H I S T O R I C A L F A C T S, TRUTH AND FALSEHOOD
ON THE INVENTION OF AERIAL PHOTOGRAPHY BY KITE

A number of people have written - on the internet and elsewhere - about the origin of the invention of kite aerial photography, often using information copied from various sources but not necessarily always checked for accuracy. In this way, the invention has often been credited to E. Douglas Archibald, sometimes to Aimé Laussédat, rather than to Arthur Batut. Some odd dates have also been quoted for the first KAP photographs, such as 1882 or 1883.
But how much of this is accurate? By examining the following documents, numbered from [1] to [8], I have I think been able to come to a definitive conclusion.

Aimé LAUSSÉDAT

Aimé LAUSSÉDAT (1819-1907) was a polytechnic engineer. Serviceman, scientist, with a keen interest in maths and geometry, he has been teacher, astronomer, inventor, and specialist of metrophotography, nowadays called photogrammetry; he improved optic instruments for astronomy and geodesy; he was interested in the progress of photography and aeronautics.
In the French army he was colonel. At the polytechnic school he teached mathematics and astronomy. As director of the Conservatoire des Arts et Metiers, he created the photographic fund which gathered photographic equipments and many pictures. He has been member of many learned society, on astronomy, geography, photography, aeronautics, etc... He published quite often papers and works on these subjects, and mainly on the metrophotography..
In one of his work on metrophotography he described the aerial photographic methods by balloon and with kite. He is one of the great scientists of the XIXth century.

Edmund Douglas ARCHIBALD

Edmund Douglas ARCHIBALD (1851-1913) was a meteorologist.
He worked on various different applications of kites and in 1882 started making observations of wind speed at different altitudes using anemometers attached to a kite line.
In 1885 he took out a patent on a kite-balloon and on June 25th 1887, wrote a paper published in Nature vol.36.
Besides meteorology, he was also highly interested in the military applications of kites.
In a leaflet written in French on military kites titled Les Cerfs-Volants militaires which he published at the end of 1888 he claimed to have taken aerial photographs in July of the same year. [4]
In The Story of Earth's Atmosphere published in 1897, he claimed to have taken aerial photographs in 1887 [5].

However, he published no photographs and gave no specific details of dates, places, trials or results.
But what in fact has he really done?

Arthur BATUT

Arthur BATUT (1846-1918) was a landowner in Tarn (South of France), humanist, a lover of arts, literature and science, devoting himself to photography.
He performed his first aerial pictures in May 1888 and subsequently sent a letter and two photographs to Gaston Tissandier to demonstrate his technique. Using this information Tissandier wrote an article [2] published in the review LA NATURE on August 25th 1888.
On February July 13th 1889 Arthur Batut shot an overhead picture of his property at 127 m elevation. This photograph was later published in LA NATURE on March 23rd 1889 with all the details of the kite, the camera and the technique employed.
He also wrote a book La photographie aérienne par cerf-volant in which he described his trials, his methods and his equipment. This book of 74 pages was published early in 1890 with a photograph of the town of Labruguiere taken on March 29th 1889. It was followed by a paper in LA NATURE on March 15th 1890.
As a result of this, a number of people got in touch with him – particularly one Emile Wenz and various improvements to his technique resulted. Further articles then appeared in LA NATURE, Sept 26th 1891 and later on January 2nd 1897 from his hand. He was always ready to share his invention with everyone, without profiting from it himself. He thus achieved the gratitude and respect from all those who were interested in Aerial Photography.
Today the Arthur Batut Museum in Labruguière holds 85 prints of his aerial pictures and much of his original equipment.

ANALYSIS AND COMMENTS

From A. Laussédat the publications are many and precise. He never claimed anything about aerial photography with kites. For geodesic surveys by photography, he didn't made the shots. He has not tried himself to do the aerial pictures with kites. After Arthur Batut's trials and the publications on aerial photography by kites he corresponded with him. He recognized the inventor and he paid tribute to Batut in a paper titled Photography with kite published in 1902 in the the Annals of the Conservatoire des Arts et Métiers [8] chapître XXXIII pages 200 to 214.

From E. Douglas ARCHIBALD we have, all in all, only his claims of success in aerial photography which consist in total of just 2 sentences of about 30 words in his leaflet of 1888 [4] and one sentence of about 30 words in his book on meteorology of 1897 [5]. He never published any aerial photographs or described his equipment.
No facts and no witnesses exist to support his claims

In addition to this, when his different claims are examined in detail, various anomalies come to light.

At the end of 1888 [4] he wrote "*I think one could easily replace the observer by a photographic camera...*"
Hardly the words of someone who had already tried and tested the idea.
It is also obvious that, having been made aware of Batut's work, he added three paragraphs to an article he had previously written in order to substantiate his claim for having originated the idea of kite photography.
In the first paragraph he claims to have succeeded in July 1888 and then carries on to say "*I am working to perfect the system for military use*". The second paragraph is a re-wording of the article of G. Tissandier and is obviously written in order to diminish the work of Arthur Batut. The third paragraph written in the form of advice gives the impression that Archibald would be more experienced than Batut.

On July 11th, 1888, the Pall Mall Gazette (London) published an article [1] titled "Kite flying as a science" written by "*a correspondent who called upon Mr Douglas Archibald*". In the last paragraph, speaking of Archibald: "*And he has engaged to raise a camera with either a system of kites or with a kite- balloon at the approaching Unionist demonstration at Eridge Park, by which means he hopes to procure a photograph both as interesting from a political as from a scientific point of view.*"
The aerial demonstration could have been in July and be the one mentioned in [4]. The same text is in the STAR newspaper, published in New Zealand on September 20th 1888 and, being a better copy, is the one shown as[1].

