BE2c at Mbuyuni airfield

Expeditionary air operations in German East Africa – The lessons for today

By Air Vice-Marshal Peter Dye RAF

Introduction

There has always been a sprit of adventurism in the Admiralty, a willingness to see possibilities and to take risks. This was as true of the First World War as it was of the age of sail when Nelson and Cochrane demonstrated that individuality need not be sacrificed to conformity and that established ways of doing business could, and should, be challenged. The Royal Naval Air Service (RNAS) is generally recognised to have been the more innovative and forward-looking of the British Air Services during the First World War. In the development and application of technology, it undoubtedly led its sibling, the Royal Flying Corps (RFC).[1] Whether in aerial navigation, shipboard operations, anti-submarine warfare or strategic bombing, the RNAS was "at the forefront of aeronautical science and its military application." [2] This has encouraged the view that the RFC, with its focus on supporting an army mired in the trenches of the Western Front, lacked enthusiasm for operational innovation and did not enjoy the same freedom to experiment. It has been argued that, when the Royal Air Force (RAF) was created from the RNAS and the much larger RFC, the under-representation of naval officers in the new organisation – with their proven track record of innovation – meant the ability to 'think outside the box' was lost. As a result, the RAF turned doctrine into dogma during the immediate post-war years, ensuring that the country was ill prepared for the Second World War – or so it is asserted.[3] While it is true that the RNAS did much to advance the practical aspects of air power, the RFC actually had a better track record at delivering and sustaining effect – particularly in the key areas of logistics and training. The long term impact of the technical developments pioneered by the RNAS was important but it is also only fair to point out that naval aviation made no significant contribution to the war at sea and just one German submarine was sunk by aircraft.[4] The air defence of the United Kingdom – originally assigned to the Royal Navy – was conducted in such an ineffective manner that in 1917 several RFC fighter squadrons had to be withdrawn from the Western Front as a stop-gap measure to bolster London's defences. Nevertheless, the RNAS has continued to be viewed as the 'brilliant' hare that was somehow robbed of its place in history by the 'dull' tortoise that was the RFC.

On the face of it, the conduct of air operations in East Africa from 1915-1917 supports this stereotype. The Admiralty, reacting quickly to events on the ground, deployed a handful of RNAS personnel and aircraft that helped destroy the last vestiges of German naval power in the region before switching them to support the Army offensive against the Colonel Paul von Lettow-Vorbeck's land forces in German East Africa. Meanwhile, the RFC laboriously assembled and trained a squadron for operations in East Africa – that eventually arrived in theatre more than a year after the first naval aircraft. Game, set and match one might think. However, the real story is more complicated - as I will attempt to explain. There are also some important lessons of continuing relevance for expeditionary warfare.

The War In German East Africa

According to General Smuts the East African Campaign was "a campaign against nature, in which climate, geography and disease fought more effectively against us than the well-

trained forces of the enemy." It took 4 years for the Allies to clear German East Africa – and even then, some residual units under von Lettow lingered on until the Armistice. The number of troops employed on both sides was not large but the operational difficulties were many. It was a war of manoeuvre and hard marching over mountains, through bush and across rivers, lakes and swamps. Periods of drought and dust were followed by torrential rains and mud. At all times the fierce heat and vegetation produced parasitic life that caused many diseases. It was also a campaign in which the RFC and RNAS played an important role – out of all proportion to the few aircraft involved. Unopposed in the air, the British still found that a massive effort was required to operate aircraft and seaplanes more than 6,000 miles from the home base. In an area of roughly 384,000 square miles, comprising just 3 railways and few roads, transport and supply presented major difficulties. The casualties from sickness and disease far exceeded those from enemy action while the climatic conditions greatly degraded aircraft performance.

The Destruction of the Königsberg

The decision to deploy RNAS personnel and aircraft to German East Africa was taken in December 1914 as part of the strategy to locate and, if possible, destroy the German light cruiser 'Königsberg', armed with ten 4.1 inch guns, that had taken refuge in the Rufiji Delta after sinking the British cruiser HMS 'Pegasus' while it was undertaking boiler cleaning off Zanzibar Town on 20 September 1914.[5]

The Königsberg had been based at Dar es Salaam, the main port of German East Africa, since June 1914. Beyond providing a visible reminder of Germany's growing naval power, the cruiser was also well placed in the event of war to raid British commerce in the Indian Ocean, supported by pre-positioned colliers. Narrowly avoiding the 3 elderly cruisers of the Cape Squadron sent to trap her,[6] the Königsberg sailed for the Gulf of Aden on 31 July 1914 and sank a merchant ship before taking refuge in the Ssimba Uranga channel of the Rufiji Delta. It was from here that she later sailed the short distance to Zanzibar to sink the 'Pegasus'.

In response to the sinking, the Admiralty had dispatched reinforcements to the area, including the 6 inch gun cruiser HMS 'Chatham' that joined HMS 'Dartmouth' and HMS 'Weymouth' in blockading the Rufiji Delta. Although numerically outnumbered, and short of fuel and ammunition, the Königsberg was more modern and faster than the ships of the blockading squadron and, while afloat, remained a serious threat to British trade in the Indian Ocean.

The Rufiji Delta comprised some 200 square miles of inaccessible mangrove swamp and a maze of channels with shifting sand and mud banks. Initially, it was impossible to know exactly where the Königsberg was laid up. Fortunately, just before the war, a civilian pilot, Dennis Cutler,[7] had been giving demonstration flights at Durban in a pair of Curtiss 'F' flying boats. Cutler was now commissioned into the RNAS and one of the flying boats leased by the Commander-in-Chief the Cape Station (CinC Cape). Cutler embarked on the 'Kinfauns Castle'[8] at Simonstown on 6 November 1914 and was landed at the small island of Niororo, 18 miles off the Rufiji Delta, where there was a sheltered sandy beach suitable for seaplane operations.

RNAS Operations against the Königsberg – 1918

After a series of problems and a forced-landing, Cutler eventually found the Königsberg about 12 miles up one of the waterways. A further sortie to confirm this report was delayed while a replacement hull from the other flying boat was brought up from Durban. Eventually Cutler, with Captain Crampton of the 'Kinfauns Castle', confirmed the original sighting but also that the Königsberg was well out of range of the British cruisers' guns.

On 10 December 1914, Cutler was forced to land at the entrance to the delta following engine trouble and, although the aircraft was salved, he was taken prisoner. The Curtiss was wrecked beyond repair but it was now clear that, with the Königsberg confined to the narrow channels of the Rufiji, there was a good chance of destroying her by air attack.

The Admiralty decided to send No 4 Expeditionary Squadron (RNAS), under the command of Flight Lieutenant John Tulloch Cull, to accomplish this task. Comprising just 2 officers and 18 men, together with 2 seaplanes, Cull's party departed Tilbury Docks in the SS 'Persia' on 16 January 1915 en-route for Bombay via Aden. Additional stores embarked on the 'Persia' included a selection of 16lb and 50lb bombs and 2,000 gallons of aviation spirit.

To gather and dispatch an expeditionary squadron in such a short timescale, when there were pressing demands from many other quarters (including the planned landings at Gallipoli), reflects extremely well on the Admiralty's Director of Air Services. Under the circumstances, it was not unreasonable to rely on Cull's initiative to make good any shortfalls in equipment, stores or personnel that might subsequently emerge. Speed was of essence while the Königsberg could still escape into the Indian Ocean. Unfortunately, expediency masked several significant omissions that would greatly hamper future operations. Some became quickly apparent, while others, such as the failure to include a doctor or any trained medical staff, would have long term implications.

Cull's party arrived safely at Bombay on 8 February 1915 where the seaplanes were immediately erected on the dockyard jetty and, together with the stores and fuel, transferred to the 'Kinfauns Castle'. Both machines having been test flown, the 'Kinfauns Castle' left for Niororo Island, via Zanzibar, on 13 February 1915. It was soon discovered,

however, that conditions at Niororo severely reduced the performance of the Sopwiths (the Rufiji Delta being just 8 degrees off the Equator). The only way the seaplanes could get airborne was by eliminating the observer and carrying no more than 1 hour's fuel – without a bomb load. Even then, the maximum ceiling was no more than 1,500 ft. To add to the frustration, one of the seaplanes was wrecked within the first week. Efforts continued over the next few months to resolve the performance problems by changing fuel mixtures, adjusting engine timings and increasing air flow (using compressed air and oxygen) – but to no avail. For some weeks the Admiralty, as well as CinC Cape's staff, were adamant that there must be a solution to hand. One apparently serious suggestion, relayed by the Director of Air Services, was to reduce the diameter of the propellers – thereby allowing them to rotate faster and so 'bite' into the thin tropical air more effectively.

The ability to improvise is an important attribute in expeditionary operations. Long lines of communication and the interaction of climate, people and technology will always create unpredictable events and unplanned demands – even before operations commence. As we will see, both the RNAS and RFC showed considerable ingenuity under extremely difficult conditions, but no amount of imagination or innovation can be expected to overcome the laws of physics. This was evident on the ground very much earlier than in London. In the meantime, the RNAS rapidly discovered just how harsh the tropical sun could be, losing a number of personnel to sunburn – requiring them to be laid up for 3 or 4 days swathed in picric acid bandages. A further problem was the appearance of sharks. This curtailed the ratings' habit of swimming between the seaplane and the ship during launching or recovering activities. The heat also played havoc with the seaplane's floats – causing the skin to peel off during landings, with dramatic results. Through trial and error it was found that the problem could be largely avoided if the individual floats were filled with water whenever onboard and the outer skins reinforced with metal plates made from flattened petrol cans.

