked for a hearing before the full Cabinet to plead the navy's case for the carrier. Mayhew had been fairly confident that the logic for continuing the carrier force as necessary to stated commitments would win the day, and he was shocked when Healey's decision went against the navy. Healey refused to allow Mayhew to speak to the Cabinet, saying that he—and he alone—spoke for Defence.

Christopher Mayhew eventually did plead his case before the Defence and Overseas Policy Committee, however, with the Prime Minister in the chair. Officially, the Defence and Overseas Policy Committee (DOPC) did not constitute a Cabinet, but it often acted with the full force of a Cabinet in making decisions in certain fields. Thus, Harold Wilson allowed Mayhew a hearing without legally questioning Healey's authority in refusing Mayhew's request to appear before the full Cabinet to speak on defense matters. Mayhew told the DOPC that to continue current commitments east of Suez without the carriers was impractical, if not impossible. He proposed that either commitments east

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of Suez be reduced, with a consequent reduction in defense expenditure to a figure lower than £2,000 million by 1969-70, or that greater funding be allocated to defense including the building of CVA-01 and procurement of F-111A's if commitments east of Suez, as they stood, were to be continued.⁴¹ Mayhew later told the House of Commons:

... the sums of the Defence Review have been worked out and it is plain that £2,000 million is a bad figure for a defence budget—it is too small if we want to stay East of Suez and much too big if we do not. It lands us with an in-between presence East of Suez, which is still extremely expensive, especially in foreign currency, involves us in considerable risks, military and political, and makes no equivalent contribution to our real national interest.⁴²

Mayhew then contended that to follow his proposed course in restructuring commitments to match the cuts in capability he charged had been made would allow a defense budget of no more than £1,800 million in 1969-70. Christopher Mayhew's pleadings did not sway the Labor leadership sufficiently to alter the decision to scrap CVA-01 and the remaining carriers in the mid-1970's. Consequently, Mayhew resigned his post as Minister of State for the Navy with feelings of having failed adequately to support the navy's case for CVA-01 and feelings of distaste for an announced defense policy that had seriously cut armed forces capability without commensurately cutting overseas commitments to reflect those reduced capabilities.

The First Sea Lord, Adm. Sir David Luce, also appeared before meetings of the DOPC as did Sir Charles Elworthy, Chief of the Air Staff. Both gave short resumés as to their service positions on the carrier question. When the issue was decided against the carrier, Admiral

Luce resigned as First Sea Lord to protest the decision and maintain the honor of the navy officer corps against what was deemed a terrible political blow. The entire uniformed composition of the Navy Board was prepared to resign with Admiral Luce on bloc to protest the decision, despite their differing views on the carrier, but Luce persuaded them that he alone should figuratively demonstrate the navy's outrage at the decision and that they should remain in office to administer and steer the navy through what might prove to be even rougher waters ahead.⁴³ Admiral Luce's resignation was based solely on the carrier decision going against the navy. Christopher Mayhew's resignation, on the other hand, was predicated by a protest against the wider aspects of defense policy east of Suez as well as the decision to end the carrier fleet and relegate the Fleet Air Arm to memory.

And so the aircraft carrier's death knell was sounded in late February 1966. The value of carriers was not lost on the Labor government, however. A passage in the Defence Review notes:

The aircraft carrier is the most important element of the Fleet for offensive action against an enemy at sea or ashore and makes a large contribution to the defence of our seaborne forces. It can also play an important part in operations where local air superiority has to be gained and maintained and offensive support of ground forces is required.⁴⁴

But the aircraft carrier as a weapons system had, in the various studies conducted by Healey, seemingly priced itself out of the market competition with the RAF for limited funds.

The navy not only suffered a major defeat at the hands of the RAF, but also remained internally scarred as a result of the carrier fight. One naval officer described the feelings of many of his aviator colleagues in these words:

Feelings as a result of the Defence Review may be divided into three: Grave distrust of the government's logic which led to the decisions of the review; A strong suspicion that the Fleet Air Arm has been "sold along the line" by senior naval officers; and incredulity at a policy which requires fixed wing aviation to continue for a planned ten years without any new carriers. Even further incredulity that this policy should appear to be supported by the present Navy Board.⁴⁵

The young aviator accused his navy seniors of being reluctant to match the tactics of the opposition in addition to the failure of many senior officers of the Navy Board to wholeheartedly support the carrier in its struggle against the RAF. "With the exception of those who have actually been connected with naval aviation, the Royal Navy as a whole has never regarded carrier aviation as anything other than a bizarre hobby; some officers ride on one-wheeled bicycles, others practice aviation."⁴⁶