Another paper [2] published July 28th, 1888 in LE TEMPS describes Archibald's work. The similarity with the documents [1] and [4] is obvious; all are from Archibald's own hand. There is no mention of successful aerial photography. It merely mentions the possibility: " *M. Archibald thinks that one could easily replace the observer ...*". It certainly sounds as though it had not been achieved at the time of writing.
This suggests unequivocally that in July 1888 E. D. Archibald had not yet succeeded in making aerial pictures either by kite or by kite-balloon.

In the 1897 book [5], the date of his first kite photography is now moved from July 1888 to the year 1887! Apart from noticing that the camera is suspended on the line and the shutter releases by 'explosion', there is whatsoever no other technical data neither dates nor places. In 1897 suspending a camera on the line was not new either.
When Archibald is writting "*Since that time kite photography has leapt into popularity*" it is clear nowadays that all was achieved without his contribution because he haven't published photographs or technical datas. And finally, to illustrate his writing, he published a kite aerial photograph taken by Baden F.S. Baden-Powell. Why not one of his own photographs? Good question!

In November 1897, in a paper titled Aerial photography in Scribner's Magazine [6], Gilbert Totten Woglom mentionned have seen an aerial picture of E.D. Archibald, "*view vertically over a courtyard wherein is a fountain basin with surrounding shrubbery"*, and shot the same year as the Emile Wenz's photographs in Berck-sur-mer, which set this picture in 1891.

In the Monthly Weather Review of October 1898 [7], a paper titled "a record of some kite experiments" written by William A. EDDY provides interesting reading. He writes first of all an account of experiments carried out by Archibald published in 1886 in Nature. This tallies with article on kite-balloons and on other accounts but not on kite aerial photography.

He goes on to quote from the Pall Mall Gazette he received from London in 1896 or 1897 where "*Archibald is recorded as having taken a kite-photograph in 1886*". A few lines further he points to: "*In the London article mentioning Archibald's kite-photograph, M. Batut of France, is credited with a kite-photograph in the same year*". What Eddy apparently ignored is that Batut's first photographs are from 1888 and not 1886. It can only be a misprint.
In between these two sentences Eddy mentions being "*without knowledge of Archibald's method of suspending his camera*" and having seen one of Archibald's kite-photographs dated 1888 at Blue Hill Observatory on July 30, 1894. He is merely noting that the picture was taken with the camera pointing straight down.
Finally, we have some concrete evidence of Archibald's kite aerial photography.

En 1908, in a paper titled "Photographie aérienne par cerfs-volants"(Kite aerial photography) [9], Emile Wenz mentionned the *booklet titled Les cerfs-volants militaires, in which an Englishman,, Mr E. Douglas Archibald, said have taken, by this means, a photography showing the drawing of terrestrial objects. The instability of the kite which was used to get this shot, probably combined to a shutter too slow, produced a document too defective so we could produce a reproduction of it.* Thus, Emile Wenz who in 1901 hadn't found any evidence of Archibald's first photographs ended to get one, and, what Wenz evoked corresponds to Archibald's words in the booklet, which set the aerial performance in july 1888. Wenz's comment explains why Eddy hasn't described the Archibald's aerial picture he saw at Blue Hill, dated 1888. Is it or not the same picture? No doubt anyway that the quality is not enough for publication. The only thing that we can deduce is that Archibald made trials, which still now we ignore the circumstances, the means, the place, the exact date. Finally, considering his own writings and other informations we will logically set Archibald's first plausible trials in July 1888.

Also, by screening different sources, the kites used by Archibald were arranged in train, a small one , then a larger one, made of bamboo and silk, diamond shape, flat, with a tail of several cones for stabilization. The line angle was rather low, about 40°. Their surface needed a strong wind to lift the load about 1,5 kg, so rendering the kites more unstable. He used a metal wire, so subject to vibrations. The photographic chamber was set vertically downward . In these conditions, combined with a shutter too slow because in 1888 there were very few with shutter speeds faster than 1/100s, as Wenz knew very well, Archibald had few chances to success a good picture.

From A. BATUT there remain 85 photographs, the frame of his kite, his equipment, his book, his notes, his correspondence, those of his friends and acquaintances, the press papers, all the details of his equipment and of his technique, the evidence of those who knew him and who have placed him on the first rank of this invention in their books. To quote for example Lecornu in his book of 1902: "*The first application of kite to aerial photography (...) is due indisputably to a Frenchman, M. Arthur Batut (...) who conceived first and executed a particular layout of a kite making make this experiment possible(...) M. A. Batut pursued his research until the completion of his programme, M. A. Batut is thus the genuine creator of kite aerial photography*"
Obviously nobody had any doubts about Arthur Batut being the first.
There is no need to dwell further on his contribution, his unselfishness, his desire to share his knowledge.
The visible proofs that he has left behind are accessible to all at the Arthur Batut Museum in Labruguière.

CONFUSION

The first misinformation is born from a misunderstanding or a loose traduction of Laussedat's paper on kite aerial photography published in 1902 in the annals of the Conservatoire des Arts et Metiers et republished in 1903 in his work La Métrophotographie. A. Laussédat explained the possible means to shot aerial pictures, and he describes the methods practiced by A. Batut and by E. Wenz. From this, an English spoken author has set Laussédat as the precursor of kite aerial photography. This assertion has then been regularly and unfortunately repeated since the Thirties by English spoken authors in books on geodesy and photogrammetry.
In fact, Aimé Laussédat has never practiced aerial photography, neither from ballon nor by kites.

