The Grande Limagne plain (Auvergne, France): a laboratory for systematic fieldwalking. The case of the largest Gallo-Roman villas

Frédéric Trément, Florian Baret, Maxime Calbris, Hugo Regad

LVR-Amt für Bodendenkmalpflege im Rheinland

Funde in der Landschaft

Neue Perspektiven und Ergebnisse archäologischer Prospektion

Materialien zur Bodendenkmalpflege im Rheinland 26

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Christine Wohlfarth/Christoph Keller (Hrsg.)

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herausgegeben von Jürgen Kunow

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herausgegeben von Christine Wohlfarth und Christoph Keller

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Inhaltsverzeichnis

Vorwort 9

Begrüßung 11

Jeanne-Nora Andrikopoulou
Funde in der Landschaft – Archäologische Prospektion als Methodenbündel 13

I Ephemere Fundplätze

Michael Geschwinde
Eingefrorene Zeit
Archäologische Prospektionen auf dem römisch-germanischen Schlachtfeld am Harzhorn 19

André Schürger und Eva Carmen Szabó
Prospektionen auf Schlachtfeldern der frühen Neuzeit: das Beispiel Lützen 1632 35

Nicolas Poirier
From archaeological evidence for agricultural manuring to an understanding of settlement and landscape dynamics
An experiment in non-invasive archaeological methods undertaken in South-West France 41

Piotr Wroniecki and Kevin Barton
Is it only finds in the landscape?
Assessing the suitability of aerial and ground archaeological prospection techniques in Rzemienowice, Poland 55

II Prospektion und präventive Archäologie

Maria Medlycott
Archäologische Feldbegehungen in Essex 1986–2005 69

Wim De Clercq, Jan Trachet and Jeroen de Reu
Artefact-accurate fieldwalking in Flanders
Integrating medieval surface finds with geophysical and historical data 81

Eelco Rensink
Accurate methods of archaeological prospection and digital information systems in the Netherlands 93

Christine Wohlfarth
Prospektion im Rheinland – wirklich präventiv? Wunsch und Wirklichkeit 103

Kristof Haneca, Sofie Debruyne, Sofie Vanhoutte, Anton Ervynck, Maarten Vermeyen und Philip Verhagen
Simulation von Suchschnitten in der archäologischen Prospektion: Bewertung der Variabilität im Anteil von geschnittenen Befunden 115

Michael Vinter
The perfect archaeological record?
Danish experiences with systematic trial trenching 135

III Landschaftsarchäologie in Südeuropa

John L. Bintliff
The development of surface survey in the Mediterranean: A brief history 151

Wieke de Neef, Martijn van Leusen, Kayt Armstrong and Burkart Ullrich
Between a rock, a gully, and a hard place
Archaeological prospection of Metal Age remains in the uplands of the Raganello Basin (Calabria, Italy) 159

Simonetta Menchelli
Pisa South Picenum Survey Project II: Raw and interpreted data 171

Jesús García Sánchez
The hinterland of *Segisamo* (Sasamón, Spain)
The landscape of a Roman city through off-site survey 181

Frédéric Trément, Florian Baret, Maxime Calbris and Hugo Regad
The Grande Limagne plain (Auvergne, France): A laboratory for systematic fieldwalking
The case of the largest Gallo-Roman villas 193

IV Landschaftsarchäologie in Mitteleuropa

Susanne Jenter und Jobst J. M. Wippern
Mit allen Mitteln
Untersuchungen zum römischen Straßennetz im Rheinland 219

Thomas Becker und Ayla Lang
Luftbild – Geophysik – Einzelfundkartierung
Prospektionsmaßnahmen im Bereich der frühkaiserzeitlichen Lager von Trebur-Geinsheim (Lkr. Groß-Gerau) 235

Joris Coolen
Zwischen Artefakten und Anomalien
Integrierte Oberflächensurveys im Kreuttal, Niederösterreich 245

Heiko Wagner
Abseits der Äcker
Archäologische Surveys in bewaldeten Regionen 257

Mathias Bertuch und Klaus Cappenberg
Folgen des Landschaftswandels als archäologisches Vorhersageinstrument
Die Aussagekraft von Auensedimenten in einer Mittelgebirgsregion 273

Udo Geilenbrügge
Ausgrabungsrealität nach intensiver Prospektion im rheinischen Braunkohlentagebau Inden 285

Autorinnen und Autoren 297

Vorwort

Seit mehr als einhundert Jahren nutzen Archäologinnen und Archäologen unterschiedliche Methoden der Prospektion, um bislang unbekannte Fundplätze zu entdecken, prähistorische Landschaften zu rekonstruieren oder vage bekannte Fundstellen zu Schutzzwecken genau abzugrenzen. Inzwischen sind angewandte Methoden weiterentwickelt und den heutigen Bedürfnissen der verschiedenen archäologischen Fachrichtungen angepasst worden.

Bereits zum einhundertjährigen Jubiläum des Erscheinens von August Schoops Untersuchung der römischen Siedlungsstellen im damaligen Kreis Düren 1905 entstand die Idee, in einer Tagung Akteure aus den verschiedenen Fachrichtungen archäologischer Prospektion zusammen zu bringen.

Vor dem Hintergrund unterschiedlicher Anforderungen – hier langjährige Erfassung antiker Landschaften, dort schnelle und kleinräumige Analyse des archäologischen Potentials – haben sich ganz unterschiedliche Ansätze und Lösungsmöglichkeiten, sowohl in der praktischen Durchführung von Prospektionen als auch in der Auswertung der im Gelände erhobenen Daten, entwickelt. Gleichzeitig führten die in den beiden letzten Jahrzehnten auch allgemein verfügbaren Innovationen im Bereich Vermessung dazu, dass sich die langen etablierten Prospektionsmethoden wieder einmal geändert und der neuen Möglichkeiten bedient haben.

Auch wenn zwischen der ersten Idee zu einer Fachtagung mit dem Schwerpunkt Feldbegehung in der archäologischen Prospektion und ihrer Realisierung noch etliche Jahre gelegen haben, so ist es am Ende gelungen, Expertinnen und Experten aus Forschungseinrichtungen, Universitäten und Bodendenkmalpflegeämtern aus zwölf europäischen Ländern zu gewinnen und in der Tagung „Funde in der Landschaft – Neue Perspektiven und Ergebnisse archäologischer Prospektion“ miteinander in einen intensiven fachlichen Austausch zu bringen.

Am 12. und 13. Juni 2017 fand die Tagung in den Räumen der Fritz Thyssen Stiftung in Köln statt. Unter vier Aspekten wurden neueste Forschungsergebnisse wie langjährige Erfahrungen präsentiert.

Zunächst ging es um ephemere Fundplätze, deren Zeugnisse sich nur im Oberboden erhalten haben und daher auch nur durch Methoden der Feldbegehung untersucht werden können. Dabei wurde der Bogen von Schlachtfeldern europäischer Konflikte über Spuren mittelalterlicher Landwirtschaft bis hin zu vermeintlich kaum fassbaren Fundstellen gezogen. Im zweiten Teil standen prospektive Methoden im Spannungsfeld zwischen Bodendenkmalpflege und Flächenverbrauch durch Siedlungsbau und Rohstoffgewinnung im Fokus, wo häufig schnelle, kostengünstige und verlässliche Untersuchungsmethoden notwendig sind. Verschiedene landschaftsarchäologische Projekte im Mittelmeerraum, die sich vor allem mit der Untersuchung ländlicher Räume beschäftigten, bildeten den dritten Themenschwerpunkt. Mit dem Blick nach Mittel- und Nordeuropa im letzten Abschnitt der Tagung wurde der zeitliche Rahmen wie auch die Fragestellung der vorgestellten Prospektionsprojekte nochmals erweitert.

