105 Years of Archaeological Aerial Photography in Italy (1899-2004)[1]

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"The 'public' image of aerial photography in the field of archaeological discoveries was chiefly due to the spreading of some photographies showing the plants of buried archaeological monuments not visible on the ground. In Italy, an example of this is the photography showing all the details of the Roman villa *ad duas Lauros* (fig. 1), buried under the grassy airstrip of Centocelle airport.

These photos struck the public imagination and put in the shade, unjustly, other 'virtues' of this instrument, as for example its importance as a historical memory, sometimes without alternative" (Piccarreta 2003, 67-74).

The interest of archaeologists in aerial photography, which offers a large overall view without any kind of perspective encumbrance, dates back to the beginning of photography, with the first aerial photo shot by Nadar in 1858. It was during these years that aerial photography was very successfull in a number of fields of surveys; but as it often happens with this kind of technological innovations, aerial observation was first used for military purposes and increased in the following decades, when the balloon was replaced by the dirigible first and the airplane later.

In Novembre 1884 an "Aerostatic Section" (lieutenant A. Pecori Giraldi) was established within the Brigata Mista of the Military Engineers of Italian Army, after buying from France a transportable hydrogen generator[2], a steam windlass for cable handling and two baloons. Together with the establishment in 1896 within the Brigata Specialisti of the "Photographic Section" of Engineers (captain M. Moris), it can be considered as the prelude to the first ascension for archaeological purposes in Europe, which took place in Rome at the beginning of June 1899.

This enterprise was realized thanks to Giacomo Boni[3], an archaeologist who, at the end of 1898, had been charged by the then Ministry of State Education Guido Baccelli[4] to direct a new excavation campaign at the Forum Romanum. (1899-1911).

In a letter to his friend St. Clair Baddeley, Boni wrote: «I have been three times on the Military Engineers baloon 400 mt above the Palatine and the Forum Romanum, and I took some dozens of pictures of plants of monuments and of panoramic views. The sight was wonderful, with the whole course of the Tiber and the countryside up to the sea. Tiberine Island is curious! I hope to take a vertical photography of it. The Coliseum, the Constantine basilica looked like wood models! I hope to publish the photo of Comizio in my small report on inscriptions» (Tea 1932, 26-27).

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[1] This contribution draws on an article recently published on the first number of the review "Aerial Archaeology. Studies on archaeological aerotopography" (cp. Ceraudo 2004).

[2] With a volume of 550 m^3 of silk proofed by varnishing. The aerial recordings were taken from a captive baloon with a camera with lens Zeiss of 150mm, thanks to the courtesy and the help of marshal Luigi Durand de La Penne.

[3] Boni was a scholar with a technical background, as he followed corse of architecture, unlike the most part of archaeologists of the period, who had a philological or literary background. For this reason, he was open-minded towards technical innovation; cf. Boni 1900, 220-229.

[4] The promoter of a wide archaeological project for Rome.

The ascents and the recordings – realized on a captive baloon of Brigata Specialisti at a height of 300-500 mt, on whose wicker basket Boni was with two engineer officers[5] – were addressed to document the state of the excavations in the central area of the town, in particular in the zone of Comizio where, after the extraordinary discovery of *Niger Lapis* occurred on 10th January 1899, the excavation intervention had been concentrated (fig. 2). These valuable pictures have been useful, even recently, to clear up particulars of the still unpublished excavations; moreover, they helped solving problems related to areas which at that time were not excavated and have been transmitted to us in a clearer way. After that first exciting experience, Boni had the permission to get again on baloons of Military Engineers, and took a lot of pictures of Palatine and the Forum; it is strange that, in one of these pictures, on the paving of the square near the column of Foca there is a part of the inscription of the praetor *Lucius Naevius Surdinus*, which then was not noticed.

In 1907, near Fiumicino, by means of baloons of Engineers, recordings of the area of the Tiber delta were made. In these pictures, the hexagonal basin of Traiano's Harbour, the track of the buried Claudio's Harbour and the track of an imperial fortress of XVI century were clearly visible (fig. 3).

In 1910 the aerophotographic survey of Pompei was made using a captive baloon without basket to which a camera, set going by an electric control on the ground, had been fixed[6].