The main current confusion stems from Clive Hart's book titled 'Kites - an historical survey'. On page 171 §3 he writes: "*The first photograph to be taken from a kite seems to have been the work of E. D. Archibald, whose meteorological studies are discussed above. In 1887 he took a number of photographs, using a small explosion to release the shutter. Many other methods of shutter release were developed later by such people as William Eddy, and the two Frenchmen, Emile Wenz and Arthur Batut.*"
And on page 190 in a chronological summary : "*1887 First kite photographs (Archibald).*"
In fact Eddy was 7 years after Batut and Archibald and 5 years after Wenz. Also, Clive Hart doesn't mention Woglom and Henshaw.
Geoffroy de Beauffort of KAPWA has been able to get to the bottom of this confusion and to explain what happened: Clive Hart read in Archibald's book of 1897 the sentences that we mentioned above [5].

Whilst not doubting the truthfulness of Archibald's claims, he covered himself by using the word "...*seems*...". In his book of 210 pages less than half a page is devoted to aerial photography. He didn't obviously went thoroughly in this topic and it is certainly the reason of this confusion.
But Clive Hart is not the only one to have been taken in, as on page 404 of the American Weather Bureau Report of September 1905 there is a short article entitled 'E. D. Archibald and the modern kite': "*In 1887 Mr. Archibald took a photograph from a kite which is also one of the first if not the very first occasion on which that was done*". This is of course a repetition of Archibald's declaration [5] in his book of 1897.

OTHER CLUES?

One could say that Archibald did have the original idea. He certainly was not the only one, and in this case he would have been superseded at least by Mr Jobert who, in July 1880 outlined a project of aerial photography using a trolley running up the line of the kite. But a project is not an execution.

Let's see again the timeline of the publications

[1]	1888, July 11	Pall Mall Gazette, article informing on Archibald's kite aerial photography project
[2]	1888, July 28	Le Temps, paper on E.D. Archibald without proof of aerial photography
[3]	1888, August 25	La Nature, paper on Arthur Batut and his aerial photographs
-	1888, September 20	Star (NZ), same text as earlier Pall Mall Gazette
[4]	1888, (end)	Les Cerfs-Volants Militaires by E.D.Archibald
-	1889, March 23	La Nature, aerial photograph of Enlaure, A.Batut's property
-	1890, (before March)	La photographie aérienne par cerf-volant by A.Batut
[5]	1897	The story of Earth's Atmosphere by E.D.Archibald
[6]	1897, November	Scriber's Magazine, paper by G. T. Woglom, Aerial Photography
[7]	1898, October	Monthly Weather Review, A record of some kite experiments by William A. Eddy
[8]	1902	Annals of Conservatoire des Arts et Métiers, Photographie par cerf-volant by A. Laussédat.
[9]	1908	Annuaire de photographie, Photographie aérienne par cerfs-volants by E. Wenz

It is curious that Archibald only published two brief paragraphs about his aero-photographic experience. Why did he not show any of his results? Surely it is what any other person would have done to strengthen their claim of being the first. Why didn't he apply for a patent as quickly as he had done in 1895 for the balloon-kite?
Any evidence that could be found of the Unionist demonstration at Eridge Park, Tunbridge Wells could perhaps clear up some of these questions.
The article of the Pall Mall Gazette in 1896 or 1897 about E. D. Archibald and Batut as mentioned by Eddy is unfortunately difficult to found at the present time and thus have not been used in this investigation. It will perhaps make interesting reading in the future?

It is also worth mentioning the bibliographical list made by Emile Wenz and published in L'Aeronaute in November 1901. This shows that Wenz found firstly no evidence of Archibald's photographs. Their contemporaries all unanimously recognized Batut as the inventor of kite aerial photography. This appears to have been universally accepted until the publication of Clive Hart's book in 1967 which sowed the seeds of some totally unsubstantiated doubt. This false information has unfortunately survived despite the investigation of KAPWA published in 1986.

OTHER MISPRINTS

Some authors have mentioned the years 1882 and 1883 as the beginning of kite aerial photography by Archibald and this is obviously totally wrong and without any foundation as indeed Archibald later made clear.
G.T. Woglom in his paper dated 1897 set A. Batut first aerial photography in 1884: misprint or repeat from another wrong document?
In a book in English on photogrammetry it is found that Laussédat made aerial photography trials with a train of kites in 1858 (Photogrammetric Engineering, 1938). These claims also fail to take into account the state of the art of photography and kiting at that time.

CONCLUSION

Three sentences would not be enough to justify a patent, and for any invention proof is of course required. It is quite obviously impossible to qualify Archibald's claims for having invented kite aerial photography. The lack of tangible evidence is not enough to classify Archibald's claims as historical facts.
If we consider the trials of Batut and Archibald, Batut wins out in May 1888 with two months advance. If we consider as success criteria a publishable photograph, there are none issued by Archibald.
Thus Archibald's attempt to rewrite history is obvious and discredits the whole affair. It is a great pity that E. D. Archibald who was undoubtedly a distinguished meteorologist seems to have lost his way on this matter.
He remains of course the first kite-photographer in the UK.

From his photographs, by the development and the fine-tuning of his technique, his accessories, his camera, by the number of shots he made, by the popularization and the share of his invention, it is a fact that **Arthur BATUT** is the **first in the world to have produce kite aerial photographs**.
He was a **true pioneer and the only inventor of kite aerial photography**. His spirit of unselfishness, of sharing and exchange have remained. Nobody should take from him what is owed and which he deserves so well.

