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# The Hessian Cloth 'Parajute' of the Second World War

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## ABSTRACT

*The Second World War in India and Burma was principally a ground campaign, prosecuted in large part with supply by air, both air landing and air dropping. Distance from the UK and other factors required GHQ India develop domestic capabilities to be partially self-sufficient. The war in India and Burma has received much less coverage than elsewhere and there are gaps in what has been published. Coverage of the supply parachute situation, critical to air dropping, is one of those gaps, with official and personal books and articles mostly focusing attention on a failed substitute, the hessian cloth parachute, at the expense of the locally produced and massively successful cotton cloth parachute.*

## Introduction

The war in Burma was primarily a land campaign, constrained by the lack of naval resources for amphibious operations and hence shaped by mountainous jungles with essentially none of the transportation infrastructure necessary for delivering logistical support. The vast distances between even the most forward supply points and troops in combat, coupled with the enemy's ability to interdict lines of communication on the ground, necessitated the use of aircraft for supply purposes. The absence of forward airstrips drove the requirement to deliver cargo by air, with or without parachutes, depending on the fragility of the supplies involved. Typically, personnel parachutes were manufactured of silk, having the necessary tensile strength and light weight, although nylon came into use during the war. For supply drops, the Royal Air Force's (RAF) pre-war parachutes were mostly personnel parachutes rejected as no longer fit for service, although a few sources also reference linen and cotton parachutes. The breadth and scope of combat operations in Burma, however, made it clear that relying on castoffs past their 'use-by date' was not an option.

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British forces in India pioneered the large-scale use of cotton parachutes for aerial delivery of supplies during the Second World War, but severe shortages in British Empire shipping and material resources necessitated local production.<sup>1</sup> With the success of early aerial re-supply efforts for then-Brigadier Orde Wingate's 1943 Chindit operation in Burma, Operation Longcloth, and then British Indian Army operations in the Arakan, demand for cargo parachutes for planned operations in 1944 greatly exceeded projected supplies. While expanding Indian domestic production and also looking to Britain and the United States, British Fourteenth Army leadership started to consider manufacturing parachutes of hessian cloth produced from jute, all locally sourced, as another option. The latter has attracted a disproportionate amount of historical attention in various chronicles of the Burma campaign. Generally, only hessian cloth 'parajutes' are discussed in accounts touching on supply-dropping parachutes. There is virtually no mention to be found in any official, academic, or commercial histories, of the 4 million cotton supply parachutes produced locally in India by the end of hostilities, much less how that capability was created in India, from scratch, resulting in an incomplete narrative of how this aerial supply capability was created.

Perhaps a surprise to some, jute, and what Americans call burlap, was an important wartime material. Locally grown, processed and woven into hessian cloth in eastern India, it had a variety of applications. Foodstuffs such as rice and atta, a type of flour, were double or triple bagged in hessian cloth and free dropped. This was first done by 31 Squadron to help feed refugees walking out of Burma in 1942.<sup>2</sup> Hessian cloth provided a lining and covering for the containers used in supply dropping as well as a wide range of other uses. One of its more unusual uses was for 'bit-hess,' hessian cloth coated in bitumen which was laid out in long sheets to 'waterproof' roads and runways in India and Burma. A post war report claimed that 77 million yards of bituminised hessian cloth were laid in this manner.<sup>3</sup>

The earliest supply parachute mentioned in any official history occurs in 'Air Transport Operations on the Burma Front,' a July 1944 booklet written by Air Staff, HQ Air Command South East Asia, and a year before the war ended. This 28-page publication was issued as a Restricted document 'intended for the information of all officers and

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<sup>1</sup>Gerald White, *The Forgotten Contributor to the Forgotten War: The Cotton Supply-Dropping Parachute of India*, Royal Air Force Museum 2022 Conference, RAF Museum, London, UK, 5-6 September 2022.

<sup>2</sup>The UK National Archives (hereinafter TNA) AIR 27/351, 31 Sq Operations Record Book (from 9 May 1942 onward), p. 46; see also Roger Arnett, *Drop Zone Burma: Adventures in Allied Air-Supply 1943-45*, (Barnsley: Pen & Sword Aviation, 2008), p. 67.

<sup>3</sup>W. A. M. Walker, C.B.E., *The Growth of the Jute Industry in India and Pakistan*, Journal of the Royal Society of Arts; London Vol. 97, Iss. 4794, (6 May 1949), pp. 409-420.

