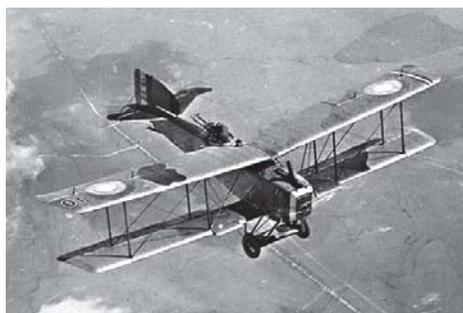




Sidney Cotton. OBE. DFC.

This a very complex story, much bigger than the space we have in *Back Focus* to devote to it and so very complex with all its facets that I'll do something strange and give you the bibliography at the beginning of the story. The two prime sources of the story are books, the first being *Evidence in Camera* by Constance Babington Smith, published by Chatto and Windus in London in 1958 and the second *Aviator Extraordinary: the Sid Cotton Story* also published by Chatto and Windus in 1969. The books are from my own library but with diligent searching on Abebooks or similar one may get lucky and if not your local library would be able to source them for you. Both are highly recommended reading.

In this country if you can kick, hit or throw a ball you will be remembered for decades, but if you do something of use, invent something that makes a difference or pioneer a technique that opens up a whole new way of looking at the world you are usually forgotten very quickly. Those of you who recognized the name may have seen the film, *Last Plane Out of Berlin* or perhaps worn a Sidcot (Pic. 3a.) suit while flying a plane, but there is so much more. Sid Cotton was born on a cattle station at Goorganga on 17th June 1894, a place situated 5



Pic. 2. Breguet WWI Bomber.

miles from Proserpine and 40 miles NW of Bowen in Queensland. In April 1915, on a trip to Brunette Downs, a family property, accompanying his father on the arduous 1200 mile journey, they heard about the sinking of the *Lusitania* and Sid decided to go and fight. His father arranged a passage on the P&O ship *Maloja* to England and for Cotton to join the RNAS (Royal Naval Air Service) as there was no air force in Australia at that time. He graduated from flying school after five hours of flying and was posted to Dover to fly Breguets.

(Pic. 2.) He was soon posted to France and flew Sopwith 1½ Strutters (Pic. 3.) in the same squadron as Kingsford Smith. Also in that squadron was Chris Draper, aka Mad Draper, who flew under the Thames bridges to raise awareness of the plight of veterans; nothing has changed. Cotton always supervised the maintenance of his own aircraft and, during one such episode, the scramble order



Pic. 3. Sopwith 1½ Strutter.



Pic. 3a. The Sidcot flying suit.

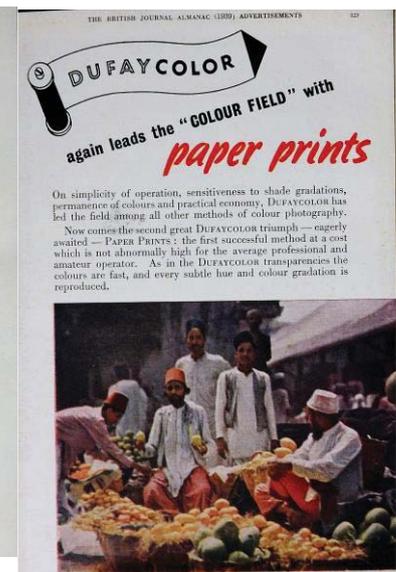
came over the Tannoy and he scrambled wearing his greasy overalls. Upon returning to the 'drome he noticed he was not cold like the other pilots and this set him thinking. Whilst on leave in London he contacted a firm and gave them his idea for a flying suit and had a couple made up for himself: a one-piece boiler suit with oiled cotton for the outer layer, fur or wool in the middle and a close-woven fabric as the inner. The suits were an instant success and were soon adopted by the RAF and RNAS as standard wear. Alcock and Brown used them to fly the Atlantic.