The idea of developing a minicarrier, advocated briefly by some officials during the carrier debate, continued to linger on. The Future Fleet Working Party, set up to plan long-range naval policy within the Navy Board, fostered plans for a minicarrier that would utilize helicopters and VTOL aircraft such as the P-1127 Harrier equipped with a heavier, more powerful marine engine. The new, smaller carrier would specialize in sea-control missions rather than support of land operations, though this secondary mission was well within the ship's designed capabilities. However, the minicarrier protagonists had considerable difficulty in fostering their scheme. An informal agreement with air marshals of the RAF that RAF pilots would fly the aircraft assigned to a minicarrier was struck in order to gain RAF support for the venture. The Air League supported this joint RAF-navy

program as well. Unfortunately, however, the subject of proposing a minicarrier to the Secretary of State for consideration was anathema to the First Sea Lord who succeeded Adm. Sir David Luce; Adm. Sir Varyl Begg thought the atmosphere so politically charged in the wake of the carrier dispute that the matter of the carrier should be put aside for the time being. What is more, he opposed the RAF flying aircraft from any future minicarrier, thus costing the navy valuable RAF support—if only tacit support—in any future bid to retain the carrier in the fleet in any form. Finally, Admiral Begg's successor, Adm. Sir Michael LeFanu, accepted the minicarrier idea, but in doing so, he changed the name of the proposed ship to a "through-deck cruiser" so as not to resurrect suspicions of the navy proceeding with a new carrier, opening old wounds, and perhaps rekindling the carrier debate in some form.⁴⁷ Only as late as 1972 did the concept of a minicarrier or through-deck cruiser seem to be coming to fruition. Even now the new carriers will not enter into service until the end of the decade. Ironically, Air Chief Marshal Fletcher, who masterminded the defeat of the carrier years before, is now in charge of procuring the aircraft for the through-deck cruiser!

In retrospect it seems that CVA-01 could have been built with no great strain on the navy's financial or manpower resources, although some funding would have had to be diverted. Half the cost of the new carrier could have been found by canceling the conversion of three *Tiger*-class cruisers to ASW helicopter carriers. The conversions proved expensive and unwieldy as well as non-cost-effective. By decommissioning these three ships, the skilled manpower might also have been found to serve as crew for CVA-01.⁴⁸ Other economies would have had to be made within the navy—nonessential airbases closed, others consolidated, and so forth—but

the carrier might have gained a reprieve had the navy fully supported its own officers fighting for the carrier and had the Navy Board been willing to make some sacrifices in order to retain the carrier into the 1980's.

But an even larger shadow loomed with the death sentence pronounced upon the carrier in 1966. Britain's whole defense posture east of Suez now hung on the RAF's ability to establish and maintain island bases in the Indian Ocean, Australia, Singapore, and elsewhere. The F-111A and the Phantom would have to carry the brunt of British peacekeeping and brush-fire war responsibilities from the mid-1970's on without the support of the carrier. The "island bases" theory had won out over the carrier's inherent flexibility as a floating airbase. One writer perhaps best summed up the situation when he wrote:

If it is decided not to build any aircraft carriers in the future, this country has two choices. It can either restrict the areas in which it has any pretensions of being able to intervene militarily to those within striking range of existing bases or it can develop sufficient new bases which, when matched to the future performance of aircraft, give comprehensive air cover to all likely areas of operations . . .

It is hoped that the Government faced up to those choices squarely when it decided not to build any more aircraft carriers. There may be a good case for assuming that we will have withdrawn from East of Suez by the early 1970's or alternatively they may be certain that adequate air support can be provided by more economical means. What must not

be allowed to happen is, that for economical and political reasons, we attempt to follow a foreign policy that we do not have the military power to support. Such a situation would at best be ineffectual and wasteful and at worst could lead to a military disaster that would do far more harm to our country than the cost of any new carrier programme.⁴⁹

The island bases were never constructed as planned or proposed by the RAF. Although many in the Ministry of Defence, including Denis Healey, agreed fully with the foregoing analysis, commitments east of Suez were not thoroughly overhauled or cut for almost another 2 years. However, the trend toward disengagement at some future date had been established in the publication of the 1966 defense white paper. In the meantime, Britain's remaining carrier force soldiered on, providing invaluable service in covering Britain's withdrawal from the far reaches of empire. Today, only *Ark Royal* remains as a strike aircraft carrier in active service.