Wir freuen uns, dass die Ergebnisse dieser erfolgreichen Tagung bereits nach kurzer Zeit in gedruckter Form einem breiteren Publikum vorgelegt werden können. Unser Dank gilt dafür den Referentinnen und Referenten, die trotz vieler anderer Verpflichtungen die folgenden Aufsätze beigesteuert haben, allen beteiligten Kolleginnen und Kollegen an Redaktion, Bildbearbeitung und Layout, die zum Gelingen des Bandes beigetragen haben.

Ein ganz besonderer Dank gilt der Fritz Thyssen Stiftung für Wissenschaftsförderung in Köln, die uns nicht nur für die Tagung gastlich in ihren Räumen aufnahm, sondern auch die Tagung wie auch die Drucklegung dieses Bandes finanziell großzügig unterstützt hat. Weitere finanzielle Unterstützung haben wir durch den Landschaftsverband Rheinland und das Ministerium für Heimat, Kommunales, Bau und Gleichstellung des Landes Nordrhein-Westfalen erhalten. Auch hierfür sei an dieser Stelle ganz herzlich gedankt.

Bonn, November 2018
Jürgen Kunow
Christine Wohlfarth
Christoph Keller

Frédéric Trément, Florian Baret, Maxime Calbris and Hugo Regad

The Grande Limagne plain (Auvergne, France): A laboratory for systematic fieldwalking

The case of the largest Gallo-Roman villas

Abstract

Over the past twenty years, the Grande Limagne plain has been the object of one of the most extensive programmes of systematic fieldwalking ever conducted in France. These pedestrian surveys are coupled with aerial surveys and paleoenvironmental studies that allow us to reconstruct with great precision the complex dynamics of the interactions between societies and environment since the Neolithic period. This region is integrated at a larger scale into the context of the Massif Central, which is in turn investigated through numerous methods (pedestrian and aerial surveys, geophysics, Lidar, paleoenvironmental studies).
The following contribution will focus on the systematic fieldwalking conducted in the Grande Limagne, a sedimentary basin known since Antiquity for the fertility of its black soil (celebrated by Sidonius Apollinarius), but also for the compelling nature of a hydrological system which required a permanent drainage of extensive marshes. As such, this region is a real laboratory for the study of the relationship between society and wetlands. It is also an extraordinary laboratory for the study of land use, on the one hand because of the high density of settlement, and on the other because conditions for prospecting are exceptionally favourable, due to the pervasive nature of ploughland and special taphonomic conditions. While the sites are only thinly covered, they have been under assault by agricultural activity only since the *Plan Limagne* was set up in 1960–1970 to drain the swamps. This makes it possible (for the Roman period in particular) to identify, map, and characterize nearly complete settlements, which are spaced at an average distance of 250 m, and of reconstructing the system of settlement in its continuity. The paper will present the taphonomic conditions, on-site and off-site prospecting methods, field data recording system, cross-referencing to aerial survey data, and – finally – a brief case study concerning the largest Gallo-Roman *villae*.

Zusammenfassung

Die Ebene der Grande Limagne (Auvergne, Frankreich) – Ein „Laborversuch“ systematischer Feldbegehung am Fallbeispiel der größten gallorömischen *villae*

Die Ebene der Grande Limagne war in den letzten zwanzig Jahren Schauplatz eines der ausgedehntesten jemals in Frankreich durchgeführten Programme systematischer Feldbegehung. Diese Feldbegehungen werden mit Befliegungen und mit Paläo-Umweltstudien kombiniert. Dadurch wird eine sehr präzise Rekonstruktion jener komplexen Dynamik möglich, die hier seit dem Neolithikum die Interaktion zwischen menschlichen Gemeinschaften und der Umwelt prägte. Der Untersuchungsraum ist in einen erweiterten Kontext eingebettet, der das gesamte Massif Central umfasst. Auf dieser Ebene werden zahlreiche Methoden der Untersuchung (Begehungen und Befliegungen, Geophysik, Lidar, Paläo-Umweltstudien) integriert angewandt.
Unser Beitrag konzentriert sich dabei auf die systematischen Feldbegehungen, die im Sedimentbecken der Grande Limagne durchgeführt werden. Das Gebiet war seit der Antike für die Fruchtbarkeit seiner (von Sidonius Apollinaris gerühmten) Schwarzerde-Böden bekannt, aber auch für den Einfluss, den die Natur in Form eines hydrologischen Systems ausübte, welches eine permanente Entwässerung ausgedehnter Marschen erforderte. Die Region stellt somit ein geeignetes Experimentierfeld für die Untersuchung der Beziehungen zwischen menschlichen Gemeinschaften und Feuchtgebieten dar. Gleichzeitig bietet es sich zur Untersuchung der Landschaftsnutzung an. Auf der einen Seite ist die

Dichte der Siedlungsstellen sehr hoch, auf der anderen sind die Bedingungen für Prospektionen aufgrund der durchgehend vorliegenden Eigenschaften von Ackerland und der speziellen taphonomischen Bedingungen außerordentlich günstig. Tatsächlich greift die Landwirtschaft erst seit dem Inkrafttreten des *Plan Limagne* in die Fundstellen ein, durch den in den Jahren 1960–1970 die Sümpfe trockengelegt werden sollten. Dadurch ergibt sich die Möglichkeit (besonders für die römische Zeit), noch fast vollständige Siedlungsstellen zu identifizieren, zu kartieren und zu charakterisieren. Diese liegen im Durchschnitt etwa 250 m voneinander entfernt. Es wird dadurch außerdem möglich, die Besiedlungsstruktur in ihrer Kontinuität zu rekonstruieren. Dieser Beitrag behandelt die taphonomischen Bedingungen, die Methoden der Prospektion von Fundstellen und ihrer Umgebung, das System der Erfassung im Feld gewonnener Daten, die Abgleichung mit Befliegungsergebnissen, und präsentiert abschließend eine kurze Fallstudie, welche die größten gallorömischen *villae* vor Ort betrachtet.

1. Research context

Over the past twenty years or so, the territory of the ancient polity of the *Arverni* has been the object of numerous archaeoenvironmental research projects aimed at characterizing settlement dynamics and their interactions with the environment in order to better understand the processes of regional development since Protohistory[1]. Fifteen microregional study windows have been opened on this vast space[2]. Among the methods used, archaeological prospection occupies a central place. Due to the great diversity of environments in this region of the Massif Central, the implementation of this method takes various forms,