The means and the technical abilities of the Brigata Specialisti were used in the following years by Dante Vaglieri (Olivanti 2002, 271-289), the director of the excavation of Ostia. In May and July 1911, the Photographic Section made the planimetric mapping of the area of Ostia, at the scale of 1:2500, with a series of pictures which, combined as a mosaic, gave the overall representation of an area deeply modified compared with the last centuries (fig. 4). From high above, the track of a lost bight of Tiber west to town and the old coastline – before the progressive advancing due to the alluvial deposits of Tiber – were visible. In October of the same year, by request of Vaglieri, the section took photos of the area of the harbour and Fiumicino.

Unfortunately, after the brilliant beginnings and the encouraging bases, this fundamental instrument of research didn't meet the desrved diffusion in our country. We do not surprise if in that period, among the most important names in the archaeological photointerpretation, there are only English, French and German scholars, often Air Force pilots or regular soldiers.

In the meanwhile in Rome, six years after the first airplane flight, major Maurizio Moris, the president of the Aviators Club who encouraged the establishment of the Photographic Section of Engineers and was with Boni during his first ascent above the Forum, organized an important event, inviting Wilbur Wright for an exhibition with his *Flyer*.

[5] Lieutenant Rodinger and captain Moris.

[6] The Photographic Section was later engaged in the aerial survey of the corse of the Tiber on behalf of the Ministery of Public Works. The experiments started in 1902-1903 with machines and baloon got ready by Attilio Ranza; in 1908-1909 a topographic survey of a tract of 50 km of the course of Tiber, at the scale of 1:3300 was begun by Ranza and completed by Tardivo.

In spite of the first aerial flight in Italy, which took place on 15th April 1909 in the field which will later become the airport of Centocelle, and of the enthusiasm for the event, there wasn't an adequate development nor any benefit from the use of the new aerial mean for archaeological applications.
With the outbreak of World War I, aerial photography became one of the war instruments for military reconnaissance and, as a consequence, processes for reading and interpretation of photographies were codified and improved. The great amount of military pictures of those years was very useful for the studies in the field of archaeological topography.
In the Italian scientific survey of that period the exception was represented by Giuseppe Lugli. Convinced of the usefulness of aerial recording in the archaeological field, in autumn 1920, during the studies on the Domiziano villa on the Colli Albani, in the attempt to define the position of the quays on the banks of the lake of Albano, he used "direct observations" from the airship; Lugli, getting in touch with the Ministery of War, thanks to the help of his master Rodolfo Lanciani (then senator), made a flight on the Roma airship[7] at the height of 800 mt above the lake basin. Unfortunately the experiment, anomalous for the lack of photographic recordings, was an isolated experience.
In April 1938 the studies on aerial archaeological photography are resumed, when at the V National Congress of Roman Studies Lugli presented a report on "The importance of aerial photography in the studies of archaeological topography" (Lugli 1940, 143 ff.). On that occasion, it was decided to start also in Italy regular aerial searchings, as it happened in other European countries. An outline plan, to be carried out in collaboration with the Ministery of Aeronautics, was defined by choosing four sample areas:

1. the town and the area of the Greek colony of Crotone;
2. the via Appia in Puglia near Taranto;
3. the area between Colli Albani and the coast (the so-called Virgilian Latium) with the towns of Lanuvium, Ardea and Lavinium;
4. the town and the Neronian harbour of Anzio.

Lugli riaffirmed the absolute necessity of a direct check on the ground to verify the interpretation of the aerial pictures – and we have to insist on this point still today –, according to what already recommended by Crawford, the first scholar to lay the foundation to a scientific archaeological photointerpretation on inhabited regions. The main results of this planned researches were presented during the 1st International Congress of Photogrammetry which took place in Rome in September 1938 (Lugli 1939).
Between the two world wars, despite of the pioneering experiments of Boni and Vaglieri, with the exception of the applications of Lugli, the role of Italian scholars, at last until the Fifties, seems to be a secondary one; it was not possible to realize, with continuity and method, any project of aerotopographic research: certainly because of the outbreak of 2nd World War, but also, probably,

[7] The biggest semi-rigid airship ever built, with a volume of 37.722 m^3, a lenght of 125 mt, designed by Umberto Nobile.

because of difficulties in communication between the military bodies and the academicians of that time.

