- History and Historic Photographic Technologies

Aerofototeca Nazionale
(The National Archive of Aerial Photography)

"If your pictures aren't good enough,
you are not close enough"

Robert Capa

This famous quote, usually attributed to Robert Capa, suggest that if you wish to obtain an interesting photo you have to be inside the scene, really close to your target.

From his point of view, Capa was right. His photos of the D-Day - took at risk of his own life - helped the Allies to win the war.

But Capa didn't work with aerial photography, and in some ways he was wrong. While he was taking the famous images of the landing at Omaha beach on the 6th June of 1944, someone else was taking crucial images from above. Those images really helped the Allies win the war.
So maybe we should say:

“If your pictures aren’t good enough, you are not **FAR** enough”.

Aerial photo of ships of the Royal Navy massing off the Isle of Wight before setting off for the Normandy beaches.
(Credits: A 23720A / Imperial War Museum)

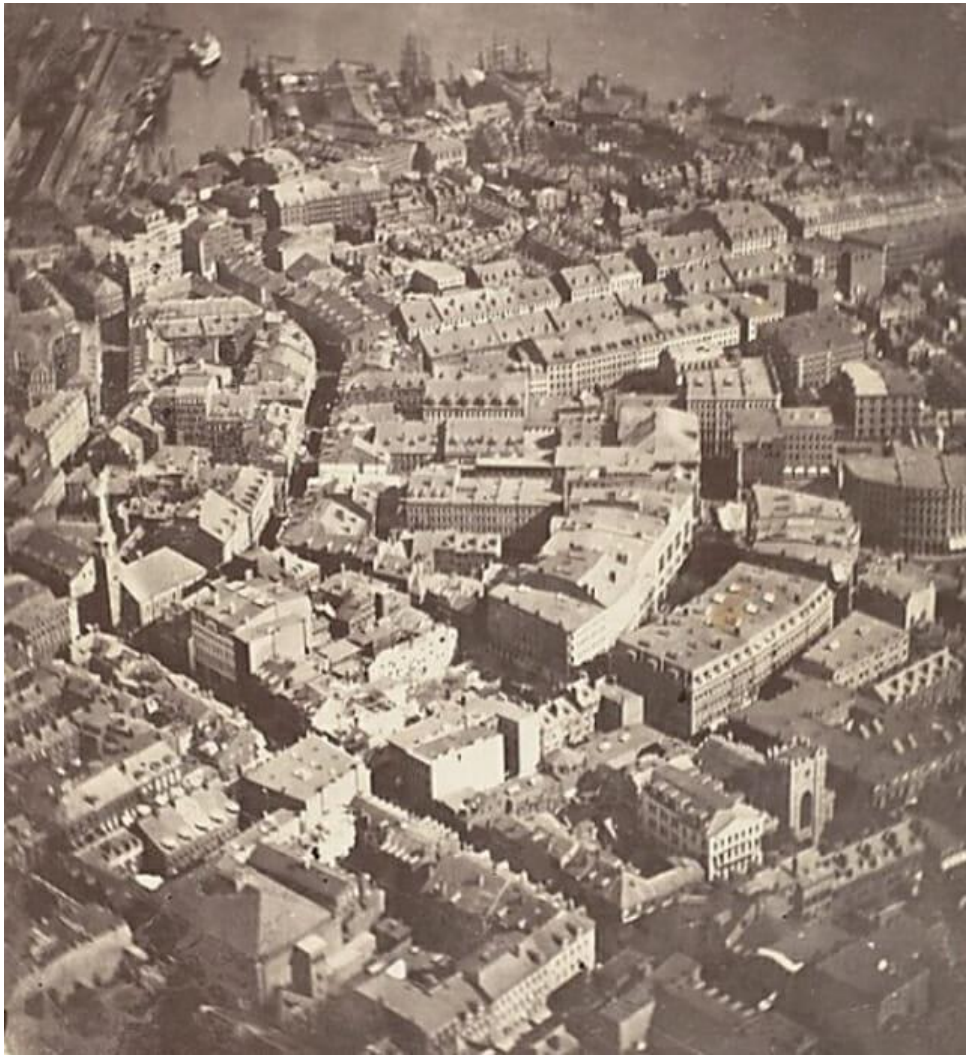
“Omaha Beach”American Liberty ships were deliberately scuttled off the beaches to provide makeshift breakwaters during the early days of the invasion somewhere in France. This scene shows 13 Liberty ships formed into a protecting screen for the vessels unloading c the beach. (Credits: U.S. Army)

Aerial photo of the landings on sector Mike, Juno Beach assault area, to the west of Courselles-sur-Mer, 6 June 1944. (Credits: CL 41 / Imperial War Museum)

The reality is that (without decreasing the importance of Capa's photos) it was the millions of aerial photos taken from above that allowed the Allies to win the war.

In fact, we can say that…

to get a good photo you have to be at the right distance from your subject at the right moment. Different distances tell very different things.



"Boston, as the Eagle and the Wild Goose See It," aerial photograph by James Wallace Black, 1860

From the dawn of photography it was clear that carrying a camera very high up in the sky would allow humanity to realize the ancient dream of seeing the world from the point of wiew of a bird.

It was immediately clear that this would also fulfill the ancient dream of every soldier, which is to see what happens beyond the hill.

The photo that you see here is probably the most ancient surviving aerial photo, "Boston, as the Eagle and the Wild Goose See It". It was taken by James Wallace Black in 1860.

“Nadar raises photography to the height of art”, 1858

Nadar can be considered the father of aerial photography. He is represented here during his first flight over Paris in 1958 in a caricature entitled "Nadar raises photography to the height of art”
He was a very interesting person, a photographer, caricaturist, journalist, novelist and pioneer of aerostatic flight.
He was a very close friend of the french novelist Jules Verne.
In his time, taking a photograph from a balloon was thought to be an impossible challenge. He did it, and he also managed to take pictures underground and invented air mail.

Portrait of Felix Nadar (1820-1910),
Photographer and Aeronautical Scientist

Nadar was also the founder and president of the "Society for the Encouragement of Aerial Locomotion by Means of Heavier than Air Machines".
Jules Verne was the secretary of the Society.
Their aim was to end the era of ballooning by creating an helicopter.
Nadar and his colleagues chose to advertise their venture by creating the biggest balloon in the world, called The Giant (Le Géant).

Gondola of Le Géant, as displayed at Crystal Palace, London (1863).

The balloon's wicker-work gondola was the size of a small cottage, and was equipped with a photographic laboratory, a refreshment room, a lavatory, and a billiard table. **Nadar was convinced that aerial photography would prove invaluable for surveying, mapmaking, and even military espionage.**

Rome, 1904. A Draken balloon for aerial survey
(Caproni archive, AFN)

As we know, Nadar was right. Aerial photography soon became a fundamental tool on battlefields all over the world, at first with Draken balloons (balloons designed to always point a tip downwards), then with airships and finally with airplanes.