BIOGRAPHIC SUMMARY



Lt. Comdr. William S. Johnson, U.S. Navy, is a graduate of the U.S. Naval Academy and holds both a master's degree and a Ph.D. from the Fletcher School of Law and Diplomacy. He has served as

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FOOTNOTES

1. Gt. Brit., Ministry of Defence, *Statement on the Defence Estimates, 1965*, CMND 2592 (London: H.M. Stationery Off., February 1965), par. 1.
2. Gt. Brit., *Parliamentary Debates* (Commons), 5th ser., v. 707, col. 1395, 3 March 1965.
3. *Ibid.*, col. 1329.
4. *Ibid.*, pars. 19, 20.
5. Gt. Brit., *Parliamentary Debates*, col. 1339.
6. This was including the garrison troops in Hong Kong. Gt. Brit., Ministry of Defence, par. 49.
7. *Ibid.*
8. *Ibid.*; also interviews.
9. Gt. Brit., *Parliamentary Debates*, col. 1330.
10. Gt. Brit., Ministry of Defence, par. 28.
11. *Ibid.*
12. *Ibid.*, par. 1.
13. Gt. Brit., *Parliamentary Debates*, col. 1342.
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15. *Ibid.*, cols. 1343, 1344.
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17. H.P. Allen, "The Future of Britain's Air Power," *Royal United Services Institute Journal*, November 1967, p. 33.
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19. Sir Peter Gretton, "The Future of the Aircraft Carrier," *Brassey's Annual* (New York: Praeger, 1965), p. 193.
20. Interviews.
21. *Ibid.*
22. Gretton, p. 193.
23. Sir Arthur Hazlet, *Aircraft and Seapower* (London: Cox and Wyman, Ltd., 1970), p. 340.
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25. *Ibid.*
26. *Ibid.*
27. See also A.W. Clarke, "The Strength of the Royal Navy, 1906-1966," *Brassey's Annual* (New York: Praeger, 1966), p. 109, regarding manpower problems.
28. Reed and Williams, *Denis Healey and the Policies of Power*, p. 19. Even with five carriers in commission, the Conservative government found it difficult, if not impossible, to keep two carriers on station east of Suez on a continuous basis.
29. *Ibid.*
30. Sir Richard Smeeton, "The Fleet Air Arm of the Royal Navy—Wither and Die?—or Wither and Why?" *NATO's Fifteen Nations*, August-September 1966, p. 61.
31. Interviews.
32. *Ibid.*
33. *Ibid.* The U.S. price for three old carriers was £20 million (1965).
34. Reed and Williams, p. 197. See also Gt. Brit., *Parliamentary Debates*, 22 February 1966, col. 256; Interviews.
35. Gt. Brit., Ministry of Defence, *Statement on the Defence Estimates, 1966-67, Part II*, CMND 2902 (London: H.M. Stationery Off., 1966), p. 30.
36. A.V. Rogers, "Does Britain Need and Can We Afford Three Air Forces?" *Brassey's Annual* (New York: Praeger, 1966), p. 299.
37. Gt. Brit., *Parliamentary Debates* (Commons), v. 725, 7, 8 March 1966.
38. Anthony R. Maness, "The Question of the Carrier," Unpublished Thesis, Fletcher School of Law and Diplomacy, Tufts University, Medford, Mass.: 1971.
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40. Gt. Brit., Ministry of Defence, *The Defence Review, Statement on the Defence Estimates 1966*, CMND 2901 (London: H.M. Stationery Off., February 1966), p. 9, 10.
41. Christopher P. Mayhew, *Britain's Role Tomorrow* (London: Hutchinson, 1967), app. II, p. 171-183; also Gt. Brit., *Parliamentary Debates*, cols. 254-265, 22 February 1966.
42. Mayhew, p. 173.
43. Interviews.

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44. Gt. Brit., Ministry of Defence, *Defence Estimates, 1966-67, Part II*, CMND 2902, p. 27, par. 21.

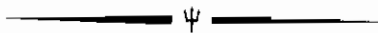
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48. *Sunday Telegraph*, 27 December 1968. Costs of the refits were quoted at £5.75 million, plus £24 million to build the Sea King helicopters in Britain. Each of the cruisers had a complement of 700 men.

49. "The Future of the Aircraft Carrier," *Naval Review*, April 1966, p. 107.



As long as there are aircraft carriers, their aircraft and crews had better be part of the navy.

Sir John Slessor: Strategy for the West, 1954