The war, if on the one hand caused the interruption of the researches, on the other hand placed an impressive amount of photographic material shot for aerial reconnaissances at scholars' disposal, with the result of encouraging this kind of studies, no longer pioneering.

A lot of pictures of that period are kept in the two most important aerophotographic archives in Italy: the National Aerial Photographic Archives of Rome and the Military Geographic Institute of Florence (Ceraudo 1997, 39-54; Piccarreta & Ceraudo 2000, 189-192). During the 2nd World War, English flights of RAF and American flights of USAAF (today USAF) determined the advance and the victory of the allies, but there were also flights, especially in the southern Italy, made by the REGIA AERONAUTICA and by the German LUFTWAFFE immediately after the allied landing in Sicily in July 1943.

These flights are today an historical evidence of the state of the territory before the great infrastructural works and the urbanization which from the Fifties on, have often deeply changed the Italian agricultural landscape; these pictures, paradoxically, are closer to the old situation of those places than to the today's reality.

The valuable aerophotographic documentation of RAF aroused the interest of two officials of British Aeronautics, John Bradford and Williams Hunt, who guessed the possibility to use the photos for archaeological studies on Tavoliere in Puglia; and it was thanks to Bradford if the material coming from the Anglo-American Aerophotographic Centre of San Severo near Foggia has not been lost (Alvisi 1980, 8-9). The following publication by the British scholar of an enlightening book on the "ancient landscapes" (Bradford 1957), with a lot of aerial photos very well annotated on Neolithic villages in Puglia, on centuriation in northern Italy and in Daunia and on Etruscan necropolis of Cerveteri and Tarquinia, showed suddenly the plenty of information given by aerial photography and the potentialities of this mean in an area, as the Italian one, with so many evidences from the past. In 1954, during a congress which took place at *Paestum*, the archaeologists proposed the creation of a centre for the collection and the study of the aerophotographic material. Four years later, at the end of 1958, thanks to the agreement between the Ministery of Aeronautic Defense and the Ministery of State Education, the National Aerial Photographic Archives were created in Rome. The office was directed by Dinu Adamasteanu, one of the archaeologists who worked for the establishment of the new structure. A convinced supporter of the use of aerial photography in the field of archaeological research, he was the author of the surveys on several sites of Sicily and Basilicata and since 1964, when when he left the Aerial Photographic Archives to direct the Archaeologic Superintendency of Basilicata, he had

worked a lot to realize new aerial pictures and, by means of analogic instruments, the detailed cartography of many ancient sites in Puglia and Basilicata[8].

An isolated example of planned and addressed aerial shots taken during low flights for aerial survey dates back to 1956, when Nereo Alfieri, thanks to a series of oblique pictures taken by Vitale Valvassori, identified the inhabited area of Spina in the Comacchio valleys (near Ferrara) (Alfieri & Valvassori 1957, 83 ff.).

In 1957, in Milan, an "exhibition of aerial photography for archaeological research" was opened[9]. It was organized by Archaeological Superintendency of Lombardia (Mario Mirabella Roberti) and by Fondazione Lerici, in collaboration with English (Bradford, Ward Perkins), French (Baradez, Chevallier) and Italian scholars (Lugli, Castagnoli), and was divided into four sections: 1) aerial photography as a document; 2) aerial photography as a means of survey; 3) aerial photography as a mapping system; 4) campaignes of Fondazione Lerici. On that occasion were presented the extraordinary pictures of the Gulf of Pozzuoli, showing the location, in the sea in front of the Flegrean coast, of the submerged ruins of *Portus Iulius* (fig. 5), thanks to the photos taken by L. Cocchiarella during a military mission and presented by R. Bucher, and the pictures of the imperial villa *ad Duas Lauros* shot at the beginning of the Fifties on the military airport of Centocelle at Rome (s. fig. 1).

An important figure in the field of aerial topography is Giulio Schmiedt who, in charge of the photointerpretation section of the Military Geographic Institute, studied and used a relevant part of the materials from aerial photographic archives of Florence. He was the author of important studies on ancient harbours and on Roman and medieval road network, of a lot of methodological essays and of a monumental work of high didactic value *Atlante aerofotografico delle sedi umane in Italia* (*Aerial Photographic Atlas of Human Settlements in Italy*), in five volumes not all published[10], which shows, by means of aerial photographies, the main ancient centres and the greater archaeological areas and national monuments (vol. II), and the centuriations and the Roman roads of Italy (vol. III).