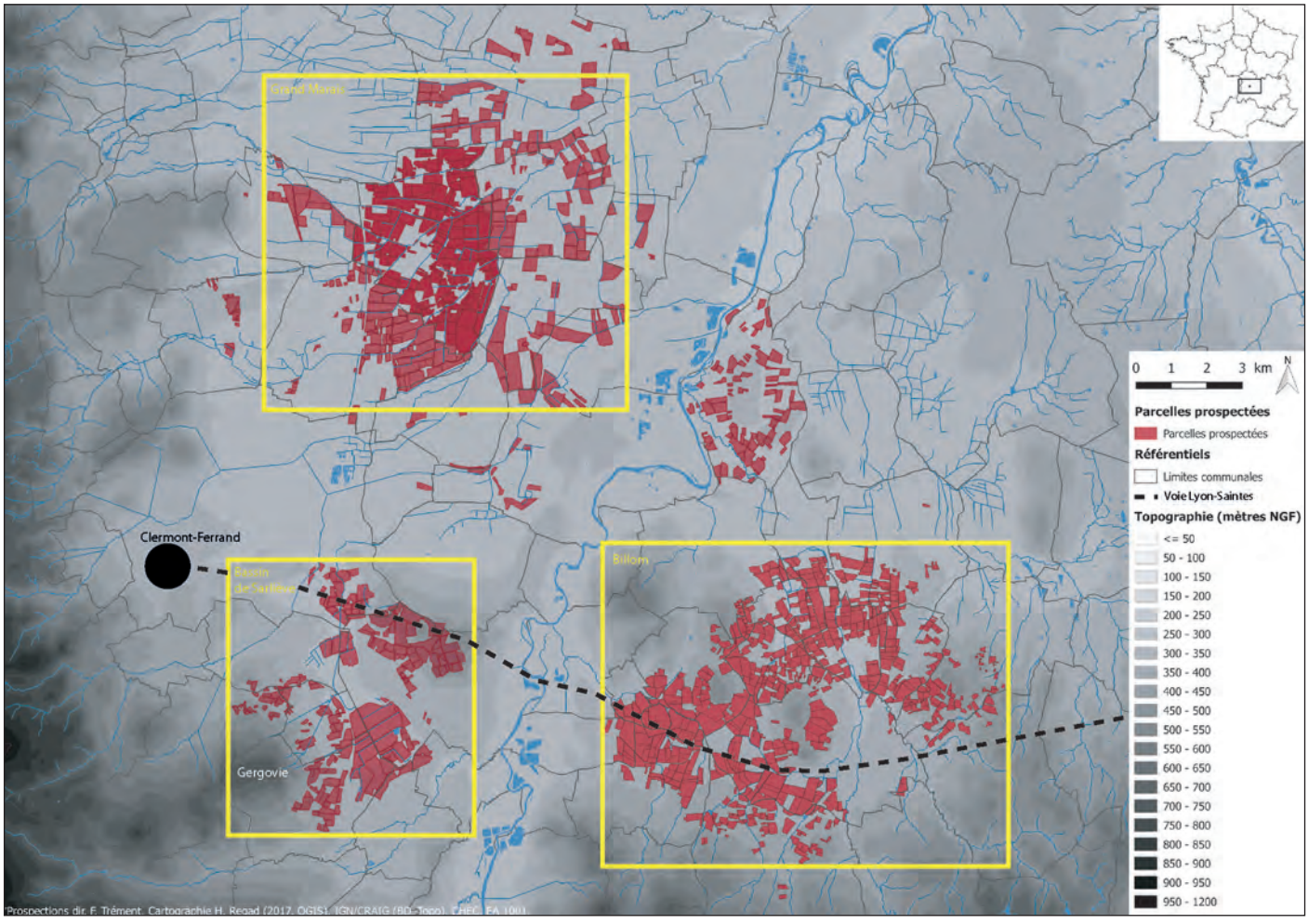


Fig. 1 Location of systematic survey areas (status in 2017).

Fig. 2 Example of a Gallo-Roman site visible in a ploughed field.

and poses complex problems concerning the comparability of results[3]. In this paper, we would like to draw attention to one of these areas, the Grande Limagne of the Auvergne, which constitutes a real laboratory for systematic pedestrian exploration (Fig. 1).
This area is of particular interest for three major reasons:

1) Firstly, it occupied a central place in the organization of the *Arverni* polity since the Iron Age; it is here that the major sites considered as successive 'central places' were concentrated 'in a nutshell' from the 4th century BC on: Aulnat/Gandaillat/La Grande Borne[4], the *oppida* of Corent[5], *Gergovia*[6] and Gondole[7], and the chief town of *Augustonemetum*[8], which constituted a major road junction in Roman time[9].
2) Secondly, as the systematic land- and air-based surveys and the numerous preventive archaeology operations carried out in this area have shown, human occupation is very ancient, and particularly dense from the Neolithic on[10]. The area is also a reference point for many periods at the national level. For example, the settlements both in the basin of Clermont-Ferrand and the wider area of the Limagne plain were spaced some 250 m apart (on average) during the first two centuries AD. One of the factors which explain the attractiveness of this area is the presence of the famous 'black soils', whose legendary fertility was already celebrated by Sidonius Apollinarius, bishop of Clermont and a large landowner of the 5th century AD. Our research has shown how the a priori forbidding environment of the Limagne marshes could be farmed from the 3rd century BC on, thanks to extensive drainage and improvement programmes which seem to have displayed a systematic character from a very early point on[11].
3) Finally, mention must be made of the taphonomic conditions, which are particularly favourable for prospection. The comparison of archaeological and palaeoenvironmental data highlights two particularly favourable factors:

The first of these is the shallow soil cover of archaeological sites (Fig. 2); in fact, the dimensions of the plain which fills this Tertiary-age basin are very large in proportion to the surrounding catchment area. This explains the sparse recent sedimentary coverings[12]; while excavations and surveys prove that the archaeological sites lie directly under the surface. Any destruction is due mainly to their use as quarries for building material during medieval and modern times, in a plain where stone is almost absent.
The second factor favourable to prospection is the recent and intensive mechanized agricultural devel-