Short Seaplanes–Zanzibar harbour

Pending the arrival of replacements, it was reluctantly decided to land at Mombasa. Flying operations continued from here until 3 April 1915 when the squadron returned to Durban where the 'Laconia' had arrived with new seaplanes and additional personnel.[9] The 'new' machines turned out to be 3 elderly Short Folders, previously employed at the Isle of Grain, moreover, when the individual crates were unpacked all were found to have been damaged in transit. Even so, by 11 April 1915, the assembled seaplanes were back on the 'Laconia', together with the stores and personnel. Niororo Island was reached on 23 April 1915 and test flights began immediately. The first reconnaissance over the Königsberg was carried out shortly afterwards, on 25 April 1915, with Cull at the controls of Short 122 and AM Boggis as observer. The machine was not climbing well and could reach no higher than 1,200 feet, dropping to 800 feet over the Delta. In the face of considerable ground fire the Königsberg was successfully found and photographed (using Cull's personal camera as none had been supplied for the expedition), although damage to the engine intake and oil supply caused a forced landing near Niororo Island – the aircraft being safely towed home.[10]

The squadron continued to carry out reconnaissance over the Delta with all 3 Shorts during the next few months – pending the arrival of shallow-draft monitors capable of closing within firing distance of the Königsberg's anchorage. Since no trained observers had been sent with the expedition, volunteers were co-opted from local RN personnel. This was not without danger. During one reconnaissance, Flight Lieutenant HEM Watkins, flying Short 119, was forced down by ground fire that damaged the rudder. The machine was wrecked on landing but the crew was rescued. Although the Shorts were certainly an improvement over the Sopwiths their performance was still inadequate and yet more powerful machines were needed.

The position changed significantly for the better in June. Not only did the long-anticipated monitors arrive – in the form of HMS 'Severn' and HMS 'Mersey' – but also news of more RNAS reinforcements including 4 aeroplanes.[11] The only possible site for a suitable aerodrome within range of the Delta was Mafia Island – captured by an amphibious landing on 10 January 1915 that had overwhelmed the small German garrison. Under the energetic direction of the island's military commandant, Colonel McKay, a landing strip was constructed and a hangar, pre-fabricated in Zanzibar, erected by 20 June 1915.

HMS 'Laurentic' arrived on 18 June 1915 bringing a further 15 RNAS personnel under Squadron Commander R Gordon and 4 crated aircraft - 2 Henry Farmans and 2 Caudrons.[12] These were transferred from to the shore, still in their cases, using the ship's pinnaces. Local manpower was then used to get the machines – each weighing over 2 tons – onto the beach and then along the mile and a half rough track leading to the airfield where assembly was completed by 20 June 1915. Perhaps predictably, one of the Caudrons and one of the Farmans were wrecked in early test flights, leaving just 2 aircraft for the planned attack.

RNAS Caudron

Reconnaissance confirmed that the Königsberg was still where she had been moored 2 months before. A basic clock code was rehearsed with the monitors (a technique first developed by the RFC in France during the autumn of 1914 to target indirect artillery fire on known locations). Once all was ready, the monitors entered the Delta on 6 July 1915; their movement being covered by a bombing raid on the Königsberg (all 6 bombs missed). The wireless-equipped Farman, crewed by Cull and Flight Sub-Lieutenant HJ Arnold, was airborne at 6 am to spot for 'Mersey' and the 'Severn'.[13] In the event, the Königsberg proved to be the more accurate and the 'Mersey' was hit twice being forced to retire. The 'Severn' appeared to have hit the Königsberg several times, although this did not diminish her return fire and by 4 pm the action was called off.

The sunken Königsberg

Following repairs, the attack was resumed on 11 June 1915, but this time the outcome was decisive. Starting later in the day, because of the tides, the first salvoes from the monitors commenced at 1230 pm and soon registered hits on the Königsberg. Large explosions were observed on the target, but one of the

Squadron Commander Cull

last acts of the burning ship was to bring down the spotting aircraft flown by Cull and Arnold. The machine landed close to the 'Mersey' but the crew was rescued. The remaining Caudron (flown by Watkins) confirmed the destruction of the Königsberg but in his excitement he crashed on landing at Mafia Island – so destroying the squadron's last remaining aircraft. In celebration of their success the RNAS officers dined that night with Colonel McKay and the captains of the 'Mersey' and the 'Severn', followed by the ceremonial burning of the Short seaplanes pulled up on the beach.[14]

Gordon, Cull and Arnold were subsequently awarded the DSO for their work in the destruction of the Königsberg.[15] There were further celebrations on Zanzibar when the squadron returned on the 'Laconia', but, almost immediately, orders came for them to proceed to Mombasa where further machines had arrived in the form of 2 Caudrons and 3 Short seaplanes.[16]

The Advance into German East Africa

With the demise of the Königsberg, the Admiralty had been reflecting on what to do with Cull and his party. In the absence of any other aircraft in the area, the aeroplanes were offered to the Army to support their spring offensive against the German ground forces to the southeast of Kilimanjaro. It was agreed that Cull would be sent up-country with the Caudrons to join General Tighe's forces at Maktau, while Gordon was directed to proceed to Mesopotamia with the seaplanes.[17]

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No real thought seems to have been given to the implications of this decision. The question of how Cull's logistic needs would be met some 150 miles from the nearest port (Mombasa) was resolved by allocating responsibility for stores and transportation to the Army, although, in the absence of an aircraft park no specialist technical support would be available. In effect, once Cull and his party left the coast they would be on their own. More worrying, there appears to have been no consideration of the squadron's suitability for land warfare. If there was such an assessment, nothing was done to address the evident shortfalls in people, skills and equipment.

The decision to send Gordon and his seaplanes to Mesopotamia was also tacit recognition that was no appetite for littoral operations. The abject failure of the British attack at Tanga in the previous year, where an amphibious landing had been badly repulsed as a result of inadequate planning, indecision and poor inter-Service cooperation, meant that the Army's strategy was firmly focused on the Kilimanjaro region. In fact, when it was suggested to Smuts his offensive be combined with a landing at Dar es Salaam, he retorted, "I don't want any more of this amphibious nonsense".[18] It would be another year before further efforts were made to seize the coastal towns and major ports of German East Africa. Even so, the seaplanes of the RNAS could have been used to help secure the Navy's blockade and possibly prevented the landing of weapons, ammunition and medical stores in 1915, and again in 1916, that helped sustain von Lettow's continued resistance. What is certain is that, by sending Gordon to Mesopotamia, the resources available to the RNAS in East Africa were immediately halved, leaving Cull with just 12 personnel and 2 aircraft to support the Army's planned offensive.

The move inland commenced on 8 September 1915, the RNAS traveling by special train that carried, in addition to the Caudrons in cases, 2 Bessoneau hangars, aviation spirit and stores. The journey took the squadron 100 miles up the Uganda Railway to Voi and then on the recently constructed branch line to the armed camp at Maktau, some 35 miles from the German East Africa border, but only 10 miles from the enemy camp at Mbuyuni, to the southeast of Mt Kilimanjaro.

As there was no space within the camp for an airfield this was constructed outside using local manpower under Royal Engineers supervision. A landing strip some 200 yards by 200 yards was established but, because of the danger from enemy patrols, the aircraft had to be hangared overnight within the camp. Before each flight, an armed party was sent out to form a screen against enemy snipers and the aerodrome dragged for hidden mines.

Bearing in mind that the destruction of the Königsberg had taken some 6 months for the loss of 11 aircraft (of which 2 were shot down by ground fire), equipping Cull with just 2 aircraft might be seen as an optimistic gesture. It is possible that the decision to send the RNAS up country owed more to a desire to be seen to be supporting the Army than any confident expectation of military effect. The truth is that, with only 2 pilots (including Cull) and no observers, there was not a great deal that the RNAS could achieve anyway.

Trial flights began from 1 October 1915 – but the weather proved to be a greater threat than the Germans. Mist and low cloud made flying difficult in the early part of the day while later in the morning the increasing heat created considerable turbulence as well as local dust storms. The surrounding hills and the presence of the camp also created a hazard when taking off or landing – depending on wind direction. Even so, some useful reconnaissance flights were made over the German camps at Mbuyuni, Serengeti and Taveta until the breaking of the monsoon.

By now, it was clear that there was a more serious problem than the climate. Away from the relatively healthy

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coastline, disease and illness soon began to reduce the small group of RNAS. Ironically, the cooler highlands were generally regarded as healthier than the low-lying coastal region, where the tsetse fly was a major threat to animals and humans, but nowhere in East Africa could be regarded as safe from endemic disease. British regular forces (including Dominion, Indian, African and other troops) employed in East Africa reached a peak of 50,000 in 1917, yet in the same year total admissions to hospital exceeded 133,000. On average some 12% of British strength was constantly hospitalised. The actual proportion of non-effectives was significantly higher as many of those discharged were not immediately fit for active operations. The position was hardly better for the 144,000 followers – recruited from all

parts of Africa - who carried stores and equipment over otherwise impassable terrain. Without this additional labour, military operations were impossible, but the followers were no more immune to disease than anyone else. In 1917 a total of 181,000 followers were admitted to hospital, the majority sick or injured.