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flying crews...' In discussing research carried out by the Airborne Forces Research Centre, the authors noted

Special emphasis was placed upon the use of materials that could be produced inside India, with an eye alike to speed in delivery and to economy in the use of articles imported from overseas. High hopes were for a time placed in the production of jute parachutes which could be cheaply and plentifully manufactured locally, although ultimately it was recognized that they were not sufficiently economical or reliable for regular use until large improvements had been made.<sup>4</sup>

On page 5, there is one reference to '.... folding the cotton or jute [parachutes] fabric' but no mention of such cotton parachutes being sourced in India.

In May 1945, The War Office published 'Notes From Theatres Of War: Burma, 1943/44', in essence a 'Lessons Learned' report separate from, and pre-dating, official despatches published by various senior commanders. In it, the authors wrote, 'Faced with a shortage of supply dropping parachutes, Fourteenth Army turned to the Calcutta jute trade, which responded by producing 'parajutes' which filled the vital gap. The parajutes worked satisfactorily during the dry weather, but in the monsoon they became sodden and ineffective.'<sup>5</sup> The report provided no production or usage figures.

In 1946, South East Asia Command's official public account of the war, 'The Campaign in Burma,' noted: 'Meantime, Fourteenth Army managed with a home-made invention of jute, the 'para-jute.'<sup>6</sup> The statement inferred a wider use of 'para-jutes' than actually occurred, which is particularly surprising given the author's access to South East Asia Command (SEAC) War Diaries and other documentation detailing cotton parachute production.

To date, a few references to 18-foot diameter cotton parachutes have been found. In a 1945 article titled 'Air Supply' published in the US Army's Military Review, Lt Col James I. Muir wrote that 'Ground troops in jungle terrain generally agree that except for special equipment, the 18-foot British cotton parachute is superior to the US 22- and 24-foot rayon chutes for supply dropping ....', he went on to state that:

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<sup>4</sup>Air Staff, *Air Transport Operations on the Burma Front*, (HQ Air Command South East Asia, New Delhi, July 1944), pp. 9-10.

<sup>5</sup>*Notes From Theatres Of War: No. 19: Burma, 1943/44*, (The War Office, London, UK, May 1945), p. 6.

<sup>6</sup>Lt Col Frank Owen, OBE, *The Campaign in Burma*, (His Majesties Stationary Office (HMSO), London, UK, 1946), p. 46.

During an emergency period at the beginning of [Imphal] operations, parachutes were made of burlap -“parajutes”- and were used to supplement a very short [British] supply; they were inefficient but nevertheless worked satisfactorily enough to carry the theatre over a very difficult period.<sup>7</sup>

An additional reference can be found in a 1946 Army Quarterly article by Lt Col J.R.L. Rumsey of the Rajputana Rifles titled ‘Air Supply in Burma’. He wrote ‘The 18-foot parachutes became a standardized supply and were produced in large numbers from indigenous resources.’ Later he states ‘After experience, the 18’ parachute became standard; it can drop a load of 180 lb ....’ There was no mention of the hessian cloth parachute.<sup>8</sup>

Another official account, ‘Wings Of The Phoenix: The official story of the Air War in Burma,’ published in 1949 by the Air Ministry, reinforced the ‘parajute’ narrative. Chapter 3, ‘Monsoon 1943: Action In An Interval,’ starts by discussing the aerial supply mission and noting that ‘Our sole Dakota squadron [31] carried out 1,100 sorties during the monsoon, using ‘parajutes’, an Indian jute substitute employed during the worldwide parachute shortage.’<sup>9</sup> As the Fourteenth Army did not commence experimentation with parajutes until late 1943, this statement is problematic.

In his 1949 presentation, ‘The Growth of the Jute Industry in India and Pakistan,’ W. A. M. Walker, C.B.E., briefly mentioned jute parachute production. He stated that: ‘At one time a special priority order was placed on a few selected mills for the immediate manufacture, within a few weeks, of 100,000 supply-dropping parachutes fabricated entirely from jute.’<sup>10</sup> He did not elaborate on the various production, manufacturing and storage problems, or hessian cloth’s heavier weight and proclivity to absorb water. In 1954, the War Office published Volume 2 of ‘Supplies and Transport,’ covering operations in India and Burma, from a Royal Army Service Corps perspective, but the study lacks references.<sup>11</sup> In one of the few references to supply dropping equipment, Col D. W. Boileau wrote, ‘Thus, when there was a shortage of supply dropping parachutes, the Calcutta jute trade produced “parajutes,” which filled the gap; they worked satisfactorily in dry weather, but in wet weather became sodden and

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<sup>7</sup>Lt Col James I. Muir, *Air Supply*, Military Review, Ft Leavenworth, KS, Vol 25, No. 8, (November 1945), pp. 61-67.