Written by Christian Becot and translated by Nigel Shaw, January 2011
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DOCUMENTS copied or translated in APPENDIX

[1] Clipping page 4 of STAR newspaper from Putanga, New Zealand published 20th of September 1888 reporting Archibald's projects expressed by him 4 months earlier and same text as PALL MALL GAZETTE July 11th, 1888.
[2] Translation of newspaper LE TEMPS (Paris), dated July 28th 1888 page 3 on E. D. Archibald
[3] Translation of Chronicle by G. Tissandier in LA NATURE published 25th August 1888.
[4] Translation of Excerp from paragraph on aerial photography in LES CERFS-VOLANTS MILITAIRES by E. D. Archibald published end 1888.
[5] Excerpt of page 174 from THE STORY OF THE EARTH'S ATMOSPHERE by Douglas Archibald and published in 1897
[6] Clipping paper Aerial Photography par Gilbert Totten Woglom in SCRIBNER'S MAGAZINE, novembre 1897.
[7] Clipping of paper written by W. A. Eddy in the MONTHLY WEATHER REVIEW, October 1898.
[8] Translation of Excerp ANNALES DU CONSERVATOIRE DES ARTS ET METIERS, Photographie par cerf-volant by A. Laussédat, 1902 et re-published 1903 in his work LA METROPHOTOGRAPHIE, volume III.
[9] Translation of Exerpt page 355 Photographie aérienne par cerfs-volants by E. Wenz dans ANNUAIRE GENERAL ET INTERNATIONAL DE PHOTOGRAPHIE, 1902

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1887 NATURE Vol. 36 page 278 published on July 21st The captive kite-balloon by E. Douglas Archibald

1888 PALL MALL GAZETTE, London, July 11th, Kite flying as a science

1888 LE TEMPS, (newspaper) Paris July 28th, Lectures étrangères, Cerfs-volants militaires.

1888 LA NATURE n°795, August 25th chronicle La photographie aérienne par cerf-volant signed G. Tissandier

1888 STAR (NZ) september 20th, paper on kite-balloon and Archibald's projects, same text as Pall Mall Gazette July 11th Also published in the Timaru Herald on29th October 1888 and in the Grey Valley Argus on 9th January 1889 (Thanks to the resource paperspast of the New-Zealand government).

1888 LES CERFS-VOLANTS MILITAIRES by E. D. Archibald, published end of the year.

1889 LA NATURE n°825 pages 257 & 258 published March 23rd, La photographie en cerf-volant by G. Tissandier

1890 LA PHOTOGRAPHIE AÉRIENNE PAR CERF-VOLANT by Arthur Batut, published beginning of the year (a)

1890 LA NATURE n°876 pages 225 & 226 published March 15th La photographie aérienne by Gaston Tissandier

1891 LA NATURE n° 956 published September 26th, La photographie en cerf-volant by Albert Londe

1897 LA NATURE n° 1231 pages69 & 70 published January 2nd, Photographie aérienne by Arthur Batut

1897 THE STORY OF THE EARTH'S ATMOSPHERE by Douglas Archibald

1897 SCRIBER'S MAGAZINE November, pages 617 to 628 Aerial photography par Gilbert Totten Woglom

1898 US MONTHLY WEATHER REVIEW, n°26, October, A record of some kite experiments by William A. Eddy

1901 L'AERONAUTE Novembre, Résumé historique, invention de la photographie aérienne par cerf-volant by E. Wenz

1902 ANNALES DU CONSERVATOIRE, chapter XXXIII, page 200-214 Photographie par cerf-volant by A. Laussédat

1902 LES CERFS-VOLANTS by J. Lecornu, re-published several times (a)

1905 US WEATHER BUREAU REPORT September issue, E.D. Archibald and the modern kite

1908 ANNUAIRE GÉNÉRAL DE LA PHOTOGRAPHIE, Photographie aérienne par cerfs-volants par Emile Wenz (a)

1967 KITES an historical survey by Clive Hart, re-published 1982 n° ISBN 0-911858-38-5 (a)

1986 KAPWA MAGAZINE n° 3 July (available on request)

1988 LABRUGUIÈRE, D. Autha - S. Negre - G. de Beauffort - R. Fosset, bilingual, and comprising the contents of A. Batut's book of 1890 n° ISBN 2-87701-007-4 (a)

1991 PHOTORESEARCHER issue n°3, December pages 20-23 Arthur Batut by Serge Negre

1995 AERIAL PHOTOGRAPHY TAKEN FROM A KITE, Yesterday and to-day, Kapwa Foundation, one edition in French and one in English, both including A. Batut's book of 1890 ISBN 2-9600048-2-5 (a)

2001 ÉTUDES PHOTOGRAPHIQUES n°9 May Un basculement du regard by Thierry Gervais

2007 DRACHEN FOUNDATION JOURNAL n°24 Summer issue, Aerial Photography in the Early Days by Timeline

2008 ARTHUR BATUT Regards d'un humaniste photographe S. Negre, S. Desachy ISBN 978-2-7089-8196-6 (a)

NB _ (a): These books are described in the bibliography www.becot.info
_ NATURE is an English review published since november1869.
_ LA NATURE is a French review published since 1873, weekly until 1926, bi-monthly until 1848 then monthly, and merged with La Recherche in 1972.