Of the non-battle casualties, malaria caused the highest rate of admissions, with dysentery as the next major cause. For British troops, although sickness greatly reduced efficiency, death rates were not high – many being evacuated overseas or to coastal bases (at first in South Africa and later in British East Africa). By comparison, the followers suffered a very high death rate from malaria, dysentery and pneumonia – some 13% of admissions.[19] Awakening to the situation, the Admiralty decided in May 1916 to supply regular replacements, equivalent to 10% of total unit strength per month for the duration of the campaign. Even so, without their own medical staff, the squadron was entirely reliant on the Army's medical services – already stretched to breaking point. In due course, a single naval doctor was allocated by CinC Cape to provide some immediate health care. By comparison the Germans, with no source of replacements, maintained their strength by providing quinine routinely to their troops and by treating casualties locally rather than by evacuation. They also had a much higher ratio of doctors and medical assistants and, arguably, a more healthy diet.

Without an efficient medical service, military operations were limited by the number of fresh replacements available and the effect of weather on the lines of communication. In the short rains (from October to December) and the long rains (from April to June), the few roads became impassable – even with motor vehicles – and movement became all but impossible. Flying was curtailed, either by storms or airfields that rapidly became waterlogged. Paradoxically, outside the monsoon season, water was a scarce resource much of it having to be brought up by carriers or provided by military pipeline.

Early in November a third Caudron and spares arrived together with a workshop lorry. Further Caudrons arrived by rail on 14 November 1915, providing a total of 6 machines, although one of them was soon wrecked in a landing accident. However, sickness meant that flying activities were still limited. Such was the state of affairs that Cull was forced to advertise locally for anyone with relevant experience. He was rewarded by a volunteer in the form of an Italian named Garibaldi, who insisted he was a qualified pilot. Not surprisingly, the individual revealed few flying skills during the subsequent test flight, although he survived the inevitable crash that totally destroyed the aircraft.

On 22 November 1915, the squadron's numbers were more than doubled by the arrival of 20 ratings and at the end of the month 3 new pilots.[20] As welcome as these reinforcements were, there was still a desperate shortage of technical skills. Thus, the responsibilities of armament officer fell to one of the newly arrived pilots, Flight Sub-Lieutenant CR Terraneau, but after an accident with a fuse - that blew away part of his hand - the task passed (somewhat reluctantly) to Flight Sub-Lieutenant LO Brown.[21] The Army assisted where it could by providing observers – none

were provided by the RNAS throughout the campaign – and specialist officers, such as Lieutenant Cherry Kearton, who undertook the unit's photographic work. To assist him in this task a dedicated darkroom was created from an empty aircraft packing crate.

The gradual build-up in British strength enabled Mbuyuni and then Serengeti to be captured by the end of January. The RNAS carried out reconnaissance and bombing in support of these attacks, including a raid by 2 Caudrons on Salaita and Taveta on 27 January 1916 when several 65lb bombs were dropped on the German defences. One of the aircraft, flown by Brown, was forced to land because of engine failure and became a total write-off, although the pilot escaped capture.[22]

It was rapidly discovered that the 'moral' effect of these raids far outweighed the actual destruction caused (which was modest at best). The mere arrival of an aeroplane overhead caused the German followers to disperse in panic, discarding their loads, and not returning for hours. The Askaris were built of sterner stuff but nevertheless attributed magical powers to the British.[23]

RFC BE2c

An advance airfield with a small ground party was soon established at Mbuyuni and the first aircraft landed there on 2 February 1916.[24] Unfortunately, the second Caudron, flown by Flight Sub-Lieutenant Stewart-Dawson had to turn back with engine trouble and crashed on landing – running into some tents and a goal post. In subsequent correspondence with the Air Department a clearly frustrated Cull stated that he had tried unsuccessfully to persuade the Army they should not play football on the landing ground.

The increasing number of South African and Indian reinforcements included the arrival of No 26 Squadron (South Africa) RFC, equipped with 8 (later 12) BE2c aircraft and, to RNAS eyes, an extravagant quantity of equipment, vehicles and support personnel.[25] Their air park (comprising 3 officers and 50 men) was left at Mombasa while the remainder of the unit (some 180 personnel) traveled by rail to Voi and then on the newly laid branch line to Mbuyuni. Billeted alongside the RNAS, No 26 Sqn soon encountered the vagaries of the supply system. In unpacking their stores it was discovered that no propellers had been provided with the aircraft. Alternatives were available but they were of a different and less suitable type that had to be re-bored before flying could begin.

By early February 1916 the first RFC machine had been erected at Mbuyuni and it quickly became apparent that the BE2c was of much higher performance and better suited to the climatic conditions. No 26 Sqn was also not without experience in operating aircraft in extremes of temperature.[26] Key members had served in German South West Africa (from May to July

1915) as part of the small South African Aviation Corps (SAAC). The SAAC had been recruited within the Union of South Africa, supplemented by experienced RNAS personnel. Flying the steel-framed Henry Farman F27 pusher aircraft, the SAAC had supported the advance of the Union Expeditionary Force through an area of sand dunes, bush, mountain and dry riverbeds covering 322,000 square miles.[27]

Possibly because of this experience, the RFC planned from the start to provide a continuing stream of replacement personnel (at a rate of 30 per month). In the event, this was not strictly adhered to and the squadron found itself, like the RNAS, under strength due to high rates of sickness. Like the RNAS, no provision seems to have been made for medical officers; the squadron relying on the limited and heavily overstretched Army medical services. When based at Kahe in May 1916, they paid heavily for the oversight. "Man after man sickened and went down with malaria. We had no doctor with us; but Pawson, who had some knowledge of medicine, took charge of the invalids and worked like a Trojan in their interest. Medicines were scarce, and comforts there were none. For aspirin – an essential remedy in the treatment of malaria – we had to depend on private stocks, which we soon exhausted and a man with a temperature of 105 degrees had to go without this merciful drug and suffer untold agonies".[28]

General Smuts at Maktau 1916

In general, though, it is difficult to fault the efforts of the RFC planners - at least in comparison to the RNAS who were forced to operate on a shoestring for most of the campaign. The squadron establishment of 27 officers (including 8 trained observers and 2 equipment officers) and was certainly sufficient to avoid having to scour East Africa for additional personnel.

General Smuts' Offensive

General Smuts had been appointed on 3 February to command the British forces in East Africa.[29] Rather than delay further, he decided on an early advance against the Germans before the rains began again. The important position of Salaita Hill to the west of Serengeti camp was taken on 9 March while a series of flanking movements forced the enemy to abandon Taveta. The RNAS and RFC were both actively involved bombing German positions and undertaking reconnaissance for the advancing columns.

Neu Moschi was occupied after hard fighting on 14 March 1916; an important gain as it allowed the Tanga and Uganda Railways to be connected – potentially shortening Smuts' lines of communication. From Moschi it was decided to press southeast down the railway while sending a flanking force under General van Deventer (commanding 2nd Division) to Kondoa Irangi, some 125 miles to the west. This was successfully achieved on 19 April

1916 after a short fight. The weather, combined with growing sickness and the loss of horses, now brought the offensive to a halt - indeed, it was all the British forces at Kondoa could do to resist German counter-attacks from the surrounding hills.

Since the beginning of the year the number of RNAS Caudrons available to support the Army had gradually fallen from the combined effects of accidents – many from force-landings following engine failure - and a lack of spares. Happily, on 15 March 1916, replacements arrived in the form of four Voisin 5s that proved to be considerably better in performance than the Caudrons and their unreliable engines.[30]

A forced-landing in the bush was a constant concern for all aviators in East Africa. Flying no higher than 2,000 ft (and this after perhaps an hour of hard climbing) meant that engine problems almost always forced the aircraft down in difficult terrain – unless the airfield was close enough to glide home. Crashes were less frightening, however, than the prospect of falling into enemy hands - the German Askari were renown for not taking prisoners. The RNAS suffered its first fatal casualties on 29 April 1916 when Flt Sub-Lt Terraneau and Captain Bruno (an observer attached from the Army) failed to return from a long reconnaissance of the Tanga Railway. It latter transpired that they had been forced down by engine trouble and shot after capture.[31] The wreckage of their aircraft was not found for some months. Terraneau's body was never recovered.