In I and II World War it soon became clear that whoever had the best images from above would win the war.

During the First World War, aerial reconnaissance became decisive for the tactics of the armies and led to the development of new techniques for making topographic maps. After the war, cartography took advantage of the experiences gained during the conflict, and at the end of the 1920s it was convenient to draw topographic maps by directly observing the photos taken from the plane.

Film J o7o5 SG v.1o.8.1943
Bild-Nr. o34 Zeit: 7.36 Uhr bearbeitet am 1o.8.1943

Hafen S i r a c u s a J-si 45 1o5

+ neu eingelaufen
V Liegeplatz gewechselt

seit 9.8.1943,7.42 Uhr

Nr.	Auswertung	Zugang	Abgang
	Kriegsschiffe:		
1o.	8 Kl.Kriegsfahrzeuge, davon 2 Minensucher mit ausgebrachtem Gerät.	3	-
11.	2 Art.Schnellboote	2	-
12.	1 Torp.Schnellboot	-	4
15.	3 Hilfskriegsfahrzeuge	1	-
16.	1 Flugsicherungsboot	-	-
	Landungsschiffe-und Boote:		
21.	1 L.S.T. mit Kfz.als Deckslադung	1	-
24.	24 L.C.T. 35o to	-	5
25.	17 L.C.T. 25o to	2	-
27.	8 L.C.I.	-	-
28.	53 L.C.M.	12	-
	Transporter,Tanker und Frachter:		
32.	1 Tanker etwa 7 ooo BRT	-	-
33.	2 Einheitsfrachter Liberty zus. etwa 13 6oo BRT	-	-
34.	6 Einheitsfrachter War-Emergency zus. etwa 42 ooo BRT	-	1/7ooo
35.	7 Frachter zus.etwa 38 9oo BRT	1/7ooo	1/25oo
39.	3 Küstenfrachter	1	-
	1 Motorsegler	-	-
	Sonstiges:		
42.	1 Landungssteg		

Gesamtbelegung: 1 Tanker etwa 7 ooo BRT
15 Frachter zus. " 94 5oo BRT

Insgesamt 16 Schiffe mit zus. 1o1 5oo BRT

Abgang seit 9.8.1943: 7.42 Uhr

2 Frachter zus. etwa 9 5oo BRT

Zugang seit 9.8.1943 7.42 Uhr:

1 Frachter mit etwa 7 ooo BRT

Der für ein Wirkungsbild verhältnismäßig kleine Maßstab von 1:20 000 ließ eins sichere Beurteilung der Angriffswirkung bei Schiffen bezw. im Hafengebiet nicht zu.Neue,beschadigte Einheiten wurden nicht erkannt.

This is a Luftwaffe photo taken the 10th August 1943. It shows the Allied landing in Sicily. The photo interpreter identified on the photo the type of ships, the tonnage and which ones were leaving or entering the port.

MAPRW-BSR-RAF collection - Pontedera (PI), May 4, 1944 (bombing of the Piaggio airplane fac[illegible]y)

After this brief introduction to aerial photography, I would like to tell you something about the history of the Aerofototeca Nazionale and its role.

The National Archive of Aerial Photography (Aerofototeca Nazionale) was founded in 1958. The first director was Dinu Adamesteanu, a Romanian archaeologist who focused his studies on territories of southern Italy.

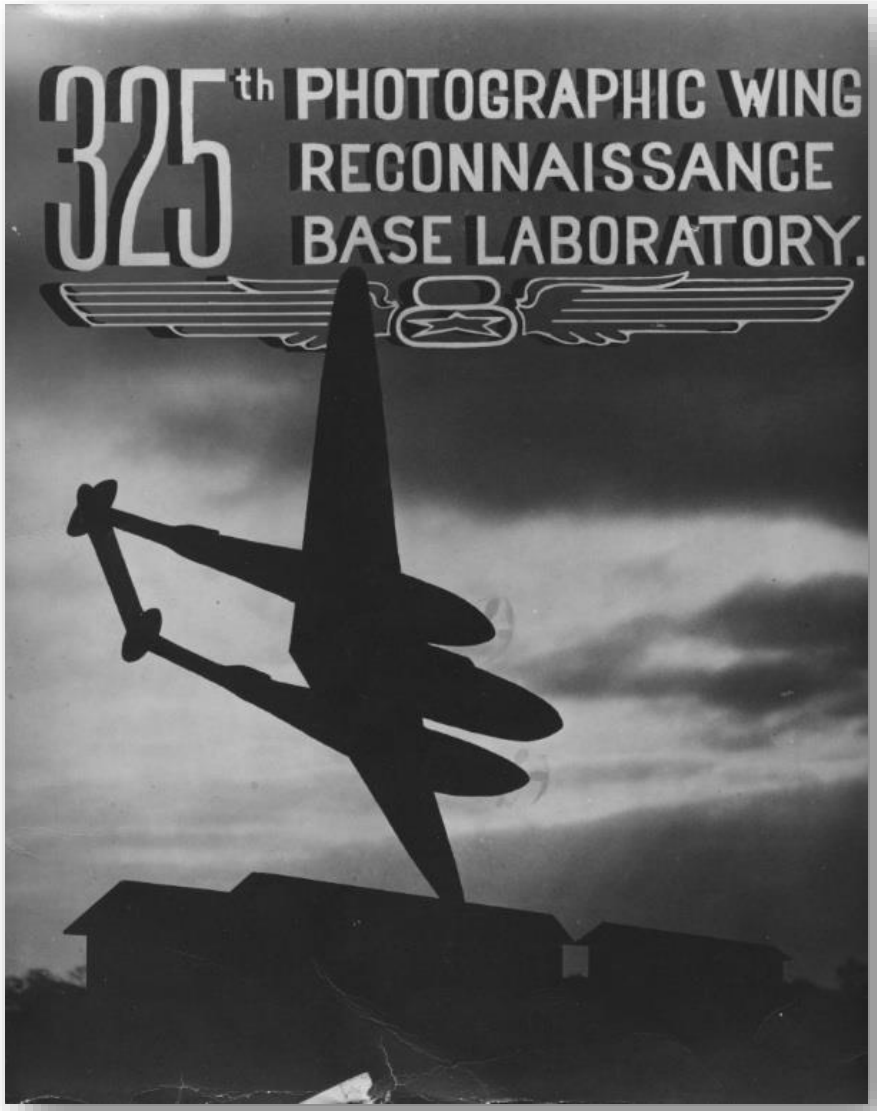
The will to found a central photographic archive at national level was of Prof. Guglielmo De Angelis D'Ossat, at that time General Director of Antiquities and Fine Arts. He was supported by the Italian Air Force, that held the rights over all aerial imagery.