After the war he returned to Australia for a while, but found he could not work with his father in any of the many enterprises the family owned, so he took his leave and

returned to England to get involved in the aviation industry. He flew in many air races and his opponents were the likes of Harry Hawker and Bert Hinkler. Looking for something more rewarding, he went to Newfoundland and started a seal-spotting service for the annual seal hunt and began a company to do aerial survey work. The contract was to photograph the whole of Newfoundland to enable the maps to be updated. This started him off in aerial photography, cold weather flying, and the science of lubrication for cameras in subzero conditions. He took out licences on vast areas of forest and started a lumber business, selling into England. At about this time he was contacted by the DuPont family to look for some French flyers who were believed lost in Newfoundland, since his knowledge and expertise were well known and respected in aviation circles. While waiting for his plane to be prepared he was invited out to Harry Guggenheimer's place on Long Island. Harry was a sponsor of the search and of another flyer houseguest, one Charles Lindbergh. The French pilots were never found and Cotton returned to England in time for the great stock market crash of 1929. When the dust settled he had about \$40,000 to his name and had lost everything else. Time to try something else, something new. He met an optical engineer called Chapman and thought that colour photography could be the way to go. Cotton put up some money and they worked solidly for nearly two years. It was a three primary-colour system but it became obvious that it would never be a commercially viable system, so it was reluctantly abandoned. The bug, however, had bitten: colour photography.



Pic. 4. Dufay Advert.



Pic. 5. Dufay Advert.

Dufaycolor was the name of this bug. Cotton was shown a sample of colour film by an ex-Ilford worker who said it had been invented many years ago by a Frenchman called Louis Dufay. An English woman, Madame Durand, had financed the project but, after getting supplies of film stock and various other supplies, was stymied by the boards of Ilford and Spicers. Cotton approached her and they formed a company Colortone, Ltd. In 1932 Cotton had 66% of the capital and Durand 33%. The Dufaycolor system relies on the primary colours: red, green and blue. The process produced a mosaic where dots of red, green and blue were placed together and were so small that, when looked at, they seemed as one. Exposure of an overlaid panchromatic film gave the required gradations for projection of the image as a colour picture. There was a series of complex deals between Cotton, Chromex, Spicers and Ilford involving distribution and production rights but Cotton was the driving force on the development side (Pics 4 & 5).

Initially, the rollers used to engrave the film base by Spicers were producing 11 lines per mm, but this gave unsatisfactory projection results, so Cotton went to a firm in Kassels, Germany, and was able to procure rollers engraved at 20 lines per mm. The results were excellent, so Ilford came back on board and they launched the product in 1934. Cotton then went to America to promote the film and used the same idea as before: to get a big company to distribute and process the product—and the biggest was Kodak. A meeting was arranged with George Eastman who seemed very keen, since Kodak's own film was not really fully developed, so a product for the interim seemed a good idea. So keen was he that he suggested that Cotton and his wife take a holiday at his favourite hotel in Florida; Eastman would arrange everything. So, borrowing a Delage sports car from a friend, A. J. Miranda, off they went. Less than 48 hours later came the news that Eastman had committed suicide

and, as no deal had been done, it was back to square one. The American market was a tough one to break into then, as now, but the biggest boost came when *National Geographic* started to use Dufaycolor and sales consequently soared. He returned to England and, just as in the Jack Hannes of Hanimex story that took place 35 years later, Sid Cotton was manoeuvred off the various boards of the companies involved in Dufaycolor, Spicers Chromex and Ilford, but retained distribution rights for Europe and this proved to be pivotal.

A telegram arrived at Cotton's apartment on 14th September 1938 from A. J. Miranda, who was coming over from America and would like to meet. The meeting was to take place in Paris and some other people had arrived. The discussion was about the gathering war clouds and the difficulties of getting information on what was happening. It had been noted that Cotton had pioneered aerial survey work in Newfoundland and was well versed in photographic procedures. Would he mind taking a few pictures on his travels? Cotton agreed and, on returning to England, was contacted by a Major Winterbotham from Military Intelligence. The plan was for Cotton to do his business trips in



Pic. 6. Williamson F24 camera.

an aeroplane of his choice and take along some fellows who would fly and take the photos. Cotton didn't really like the idea but gave it a try, with disastrous results. The flying was not up to scratch and neither were the photos. Cotton then arranged to do the flying and photography himself and two Leica Reporters were fitted, one in each wing, and he had a brace of hand-held Leicas in the cabin. And so began the next phase in the Cotton story. There were many trips around the Mediterranean and then the big ones down the Red Sea to Aden

and back and, for these, F24s were installed, one facing to port, one to starboard and one vertical, giving a wide field of view with one pass of the plane (Pic. 6). Cotton continued to fly (his business trips being the cover story) and develop techniques and ideas for directing warm air to the cameras, where his knowledge of cold climate camera lubrication was proving invaluable. On 24th August 1939 at Templehoff aerodrome, Berlin, Cotton was in his Lockheed on the tarmac awaiting permission to fly which was finally given at 11.15 am along with a set route out of Germany and a set height



Pic. 7. Sid Cotton's Lockheed.