<sup>8</sup>Lt. Col. J.R.L. Rumsey, *Air Supply in Burma*, Army Quarterly (AQ) 55, (October 1947-January 1948) pp. 33-42.

<sup>9</sup>*Wings Of The Phoenix: The official story of the Air War in Burma*, (London: HMSO, 1949), p. 32.

<sup>10</sup>Walker, *The Growth of the Jute Industry in India and Pakistan*, pp. 404-420.

<sup>11</sup>There is a rudimentary bibliography in Appendix XIII listing documents and reports collected and archived by the RASC at Aldershot.

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ineffective.<sup>12</sup> Apparently, he quoted but did not cite 'Notes From Theatres Of War: No. 19: Burma, 1943/44' mentioned above.

The more recent official history, 'The War Against Japan Volume III: The Decisive Battles,' was published in 1962. To date, it provides the most accurate recounting of the supply parachute issue. It briefly discusses production of the 18-foot cotton parachute and relegates the 'parajutes' to a footnote, explaining that they 'did not prove to be entirely satisfactory, especially in wet weather; they were thereafter held as an emergency reserve.'<sup>13</sup> Without references, it is not possible to ascertain the sources used as the information presented is not detailed in any other official history. It should be noted that one of the volume's authors, AVM Noel L. Desour, served as a senior air planner on the AHQ (India) staff in 1943 and then SEAC in 1944, and oversaw several JPS papers concerned with supply parachutes and equipment.

Moving from official histories to personal accounts, the story gets only slightly more detailed in Field Marshal Viscount William Slim's widely read, highly regarded, and oft-cited 1956 'Defeat into Victory'. He recalled that demand for supply parachutes for a planned 1944 offensive greatly exceeding the available supply. After discussions with his Major General Administration, Maj Gen A. H. J. 'Alf' Snelling and others, one of his staff approached Calcutta businessmen about producing jute parachutes. Testing prototypes commenced within 10 days and a working model achieved in a month. He also cited the projected cost savings, writing that 'the cost of a parajute was just over £1; that of a standard parachute over £20.' Published eleven years after the war's end, Slim apparently overlooked, or perhaps had forgotten, the role that cotton supply parachutes were playing, and the challenges of ramping up domestic Indian production to meet military needs. As he mentions conferring with Maj Gen Snelling 'and one or two of his leading air-supply staff officers,' it is difficult to imagine that this information was unavailable to him. Again, unfortunately, there are no references cited.<sup>14</sup> Snelling wrote a two-part 'Army Quarterly' article in 1947 but made no mention of the parachute supply issue. Similarly, there are apparently no despatches, papers or memoirs by him or other senior logisticians from Fourteenth Army that might provide the missing details.<sup>15</sup> Nevertheless, given the generally positive assessments of his

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<sup>12</sup>Col D. W. Boileau (Late of the R.A.S.C.), *Supplies And Transport, Vol II*, of the series 'The Second World War, 1939-1945, Army,' (London: The War Office, 1954), p. 58.

<sup>13</sup>Maj Gen S. Woodburn Kirby, et al., *The War Against Japan, Volume III: The Decisive Battles*, (London: HMSO, 1962), p. 39.

<sup>14</sup>Field Marshal Viscount William Slim, *Defeat into Victory*, (London: Cassell & Co., 1956; republished as (London: Pan Books, MacMillan, 1999), pp. 224-6.

<sup>15</sup>Maj Gen A. H. J. Snelling, C.B., C.B.E., 'Some Fourteenth Army Administrative Problems,' AQ Vol 53, No. 2, (January 1947), pp. 219-230 and 'More Fourteenth Army Administrative Problems,' AQ Vol 54, No.1, (April 1947), pp. 49-65. An interesting read; it is curious

leadership throughout the arduous campaign, Slim retains great authority as a major source on the subject.

In his 1995 work, 'The Forgotten Air Force,' Air Commodore Henry Probert mentions the parajute in passing, noting that they 'were adequate for ordinary supplies and enormous quantities were produced costing just £1 each as opposed to £20 for normal parachutes,' citing figures from Slim's 'Defeat into Victory.'<sup>16</sup> The source for these prices is unclear. A parachute inventory for Akyab and Ramree airfields shortly after the war values cotton parachutes at 42 rupees apiece, or just over £3 at 1945 values.<sup>17</sup> Other sources confirm this amount as the actual cotton parachute production cost.