Dinu Adamesteanu (1913-2004)
with Gen. Ludovico (1905-1991)

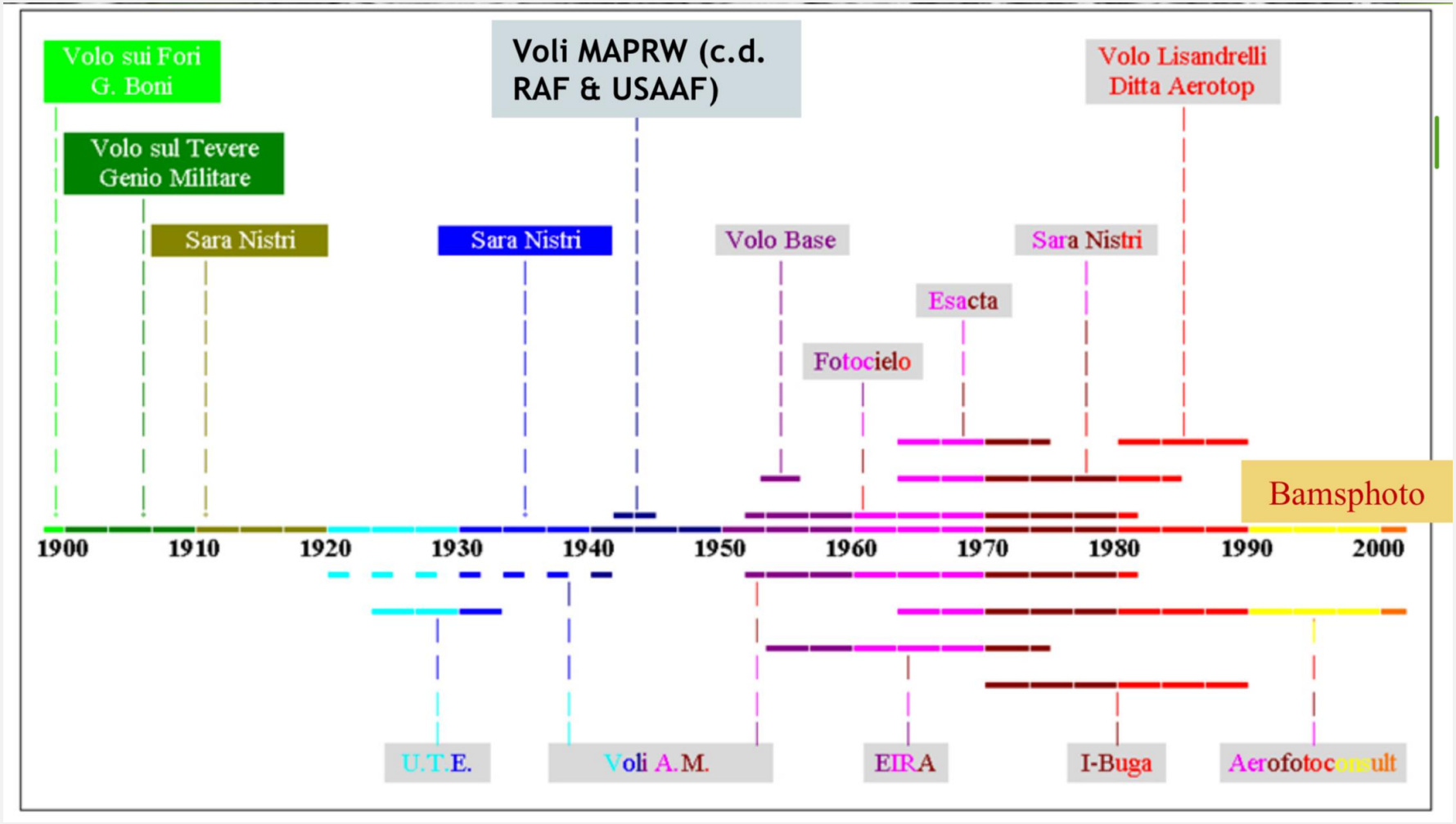
D'Ossat was a firm believer in the large-scale introduction of aerial photography in the field of archaeological research.

He decided to create an office that could collect, coordinate and make available all the aerial photographic material useful for research on the ground.

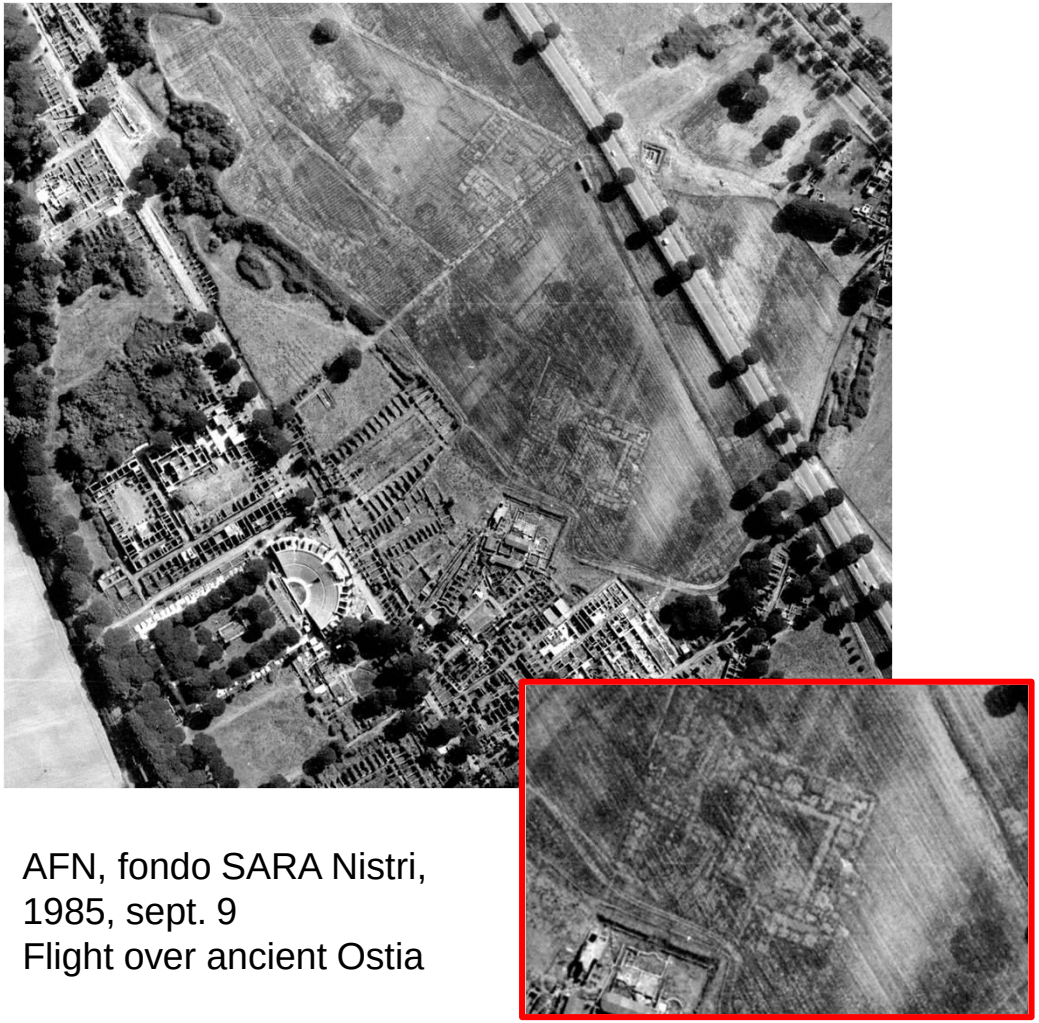
Adamesteanu understood immediately the importance of aerial photography, traditionally managed by military intelligence, for the control of the territory.