Pic. 8. Fitting camera to Spitfire.

to fly at: 'Deviate one metre Herr Cotton and we will shoot you down'. The flight proceeded smoothly and the Leicas clicked away happily and some marvellous shots of Wilhemshaven naval base made the Royal Navy very happy. His was the last plane out of Berlin (Pic. 7).

The next stage of the story concerns itself with the trials and tribulations of a businessman/inventor/leader and his battle with bureaucracy. Cotton was asked to form a photoreconnaissance unit, which he did, and was soon getting good results, better than the RAF and this set

the foundations for his demise but, while he had backing from Churchill and others, he was reasonably secure but they got him in the end and all because of inter-service jealousy and petty politics. Sid Cotton's contribution to aerial photography was enormous and the American forces took to it whole heartedly. The principles of three cameras, fine fine-grain film and developers, heated camera compartments, and skilled interpreters was essential as was creating a history. This entailed flying over the sites at regular intervals and comparing the photos to see what had changed. Other innovations, such as the colour of the paint on the underside of the reconnaissance planes, a sort of duck egg blue, which rendered them virtually invisible to ground based spotters, were invaluable. All these things were great contributions to the war effort and to aerial photography in general, things which we of course take for granted these days. (Pics 8 & 9).



Pic. 9. Photo Reconnaissance Spitfire.

Camera design was another area of input: the original cameras used were of 5-inch focal length and, at 30,000ft, this gave a scale of 1:70,000; switching to 20-inch lenses brought this back to 1:18,000. The Air Ministry eventually relented and developed the F52 and that gave a scale of 1:1000. The use of stereoscopic viewing of the images was also developed in the PDU as Cotton's outfit was called: the Photographical Development Unit. The Leicas, while excellent on the low level 'civilian' flights, were too small to be effective at 30,000ft (Pic 10).

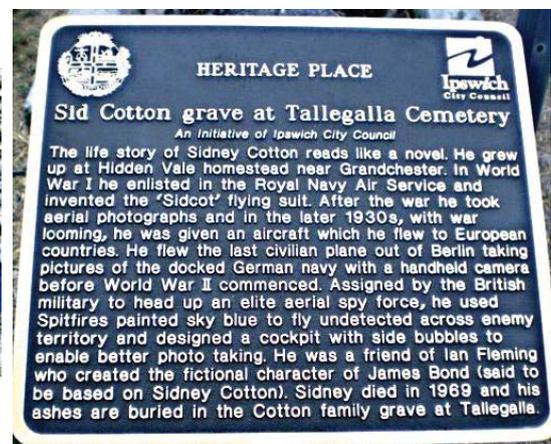
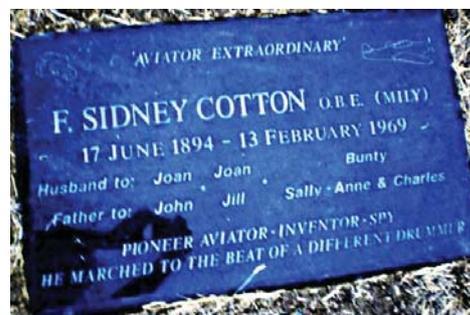


Pic. 10. Selection of aerial cameras.

As a footnote: the first aerial photographer was the Frenchman Felix Tournachon who fixed a camera to a balloon basket and photographed Paris in the spring of 1860. The first military use of aerial photography was during the American Civil War in 1862 when General Lillan sent up a photographer in a tethered balloon to photograph the Confederate positions near Richmond, Virginia. Finally the first photos from an actual aeroplane were taken by a photographer flying with Wilbur Wright on 24th April 1909. Few would have been quite as unique as this one used during WWI. A panoramic camera attached to a pigeon?



Sidney Cotton, considered by many the 'father of photo reconnaissance', was certainly a colourful character (and a bit of a larrikin) by any standard. A.J. Miranda introduced him to the Deuxieme Bureau in Paris and to



Winterbotham in MI6. Churchill backed him to the hilt, as did others, including Ian Fleming and a shadowy figure called 'Pluto' in Military Intelligence. Fleming at the time was Naval Intelligence. There is rumour that his friendship with Ian Fleming resulted in him basing his character James Bond on an amalgam of Cotton, a Peter Reilly and Porfirio Rubirosa. He died virtually penniless on the 13th February 1969. His ashes were sent to Tallegala near Ipwich QLD. The local council is making a tourist promotion from the connection to James Bond.