In the international scientific survey, a prominent position is reserved to the figure and the work of Ferdinando Castagnoli (Castagnoli 1961, 41 ff.; Castagnoli 1969, 7 ff.), the most famous exponent of the "Roman school" of ancient topography, a convinced supporter of topographic research based on the use of aerial photography for the complessive reading of centurial areas or the identification of the plants of ancient towns and the reconstruction of the town planning models.

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[8] The topographic maps, unfortunately still unpublished, were made in particular for protection purposes (the arrangement of archaeological bonds or the planning of expropriations), but are very accurate in the restoration of details of archaeological kind and in the representation of the anomalies of the ground that could hide buried structures. Among the mapped inhabited sites, we must remember, for the high quality of the work, those of the Greek colonies of *Heraclea* and Metaponto on the Ionian coast and those of *Grumentum*, Serra di Vaglio, Muro Lucano and Satriano in the interior.

[9] Its starting point was a previous exhibition organized in Varese in 1954 by the Prehistorical and Archaeological Studies Centre (Mario Bertolone) with material coming from the exhibition promoted by the Ashmolean Museum of Oxford and flight strips of Northern Italy made by American, English and Italian Aeronautics.

[10] Schmiedt 1964; Schmiedt 1969; Schmiedt 1989; only three volumes at the moment published by I.G.M.

Two of his works, *Ippodamo di Mileto e l'urbanistica a pianta ortogonale* (Castagnoli 1956) and *Le ricerche sui resti della centuriazione* (Castagnoli 1958), are of the greater importance for the studies on the subject; we must remember, moreover, a lot of essays on archaeological photointerpretation published between 1964 and 1968 in the "Quaderni dell'Istituto di Topografia Antica", a review edited by him. Castagnoli was one of the first to understand the potentialities of aerial photogrammetry for our branch of studies, as he worked out with G. Schmiedt a fundamental study on the town planning of Norba (1956); for the first time, this tecnique was used for exclusively archaeological purposes (Castagnoli & Schmiedt 1957). His interest in new technologies led to the precocious realization of a sector dedicated to photogrammetry addressed to archaeology in the then Institute of Ancient Topography at "La Sapienza" University of Rome, with the acquisition of an instrument for analogic photogrammetry (Nistri O.M.I. *Photomapper VI*).

In the following period, from 1960 onwards, while in Europe there is an accentuated interest in the methods and tecniques of recording addressed to an archaeological use and in systematically organizing aerial survey and related studies, in Italy the use of aerial pictures is limited to vertical pictures of military kind, which are more suited to a complessive reading of an area (a sort of "cultured" photointerpretation, a support of the historical-archaeological survey), a direct result of strict regulations in force dating back to 1939 (Royal Decree of 22nd June 1939) which hampered the survey made by Boards not in charge of this kind of operationsand prevented from freely taking aerial recordings.

In Italy, the studies in this sector were stimulated by the impressive carried out by the Archaeological Aerial Photographic Archives, thanks to the recovery and classification of a lot of aerial photographic material, the organization in collaboration with the Aerial Cooperation School of Guidonia of courses of photointerpretation for archaeologists and technicians of the Archaeological Superintendencies and of the Universities and the realization, in accordance with Military Aeronautics, of special aerial recordings. We must remember the researches and studies of the new director of the structure, Giovanna Alvisi, under whose direction the Aerial Photografic Archives were named "Laboratory for Photointerpretation and Aerial Photogrammetry of the Ministry for the Cultural Heritage", on the Roman road network in Daunia and on the techniques and materials useful for addressed aerial recordings (Alvisi 1970). In 1980, at the "British School" of Rome, the Central Institute for Catalog and Documentation of the Ministery for the Cultural Heritage organized a second important exhibition on "Aerial Photography from war material to cultural heritage: the aerial pictures of RAF" (Alvisi 1980).