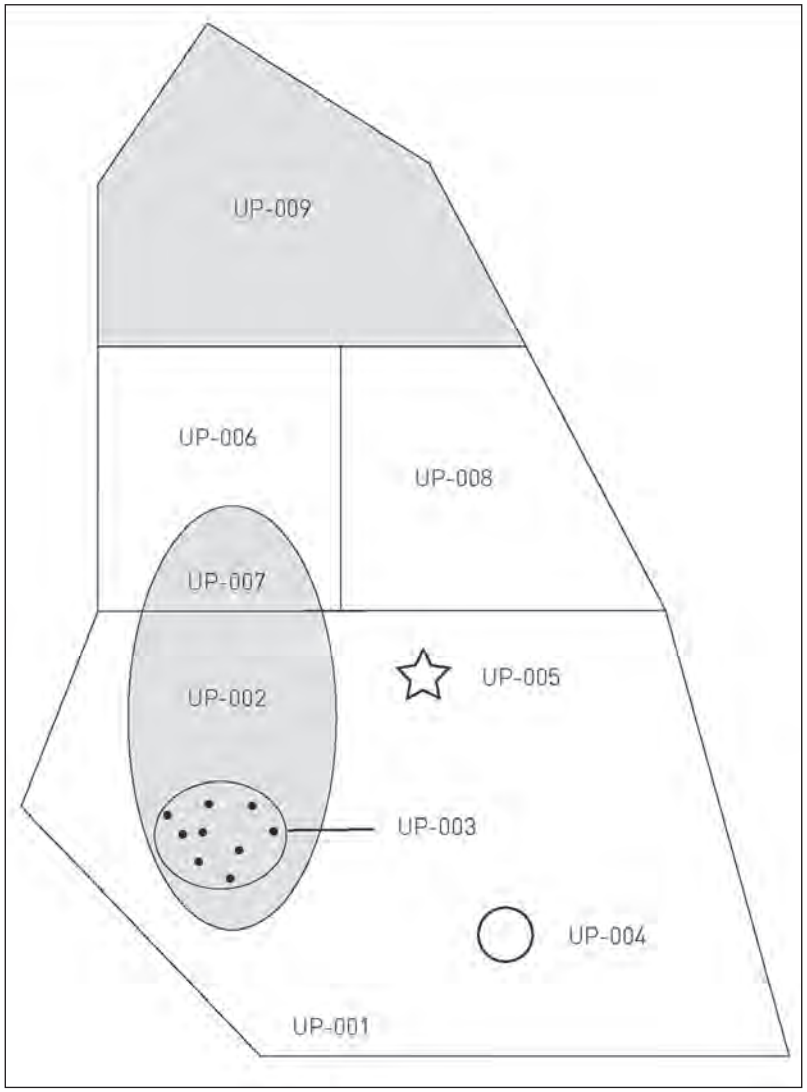


Fig. 3 The principle of the *Prospecting Unit* (UP). UP-001: Prospected parcel (contains UP-002/003/004/005) – UP-002: Gallo-Roman site – UP-003: *Hypocaust* fragments individually located by GPS and grouped into an UP corresponding to the thermal part of the establishment – UP-004: Site index – UP-005: Isolated find – UP-006: Prospected parcel (contains UP-007) – UP-007: Continuation of site UP-002 – UP-008: Prospected parcel archeologically sterile – UP-009: Prospected parcel covered by an off-site pottery spread.

opment. This followed the *Plan Limagne*, an extensive drainage and reclamation programme initiated in 1962 but mainly implemented in the 1970s and the 1980s. The levelling of archaeological sites is therefore a recent phenomenon, the negative effects of which can be observed from year to year, due to the use of increasingly aggressive techniques of ploughing which cause a progressive disintegration of artefacts.

Three research windows have been the subject of systematic prospections within the framework of the archaeological licence course of the Clermont Auvergne University since 1997 (Fig. 1):

– from 1997 to 2000, the area of the Grand Marais, immediately northwest of Clermont-Ferrand[13];
– from 2001 to 2003, the Sarlième basin, immediately south-west of Clermont-Ferrand, at the foot of the *oppidum* of *Gergovia*[14];
– since 2005, a large sector centred on the commune of Billom, on the right bank of the Allier river.

Complemented by other surveys, these three windows cover a large part of the south of the Limagne plain, i. e. 300 km², of which more than one third has been systematically prospected.

2. Prospection method and recording system

The method of prospection used is the same throughout[15]. It is carried out on bare ground, after ploughing, between February and the beginning of April. The spacing between prospectors is 10 m maximum. Teams are usually made up of 5 to 10 prospectors.

In the field, four types of data are identified[16]:

– the site: a concentration of artefacts precisely delineated in space and consistent from a chronological point of view, attesting one or more occupations or human activities at a given point;
– the site index: a potential site, insufficiently characterized from a spatial point of view for taphonomic reasons (erosion, overlap, vegetal cover, various rearrangements);
– the isolated find: generally a noteworthy object gathered from any context;
– the background noise: a diffuse but recurring presence of shards of small size, with blunted angles, resulting a priori from old agrarian practices (improvement, fertilizer spreading, filling of ponds).

Several on-site collection methods have been tested. In Saint-Beauzire, in the Grand Marais, the sites were collected by grids with sampling at 10 or 20 %, or even in entirety[17]. Part of this commune was the object of a 10 % sampling for mapping off-site pottery dispersion resulting from land improvement[18]. These methods were abandoned at the beginning of the 2000s, due to their cumbersome nature (both in the field and during data processing), in favour of more flexible methods permitted by the standardization of the use of GPS.

This major evolution led us to develop the concept of 'prospection units' (UP), derived from the 'strati-

graphic unit' used in excavation (Fig. 3). The prospection unit is defined as the smallest unit of spatially identifiable information in the field at the time of the prospection: prospected parcel, site, site index, isolated find, or background noise[19]. An UP number is automatically assigned to a prospected parcel, whether it contains archaeological information or not, the fact that it has been prospected being deemed an essential information. If this parcel contains one or more sites, site indices, or isolated finds, each of these elements receives an individual UP number. Each UP number is unique. As for background noise, cases are now recorded at the parcel scale on a qualitative basis. This method offers many advantages: in addition to its flexibility, ease and speed of implementation, it allows us to stick with the realities of the field, and to record large amounts of data finely and precisely, so that they can be combined and augmented from one year to another.

For sites which may correspond to settlements, two mapping and collection methods are used depending on the nature of the concentration (Fig. 4). In the case of 'distinct concentrations', the nucleus and concentration limits are clearly visible due to the high artefact density and the presence of bulky building materials (such as quarry stones and tiles). This is particularly the case with Roman sites, which contain buildings built from solid materials.

The method used to delimit this kind of concentration consists of radiating from the apparent centre of the nucleus towards its periphery in order to mark the boundary, which is verified during a second passage in the opposite direction (from the outside to the inside). The location of each marker is recorded by GPS at the end of the registration.

Once the site is delimited, an integral collection is carried out along parallel lines spaced 2 m apart. The elements important for the interpretation of the site are individualized, localized and recorded as a cloud of points (for example, fragments of *hypocaust* tiles, painted plaster, mortar, mosaic tiles, slag, *dolia*, or those shards characteristic of occupation periods before or after the main occupation). This method enriches the typological, chronological and functional analysis of the settlements by providing the advantages of grid collection method without its disadvantages.

In the case of 'diffuse concentrations', a nucleus will not be clearly perceptible, and limits equally so; on protohistoric and early medieval sites, for example, building materials are not conserved because of their perishable nature, and ceramics are difficult to spot because they are more scarce and fragmented. On these sites, the artefacts do not come from the buildings, but from refuse pits and other excavated structures which are uncovered by ploughing.

The method used to delineate this kind of site is that of the *cloud of points*, which consists of going across the site in near parallel lines (2 to 3 m apart) in order to tag each artefact by means of a bag in which it is deposited (Fig. 5). Each bag is then spotted with GPS before being picked up. It is therefore possible to carry out spatial analyses and to discriminate, for example, the different phases of occupation (Fig. 6).