In 1961 the Italian Air Force thus gave to the National Archive of Aerial Photography all the negatives showing archaeological areas. In 1964, more photos arrived as a gift from the American Academy in Rome, followed a few years later by the deposit of those preserved by the British School at Rome (1943-1945). The reconstituted fund was renamed in 2012 M.A.P.R.W., Mediterranean Allied Photo Reconnaissance Wing.



Many other collections have since become part of the National Aerial Photographic Archive, often resulting from the activity of private companies.

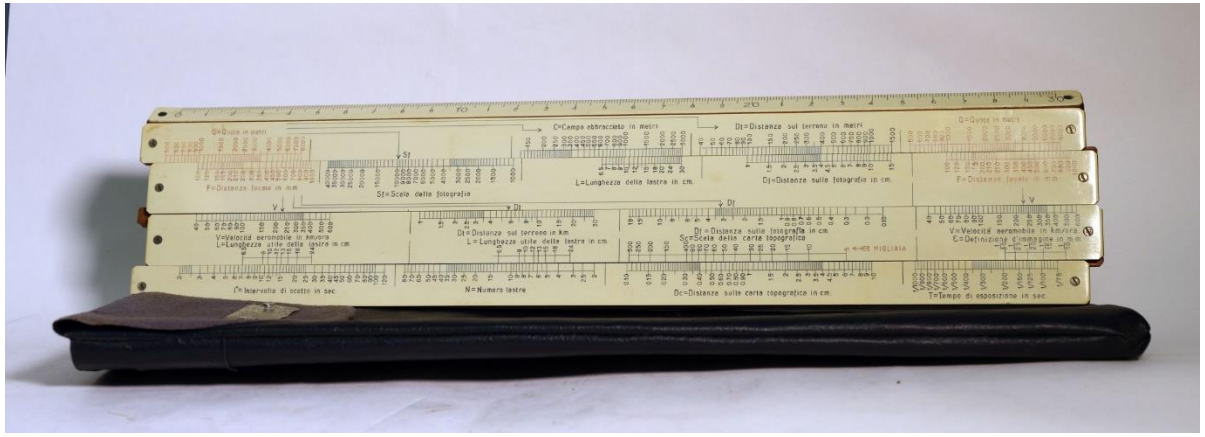


AFN, fondo SARA Nistri,
1985, sept. 9
Flight over ancient Ostia

After Adamesteanu, under the direction of Giovanna Alvisi (from 1964 to 1990), the material kept in the archive began to be used also for the study of the territory in general, for the protection of the environment and architectural heritage, and no longer only for archaeological purposes.

During those years, the Aerofototeca also commissioned many photographic campaigns.

Along with photographs, many aerial cameras have also been acquired from private companies. Most of these tools were used during the II World War by the Allied forces. Dismissed by the Allies at the end of the war as scrap material, they were purchased by private aerial companies and used for decades to take photos all over Italy.

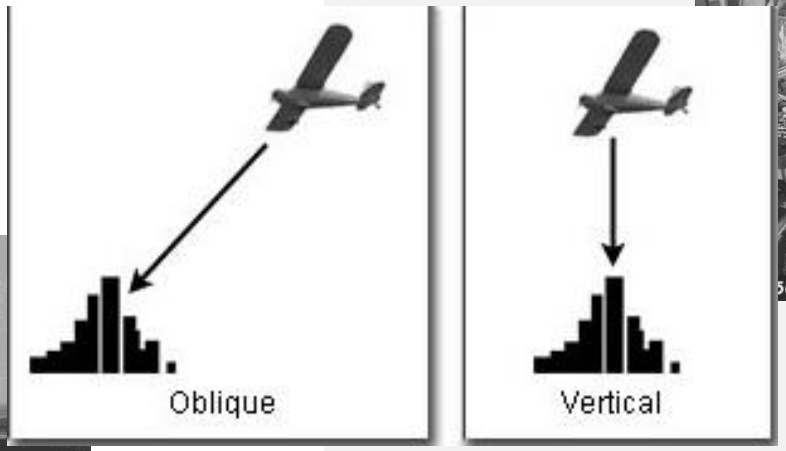


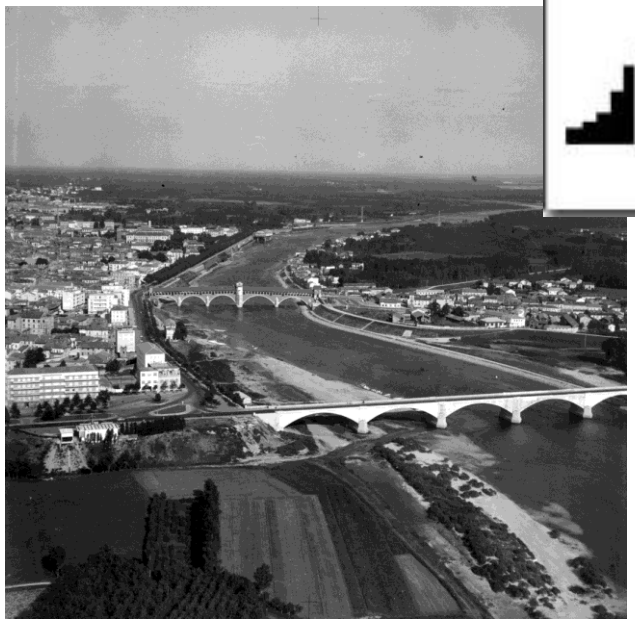
Like any other tool, cameras tell us the story of the people who designed and used it.

To observe this equipment takes us back to the era in which it has been conceived, allows us to understand how it was used and the difficulties faced by those who had to take a picture under anti-aircraft fire, sighting through the small galilean viewfinder

Loading lever and shutter button are merged in a single command, oversized to allow use without having to remove the heavy padded leather gloves, thus exposing the operator's hands to the low temperatures encountered at high altitudes.

The fuselage of the B-17 Flying Fortress was not pressurized, and the temperatures inside the bombers could even reach 50 degrees below zero. This made necessary to use oxygen masks and electrically heated jackets.