The ones mentioned up to now are only some of the main personalities, maybe the most representative, who in Italy, from the end of the 2nd World War onwards, gave a decisive impulse to the studies of "Archaeological Aerial Topography", even if the number of scholars of high scientific level who contributed to the topographic research is certainly larger. Among the most significant experiences we have to remember: the searches of J.B. Ward Perkins and C. Fredericksen on the

area of Veio, on the via Clodia and on the area of Falisco; the surveys directed since 1978 by Pierluigi Tozzi at the University of Pavia following the studies made by Plinio Fraccaro on the padan landscape through photointerpretation and low flights; the work made by a team of French scholars from the University of Besançon, directed by Gerard Chouquer, togheter with the *École Française* of Rome in the first Eighties, on the remains of different centuriations in central and Southern Italy.

At the half of the Eighties, within the activities of the mentioned laboratory of "Addressed Photogrammetry" of the Institute of Ancient Topography of Rome, Fabio Piccarreta made the first experiments of analitic aerophotogrammetry applied to archaeology: we must remember, as the first work, the mapping of the microsurvey on the paving of the square of Forum Romanum; and Piccarreta was also the author of the first Italian handbook on our subject, *Manuale di fotografia aerea: uso archeologico* (Piccarreta 1987).

And we are at the present time. In 1991, as a result of an agreement between National Research Council and University of Lecce, the "Laboratory of Ancient Topography" was founded, in order to exploit the cultural heritage of Southern Italy and create operating structures in the region. The laboratory has a photogrammetry section for archaeology.

During these years of activity a lot of aerophotogrammetries in several cultural spheres have been produced, in order to check the operative potentialities of the system on subjects which differ in history, morphology and topography, among which some ancient inhabited sites of Southern Italy (*Heraclea*, Serra di Vaglio, Ugento, Vaste, *Rudiae*, Rocavecchia, Valesio and Arpi), of Southern Etruria (Veio and Cerveteri) and of Latium (*Lavinium*, Terracina and *Aquinum*). During these years, some fixed points have been reached, which allow us to determine a procedure to realize the cartography addressed to the cultural heritage based on three basical steps[11]: planimetric level; altimetric level; coding (Ceraudo 1999).

To simplify:

Planimetric level: means the cartographic restoration of all the elements with an archaeological value, direct as well as indirect (archaeological features, in themselves or in track, their way to interfere with the context, etc.)[12].

Altimetric level: by meticolously contouring the isohypses in a detailed analyses which points out every slightest characteristic of the ground, trying to reproduce the morphology as accurately as possible, intervening on the equidistance of the contour line[13].

[11] The first two have been acquired for a long time, while the third is more recent; it can be insert in the procedure also successively and is linked to the use of data processing systems.

[12] In the same way i twill be possibile to survey modern elements which, in a generic map, could also be disregarded (boundaries of crops, huts, barns, haylofts, road signs, isolated trees, bushes, etc.) but which, in a project of immediate work, could be valuable.

[13] Stereoscopic vision and the comprehension of the slightest changes of the round, which are often not visible through a direct observation from the ground, can show, through the accurate restoration of the microsurvey, the presence of something which requires a further survey. The archaeologist-restorer, thanks to his scientific qualification, will be able to decide from time to time where it is necessary to force this system of "altimetric sonde" further reducing the equidistance till reaching special effects such as the graphic restoration of the microsurvey.

Coding: this is quite a recent aspect which is strictly linked to analitic cartography; it means the creation of a graphic data bank of the single objects represented, according to an open system of alphanumeric codes, structured in order to accentuate the aspect of data container of numeric cartography; it is an anticipation of the Territorial Informative Systems in which it should converge and by which it should be managed (Guaitoli 2001, 385-402).

In an aerophotogrammetry deliberately realized for archaeologic purposes, a third important aspect - besides the mapping and the data documentation and transmission – is the discovery. The carrying out of an aerial photogrammetry addressed to the drafting of an archaeologic map, made by the archaeologist himself, can be a fundamental moment to analyse the ground and to study and research. By analysing the ground on a tridimensional model, the encharged for restoration acquires a deep knowledge of the geomorphological characteristics of the area and is able to read and interpret those "anomalies", the archaeological tracks, which can provide new hints of study and can enrich the work of data and elements which are very important for the research.

A different matter are the archaeological tracks visible in the stereoscopical couple to be restored. These tracks, appropriately identified by the photointerpreter archaeologist, can be directly inserted in the archaeological map under preparation. This procedure is important because it enable us to acquire elements and tracks from aerial photograms of different ages (historical and recent recordings) and to construct with precision a homogeneous mosaic of the tracks found on all the analyzed pictures.