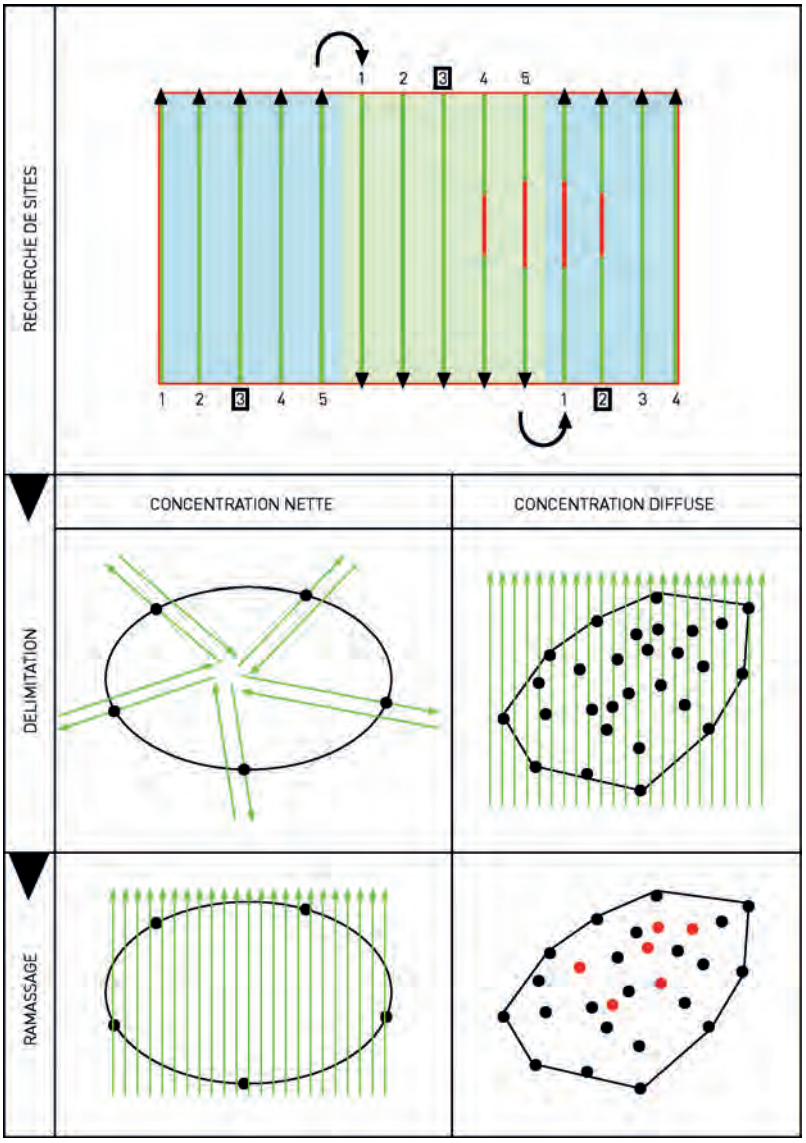


Fig. 4 Systematic fieldwalking protocol.

Fig. 5 The *cloud of points* method used to delineate a 'diffuse concentration' of artefacts.

3. First results and problems

After this brief presentation of methods, some preliminary results will be presented and different kinds of problems highlighted. Since the data from the 'Grand Marais' and 'Sarlième' windows have already been widely published, we will focus on the 'Billom' window, whose surveys, initiated in 2005 and still in progress, have become the subject of first analyses. The published data, produced for the specific needs of this paper, are therefore at a very elementary and provisional stage of interpretation.

The study area, located on the right bank of the Allier river, constitutes the southern part of the plain of Limagne (Fig. 7). It has some characteristics of the Limagne des Marais (notably the presence of wetlands and black soils), but also of the Limagne des Buttes (it is dotted with steeply sloped mounds of mixed sedimentary and volcanic origin). This space is crossed from east to west by the Agrippa road which links Lyon and Saintes to Clermont[20]. The chief town of *Augustonemetum* (Clermont-Ferrand) is only 10 km to the west, and the pottery production complex of Lezoux 5 km to the north.

The study area extends 11 km from west to east, and 9 km from north to south, some 100 km^2. The area actually surveyed to date covers more than 27 km^2, i. e. an effective coverage rate of 38 %, but close to 60 % if the non-prospectable (urbanized, wooded or grazed) areas are removed.

To date, 1918 UP have been registered (Fig. 8). The number of prehistoric sites amounts to 30, that of the protohistoric sites to 142, that of the Roman sites to 305 and that of the medieval sites to 105 (Fig. 9). In addition to some Palaeolithic indices, the oldest sites date from the Middle Neolithic. The Early Bronze Age and the Early Iron Age are particularly well represented in the form of large settlements which often cover between 5 and 10 ha. With regard to the western part of the Grande Limagne, the relative scarcity of Later Iron Age settlements is surprising, as they are much more numerous in the Grand Marais and in the

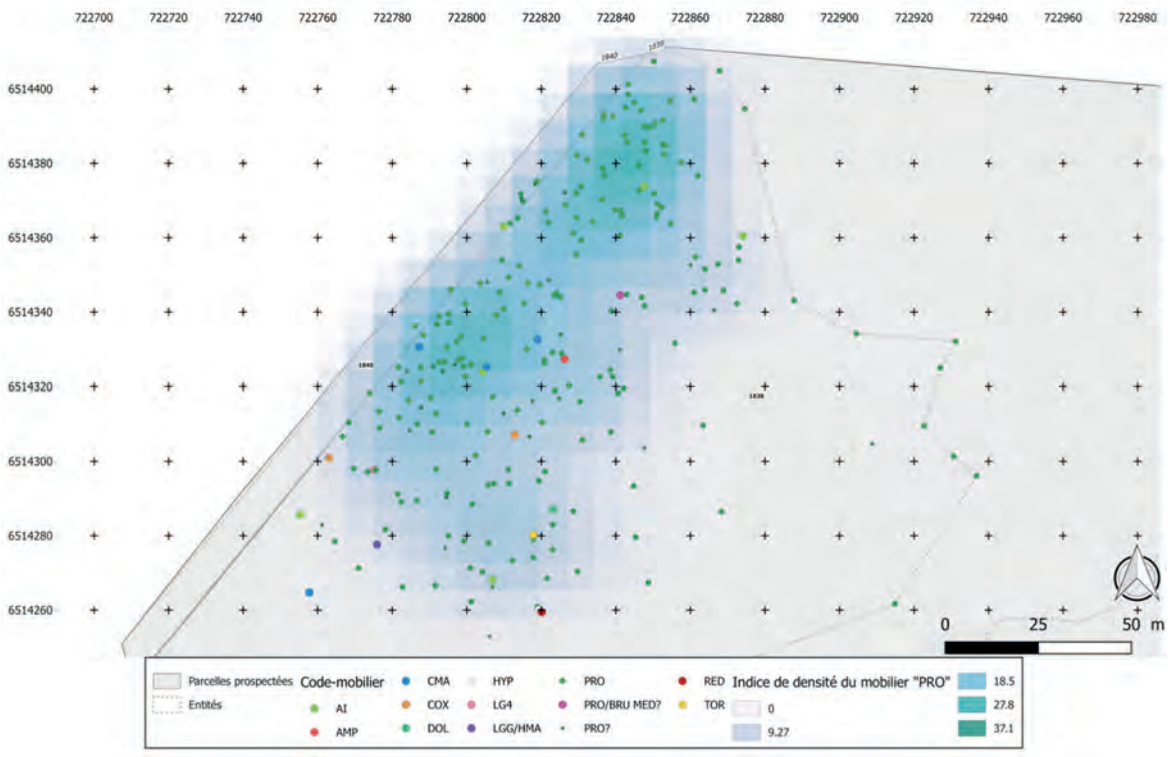


Fig. 6 Distribution of protohistoric pottery on site UP-1839.