ESPACE ARTHUR BATUT

Holder of Arthur Batut's collections and equipments
LABRUGUIÈRE 81290, Tarn, France
http://www.espacebatut.fr/

A correspondent who called upon Mr Douglas Archibald, F.R. Met. Soc., who has invented the combination of the kite-balloon, supplies the following account of the invention :—

Mr Archibald stated that experience had shown that captive balloons can only be flown with any success for purposes of observation during, on an average, a third of the year, on account of their extreme sensitiveness to the action of the wind. Indeed, a captive balloon cannot be utilised at all when the wind is blowing more than twenty miles an hour. By the invention of the kite-balloon, not only are these difficulties overcome, but a kite adds immensely to the lifting power of the balloon, and thus economises the cost of the gas employed. The kite is of silk, stretched on two transverse rods of bamboo, and is made in proportion to the size of the balloon. It is fastened to the side of the balloon, almost covering it, and thus protects it from the wind. With this application captive balloons can be flown during no less than about 330 days, as against 100 days without the kite. At a recent trial before Major Templar, at Chatham, the additional lifting power of the kite was fully demonstrated. Alone a small balloon of 100 cubic feet capacity could only raise 4lb; but when attached to one of the small kites in a very light breeze, it lifted 1000ft of steel wire (the earth-line) and one of the soldiers' coats, extemporised for the occasion, weighing 10lb, a result which the balloon department declared had never yet been accomplished with so small a balloon Or, to put the matter in another way, illustrating the value of the kite application as regards economy of space and cost, a balloon of 2000 cubic feet capacity, with coal gas plus, a proportionate kite will lift 180lb, say, in a wind of twenty miles an hour, while to lift the same weight by balloon alone, a balloon of 4500 cubic feet capacity would be required. Mr Archibald claims the utility of his invention for signalling at sea, where the wind is almost always too strong for a captive balloon to fly alone; and in combination with Bruce's electric light balloons, naval signalling might be effected with ships below the horizon.

Mr Archibald has been for years carrying on experiments in anemometrical observation, under grants from the Royal Society, with a system of kite-flying. He raises his kites tandem fashion in very light winds. A small one is first got aloft, which helps up a heavier one, and so on. With two small kites he once lifted about 2500ft of steel wire, and three anemometers, each weighing 1½lb, to a vertical height of 1100ft, with a wind of only a little over seven miles an hour. And he is now organising a system of kites which will in twenty minutes raise a man sufficiently high to take an observation of the enemy, with the wind blowing from twenty to thirty-five miles an hour, when no balloon could possibly be utilised. And he has engaged to raise a camera with either a system of kites or with a kite-balloon at the approaching Unionist demonstration in Eridge Park, by which means he hopes to procure a photograph both as interesting from a political as from a scientific point of view.

[1] STAR Putanga

20 mahuru 1888

page 3, 1888, september 20

Same text as

Pall mall Gazette, London, 1888, July 11

[3] LA NATURE

2ème semestre

25 août 1888

N° 795 page 206

CHRONIQUE

La photographie aérienne par cerf-volant. — Nous recevons de l'un de nos lecteurs, M. Arthur Batut, à Enlaure (Tarn) une intéressante communication dont nous reproduisons la partie essentielle : « Je poursuis depuis six mois environ la solution du problème de photographie aérienne par *cerfs-volants*. Les résultats que j'ai obtenus, bien que très imparfaits encore, me permettent d'espérer une réussite complète.... Le cerf-volant est un appareil peu coûteux, d'un transport relativement facile et qui, sans excéder des dimensions très acceptables (2 mètres de haut sur 1m,40 de large), enlève facilement un appareil photographique du poids de 1 kilogramme. » Notre correspondant accompagne sa lettre de l'envoi de deux photographies mesurant 0m,080 sur 0m,100, obtenues, l'une à 100 mètres, l'autre à 80 mètres environ d'altitude, et donnant la vue de la maison et de la ferme d'Enlaure, appartenant à l'expérimentateur ; ces épreuves sont *flou*, mais elles donnent cependant le plan des habitations et des arbres qui l'environnent. Il y a là, assurément, un premier résultat très digne d'être encouragé.

[4] Les Cerfs-volants militaires

fin 1888

Extrait pages 7 & 8

Photographie aérienne au moyen des cerfs-volants conjugués. — Dans le cas où il ne sera pas jugé prudent d'exposer un homme au tir de l'ennemi, je pense qu'on pourra aisément lui substituer un appareil photographique qui rapportera une épreuve instantanée, après une rapide ascension.

Pour cet objet les cerfs-volants conjugués sont spécialement avantageux. Au mois de juillet dernier, j'ai pris, par ce moyen, des photographies montrant distinctement le plan des objets terrestres. Je m'occupe à perfectionner ce système dans un but militaire.

J'ai appris dernièrement qu'un Français, M. Arthur Batut, à Enlaure (Tarn), poursuivait, de son côté, depuis quelque temps la solution du problème de la photographie aérienne au moyen des cerfs-volants. Les résultats qu'il a obtenus, bien que très imparfaits encore, lui font espérer une réussite complète. Les épreuves qu'il a obtenues sont *flou*, mais elles donnent cependant le plan des habitations et des arbres environnants.

Je crois que le *cerf-volant-ballon*, offrant plus de stabilité et de pouvoir ascensionnel, donnerait de meilleurs résultats.

LECTURES ÉTRANGÈRES

CERFS-VOLANTS MILITAIRES

Un membre de la Société météorologique de Londres, M. Douglas Archibald, poursuit présentement d'intéressantes recherches sur l'emploi du cerf-volant comme moyen d'observation militaire.

L'expérience a montré depuis longtemps que les ballons captifs ne peuvent être employés à la guerre qu'un jour sur trois ou quatre, en moyenne, à raison de leur extrême sensibilité à l'action du vent. Aussitôt que la vitesse de ce vent dépasse une trentaine de kilomètres à l'heure, ce qui est un cas fréquent, surtout en certaines régions de l'Europe, le ballon captif devient inutile.

C'est ce qui a suggéré à M. Archibald l'idée, non pas de lui substituer, mais de lui associer le cerf-volant. Il est arrivé par cette simple combinaison à rendre possible l'emploi du ballon captif par des temps qui l'auraient naguère absolument prohibé. Non seulement le cerf-volant imprime une grande stabilité au système, mais il apporte au ballon une force ascensionnelle notable et diminue ainsi la dépense en gaz.