In view of the time spent in theatre, and with regard to their weakened state from disease and illness, there was hope that the RNAS could be withdrawn once the

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The move inland via the Uganda railway

RFC were able to take over their duties.[32] The Admiralty's proposal to this effect was rejected by General Smuts, who was reluctant to lose the services of the RNAS, particularly as No 26 Sqn was not yet at full strength.[33]

However, as the health of Cull's party after more than a year in East Africa was of concern to the doctors, it was decided to replace them by part of Flight Commander Nanson's party, newly arrived at Zanzibar. It would seem that this was the point at which the 'up-country' squadron was designated No 7 Sqn and the personnel and seaplanes remaining at Zanzibar No 8 Sqn – although no formal direction to this effect has been found. What is certain is that, by May 1916, these number plates were being employed in routine correspondence with the Admiralty.[34] The evident benefits enjoyed by the RFC in operating the BE2 – greater engine reliability and more benign flying characteristics - appears to have persuaded the Admiralty to retain at Mombasa the remaining Voisins brought out by Nanson's party; rather than sending them 'up-country' as

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replacements. In their place, 3 BE2c machines were dispatched to East Africa on 12 May 1916 and a further 3 sent out soon afterwards; together with more ratings.[35]

Nanson, accompanied by 100 personnel – some 50 had been left at Zanzibar – arrived at Mbuyuni on 2 May 1916 to take over the remaining aircraft and stores. Nanson was appointed acting Squadron Commander and Cull, together with those personnel who had formed his original party, left for Mombasa.

Van Deventer's March into the Interior

By the beginning of May 1916, the monsoon had eased and the ground started to dry out. It was decided that, while No 26 Sqn would assist the main advance, No 7 Sqn would be deployed further to the west in support of the hard-pressed 2nd Division at Kondoa Irangi – once an airfield had been prepared. This was achieved by sending a small ground party (an officer and 5 mechanics) with 1,000 porters, to walk the intervening 200 miles.[36] The safari reached Kondoa Irangi 3 weeks later, having prepared an intermediate landing strip at Lol Kissale.

Both airfields were ready by 29 May 1916 and the first 2 Voisins left Mbuyuni for Kondoa Irangi on 30 May 1916. After successfully refueling at Lol Kissale they lost their way due to faulty maps and had to force land well to the north of Kondoa Irangi.[37] Fortunately, the machines were undamaged and the pilots, Flight Lieutenant Moore and Flight Sub-Lieutenant Stewart-Dawson, were able to walk to safety.[38] After refueling both aircraft eventually reached Kondoa on 6 June 1916.

On their arrival at Kondoa the squadron was actively engaged in supporting the 2nd Division' renewed offensive – providing reconnaissance and undertaking bomb dropping. Because the Germans still occupied the surrounding hills, the airfield was occasionally shelled requiring that the machines be run under the lee of a small hill.[39] Although no aircraft were damaged in these attacks, it was decided to move to Salim, some 12 miles north of Kondoa. The new airfield was occupied on 12 June 1916 and continued to be used until the end of the month when aerial reconnaissance confirmed that the enemy was once more in retreat.

On 12 July 1916, the first BE2c aircraft arrived at Kondoa, having flown from

Mbuyuni via Lol Kissale.[40] A second was badly damaged in a landing accident near Kondoa and had to be written-off, but the third BE2c arrived safely on 18 July 1916.[41] Together with the remaining Voisins, the squadron now had 4 aircraft available to support the 2nd Division.[42]

For the next few weeks the RNAS occupied a succession of temporary airfields as the Germans retired to Dodoma (on the Central Railway) and then to the east towards Dar es Salaam. On 23 July 1916 they were at Aheti and then, from 6 August, at Dodoma itself. The German forces were continuously harried and bombed (Dodoma being attacked on 26 July by Moore) – often as low as 700 ft, although only one aircraft was hit by return ground fire.[43]

RNAS Voisins

On 15 August, an advanced aerodrome was established at Mpapua, 85 miles from Dodoma, while a week later a further move was made to Kilosa – recently occupied by British troops. As successful as the advance had been, the main German forces continued to avoid decisive battle and managed to elude the pursuing columns.

The 2nd Division needed time to regroup and recover having covered more than 200 miles through difficult terrain. The supply lines for No 7 Sqn were by now heavily over-stretched. Immense difficulties had been overcome in moving from Kondoa to Dodoma. In the absence of roads, stores had had to be moved by ox convoy while the ratings followed on foot through largely waterless territory. The majority of their supplies continued to be provided from Mbuyuni, over 300 miles away. As a result, urgently needed spares were delayed, damaged in transit, stolen or simply lost amongst the mass of army stores.

The end of September also saw the last of the Voisins deleted.[44] They had served the RNAS well, albeit that they were heavy on the controls. Accidents and the absence of shelter for nearly 4 months had taken their toll but the shortfall was made good by the arrival of additional BE2c aircraft. The Voisins had flown more than 6,500 miles since the beginning of June, but the BE2c was better suited to the prevailing conditions – even if unable to stand exposure to the weather to the same extent.

The Advance to the Nguru Mountains

While No 7 Sqn was engaged with van Deventer's forces, No 26 Sqn stayed close to the main columns advancing from Kahe along the Pangani river and the Tanga railway. This was a particularly difficult time for the squadron. The adjacent Pare Mountains rose to over 8,000 ft, while much of the terrain was thickly forested or covered with dense scrub. Suitable landing grounds were few and far between, forcing the crews to fly considerable distances before any actual work could commence. If this were not enough, the

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Pangani River area subsequently proved to be extremely unhealthy.

The move forward began on 21 May 1916 with the squadron providing reconnaissance from an advanced landing ground at Kahe. Even so, they found they were hard pressed to keep up with the advance. The shortage of motor transport and the fine dust greatly slowed progress in establishing new airfields. In addition to providing invaluable information on the terrain ahead of the advancing columns, the opportunity was taken to bomb German camps and to photograph their entrenchments. Unhappily, the squadron's first fatalities occurred on 18 June when a BE2c came down in thick bush after engine failure – both occupants being killed in the crash (Flt Lt Bertram and Flt Sgt Hutchings).

By July 1916 No 26 Sqn was based at Mbagui, to the south of the Tanga Railway, with an intermediate landing ground at 'Palms'. Additional aircraft had now arrived in the form of steel-framed Henri Farmans. Under-powered compared to the BE2c, they proved reliable and generally less vulnerable to the elements. There were now 6 machines available to support the continuing advance south towards the Central Railway. Eventually, on 31 August 1916, the squadron arrived with just 3 serviceable aircraft at Morogoro astride the Central Railway and alongside Smuts' headquarters.

Up to this point, the only way that supplies could be obtained was by rail from Mombasa to the airfield at Mbuyuni and thence by third-rate road – a round trip in excess of 900 miles. However, the capture of Dar es Salaam enabled the aircraft park to be transferred from Mombasa and the airfield at Mbuyuni to be abandoned. While a shortage of shipping delayed the completion of the final moves until 6 December 1916, the result was greatly shortened lines of communication that significantly improved logistic support to both the RNAS and the RFC.

Although some 3 ½ tons of bombs were dropped on German positions in the Nguru mountains during July 1916 alone, the squadron's most valuable contribution to the advance continued to be reconnaissance. The information provided helped mitigate the poor mapping available and gave some indication of the enemy's intentions, particularly his direction of retreat. However, the terrain was such that, once the Germans moved away from the main roads and the railways, little could be seen. For some soldiers, aviation

of ignorance and derision. Francis Brett Young, in describing a wrecked train and trucks he had found just outside the station at Tanda, during the advance down the Tanga Railway, noted that its destruction was claimed by the Flying Corps and that "this had done something to heighten their prestige which was lower than it need had been – seeing that their only targets in this busy world were the tops of trees". Later, he refers to "a bundle of maps and airmen's sketches and reports. It was a pity that neither were very reliable".[45]

General Northey's Advance from Nyasaland

Notwithstanding these successes, General Smuts was worried that the Germans might overwhelm one of his columns or escape to the west, beyond the encircling forces. A particular concern was the area of Iringa, some 130 miles to the south-west of Kilosa, that lay between the van Deventer's 2nd Division and General Northey's columns (Norforce) advancing from Nyasaland. British forces had reached Iringa at the end of August but a German column had briefly cut them off in October. A temporary landing strip was constructed and a small RNAS party, under the command of Lieutenant Kearton, was sent cross-country to provide ground support. The first aircraft reached Iringa on 6 November 1916 and discovered that the enemy was in fact preparing to retreat further into the heart of German East Africa.

The airfield at Iringa proved quite unsuitable for safe operations, being laid out on the side of a hill and across the prevailing wind and a new site was selected at Alt Iringa. Moore describes it as a comfortable camp in a beautiful natural site.[46] However, because of the altitude (the airfield was nearly 6,000 ft above sea-level) the BE2c was slow to climb while the surrounding hills and dense clouds made navigation difficult. As pleasant as Alt Iringa might be, the squadron commander reported in January 1917 that about one third of the entire squadron was usually sick.[47]

Operations in support of the army continued from Alt Iringa for the next 2 months. However, to ease persistent logistic problems, the main stores were moved to Iringa on 11 November 1916, transported by rail to Dodoma and thence overland to Iringa.

By December 1916, General Northey's headquarters was at Ubena, some 150 miles from Iringa. This was too far for the squadron to provide effective reconnaissance. The roads being impassable, Air Mechanic EW Nelson was dispatched alone cross-country on a motorcycle to prepare a suitable airfield with the help of Army engineers. By 20 December a landing ground and hangar were ready at Njombe, a few miles from Ubena, and 6,400 ft above sea-level. The first aircraft to land was a BE2c flown by Moore. An initial sortie was completed on 22 December over the enemy positions at Mfrika. For the next 3 weeks this single BE2c provided invaluable support to Norforce, including bombing enemy fortifications and camps using rifle grenades and locally manufactured 16lb bombs.