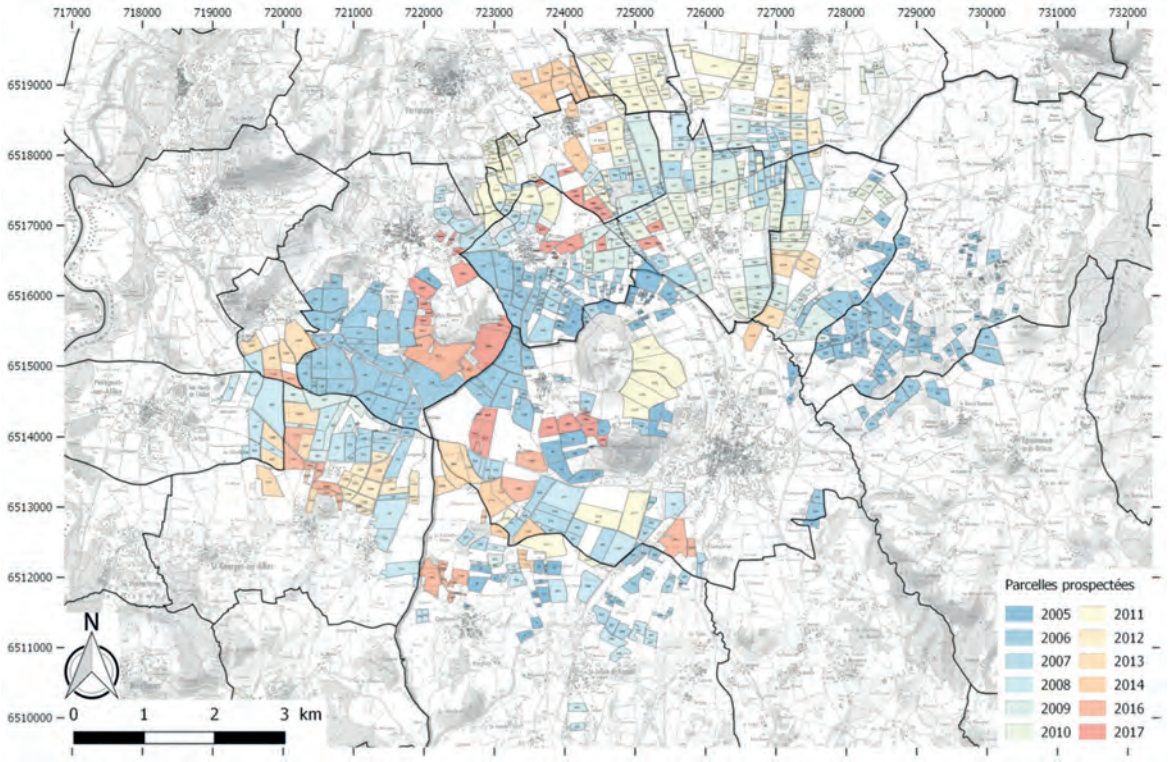


Fig. 7 Location of the parcels surveyed in the Billom area between 2005 and 2017.

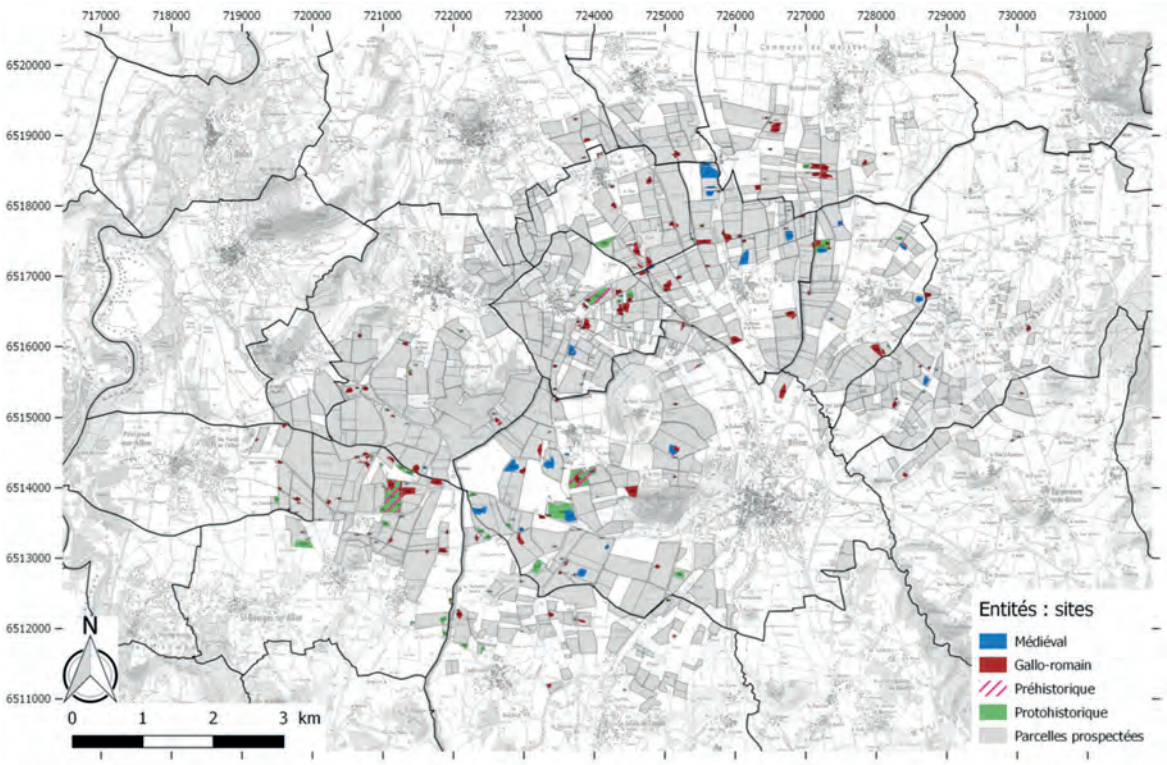


Fig. 8 Extension of sites by chrono-cultural period.

Prospection area	Total area (ha)	Prospected area (ha)	Coverage (%)	Number of UP
Grand Marais (Saint-Beauzire)	1500	1425	95	309
Basin of Sarlève	2880	1160	40	336
Billom	7166	2710	38	1918
TOTAL	11546	5295	46	2563

A

	Pre-history	Neo-lithic	Proto-history	Roman period	Middle Ages	Modern Times	Undeter-mined
Site	30	21	142	305	77	3	3
Site index	12	10	72	85	35	0	5
Isolated find	36	4	51	63	3	0	10

B

	Prehistory / Protohistory	Protohistory / Roman period	Roman period / Middle Ages	Middle Ages / Modern Times
Site	29	63	62	3
Site index	11	14	20	0
Isolated find	2	10	0	0

C

Sarlève basin. This may be the result of a concentration of the population around the major La Tène sites which are concentrated in the Clermont basin.

The Roman period, and especially the Early Empire, are characterized (as in the other windows) by a very high density of settlement (Fig. 10). At this stage, however, it is still difficult to propose a map, a typochronology and a spatial analysis of these sites. One of the difficulties is the overabundance and richness of the information generated by the method of prospection and data recording, which raises the problem of the relevance of our notion of a site.

For the purposes of this paper, we have limited ourselves to identifying and summarily characterizing the higher-ranking rural settlements, which correspond to large and luxurious *villae*.

Fig. 9 Quantitative assessment of the systematic surveys carried out in Grande Limagne.
A For the three study areas.
B Billom area: distribution of discoveries by chrono-cultural period.
C Billom area: occupation over two consecutive chrono-cultural periods.