The drawing, that is the action of fixing in the space and in this case on the paper (cartographic positioning) a defined object, even if in track, is the main requirement for the knowledge and the protection of the cultural heritage. If the archaeological tracks, even if read, interpreted and described, were not graphically reproduced, they would be an abstract element which couldn't be protected. A great relevance is given also to oblique aerial photographies; they are usually treated with particular softwares for the correction and the numerical transformation of perspective pictures: photos are corrected geometrically, georeferenced on check points, and the tracks, after being vectorialized, are rototranslated in the analitic cartography under preparation[14].

More recently, the abrogation of the restrictive and anachronistic "Royal Decree" of 1939 about aerial recordings, in December 2000[15], is to be considered as one of the most significant changes in our field, and opened also in Italy the frontiers of aimed low flights and of recordings of oblique pictures. The change in the legislation and agreements with Boards or Institutions qualified for flying as the "Nucleo Tutela del Patrimonio" of Carabinieri, the Corpo Forestale dello Stato and the

[14] At present in Italy there are several laboratories of photogrammetry addressed to archaeology: at the University of Lecce (*Laboratorio di Topografia antica e Fotogrammetria* Università-C.N.R), at "La Sapienza" of Rome, at Bari (*Laboratorio Centro Aerofotografico*), at Potenza (*Istituto di Studi Federiciani* del C.N.R.), at Viterbo (*Laboratorio Fotografico e Laboratorio di Registrazione e Documentazione Grafica*), at the Seconda Università of Naples (*Laboratorio di Fotogrammetria Finalizzata*); similar sectors are also at the Ministery for the Cultural Heritage (*Laboratorio di Topografia e Fotogrammetria*), at the C.N.R (DRR - *Laboratorio di Fotogrammetria finalizzata*), at the *Centro di Documentazione della Regione Lazio* (*Laboratorio di fotogrammetria*) and ICCD.

[15] Decree by the President of the Republic, 29th September 2000, n. 367, in "Gazzetta Ufficiale - Serie Generale", 141, 289, 12th December 2000, Rome.

“Nucleo Elicotteristi” of the fire brigade of Rome in the last years allowed teachers and researchers of the University of Lecce to monitor from high above – for protection and research purposes – some important ancient sites, such as Veio (fig. 6), Cerveteri and Tarquinia in Etruria; Fabrateria Nova and Aquinum in Southern Latium; Arpi in Puglia.

The liberalization of the activities of aerial recordings on national territory made it possible to organize, in 2001 at the University of Siena and in 2003 at the University of Foggia, courses of “Archaeology addressed to archaeological aerophotography”: two “Aerial Archaeologiy Reasearch School” under the direction of Robert Bewley (English Heritage, UK) and Chris Musson (Royal Commission, Wales) in collaboration with the Aerial Archaeology Research Group. Within these initiatives, aerial surveys have been started in order to verify the potentialities of oblique picture in the area of Siena in Tuscany and in the Tavoliere in Puglia.

An important moment for aerial archaeological photography in Italy has been the recent opening of a great exhibition entitled “Lo sguardo di Icaro. Le collezioni dell’Aerofototeca per la conoscenza del territorio” which took place in Rome in May 2003. The exhibition, realized thanks to the cooperation among ICCD, Istituto CNR Beni archeologici e monumentali of Lecce and the faculty of Beni Culturali of the University of Lecce), aimed to show the rare collections of historical aerial photographies of National Aerial Photographic Archives as a basic instrument for knowledge and exploitation of cultural heritage (*Sguardo di Icaro* 2003). The aerial recordings which have been used, unique and difficult to find, taken from several reasons linked to the activities on the territory and often for military purposes, show past situations, preisely dated, documenting in substance the recent history of our country. It is an important occasion, of collection and reflection, to consider the state of our subject.

As regards the archaeological researches supported by aerial pictures, the Italian situation at the present, on account of the spreading of systematic aerial reconnaissance, oriented aerial shots and derived studies, is greatly developing. Thanks to the abrogation of the old regulations, the collaboration with the bodies in charge of the flights and the simulating meeting with colleagues from the other side of the Alps, a number of initiatives and interventions take place in particular in some regions of our country. But it is important to insist on a point: this line of research, that must be followed, is good only if founded on sound cultural basis, linked to a deep-rooted tradition of studies and with professionalisms and specific abilities connected to the activity on the territory and not improvised or created on purpose. Actually, in some cases there is the doubt that the motive is not exactly a consolidated line of research but an occasional availability of funds.