Le cerf-volant militaire est construit en soie sur deux traverses perpendiculaires de bambou, et de dimensions proportionnées à celles du ballon. Il est attaché au flanc du ballon de manière à lui servir d'écran et à l'abriter du vent. L'observation démontre qu'avec cet appendice le ballon captif peut servir 330 fois dans l'année, alors qu'on pourrait à peine l'élever 100 fois sans cerf-volant.

Des expériences exécutées à l'arsenal aéronautique militaire de Chatham, en présence du major Templan, ont mis hors de doute la force ascensionnelle du cerf-volant. Un petit ballon de 100 pieds cubes n'élevait qu'un poids de 4 livres : associé au cerf-volant, par une brise très faible, le ballon enleva 1,000 pieds de fil d'acier, plus une capote de soldat pesant 10 livres. Des observations répétées ont permis d'arriver à la conclusion qu'un ballon de 2,000 pieds cubes, chargé de gaz d'éclairage et associé à un cerf-volant de dimensions appropriées, élève le même poids, par une brise de 20 milles, que peut élever un ballon de 4,500 pieds cubes, sans cerf-volant.

Il y a déjà plusieurs années, du reste, que M. Archibald poursuit des observations anémométriques par un système de cerfs-volants et reçoit à cet effet une subvention de la Société royale. Entre autres procédés ingénieux qu'il mit en œuvre, il faut citer sa manière d'atteler plusieurs cerfs-volants ensemble et de les rendre solidaires. La brise est-elle très faible, par exemple, il commence par en lancer un très léger, qui aide à en élever un autre plus lourd, et ainsi de suite, arrivant de la sorte à des poids surprenants. Par une brise de sept milles, il a pu parvenir à élever à 333 mètres de hauteur verticale, avec deux très petits cerfs-volants, environ 2,500 mètres de fil d'acier et trois anémomètres pesant chacun une livre et demie.

Présentement, il se fait fort, par son système de cerfs-volants accouplés, d'élever, en vingt minutes, un homme à hauteur suffisante pour observer les mouvements de l'ennemi, par un vent de trente à cinquante kilomètres à l'heure, qui rendrait inutiles tous les ballons captifs.

Dans le cas où il ne sera pas jugé prudent d'exposer l'observateur au tir de l'ennemi, M. Archibald pense qu'on pourra aisément lui substituer un appareil photographique qui rapportera une épreuve instantanée, après une rapide ascension. Il estime que son invention peut être utilisée avec succès pour les signaux à la mer, où la force du vent interdit presque toujours l'usage des ballons captifs ; et il suffirait d'associer le cerf-volant au petit ballon électrique de Bruce pour que ces signaux pussent être visibles, de nuit, pour les navires placés au-dessous de l'horizon.

Au total, les destinées nouvelles tracées au cerf-volant paraissent devoir être des plus brillantes, et ce charmant jouet, qui a déjà servi à Franklin pour aller chercher la foudre dans les nuages, pourrait bien être gros d'applications inédites.

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[2] *LE TEMPS* Paris
28 juillet 1888, page3

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[5] THE STORY OF THE EARTH'S ATMOSPHERE

1897 Extract page 174

~~eral occasions for three years.~~ Kites were also employed, first by the author in 1887, to photograph objects below by means of a camera attached to the kite wire, the shutter being released by explosion. Since that time kite photography has leapt into popularity, and has been successfully practised by M. Batut in France, Capt. Baden Powell in England, and Eddy in New Jersey.

The figure following represents a recent photograph of Middleton Hall, Tamworth, taken by Capt. Powell with a kite-suspended camera at a height of about 400 feet above the ground.

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[6] SCRIBNER'S MAGAZINE

page 621, November 1897
AERIAL PHOTOGRAPHY

~~of the then Minister of War.~~ Another Frenchman, M. E. Wenz, experimented near Reims with a tail-kite 98.31 inches × 66.92 inches. The kite frame was arranged with ferrules to be disjointed like a fishing-rod for ease of transportation, and the camera was made a part of the bridle, so as to adjust it to variable inclinations with the plane of the landscape. The size of his camera was 4.33 × 6.10 inches, and with it he secured some fine views about the coast of Berck-sur-mer. Pictures were taken from an altitude of 1,000.6 feet, computed from the height of one of the buildings in the view.

In the same year, Mr. Archibald, in England, is reported to have taken several photographs from a small camera suspended, lens downward, from one of his trains of tail-kites. One picture which the writer has seen is a view vertically over a courtyard wherein is a fountain basin with surrounding shrubbery. ~~Mr. Eddy began~~

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[7] MONTHLY WEATHER REVIEW

A RECORD OF SOME KITE EXPERIMENTS.

By William A. Eddy, Bayonne, N. J. (dated December 5, 1898).

My first experiment with a kite was in 1863, when with another boy I tied a lantern to the tail of an ordinary kite at night. The lantern was soon extinguished by the rapid motion of the kite tail, but it did not occur to me to suspend the lantern from the string below the kite. In 1887 I heard of the life-saving use of the kite for towing buoys ashore, invented by J. Woodbridge Davis, of New York, and while looking up the subject, I read an account of the experiments of E. Douglas Archibald, of England, published in Nature, in 1886. In a copy of the Pall Mall Gazette sent to me in 1896 or 1897 from London, Archibald is recorded as having taken a kite photograph in 1886. I am yet without knowledge of Archibald's method of suspending his camera, but one of his kite photographs which I saw at Blue Hill Observatory when I first flew my kite there on July 30, 1894, revealed the fact that his camera pointed straight downward. The view was dated 1888. In the London article mentioning Archibald's kite-photograph, M. Batut, of France, is credited with a kite-photograph in the same year. Wenz, of Paris, seems to have taken up the subject of kite-photography in 1890 or 1891. He has recently sent to me, care of Blue Hill Observatory, a clear kite-photograph, not titled, but evidently of the Seine in Paris, for which I shall send him two of my own of the Capitol at Washington, one taken by hand from the roof of the Coast Survey Building, and the other with the camera suspended from the kite cable about 300 feet above the roof.