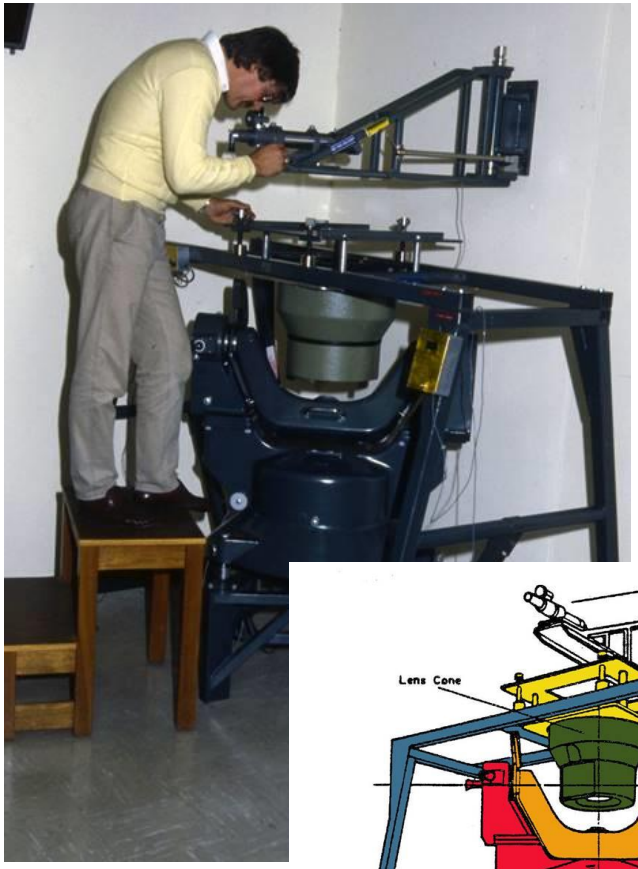


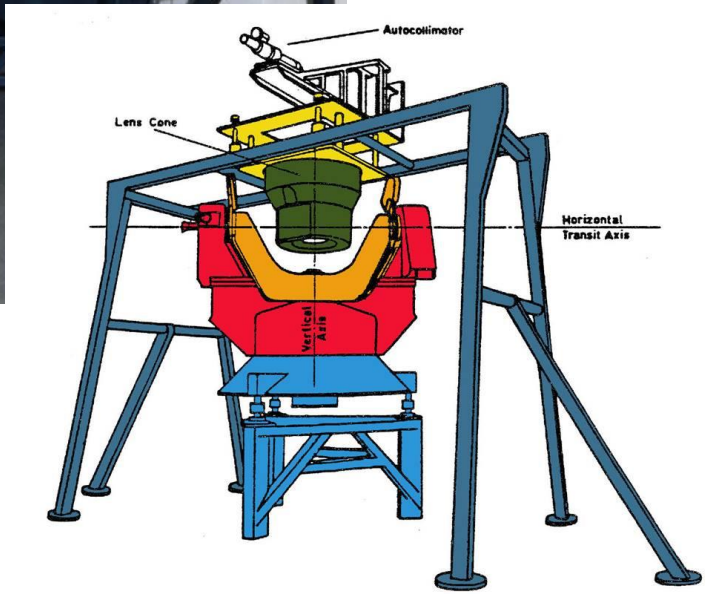
Aerial photographs are taken in two basic forms and both have different uses and applications: **oblique and vertical.** Vertical photos are the most useful for the purposes of mapping.

Aerial photographer, Charles Ferguson, operating Wild RC-10 camera installed on NOAA De Havilland Buffalo N13689

Aerial photo cameras have typically fixed focus lenses, and are equipped with very large negatives to be printed in contact with bromographs without the use of enlargers. Their optics are designed to avoid optical aberrations as much as possible.

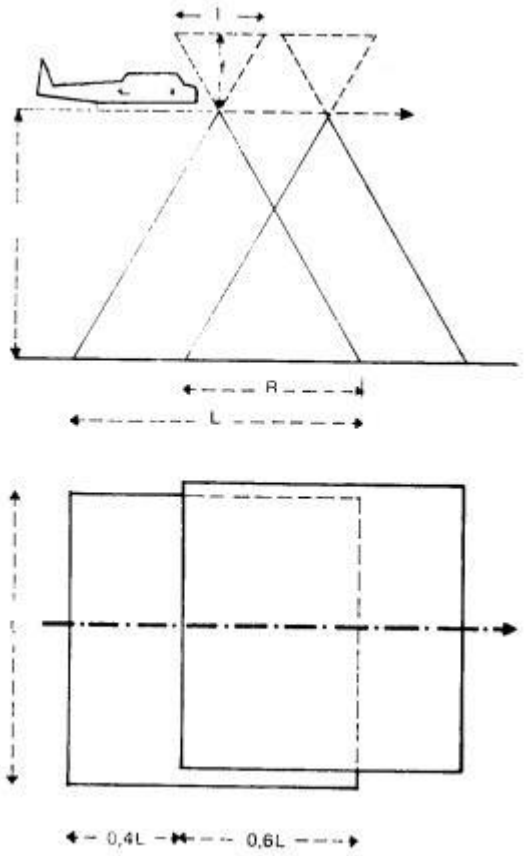
The cameras used in aerophotogrammetry for vertical photos were provided with a calibration certificate.