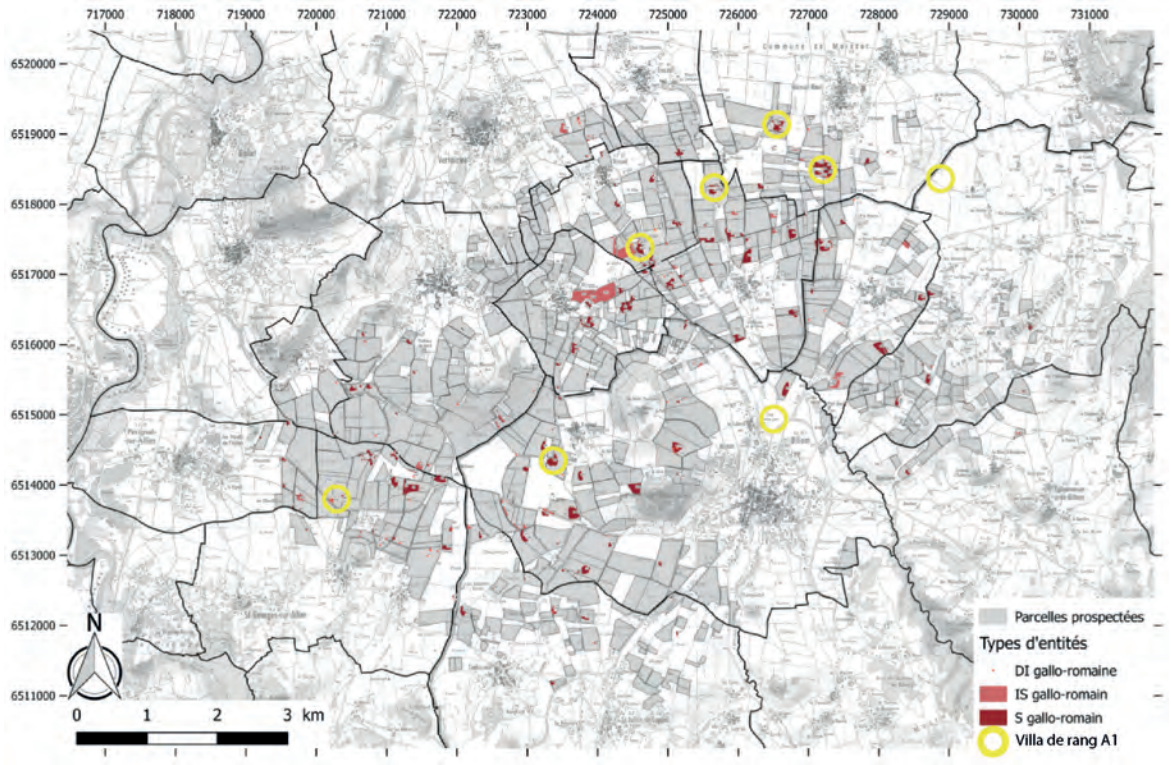


Fig. 10 Extension of the Gallo-Roman sites with location of the A1 rank *villae*.

4. Case study: the largest Gallo-Roman *villae* (A1 type)

Eight *villae* correspond to the A1 type of our typology of rural settlements elaborated for the Limagne[21] (Fig. 10). These are the largest *villae* (at over 20.000 m²), and also the most luxurious (they provide mosaic, moulded marble, polychrome painted plaster and *hypocaust* finds).

In the western part of the study area, two *villae* of A1 rank lie within a distance of 3 km. The *villa* of 'Les Valots' (Saint-Georges-sur-Allier) comprises a series of buildings extending 180 m from west to east and 150 m from north to south, i. e. about 20.000 m² (Fig. 11). The *pars urbana* is clearly situated to the west, where mosaic, marble and a large amount of polychrome painted plasters and *hypocaust* finds are concentrated. To the east, several agricultural buildings may have been organised around a large courtyard. In comparison, the *villa* of 'La Prade Nord' (Billom) appears to be larger, since the *pars urbana* alone extends over 20.000 m², a fact confirmed by aerial data (Fig. 12) and by the presence of marble and *hypocaust* finds. We must note, however, that no mosaic tiles have been found on this site to this day. As regards the *pars rustica*, its localization and its extension are not clearly defined. Finally, two richly furnished incineration sites were intersected during the digging of a ditch a hundred metres to the east[22].

Less than 2 km to the south, the site of 'Marcillat' (Billom) presents the striking example of a *villa* covered by a feudal motte (Fig. 13). It is clear in this case that the characterization of the *villa* is problematic from the surface data. The presence of white marble and *hypocaust* finds suggests the existence of a *villa* of A2 rank with an area of 12.000 m². The study of the ceramics which were collected in large quantities on this site reveals a continuity of occupation between Antiquity and the Middle Ages.

In the eastern part of the study area, several *villae* of A1 rank were recognized. Two are particularly extensive. Straddling three communes (Vassel, Chas and Espirat), the *villa* of 'Fiole' extends some 500 m from north to south and nearly 300 m from west to east, i. e. more than 10 ha (Fig. 14). The *pars urbana* is clearly located to the north, where mosaic, marble, painted coatings and *hypocaust* finds were collected in abundance. As for the *villa* of 'Les Guérins' (Glaine-Montaigut), it is known for the moment only through aerial surveys, the compilation of which makes it possible to restore the

A

B

Fig. 11 Gallo-Roman *villa* of 'Les Valots' (Saint-Georges-sur-Allier).
A Extension of surface artefacts.
B Spatialization of noteworthy architectural elements.

Fig. 12 Gallo-Roman *villa* of 'La Prade-Nord' (Billom).
A Extension of surface artefacts
B Aerial view of the *pars urbana*, taken from the east.

A

B

Fig. 13 Gallo-Roman *villa* and medieval motte of 'Marcillat' (Billom).
A Extension of the Gallo-Roman *villa*.
B Vertical view of the medieval motte.
C View of the medieval motte from the ground.
D Aerial view of the motte.

complete plan (Fig. 15). Organized around two large peristyle courtyards, the pars urbana is 125 m long and 90 m wide, i.e. 11.250 m². All of its buildings extend over a length of more than 230 m and a width of 125 m, i.e. an area approaching 3 ha (28.750 m²).

Another very important *villa*, the example at 'Oriat' (Billom), has been recognized by aerial survey, but has not yet been systematically prospected (Fig. 16). This site covers a very large area and has a complex structure. The other A1 *villae* such as 'Pironin' (Espirat)