Michael Pearson, in his 2006 work, 'The Burma Air Campaign' draws upon Slim's 'Defeat Into Victory' and not surprisingly repeats his origins of parajutes account almost verbatim. As noted above, however, Slim did not reference primary sources. Similarly, while Pearson notes monthly parajute production 'increasing from 35,000 to 144,000, with a target of 250,000 per month by end of 1943,' he also provides no source for these figures.<sup>18</sup>

In his 2008 book 'Drop Zone Burma: Adventures in Allied Air-Supply 1943-45', Roger Annett also touches briefly on the parajute narrative. He notes that 'These 'parajutes' were not a long-term success-they were like sponges when it rained-but they filled a short-term gap.' As the official histories and primary source documents show, his is perhaps the least inaccurate assessment to date.<sup>19</sup>

Graham Dunlop, in his excellent 2009 work 'Military Economics, Culture and Logistics in the Burma Campaign, 1942-1945,' echoes Annett's judgement when he writes,

To make up the anticipated shortfall before full production [of cotton parachutes] was achieved, the Union Jute Company of Calcutta was invited to make hessian sackcloth parachutes, nicknamed 'parajutes' for dropping more robust supplies. Following successful trials, the 14<sup>th</sup> Army estimated a

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that Maj Gen Snelling never mentioned hessian-cloth parajutes as Fourteenth Army was the prime beneficiary of the supply parachute and initiator of the parajute.

<sup>16</sup>Air Cdre Henry Probert, *The Forgotten Air Force*, (Brassey's, London, UK, 1995), p. 156.

<sup>17</sup>TNA, AIR 203/1478, Salvage, General, ASD Equipment, Memo for 12th Army, Surplus Supply Equipment at AKYAB and RAMREE, MGA ALFSEA, 7 September 1945.

<sup>18</sup>Michael Pearson, *The Burma Air Campaign: 1941-1945*, (Pen & Sword Aviation, 2006), pp. 108 & 138.

<sup>19</sup>Annett, *Drop Zone Burma*, p. 75.

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requirement for 140,000 'parajutes' by the end of April 1944. They worked adequately in dry weather, but not in wet, so their use was discontinued during the 1944 monsoon, after which adequate supplies of conventional parachutes became available.<sup>20</sup>

### Conclusions

Although more detailed research is needed, the bottom line is that the hessian cloth 'parajute,' while initially showing promise, ultimately failed for multiple reasons. These included: the much greater weight of the parachute, 33 pounds, versus 11 pounds for a Mark II cotton parachute, the uneven quality of the hessian cloth, and numerous production problems. The biggest obstacle was jute's propensity to absorb water which, along with shortages of rot-proofing chemicals, made 'parajute' storage and use, especially during monsoon season, impractical.<sup>21</sup> Multiple SEAC War Diary entries for late December 1944 noted that 250,000 'parajutes' were produced in two batches during February-May 1944 and 'consigned directly to airfields. They have not been successful and 180,000 were still held on airfields at the end of the year.'<sup>22</sup> An 'improved' Mark II hessian-cloth parachute was introduced in late 1944 but, with basic problems still unresolved and the increasing availability of cotton parachutes throughout 1944 and into 1945, most 'parajutes' likely went directly to salvage or disposal. By way of comparison, approximately 4 million 18 feet diameter cotton cloth parachutes were produced in India, with some 3 million employed in the various Indian and Burma campaigns between early 1942 and August 1945.<sup>23</sup>

For as yet undiscernible reasons, the marginally useful hessian cloth 'parajute' still figures more prominently in most written accounts of the Burma campaign than is merited by the facts. The successful production and deployment of the cotton supply parachute was vital to the air supply miracle that was the Burma campaign. The cotton supply parachute story is a largely forgotten component of the forgotten war of the forgotten army.<sup>24</sup>

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<sup>20</sup>Graham Dunlop, *Military Economics, Culture and Logistics in the Burma Campaign, 1942-1945*, (London: Pickering & Chatto, p. 103.

<sup>21</sup>TNA WO 203/3712, Airborne Forces Parajutes; WO 203/850, Air Supply Parachutes Stocks & Requirements.

<sup>22</sup>TNA WO 172/1472, South East Asia Command Diaries, SUPPLY DROPPING, 24 December, p. 68; 28 December, p. 291; 31 December, pp. 498-503.

<sup>23</sup>Government of India Department of Commerce Administrative Intelligence Room, 'Statistics relating to India's War Effort' (Manager of Publications, Delhi, India, 20 February 1947), p. 7; <https://nla.gov.au/nla.obj-51156611/>. Accessed 6 February 2024.