On 10 January 1916, Moore with Nelson as observer conducted a long-range reconnaissance with the aim of determining the direction of the enemy's retreat in the face of Norforce's advance. To extend their range, additional petrol was carried in 2-gallon tins and used to top-up the main tank. This enabled the BE2c to stay airborne for over 5 hours and for Moore to confirm that the enemy was indeed retreating to the Rufiji Delta.[48] On 13 January 1917 orders were received for No 7 Sqn to return to England. All their aircraft, together with stores, transport, hangars and spare engines were handed over to 26 Sqn.[49] The remaining RNAS personnel made their way to Dar es Salaam where they embarked for Durban on the troopship 'Ngoma' and thence to England on the 'Walmer Castle'.

During the seven and a half months since its formation, the handful of pilots belonging to No 7 Sqn had flown 55,000 miles[50] and provided extremely useful reconnaissance information, as well as delivering close support to the advancing British forces and disrupting the enemy retreat – all without loss to enemy fire. The ground crews had overcome significant difficulties in moving stores and petrol over long distances in extreme climatic conditions while managing to keep the machines operating; without any serious loss or breakdown.

The London Gazette of 15 June 1917 announced the award of the Distinguished Service Cross to Squadron Commander Eric Roper Curzon Nanson for "organising his unit with great efficiency and zeal, and carrying out reconnaissance work under great climatic difficulties."[51]

Coastal Operations

Cull's party had left Mbuyuni for Mombasa on 9 May 1916, reaching Zanzibar 2 days later. From Zanzibar Town they were taken some 7 miles south to Chukwani, where the remainder of Nanson's party had established themselves in one of the Sultan's many palaces on the island. This had seen better days but stood in its own grounds amongst coconut and other palms on top of a cliff overlooking the sea. To one side was a small bay with a sandy beach where the seaplanes were based, together with the Bessoneau hangar. The gardens were overgrown but abounded with cloves, oranges, limes, mangoes, bananas, passion fruit, custard apples and avocado pears. Life at Chukwani was to prove "pleasant and romantic" – for those that had served 'up-country' it must have seemed a paradise.[52]

The squadron's primary role was to support the naval blockade of the East African coast. This comprised: reconnaissance (including photography) of the ports and coastal zone; spotting for individual warships shelling shore installations and shipping; and the bombing of military installations and camps. The naval blockade had been successful in preventing significant seaborne traffic between Tanga and Dar es Salaam but coastal dhows remained difficult to intercept. Nevertheless, the interdiction of the supply route to Tanga greatly inconvenienced the Germans.

The 620 miles of coastline was divided, for the purpose of operations, into 2 sectors. The northern section stretched from the port of Tanga to a point just south of Dar es Salaam. The southern section stretched as far as Mnazi Bay, south of Lindi, on the border with Portuguese East Africa. The Short Type 827 seaplanes were readily able to patrol the channels approaching Zanzibar as well as the immediate East African coast, including Dar es Salaam. However, to cover the coast to the north (as far as Tanga) or to the south (as far as Lindi) required a support ship. Initially, this was

provided in the form of the 'Laconia', already familiar to the RNAS from the Königsberg operation.[53] The armed merchant cruiser 'Himalaya' and the kite balloon ship 'Manica', recently refitted since employment in the Dardanelles, joined the 'Laconia' in May 1916. With a temporary canvas hangar erected on their deck, all three ships, would host seaplanes from No 8 Sqn through the remainder of 1916 and into 1917.

The normal procedure was to embark one or two seaplanes, a pilot and up to a dozen ratings and to cruise off the coast for a week to 10 days. The seaplane was lifted on and off the water using a derrick with wings folded. Once on deck the seaplane was lashed down and the propeller protected by a canvas cover. Since there was no compressed air available onboard, all the Shorts were converted to hand starting.

The first patrol with 'Laconia' took place at the end of March 1916, a reconnaissance of Dar es Salaam. Typical of these early patrols was that carried out on 1 May 1916 by Flight Lieutenant Moon, with AM Groucott as observer, in a Short Type 827. The sortie took them over Makatumbe, Upanga Bay and Msassani Camp. Shell holes were noted south of Upanga as was damage from shellfire at Msassani camp. Two long trains were observed leaving Dar es Salaam. On 3 June 1916, photographs were taken of trenches and gun positions at Dar es Salaam – this time by Moon and AM Wilmshurst. Later on the same day, Cull dropped half-a-dozen 16lb HE bombs in the vicinity of the Railway Station, although the building was not hit.

Smut's successful invasion of German East Africa in May 1916 opened the way to securing the coastal region. The warships of the Cape Squadron attacked the northern port of Tanga on several occasions in early June, in anticipation of amphibious landings. The kite balloon from 'Manica' provided the necessary spotting, as did a seaplane operating from Zanzibar. On 29 June 1916 the Navy landed at Tanga, finding it largely empty and most of its facilities destroyed. By 7 July, the Army was in full possession of the port and railhead.

Throughout June, both 'Manica' and 'Himalaya' had patrolled the southern sector. Flight Sub-Lieutenant CFM Chambers and AM F Elmhurst[54] flying from 'Manica' undertook reconnaissance of much of the coastline, while Cull and Gallehawk, operating out of 'Himalaya', found 4 large dhows in a creek at Gingwea, near Kilda Kisiwani to the south of the Rufiji Delta. These were attacked, in conjunction with HMS 'Challenger', on 29 and 30 June, and direct hits recorded on all of them. Reconnaissance was also flown over Mikendani, Port Beaver and Port Nisus, although nothing else of interest was found.

Dar es Salaam was bombarded on 21 July 1916. Cull and Gallehawk spotted initially for HMS 'Vengeance' but they were forced to land with engine trouble, drifting ashore on Makatumbe Island near the entrance to the harbour. Once the engine had been restarted, spotting continued with HMS 'Mersey', firing at the German merchant vessel, 'Feldmarschall', until they were relieved by 'Manica' and her kite balloon. It had been intended that Cull would be quickly replaced by Squadron Commander Frederick Bowhill, together with an additional flight officer and 14 ratings, to allow the members of the original expedition to return to England. Orders to this effect were issued on 31 May 1916, but Bowhill, who was based in Mesopotamia, did not reach Zanzibar until 8 August 1916.[55] On 10 August 1916, Sultan Khalifa bin Haroub paid an official visit to Chukwani and having been showed round the machines went on a short 'taxi' that involved a 'hop' of some 100 yards. This was Cull's last official duty in charge of the squadron. Two days later he, Gallehawk and 34 ratings left for Durban.[56] They sailed from Capetown on the 'Walmer Castle', reaching England on 9 September 1916 – some 18 months since they had embarked on the 'Persia' to sink the Königsberg.[57]

A seaplane from 'Manica' worked with the battleship 'Vengeance', as well as the cruiser 'Challenger' and the monitors 'Severn' and 'Mersey' in bombarding targets at Bagamoyo during the amphibious landings that took place on 15 August 1916. The planning for the assault made considerable use of the information provided by seaplanes in the previous months.

At the end of the month, it was the turn of Dar es Salaam. Seaplanes from the 'Manica' were closely involved in the preparatory attacks, spotting for the 'Vengeance', 'Hyacinth', 'Severn' and 'Mersey'. Once again, intelligence provided by No 8 Sqn proved invaluable in planning the landings that took place on 4 September. In the event, these were unopposed - the Germans destroying all the major facilities before withdrawing into the interior.

By the end of September all the remaining ports in the southern sector had also been captured, including Mikidani, Sudi Bay, Lindi, Kilwa and Kiswere. Air support for all these operations was provided by seaplanes embarked on 'Manica' and 'Himalaya' – the 'Laconia' having been handed back to Cunard in July 1916.[58]

The Rufiji

Operations now focused on the Rufiji Delta and the area inland from the coast where the Germans still remained in force. To assist the planned encircling movement, one flight of No 26 Sqn was moved to Dar es Salaam while part of another flight was transferred 70 miles further south to Tulo. Pending the end of the rains, the squadron spent a great deal of time mapping the area, assisted by reconnaissance flights flown from the 'Himalaya' and the 'Manica'. Early in December a third flight was moved to Kilwa to co-operate with the forces advancing inland. When operations began on 31 December 1916, the squadron was actively involved in bombing enemy detachments and keeping the advancing columns in contact. Once again, the Germans avoided a pitched battle and slipped away, although efforts were made by 26 Sqn to interdict their retreat by cutting the bridges across the Rufiji.

On 20 January 1917 General Smuts left Dar es Salaam to represent South Africa at the Imperial Conference, being replaced by General Hoskins. The advance continued although progress was slow in the face of heavy rains. By May 1917 the Rufiji had been cleared. Very little flying was achieved because of the water-logged state of the airfields. More achieved in the south-west where a flight of No 26 Sqn was now operating with the aircraft left by the RNAS. Even here, however, success was limited. Part of the difficulty was that for 4 months, between February and June 1917, the

Ubena detachment received no petrol, bombs or spares. Improvised bombs were fashioned with some success from paraffin tins and dynamite, but such petrol as did arrive had to be filtered as the porters poured much of it away at the start of their journey, refilling the cans with water closer to their destination.