The European kite photographers seem to have taken map views, leaving the writer to take his first perspective view from kites on May 30, 1895, at Bayonne, N. J.[1]

[8] A. LAUSSÉDAT

1902 Annales du Conservatoire

1903 La métrophotographie

Les premiers essais de photographie à l'aide d'un cerf-volant, faits par M. A. Batut, remontent à 1888 (2). Frappé de la netteté et de l'intérêt des résultats obtenus par d'habiles aéronautes, mais en même temps de la dépense et des autres difficultés inhérentes à l'emploi des ballons (3), M. Batut s'était demandé pourquoi l'on ne tenterait pas de recourir au cerf-volant et, en très peu de temps, grâce à son ingéniosité, il parvenait à réaliser un projet qui, au premier abord, aurait pu paraître bien hasardeux.

La publication dans *la Nature* des premières épreuves obtenues par un procédé aussi original fut à la fois une sorte d'événement dans le monde photographique et un véritable triomphe pour l'inventeur. Mais, quoique ces épreuves fussent déjà remarquablement nettes (et l'on en pourra juger par la vue de Labruguière, photographiée le 29 mars 1889, le cerf-volant étant à 90m de hauteur, reproduite *Pl. VIII*), l'inventeur ne se tint pas pour satisfait et, avec la plus louable persévérance, il a continué et continue encore à perfectionner la construction du cerf-volant et de sa chambre noire, le mode de suspension de cette dernière, le mécanisme de l'obturateur,

(1) Dans plusieurs grands pays de l'Europe et aux États-Unis. En France, il convient de mentionner tout particulièrement l'*Observatoire de Trappes*, si habilement dirigé par M. Léon Teisserenc de Bort.

(2) A la même époque, un Anglais, M. E. Douglas-Archibald, avait employé le cerf-volant pour obtenir des vues photographiques. Le fait est consigné dans une brochure ayant pour titre : *Les cerfs-volants militaires*, par E. DOUGLAS-ARCHIBALD, Librairie Universelle, Paris, 1888; mais on ne connaît aucune reproduction des épreuves de cet auteur.

Photographie aérienne par Cerfs-Volants

Par Émile WENZ

[9] ANNUAIRE GÉNÉRAL ET INTERNATIONAL DE PHOTOGRAPHIE

1902

L'emploi du *cerf-volant* pour enlever une chambre noire à laquelle on donnera comme mission d'aller prendre des vues photographiques du pays environnant, a été signalé pour la première fois en 1888. En effet, nous trouvons qu'il en a été fait mention dans deux publications parues cette année-là : la première, dans la *Nature* du 25 août 1888 (p. 206), dans laquelle M. Arthur Batut, d'Enlaure (Tarn), dit poursuivre depuis six mois environ la solution du problème de photographie aérienne par cerfs-volants; il a soin d'accompagner sa communication de deux épreuves 8 × 10 qui, quoique *floues*, constituent une preuve palpable que la chose est réellement faisable; la deuxième, dans une petite plaquette, publiée à la librairie universelle, intitulée *les Cerfs-volants militaires*, dans laquelle un Anglais, M. E. Douglas Archibald, dit avoir pris, par ce moyen, une photographie montrant le plan des objets terrestres. L'instabilité du cerf-volant qui a servi à obtenir cette épreuve, jointe sans doute à un obturateur trop lent, en font un document trop défectueux pour que nous puissions en donner une reproduction.

Ajoutons que c'est M. Archibald qui, en 1883, a fait renaître l'emploi du cerf-volant pour élever des instruments météorologiques.

APPENDIX

[2] Translation of clipping from LE TEMPS, Paris, Cerfs-volants militaires

Published July 28th 1888, page 3.

Military kites

A member of the Meteorological Society of London, Mr Douglas Archibald, is presently pursuing interesting researches on the use of kite as means for military observation.

Experience has shown since a long time that captive balloons can be flown at war only one day on three or four, as average, on account of their extreme sensitiveness to the action of the wind. As soon as this wind is blowing more than about 30 kilometers by hour, which is a frequent situation, especially in some parts of Europe, the captive ballon cannot be used.

This is what have given to Mr. Archibald the idea, not to substitute, but to associate to it a kite. He ended with this simple combination by making possible the use of the captive balloon in conditions which lately would have prohibited it. Not only the kite provides a great stability to the system, but it gives to the ballon an appreciable lifting power and thus economises the cost of gas.

The military kite is of silk, stretched on two transverse rods of bamboo and is made in proportion to the size of the balloon. It is fastened to the side of the balloon, in such as to provide a shelter and protects him from the wind. Observation shows that with this appendix the captive balloon could be flown 330 days a year as against it would be lifted barely 100 days without the kite.

The trials done at the aeronautic arsenal of Chattam before Major Templan, have cast beyond doubt the lifting power of the kite. Alone a small balloon of 100 cubic feet capacity could only raise 4lb; but when attached to the kite in a very small breeze the balloon lifted 1000ft of steel wire plus a soldier's coat weighting 10lb. Repeated trials have lead to the conclusion that a balloon of 2000ft capacity loaded with coal gas plus a proportionate kite, can lift the same weight, by a 20 miles breeze, than will lift a ballon alone of 4500 cubic feet without kite.