As regards the methodology, we are still sure that the use of aerial photography must be closely connected to the primary need of contextualization and topographic placing of the find (track) and to its exact survey. The drawing, that is the action of fixing in the space and in this case of returning on paper (cartographic positioning) a defined object, even if in track, is the necessary requirement for the knowledge and protection of the object itself. In the case of archaeological

tracks, if they are read, interpreted and described, but not graphically reproduced with photogrammetric precision and georeferenced, they would remain an abstract element, a passing moment in the research on a territory, on which it would be impossible to exercise any form of protection.

Therefore, the consolidated use of vertical aerial photogrammetric pictures was not, and is not, also by the light of the change in regulations, a makeshift solution, but is still a point of strenght, a basic step of the research in the studies of “Archaeological aerotopography”, coupled with the cartographic return. In my opinion, there is a higher refining of archaeological photointerpretation which works without ignoring nor the smallest sign potentially contained in the aerial pictures, in the attempt of collecting data also from those signs which are fragmentary or hardly visible on the ground, certainly less sensational than some astonishing photos but equally important for the aims of an activity of integrated research. Some colleagues, which work in different environmental situations, sometimes seem not to understand this statement and seem to favour the part strictly connected to the aerophotographic shot only as a search for sensational pictures.

I want to conclude this rich roundup on the history of aerial archaeological photography in Italy with an anticipation - I hope it can be of any interest for the present colleagues - giving notice of a new thematic review entitled “Archeologia aerea. Studi di Aerotopografia archeologica” (published by Istituto Poligrafico e Zecca dello Stato), whose first number will be published in 2004, exactly one century and five years after the first historical ascent of Giacomo Boni on the Forum Romanum, in a bright spring day of 1899.

Fig. 1 *A duas Lauros* (Centocelle Airport, Rome); detail of the large imperial villa.

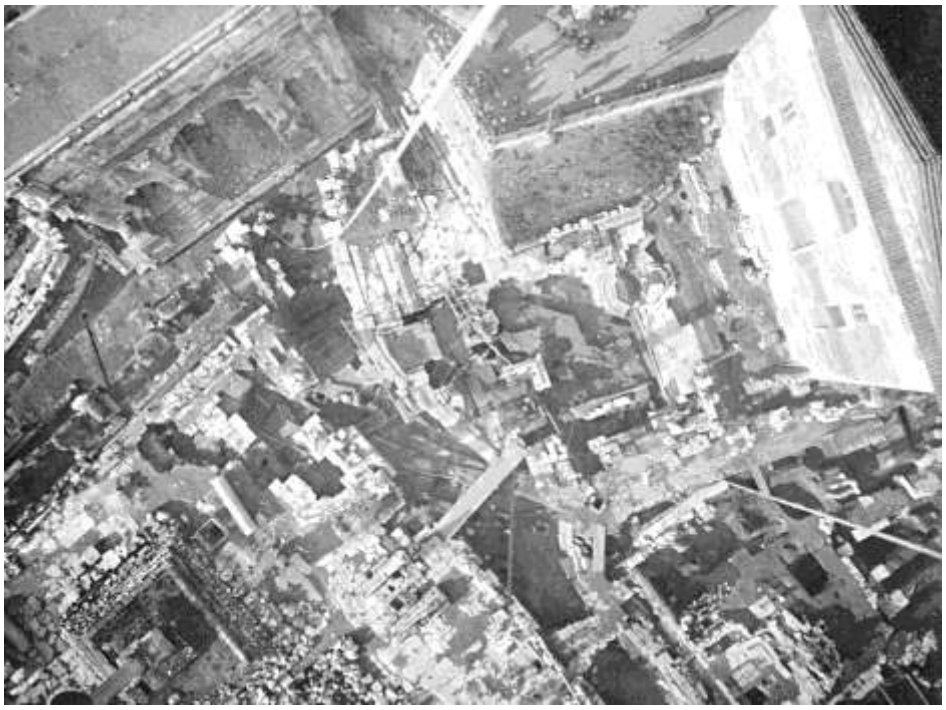

Fig. 2 Excavation campaign in the central part of the Forum (area of Comizio and of *Niger Lapis*) recorded by g: Boni on a captive baloon of Brigata Specialisti of the Military Engineers of Italian Army.