Kilwa and Lindi – The Last Phase

Although the Germans had now been pushed south of the Rufiji River, poor weather prevented any further significant gains. The pause allowed reinforcements to be brought up and units to be rested. It was decided to recommence the offensive in June 1917, once the ground had dried out, with separate converging columns advancing from Kilwa and Lindi. No 26 Sqn was assigned to support the Kilwa column and No 8 Sqn to support the Lindi column. Responsibility for this final phase of the campaign, which would see some of the fiercest fighting, fell to General van Deventer who had replaced General Hoskins on 29 May 1917.

By the beginning of June, Bowhill had flown the first of two Voisins from Kilwa (the aircraft having originally been ferried ashore on lighters and assembled on the beach) to a new airfield at Lindi. The squadron's initial task was to survey and map the area still held by the Germans, although the machines proved difficult to control in the climatic conditions. This work was undertaken in conjunction with Brigadier-General O'Grady, commander of the Lindi column, who was flown a number of times over the local area.[59] During the subsequent fighting the Voisins provided extremely useful intelligence on the enemy's dispositions and directed naval gunfire on targets of opportunity. By 18 August, the Germans had been pushed back to Nurunju, although the attack faltered in the face of enemy reinforcements and strong entrenchments.

The advance recommenced in September 1917 and, after a brief fight, the Germans withdrew from Nurunju. The RNAS and RFC closely tracked the enemy's movements and, just as importantly, allowed communication between the various independent columns.

After a pause to replenish stores and recover from the heavy fighting, the offensive was re-opened on 6 November 1917. The RFC and RNAS were again employed in reconnaissance and survey work, as well as photographing and bombing enemy positions. Although they did not know it at the time, they were observed from the ground by Cutler and Moon, held as POWs in the hills between Lindi and the Revuma River. When von Lettow subsequently retreated into Portuguese East Africa he left his prisoners and about 700 sick and wounded troops behind.[60] Released by the advancing British forces, the pair made their way to the airfield at Lindi where they reported to the RNAS contingent, already engaged in the process of packing up to return to Zanzibar.

The surviving remnants of von Lettow's forces escaped over the Revuma on 25-26 November 1917. He would fight on until the Armistice, but the German East Africa Campaign was effectively over. No 8 Sqn was ordered back to Lindi and thence to Zanzibar. In view of the wear and tear suffered by the Voisins, Bowhill was given authority to delete them, rather than recover the machines. He and the remaining RNAS personnel sailed for England in January 1918. In the same month the majority of the officers and men of No 26 Sqn left for Egypt – the first air war in Africa was over.

On their departure for Zanzibar, General O'Grady provided the following appreciation of the services provided by the RNAS, "the work done by them is deserving of the highest commendation, and has been invaluable to us".[61] General van Deventer, writing in his final dispatch on the campaign, stated that, "The Royal Flying Corps under Major Wallace and the Royal Naval Air Service under Commander Bowhill have been indefatigable in their work of reconnaissance, of such great value in this badly-mapped country, and have never hesitated to take any risks in carrying out this duty. Their well-organised bombing raids have also been most successfully carried out."[62]

Lessons for Expeditionary Operations

Commander's Intent

Although the RNAS and RFC played an important, albeit modest, role in the German East Africa campaign, their involvement appears to have been more of an accidental deployment than a carefully considered strategy – at least in the case of the RNAS. The decision to keep Cull and his small party in-theatre after the destruction of the 'Königsberg' was driven more by opportunism than necessity. When the cost of maintaining the RNAS in theatre eventually forced the Admiralty to suggest that they be withdrawn, Smuts was unwilling to accede.

Once under Army control, the RNAS were moved as events demanded and employed as local commanders required. Van Deventer, who would eventually become a strong advocate of the Air Services, initially knew very little about aviation. When it was first suggested that the RNAS would support him, he is reputed to have enquired what sort of stabling did aeroplanes need?[63] More significantly, perhaps, he could not understand why the RNAS would not advance in conjunction with his own troops. It proved difficult to impress on him that aeroplanes were more profitably employed operating from a comparatively safe base in the rear of the column.[64]

As a result, by the end of 1916, we find several small aviation detachments spread across the interior of German East Africa, hundreds of miles from their port depot and the nearest naval warships. One might well ask why any RNAS aircraft were in Africa, long after the rationale for their deployment had disappeared and some 4 months after the entire coastline had been secured? In truth, the Admiralty's thinking never evolved beyond the need to eliminate the Königsberg. Having ceded control to the Army, the Director Air Services was left simply to respond to Cull's logistic and personnel needs as they arose.

How this came about may partly lie in the Admiralty's determination to play as large a part in offensive operations as possible – allied to a penchant for the dramatic. The First Sea Lord, Sir Henry Bradwardine Jackson, is reputed to have noted that, "it is both the duty and the tradition of the Royal Navy to engage the enemy wherever there is water to float a ship." It was this ethos, underpinned by the easy self-confidence of the world's leading naval power, which provided the impetus for the contemporaneous expedition to

Lake Tanganyika. Conducted by a small group of naval personnel, under the determined but eccentric leadership of Lieutenant-Commander Geoffrey Spicer-Simpson, the expedition faced immense practical and logistic difficulties in moving 2 motorboats some 8,000 miles from England by sea, railway, steam tractor and river to a land-locked lake in the middle of Africa. The story of this heroic, colourful but ultimately slightly bizarre endeavour has been extremely well told in Giles Foden's, *Mimi and Toutou Go Forth*.[65] As brilliant as the operation was in concept, the actuality was disappointing and did not represent the decisive outcome that had been expected.

Logistics

Some of the logistic problems faced in the East African Campaign have already been described, but it is difficult to exaggerate the difficulties faced in supplying the small, widely dispersed RFC and RNAS units. Inaccurate maps, limited motor transport, roads that were regularly made impassable by the weather and reliance on the Army, who little understood aviation needs and gave them even less priority, meant that delivering the right stores to the right place was a hit or miss affair – it was certainly never a rapid process. "My own orders were to take charge of the Iringa depot and superintend the forwarding of stores. The hangar contained one aeroplane minus its starboard top plane. Hodge had wired to Dar es Salaam for a spare and we had received notification of its dispatch. Three weeks later it arrived. It had been carried the whole distance by relays of porters, who pathetically described the journey as a 'very bad business'. When we came to fit it to the machine it was found to be the wrong size and utterly useless. The porters decided that it had been an even worse business when I told them this"

The lines of communication were so long and convoluted that problems were inevitable – even without the weather and the poor roads. At any one time, the individual RFC and RNAS detachments were 400-500 miles from their port depot. From here it was a further 6,000 miles to England (via the Suez Canal) or over 9,000 miles via the Cape. There was every opportunity for friction to arise. "We were urgently in need of spare engines and several cables had been sent home with the information. One day 3 mysterious-looking cases, labeled 26 Sqn East Africa, arrived at Bombay. After remaining on the wharf for a week or two, some bright person thought it would be a good idea to put them in a boat leaving for Mombasa. Here they eventually arrived, and a wire announcing this fact was sent to General Headquarters Nairobi. These good people disclaimed all knowledge of them and the engines were re-shipped and sent back to England."[66]

These issues apart, the management of the supply chain was not made any easier by organizational problems within the Army staffs. Differences between the Indian Army and the Regular Army (and between the India Office, the Colonial Office and the War Office), allied to personality clashes – notably between DA&QMG and the Inspector General of Communications - did not make for efficient administration. Bearing in mind that the bulk of stores had to be brought in from overseas (South Africa, India and England), the supply system worked tolerably well, but there were occasions in 1916 and 1917 when it faltered and troops had to subsist on half-rations or less. Under these circumstances, it is hardly surprising if food and water took precedence over aviation spirit, engine oils and technical stores.[67]

According to Hew Strachan, the difference between the war in Africa and that on the Western Front was that the individual was not tyrannised, as he was on the Western Front, by the industrialisation of warfare.[68] While this is undoubtedly true, it is also clear that the RFC and RNAS could not have functioned without a continuous supply of replacement machines, engines and spares. Maintaining and operating aircraft in the field presented significant challenges to all sides in the First World War. While the RFC was considered to have the most effective logistic arrangements of all the air services, the conditions faced in German East Africa were particularly testing – necessitating a support chain that stretched many thousands of miles to the storage depots and factories of England. The employment of air power in the German East Africa Campaign depended entirely on substantial industrial capacity allied to an effective logistic system.

Communications

Communications between England and East Africa relied on wireless and undersea cable. Away from the coast, wireless communication was generally unreliable. Operational reports were handwritten or typed and took several months to reach London. Urgent messages, including spares demands, were sent in code by cablegram.[69] Errors in transcription were frequent while the handling process between the various sections in the Air Department was sometimes confused. In fact, special instructions had to be issued in December 1915 to explain how telegrams from Foreign Service units were to be dealt with. Even so, the experience of unpacking eagerly awaited spares only to discover that they were of the wrong type or deficient in some respect continued to be a common occurrence.