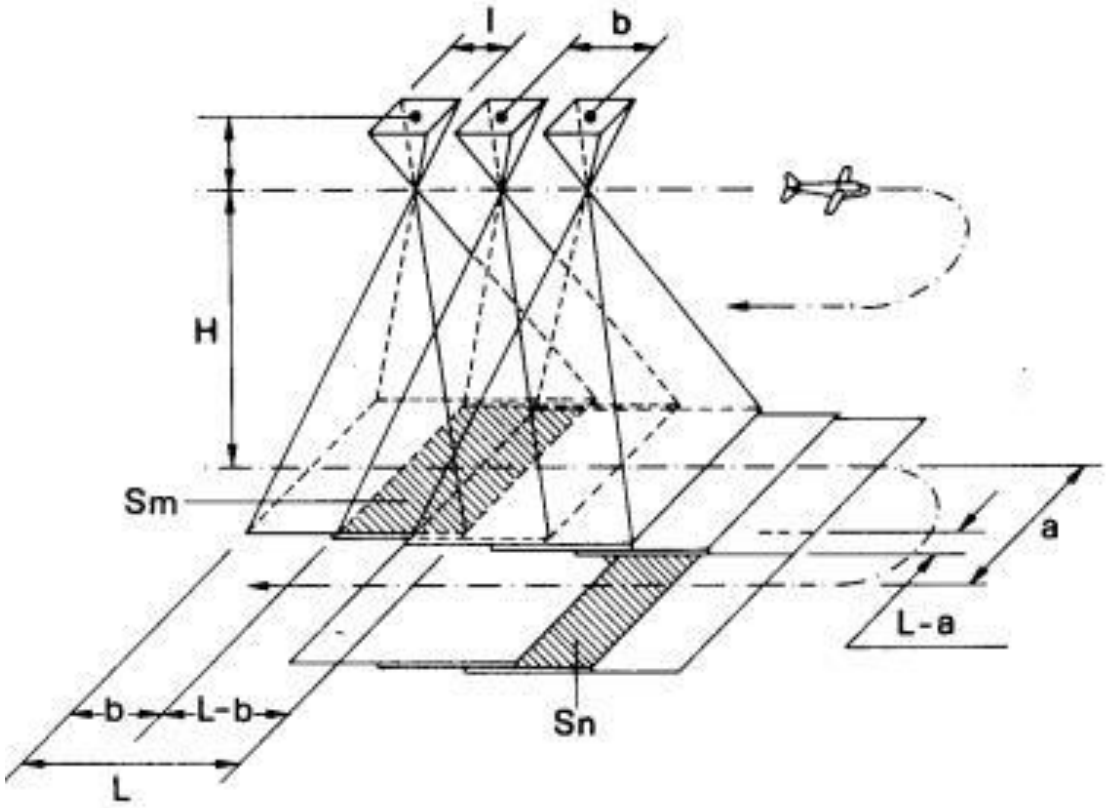




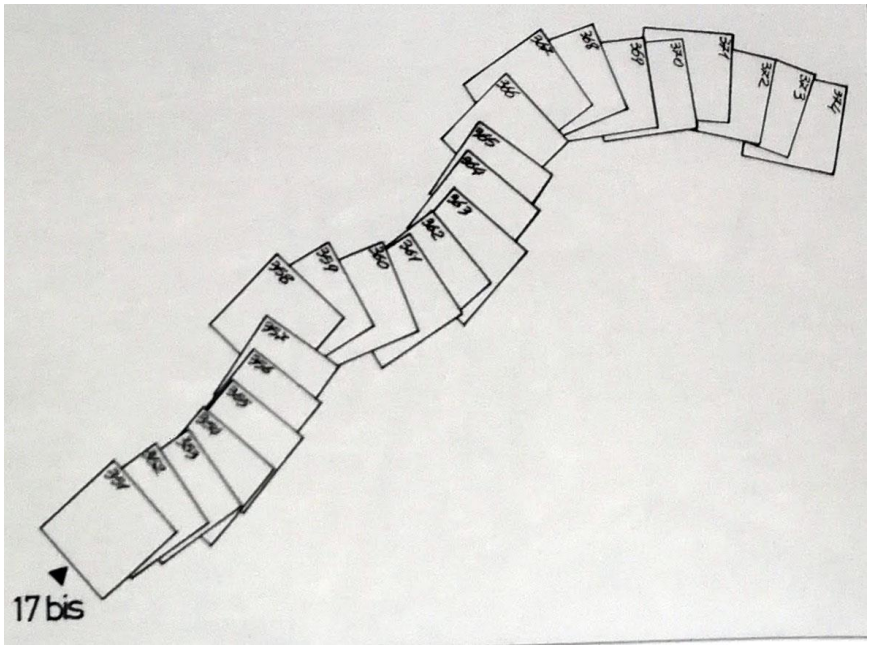
The purpose of the certificate was to minimize aberrations that cannot be avoided during the construction of the lens. It was introduced in the early 1960s.

At the end of the calibration process, a certificate was drawn up, and had to be updated periodically by carrying out new tests with goniometers like the one shown here in the photo.
It ensured that the metric quality of any aerial photography acquired by the cameras would be suitable for mapping.