Mr Archibald has been for years carrying experiments in anemometrical observation with a system of kite-flying, under grants of the Royal Society. Between other ingenious methods he applied, it must be mentionned his tandem fashion to link together several kites. For example, be the breeze very light, a small one is first got aloft, which helps up a heavier one, and so on, getting that way surprising weights. With two small kites, he once lifted about 2500ft of steel wire and three anemometers, each weighting one and half pound, to a vertical height of 333 meters, with a wind of only seven miles.

Actually, with his tandem kites, he is sure to raise in twenty minutes a man sufficiently high to take observations of the moves of the ennemy, with the wind blowing from thirty to fifty kilometers per hour when no captive balloon could possibly be utilized.

In the opportunity it would not be found wise to expose a man to the fire of the ennemy, Mr. Archibald thinks that one could easily replace the observer by a photographic camera which will bring back an instant print, after a fast climb. He considers his invention could have a successfull utility for signalling at sea, where the wind almost always is keeping the captive balloons off flying; and it would be sufficient to combine the kite with Bruce's electric light small balloons for the signals to be visible to ships below the horizon.

In all, the new ways destined to the kite look to be the most brilliant, and this delightful toy, which has already helped franklin to get the thunderbolt in the clouds, could just be empty of original applications

[3] Translation of G. Tissandier's paper in La Nature magazine issue 795

published 25th August 1888.

Aerial photography by kite

We receive from one of our readers Mr Arthur Batut, in Enlaure (Tarn) an interesting communication from which we are reproducing the essential part: " I pursue since about six months the solution to the problem of aerial photography by kites. The results that I have got, although still very unfinished, let me hope a full success... The kite is a cheap equiment, its transportation is relatively easy and which, without exceeding very acceptable dimensions (2 m high and 1,4 m width), is lifting easily a camera box weighting about 1 kilogram." Our correspondant enclosed his letter sending two photographs measuring 0,080 m by 0,100 m, obtained, one at 100m, the other one at about 80 m elevation, and giving the view of the house and the farm of Enlaure, belonging to the experimenter; these prints are blurred, but they give nevertheless the plan of the buildings and of the surrounding trees. There is there, undoubtedly, a first result well deserving to be encouraged.

[4] Translation of the page 6 of Les Cerfs-Volants Militaires, author E. Douglas Archibald, published end of 1888.

In the opportunity it would not be found wise to expose a man to the fire of the ennemy, I think one could easily replace the observer by a photographic camera which will bring back an instant print, after a fast climb. For this instance, the combined kites are especially advantageous. During last July, I took, by this means, some photographs showing distinctly the plan of terrestrial objects. I am working to improve this system for military use. I got to know lately that a French, Mr Arthur Batut, in Enlaure (Tarn), pursued on his own, since some time, the solution to the problem of the aerial photography by the means of kites. The results he got, although quite imperfect, let him hope a complete success. The prints he got are blurred, but it gives the plan of the buildings and the surrounding trees.
I think that the kite-ballon, offering more stability and lifting power, would give better results.

[8] Translation of Chapter XXXIII, Photographie par cerf-volant, author A. Laussédat
Annales du conservatoire des Arts et Métiers, 1902, 3rd serie tome IV, page 201
and La métrophotographie, volume 3, 1903, page 195

The first trials of kite aerial photography, performed by Mr A. Batut, goes back to 1888 (2). Impressed by the sharpness and the interest of the results obtained by skillful aeronauts, but at the same time of the cost and the difficulties inherent in the use of the balloons, Mr Batut asked himself why one could not have a try by having recourse to kite and, in a short time, thanks to his cleverness, he managed to achieve a project which, at first sight, would appeared just risky.
The publication in La Nature of the first prints by such an eccentric method has been both some kind of event in the photographic world and a real triumph to the inventor. But, although these prints were already remarquably sharp, (and one will be able to judge it by the view of Labruguiere shot the 29th of March 1889, the kite being 90 m high, reproduced fig. VIII) the inventor didn't feel happy with it and, with the most commendable perseverance, he kept on and he is still keeping on improving the making of the kite and of the camera, its suspension design, the shutter mechanism, (...)
(2) In the same period, an Englishman, Mr E. Douglas-Archibald, used the kite to get photographic views. The fact is wrote down in a booklet with the title "Les cerfs-volants militaires", but we don't know any reproduction of the prints of this author.

[9] Translation of the page 355, Photographie aérienne par cerfs-volants, author E. Wenz, published in 1908, Annuaire général et international de la photographie, librairie Plon.

The use of kite to lift a camera which purpose is to shot views of the surrounding country has been pointed out for the first time in 1888. In fact, we find that it was mentionned in two publications issued that year: the first, in La Nature, on 1888, August 25th, page 206, in which Mr Arthur Batut, of Enlaure (Tarn), said having carried on since about six months the solution to the problem of the aerial photography by kites; He had care to attach to his message two prints 8 x 10 [cm] which, though blurred, make up a palpable proof that it is really feasible; the second, in a small brochure, published at the Librairie Universelle, titled Les Cerfs-volants Militaires, in which an Englishman, Mr E. Douglas Archibald, said have taken, by this means, a photography showing the drawing of terrestrial objects. The instability of the kite which was used to get this shot, probably combined to a shutter too slow, produced a document too defective so we could produce a reproduction of it.
Let's add that Mr Archibald is the one who, in 1883, made re-born the use of kites to lift meteorological instruments.

Translations by Christian Becot, December 2010 and August 2013