Erratic communications, allied to an ill-defined intent, left decisions about the effective employment of air power to local Army commanders. Limited contact with the aviation staffs of the Admiralty and the War Office, exacerbated by the time it took simply to send a message and receive a reply, created a sense of personal and professional isolation. Airmen, who left England during 1915, only to return 2 or 3 years later, had only limited visibility of the rapid technological advances, innovative tactics and operational insights that transformed air warfare on the Western Front. In today's dynamic environment, where the pace of change is growing inexorably, global awareness is the foundation of operational effectiveness. Communications during expeditionary operations are, therefore, as much about sustaining a community of professionalism as exercising command and control.

Agility

At the start of the campaign, aircraft were largely employed in the reconnaissance role with the occasional bombing sortie. This soon expanded to include close air support, spotting for coastal bombardment, support to amphibious landings, maritime patrol (including anti-shipping operations), mapping, and 'coercive' activities. Both the RFC and the RNAS demonstrated great flexibility and innovation – in the face of significant operational and logistic challenges. Much of the credit should be given to the individual mechanics, who, despite the extremes of climate and debilitating sickness,

found ways to improve aircraft and weapons to meet operational needs. On occasions they even constructed bombs from scratch – using tins, grenades and gelignite. The sheer range of their ingenuity is impressive, from the design and construction of special bomb-racks to the machining of new engine spares from worn or unusable stock and the fitting of Voisin wheels when the original BE2 spares were exhausted. The same determination was shown in finding ways to improve living conditions, such as turning an aircraft packing crate into a squash court or demonstrating that beer bottles taken up to 3,000 ft returned naturally chilled with a beautiful 'bloom'! Driven by necessity and the vagaries of the supply system, there is no doubt that innovation and agility played a large part in the continuing effectiveness of air power throughout the campaign.

Environmental Issues

The debilitating effect of disease and sickness has already been mentioned. It is difficult to exaggerate the suffering it caused. Some indication is provided by the following diary entry, recounting the experiences of a RN wireless operator, attached to the Royal Engineers, based only a few miles from the RNAS unit at Alt Iringa near the Ruaha River. On 2 January 1917, he wrote:

"News in Camp about man suffering from Blackwater and no hospital or doctor or even orderly in Camp. Man died at 12 noon. Someone should get into trouble for this and allowing such a state of affairs. Nice place this, in the middle of swamps and game and wild animals and rainy season and if you get ill you have to get better again or die and no Hospital or Doctor or Medicines here for you. Roll on Blighty! That poor chap was buried last night at 9pm."[70] While the heat and the rain were difficult enough for those not used to the tropics, there was also a constant danger from wildlife, including scorpions, jigger fleas, poisonous snakes and lions. Even the humble earwig presented a hazard, owing to its propensity for inserting itself into every hole or crevice in airframes and engines. Fine dust and earwigs, added to the lack of cover and the immense heat, placed a great strain on the aircraft mechanics.

For the aircrew, there were further problems. The turbulent weather associated with the monsoons (including intense but localized tropical storms), locust clouds and dust-devils (gyrating columns of sand rising as high as 1,500 ft and 500ft in diameter) made flying for any length of time an extremely tiring business. The elevated height of the up-country airfields meant that hypoxia was also a danger – apart from the effect on aircraft performance. Meanwhile, the possibility of having to make a forced-landing in the unmapped wilderness, miles from any roads and friendly forces, was not a pleasant prospect. On the 26 February 1917, Lt Garrod of No 26 Sqn was forced by engine trouble to land 20 miles south of his airfield. He was found 4 days later, having spent the intervening time trekking without food through the jungle. When he was rescued he was suffering from fever, shock and exhaustion - wearing only his helmet, vest and boots. His revolver, food and some of his clothes had been lost while crossing a river, but the bulk of his clothing had been stolen by baboons when it was drying. His experiences included a narrow escape from a crocodile while swimming a river and a night spent up a tree with a leopard beneath.

Leadership

In the face of such adversity, leadership in the RFC and RNAS was outstanding. Given the many and varied difficulties that have been described, successfully operating fragile and complex machines so far from the home base seems little short of miraculous. The demands made on individuals, often wracked with sickness, were immense and yet moral remained high to the very end of the campaign. The continuing lack of skilled tradesmen and the slow trickle of reinforcements meant that everyone had to muck in and yet they did so with evident enthusiasm and goodwill. Motivating and inspiring personnel under such circumstances demands leadership of the highest order and tests unit cohesion to the very limits.
Both air services were also blessed with very capable senior commanders – as their subsequent careers confirm. The majority were decorated, several reaching air rank, and all were greatly admired by their subordinates. Eric Nanson, commanding No 7 Sqn, was a well-liked officer, who was "always cool and level-headed whatever happened, and when emergencies arose he took very quick and decisive action. He was very friendly with his officers, yet he kept himself just that much aloof to be always undeniably the boss."[71] When Frederick Bowhill was appointed to command No 8 Sqn, Petty Officer Lincoln wrote in his personal diary "A better man could certainly not have been chosen for when Bowhill cottons on to a scheme he puts his whole mind into the job and works out everything in great detail..... This is certainly a change for the better for Bowhill is an excellent fellow, a splendid organiser and one who takes a great interest in the work of his men."

The Smuts Report

Following his recall from East Africa to represent South Africa at the Imperial Conference, General Smuts was asked to study the direction of British air policy in light of the German daylight raids on London. The Smuts Report, issued in some haste on 17 August 1917 after only 5 weeks work, advocated the creation of a separate Air Ministry and the amalgamation of the air services. Smuts believed that aviation had come of age as an independent means of waging war. Indeed, he expressed the view that "the day may not be far off when aerial operations with their devastation of enemy lands and destruction of industrial and populous centers may become the principal operations of war." It has been suggested that, as he had no specialist knowledge, Smuts must have been heavily influenced in his thinking by General Henderson who was known to be enthusiastic about the creation of an independent air arm. While Henderson's views may well have carried weight, Smuts was unquestionably his own man. He possessed a keen intellect and had seen the effect of air power during both the German South West Africa and German East Africa Campaigns. Smuts knew what aircraft could and could not achieve. In his first dispatch as Commander-in-Chief, East African Force, describing the successful operations in the Kilimanjaro area, he recorded that the "Air Services performed valuable reconnaissance work throughout the operations, and on several occasions considerably demoralized the enemy by the use of bombs." [72] It is intriguing,

therefore, to consider what influence the small RFC and RNAS units operating in Africa during the First World War may have had on the momentous decision to create the Royal Air Force.

Conclusions

Although the RFC and RNAS faced no aerial opposition in German East Africa (albeit that ground fire was often heavy), the sheer size of the theatre of operations coupled with the hostile environment and high rates of sickness and disease made it a challenging and often frustrating experience. Supply chains that stretched over thousands of miles meant that aircraft were only kept in the air with considerable effort and with a great deal of ingenuity. Spares were a perennial problem and, with only a few rudimentary facilities, maintenance was a continuous struggle. What was achieved with no more than a handful of aircraft and personnel is all the more remarkable. The 'Königsberg' was the first capital ship to be destroyed with the assistance of air power while the support provided to the Army, in its attacks against the German forces in the interior, and the continuing operations on the coast were a model of inter-Service co-operation. There is no doubt that the RFC and RNAS played a significant role in the successful outcome to the campaign. Their efforts certainly deserve wider recognition and have a continuing relevance for expeditionary operations.

Notes

1 When the Royal Flying Corps was formed in April 1912, it comprised a Naval Wing, a Military Wing and a Central Flying School. The Navy were never happy with this arrangement and successfully argued for the creation of a Royal Naval Air Service in 1914. The Military Wing retained the title Royal Flying Corps.

2 In particular, see Goulter, The Royal Naval Air Service: A Very Modern Force, Air Power History, pages 3-63, Frank Cass, London, 2002.

3 Layman makes similar charges to Goulter. Arguing that the Royal Navy was the world's foremost leader and pioneer in virtually every facet of naval aviation, he states that British leadership perished with the creation of the RAF. Naval Aviation in the First World War, pages 195-199, Chatham, 2002.

4 The submarine UB32 was sunk in September 1917 by bombs dropped from a seaplane in the English Channel. This was the only loss, out of a total of 178 U-Boats sunk during the First World War, from air action. Tarrant, The U-Boat Offensive 1914-1945, Cassell & Co, London, 1989.

5 Kevin Patience has written an excellent detailed history of the Königsberg and its eventual destruction, which is recommended to those wanting to know more about the ship and its long struggle to evade the Royal Navy. Patience, Königsberg – A German East African Raider, Zanzibar Publications, 1997.

6 HMS 'Astrea', HMS 'Hyacinth' and HMS 'Pegasus'.

7 HD Cutler had earned his RAeC Certificate in March 1912 on a Short tractor biplane at the Naval School Eastchurch. His war experiences, covering his long period of captivity, can be found in NA AIR1/2393/231/1. Cutler Moon (captured in January 1917) remained prisoners of the Germans until November 1917 when they were released and returned to England via Zanzibar.