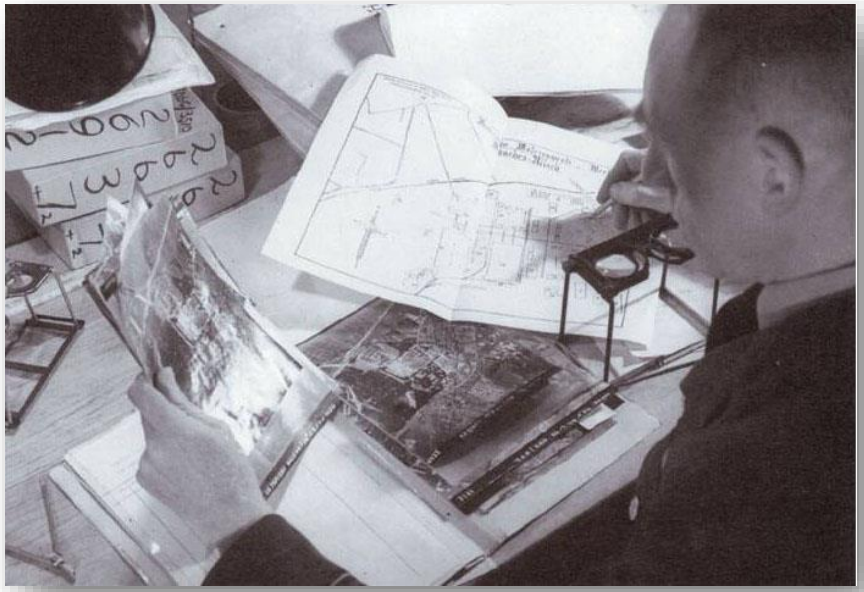




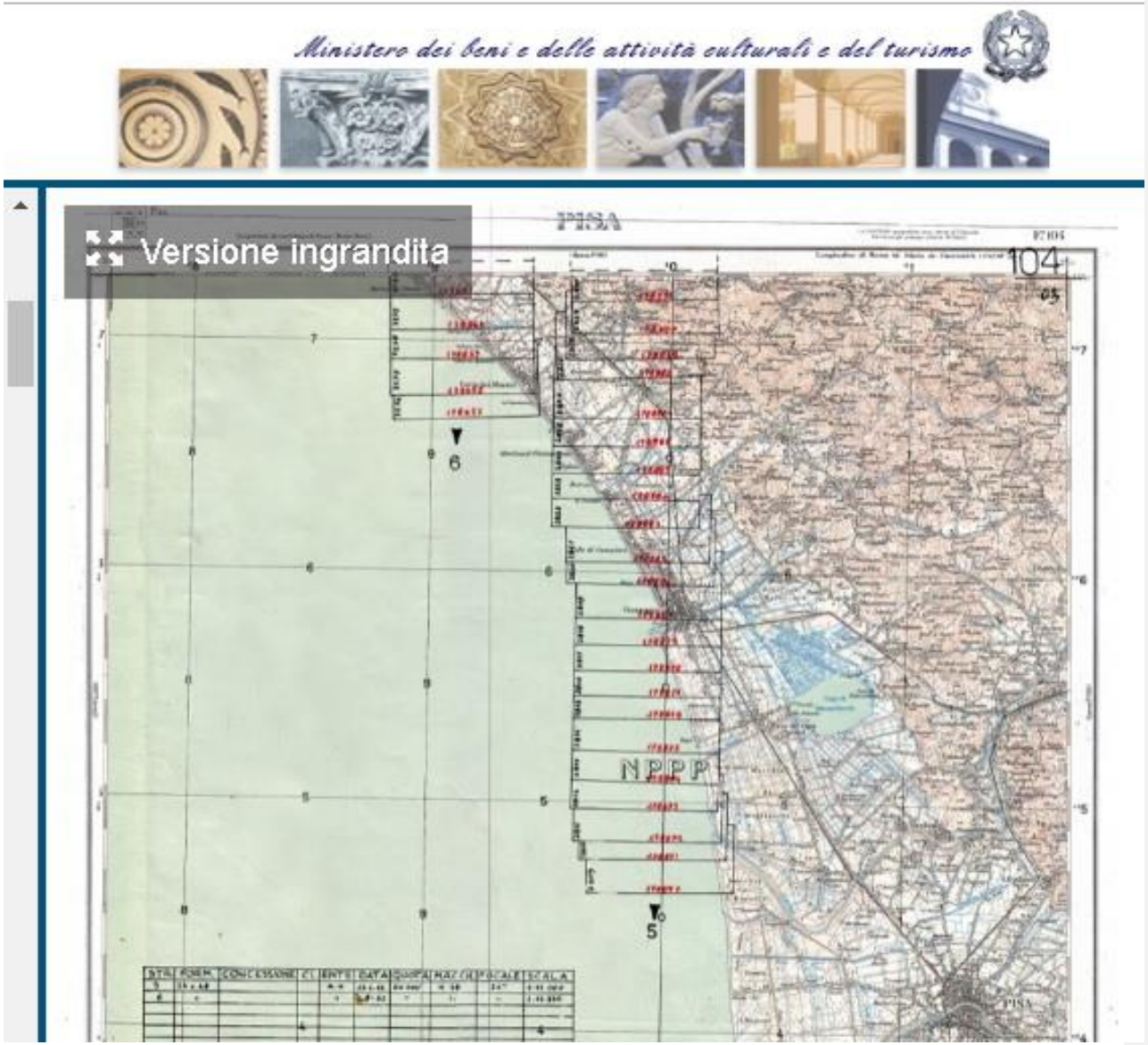
Vertical aerial photos are always taken in sequences called strips (italian: “strisciate”) The purpose of these strips is not only to obtain continuous sequences of the photographed surface, but also to have stereoscopic pairs of photographs that allow to see the surface in three dimensions.



In the two images above you can see the graphic representation of a strip as it is represented on the transparencies to be superimposed on the cartography, and a portion of the strip of the overlaid photos.

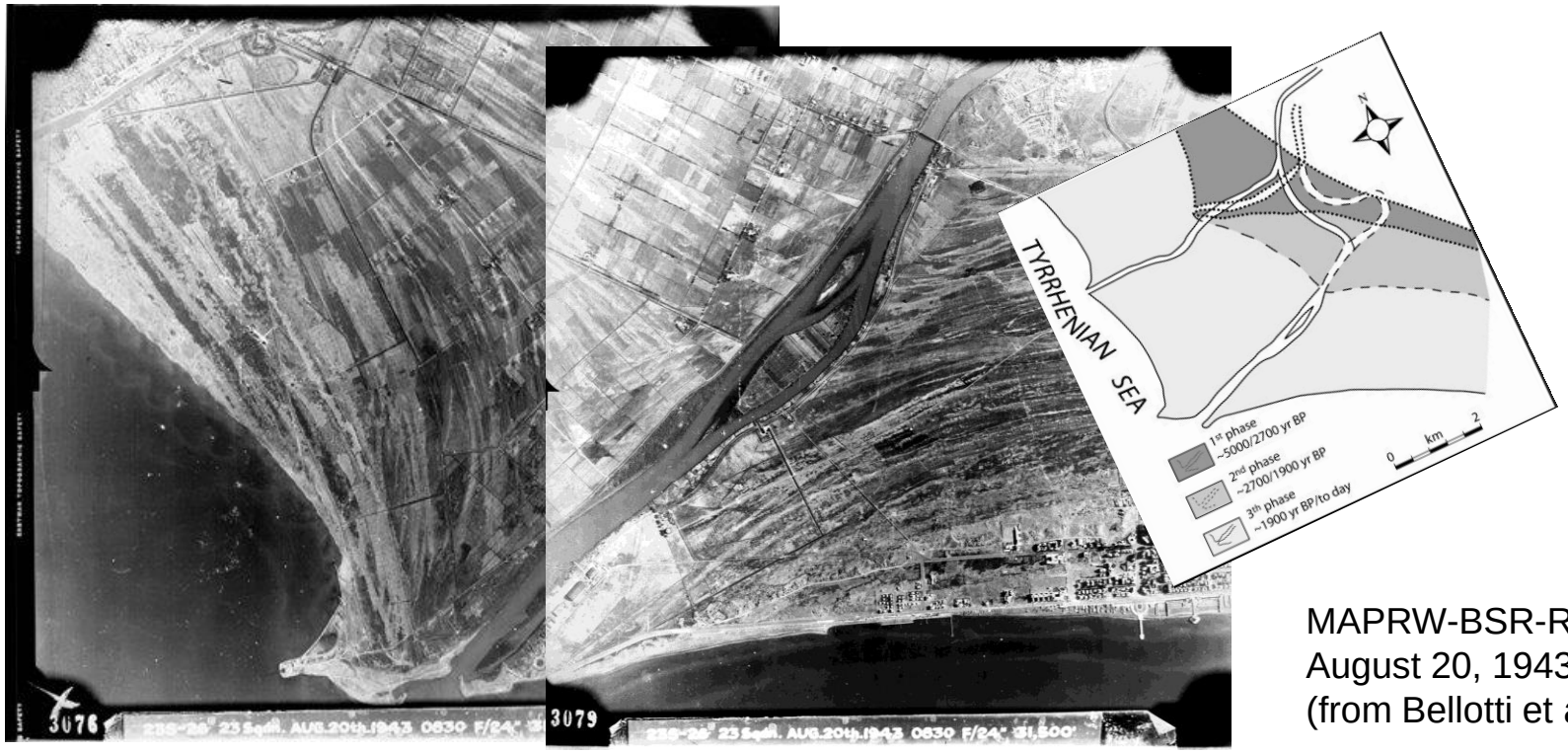


Each stereoscopic pair of images can be seen and studied in three dimensions in the overlapping part with special viewers.