Fig. 3 Aerial picture of Claudio's Harbour and Traiano's Harbour, near Fiumicino, shot by the baloon (1907).

Fig. 4 Aerial sight of Ostia during the excavations of Vaglieri and of a lost bight of Tiber (1911).

Fig. 5 Submerged ruins of *Portus Iulius* in the Gulf of Pozzuoli.

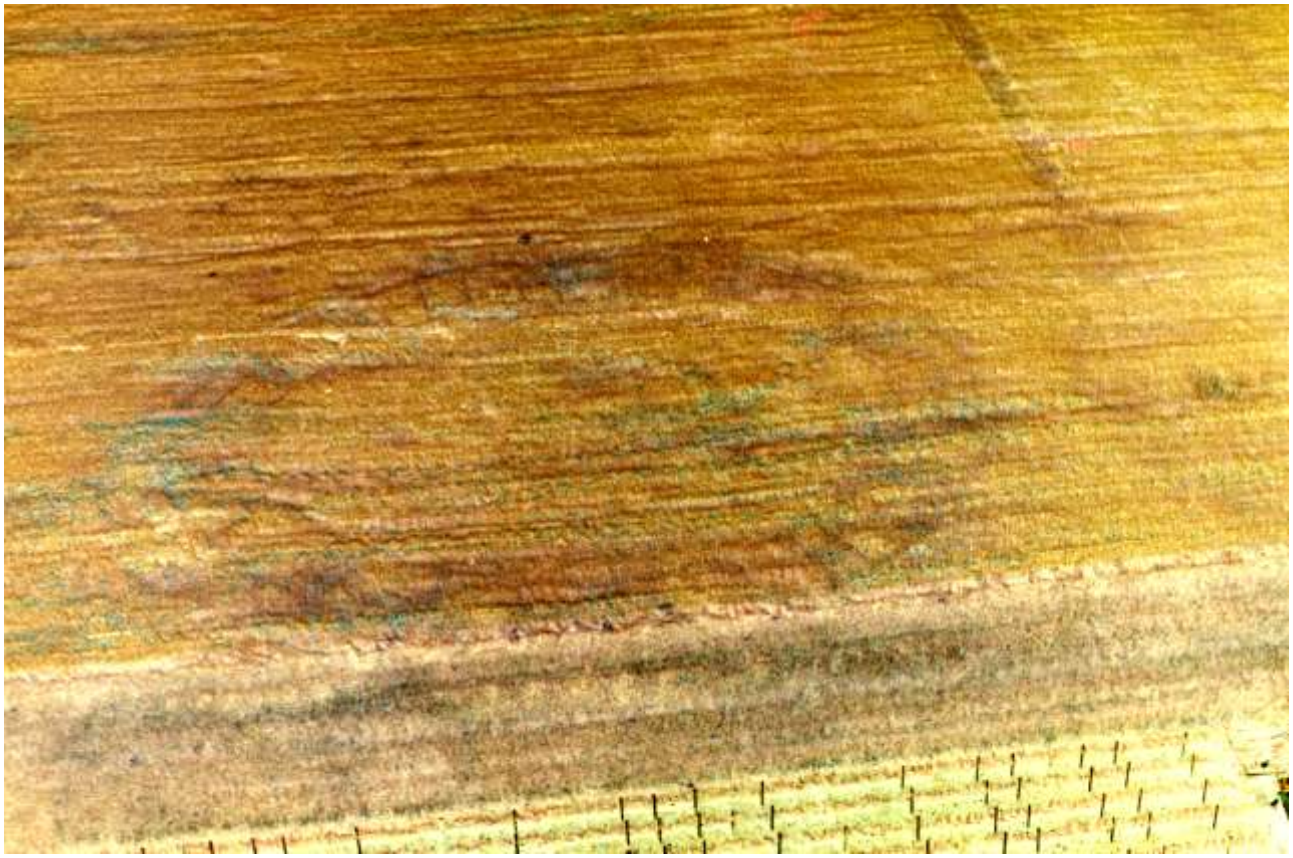

Fig. 6 Remains of a amphitheatre in the urban area of Fabrateria Nova.

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