8 The 'Kinfauns Castle' had been taken over by the Royal Navy as an auxiliary cruiser in August 1914 and initially employed patrolling the trade routes from the Cape. Originally fitted as a passenger ship on the South Africa run, most of the cabins had been removed for storing coal and ten 4.7 inch guns fitted together with searchlights.

9 The 'Laconia' had been requisitioned from Cunard on the outbreak of war and turned into an armed merchant cruiser for work in South African waters. She was a large ship (18,000 tons) but designed for carrying passengers rather than freight. By April 1915 she had joined the small RN force blockading German East Africa.

10 The London Gazette of 8 December 1915 recorded the award of the Distinguished Service Medal to Air Mechanic Ebenezer Henry Alexander Boggis for his efforts in the destruction of the Königsberg on 6 and 11 July 1915.

11 The monitors 'Severn' and 'Mersey', fleet messenger 'Trent', 4 tugs and a collier left Malta on 28 April 1916, and, travelling via the Suez Canal, the Red Sea and Aden, arrived at Mafia Island on 3 June 1916.

12 The 'Laurentic' (14,892 tons) was a White Star liner impressed by the Royal Navy in 1914. She was lost off Ireland on 25 January 1917 after hitting a mine.

13 Farman F27 No 3617. On Cull's return, the aircraft was refuelled and returned to continue spotting for the monitors, flown by Squadron Commander Gordon with Flight Sub-Lieutenant Arnold as observer.

14 Ray Sturtivant, The Sinking of the Königsberg, Aviation News, pages 184-189, 12-25 July 1985, provides a more detailed description of the RNAS contribution to the destruction of the Königsberg. Another useful account by Edward Leiser may be found in the Loss of the Königsberg, pages 357-376, Cross & Cockade Journal Vol 13 No 4, Winter 1972.

15 The London Gazette of 8 December 1915 recorded the award of the Distinguished Service Order to Squadron Commander Robert Gordon and Flight Commander John Tulloch Cull and the award of the Distinguished Service Cross to Flight Lieutenant Harwood James Arnold.

16 Admiral King-Hall, in his despatch of 15 July 1915, noted that "most serious risks have been run by the officers and men who have flown in this climate where the effect of the atmosphere and the extreme heat of the sun are quite unknown to those whose flying experience is limited to moderate climates.....the Flying Officers, one and all, have earned my highest commendations."

17 The low-lying coastal area had proved unsuitable for offensive operations because of the unhealthy conditions and the difficulty of moving in the thick bush. As a result, the main effort had moved inland to the highland area where the going was better – although disease still remained a significant problem.

18 Young, Marching on Tanga, pages 259-260, Naval & Maritime Press, Uckfield, 2004.

19 Mitchell & Smith, History Of The Great War – Medical Services, pages 252-260, HMSO, 1931.

20 Flt Sub-Lts Terraneau, Brown and Stewart-Dawson.

21 Brown, Flying During The Campaign In German East Africa, pages 125-130, The Hawk, 1929.

22 Caudron Ser No 3882.

23 NA AIR1/725/166/1, page 18.

24 A good description of the conditions at Mbuyuni can be found in 'An Airman's Experiences in East Africa' by Leo Walmsley, published in Blackwoods Magazine, Nov/Dec 1919 and Jan/Feb 1920 - NA AIR1/2326/223/54/1.

25 The personnel establishment comprised 20 officers and 150 Other Ranks.

26 A full history of No 26 Sqn may be found in NA/AIR1/1247/204/7/4. The aviation contribution to the Campaign in German South West Africa is covered in detail in the Cross & Cockade Journal, Vol 34, Nos 3 & 4.

27 Although the steel frame of the Henry Farman proved more resistant to the climatic conditions found in Africa, it was not without its problems. During the voyage from England, several of the crates stored on deck were damaged during storms. When they were unpacked the aircraft were found to be badly corroded.

28 Walmsley, Op Cit, page 643.

29 Early January 1916 also saw Admiral King-Hall replaced by Admiral Charlton as CinC Cape.

30 It appears that 4 Voisins were retained at Mombasa and were later employed by No 8 Sqn at Lindi.

31 Probably in Voisin Ser No 8706.

32 There was also a short-lived plan to re-deploy 7 Sqn to the Belgian Congo. In the event, this came to nothing, although 4 Short Type 827s were sent from Zanzibar to Matadi Harbour, at the mouth of the Congo, arriving in January 1916, for use by the Belgian Naval Expeditionary Force on Lake Tanganyika. Hearde, Mission To Kigoma, Air Classics Quarterly, May 1965.

33 NA AIR1/652/17/122/479 - Telegram dated 26 March 1916.

34 There seems to have been a degree of confusion over the titles and styling of RNAS units employed

period there were identically numbered squadrons serving on the Western Front.
35 NA AIR1/652/17/122/479. Although not listed, the first batch comprised BE2c Ser Nos 8714, 8715 and 8716.
36 The journey was not without incident – 3 of the porters were eaten by lions.
37 Flight Sub-Lieutenants Moore and Stewart-Dawson.
38 Stewart-Dawson suffered a serious knee injury that hospitalised him for some months. The London Gazette of 15 June 1917 announced the award of the Distinguished Service Cross to Flight Lieutenant Norman Gordon Stewart-Dawson for carrying out reconnaissance over difficult country on 30 May 1916 when he was obliged to land in the bush.
39 The Germans were employing guns salved from the Königsberg.
40 BE2c Ser No 8715.
41 BE2c Ser No 8714 was damaged beyond repair on 12 July 1916.
42 Voisin Ser Nos 8707 and 8705, BE2c Ser No 8715 and 8716.
43 7 Sqn RNAS Operations Report dated 14 August 1916. NA ADM1/8467/224.
44 Voisin 8707 was badly damaged in a landing accident on 6 September 1916 when being flown by Flt Lt Moore en-route to Dar es Salaam for overhaul (and the renewal of beer supplies).
45 Young, op cit, pages 129 and 226, N&M Press, Uckfield, 2004.
46 Moore, op cit, pages 65-66.
47 NA AIR1/659/17/122/616.
48 The London Gazette of 16 February 1917 recorded the award of the Distinguished Service Cross to Flight Commander William Geoffrey Moore in recognition of the excellent work which he had done in East Africa, and especially on the 10 January 1917, when he flew a distance of 300 miles from Ubena to Mahenje. The London Gazette of 16 February 1917 recorded the award of the Distinguished Service Medal to Air Mechanic Ernest Wright Nelson.
49 BE2c Ser Nos 8424, 8425, 8427, 8428 and 8716.
50 The Official History has erroneously transcribed Nanson's statement on the distance travelled as '85,000 miles' and also conflated his comments about the flying and ground staffs' achievements.
51 The same Gazette also announced the award of the Distinguished Service Cross to Flight Sub-Lieutenant Leslie Oswald Brown "For bravery, zeal and ability shown in many long flights over enemy territory on reconnaissance work and bomb dropping; he was repeatedly under fire."
52 Moore, op cit, page 33.
53 The 'Laconia' was handed back to Cunard in July 1916; only to be torpedoed and sunk by the German submarine U-50 on 25 February 1917.
54 The London Gazette of 15 June 1917 recorded the award of the Distinguished Service Medal to Air Mechanic Frederick Wilmshurst.
55 NA AIR1/652/17/122/479. A comprehensive account of Frederick Bowhill's career can be found in Alan Smith's From Sail To Wing, CCI Vol 25 No 1, 1994, pages1-17. Bowhill remained in the RAF after the war, reaching the rank of ACM. He died in 1960.
56 Watkins, who suffering badly from fever and dysentery, had already left for England.
57 Cull transferred to the RAF on a permanent commission after the war and retired as a wing commander. He died in 1962. Gallehawk and Watkins also remained in the RAF. Gallehawk later commanded No 14 Sqn and retired in 1942 as an Air Cdre. He died in 1945. Watkins retired in 1934 with the rank of Wg Cdr. He died in 1972.
58 It would seem that the RNAS personnel at Zanzibar were formally 'borne' on the books of 'Laconia' until 31 May 1916, when 'Manica' became their (notional) parent ship. When, in April 1917, 'Manica' was in turn withdrawn personnel were borne in 'Hyacinth'.
59 The other officers deployed to Lindi included Dunn, Delamere, Deans and Fitzherbert - together with some 20-30 ratings.
60 Cutler, op cit, page 9.
61 Ibid.
62 London Gazette, 5 April 1918.
63 Richardson, The Crowded Hours, page 212, Max Parrish, London, 1952.
64 Ibid, pages 216-217.
65 Foden, Mimi and Toutou Go Forth, Michael Joseph, London, 2004.
66 Walmsley, An Airman's Experiences In East Africa, Blackwoods Magazine, 1919.

67 Fendall, The East African Force 1915-1919, pages 186-196, Naval & Military Press, 2004.
68 Strachan, The First World War, 2001.
69 Typical monthly demands might include: instruments, aircraft nose pieces, cam boxes, spark plugs and lubricating oils.
70 Rider, Personal Diary, IWM 96/23/1.
71 Moore, Early Bird, page 27, Putnam, London, 1963.
72 London Gazette, 20 June 1916.