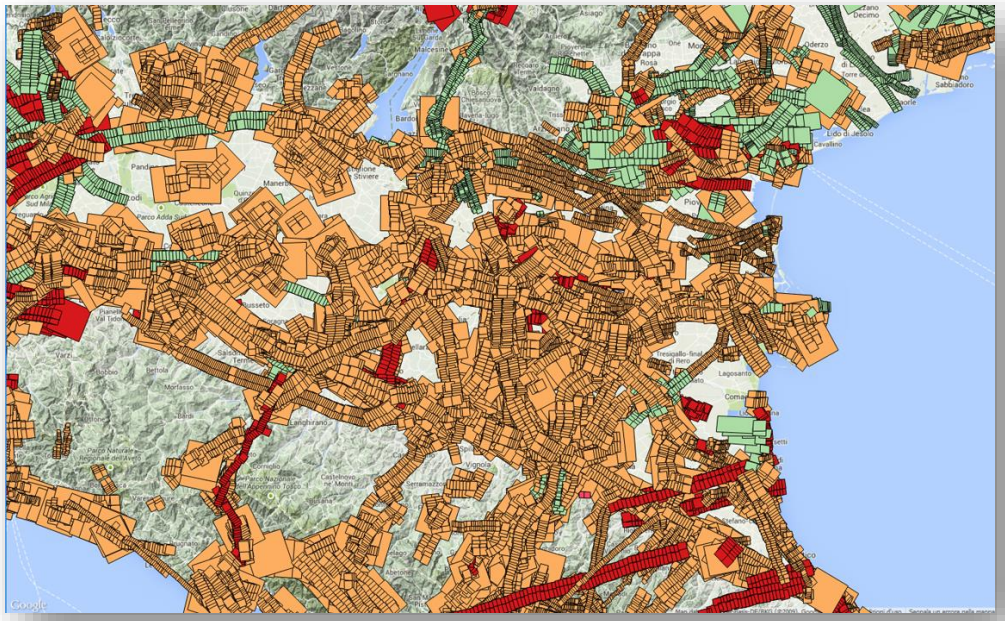
The only way to find an aerial photo in an archive that holds millions of similar images is through rigorous archiving criteria, which traditionally involved the use of photo-indexes like the one shown here.

A major digitization campaign has been launched in recent years to make them available online.

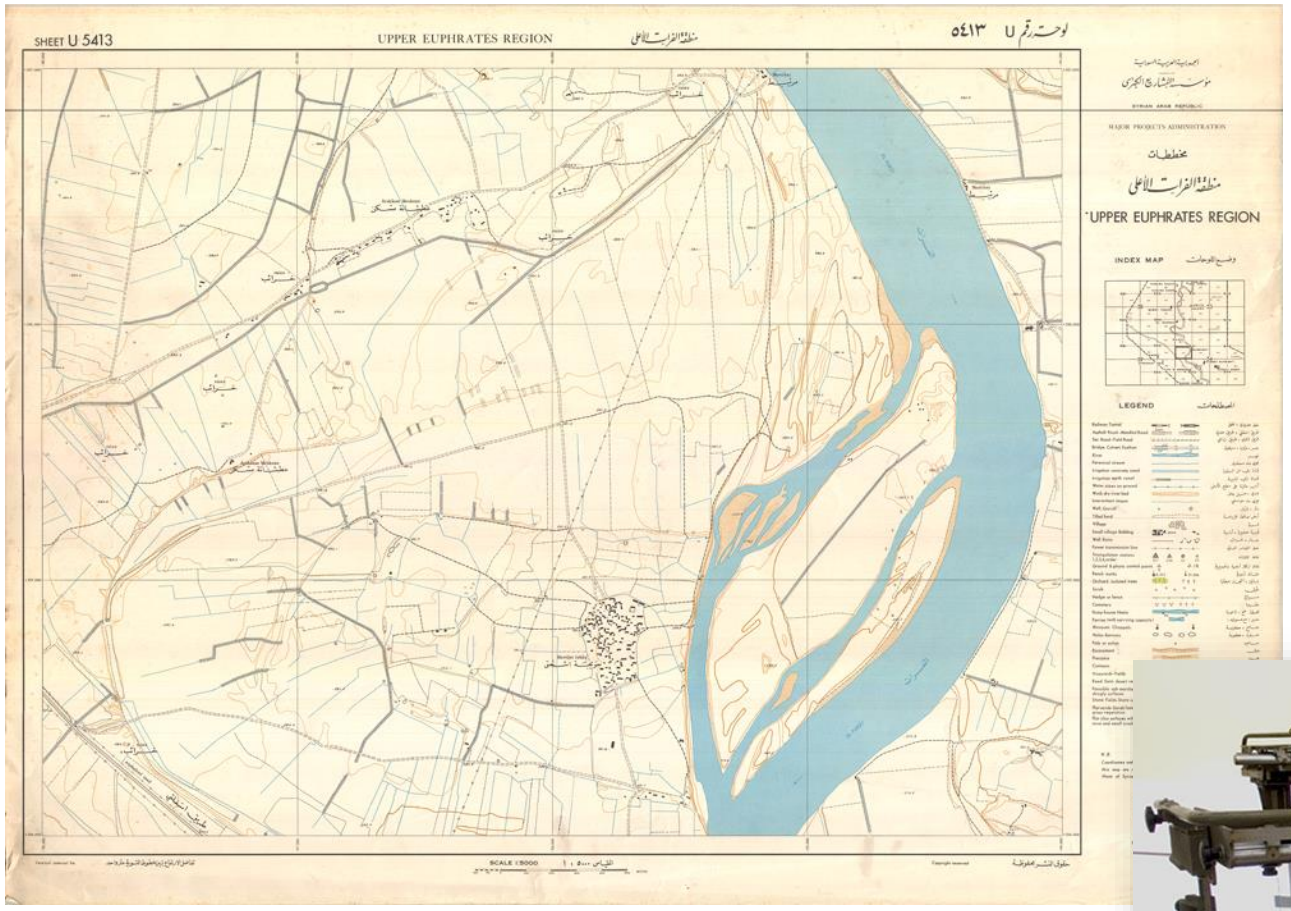


MAPRW-BSR-RAF
August 20, 1943
(from Bellotti et al., 2001)

Nowadays, with the arrival of satellite images released by national and international agencies and the use of drones, military aerial reconnaissance has become less important.
Nevertheless, historical aerial photography has become more important for wider environmental studies as mapping forests and changes in vegetation overtime, tracking changes in river direction, and planning conservation work of river systems, or changes in the landscape after natural processes.



At the same time, a database connected to a webgis was created to obtain a powerful online search tool for historical images all over Italy.



The Aerofototeca also preserves an archive of historical cartography, kept in controlled temperature environments, and a museum of topographical restitution tools.

"New Prospects on Archeological Research", Lumos Film, 1961

I would now to show you a short film, produced in 1961, on the activity of the National Aerial Photographic Archive in the archaeological field.

In the film it is possible to see the traditional way of working with aerial photography, in the era in which the images now preserved in the archive were a daily working tool. Thank you for your attention.