C

D

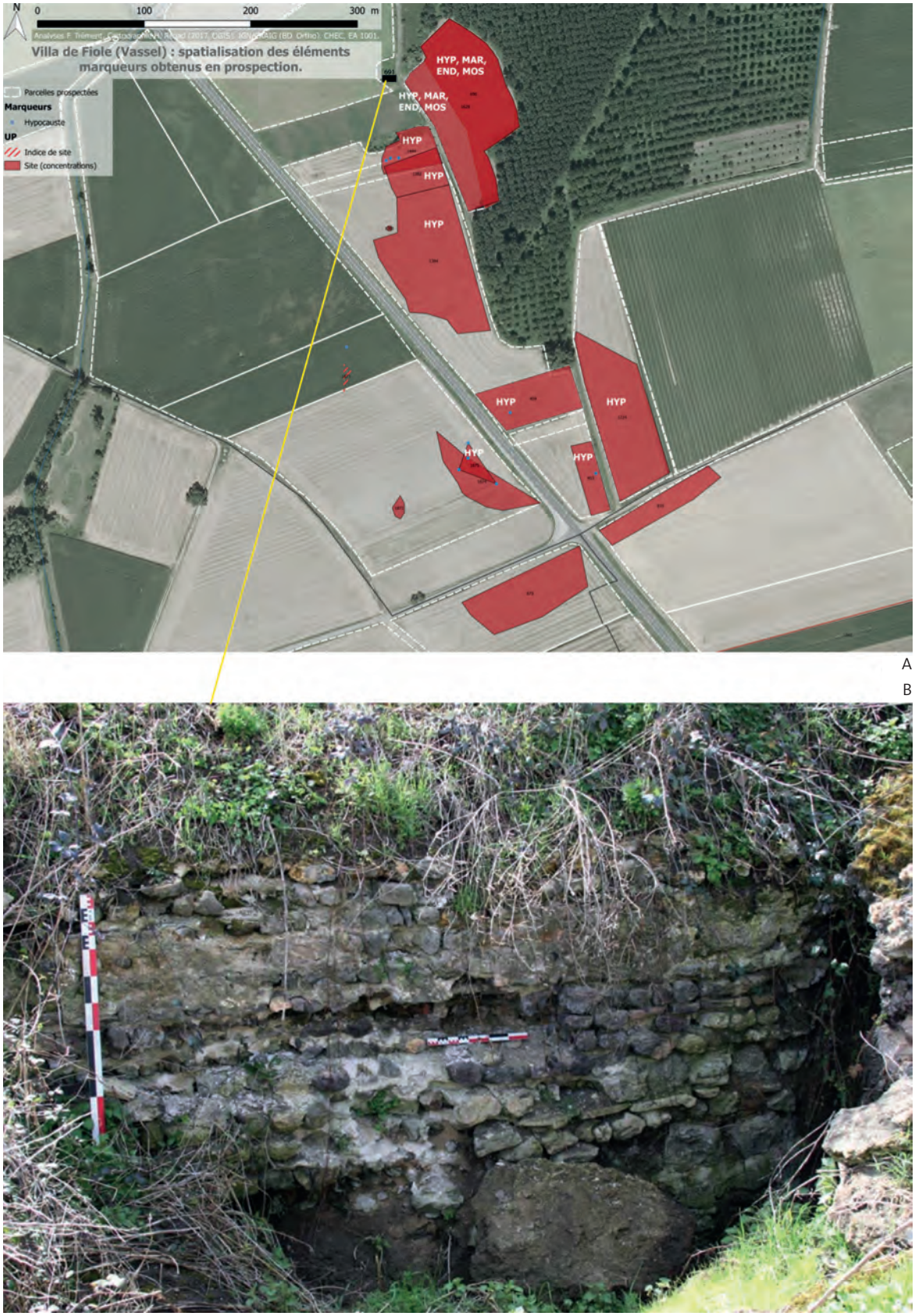
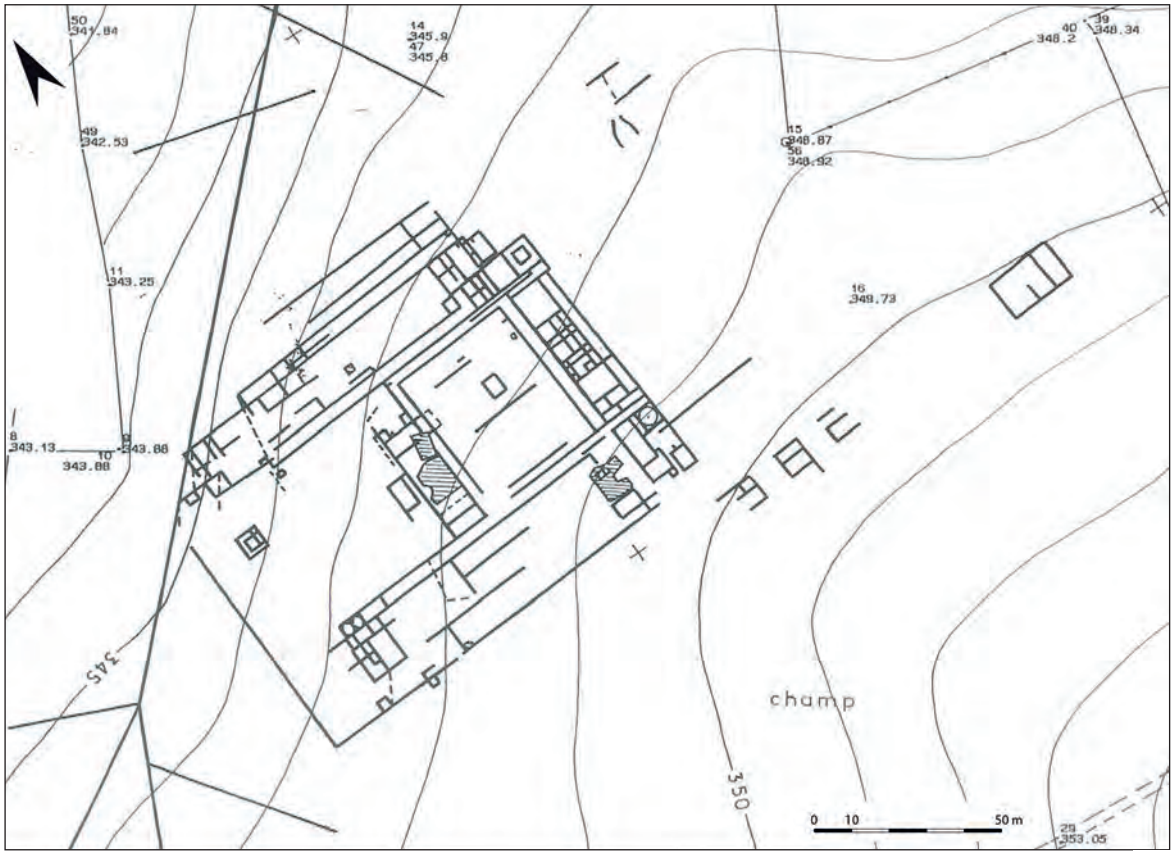


Fig. 14 Gallo-Roman *villa* of 'Fiole' (Vassel).
A Spatialization of noteworthy architectural elements.
B View of a wall of the *villa* (UP-691) located in the *pars urbana* area.



A

B

Fig. 15 Gallo-Roman *villa* of 'Les Guérins' (Glaine-Montaigut). **A** Plan obtained by orthorectifying oblique aerial photographs. Orthorectifying and analytical restitution: S. Laisné and V. Tripeau. **B** Aerial view of the eastern part of the *pars urbana*.

Fig. 16 Gallo-Roman *villa* of 'Oriat' (Billom).
A Aerial view of the *pars urbana* taken from north – north-east.
B Aerial view of the *pars urbana* taken from the east.
C Interpretation of photo 2007–05/NUM I-210.
D Aerial view of auxiliary buildings taken from the south.

and 'Espezin' (Moissat) display areas of respectively 22.500 m² and more than 50.000 m² (Fig. 17–18). Both of these sites present *hypocaust*, painted coatings, and mosaic finds, while marble has also been collected at the second site. These elements, and aerial photographs for the second site, allow us to precisely localize the partes urbanae.

We will end with the very enlightening case of the *villa* of 'Pré Gilbert' (Moissat), prospected in 2011. Several buildings were clearly visible on the ground, but there was no 'luxurious' element to conclude the existence of a *villa*. The observation of the Google Earth cover revealed a posteriori the presence of a *pars urbana* west of the road, confirming by the way the great precision of our surface surveys (Fig. 19).

The compilation of the data thus highlights the complementarity of the two methods. The absence of marble, painted plaster or even *hypocaust* finds in the pars urbana could be explained by the more substantial cover overlying these structures. However, it is more likely to assume a methodical recovery of these materials during Late Antiquity or the Middle Ages. Indeed, it appears that while the occupation of the pars urbana sector is limited to the Early Empire, that of the sector interpreted as the *pars rustica* endured until the Early Middle Ages (Fig. 20). For the Early Empire, one can restore a vast *villa* with a length of 330 m and a width of 220 m, covering about 5 ha. This large expanse would make it a settlement of A1 rank, in spite of the lack of materials characteristic for the luxury these large *villae* enjoyed.

Conclusion

To conclude, we will emphasize that the few results presented here are only the beginning of our analyses, which will eventually make it possible to refine the typological, functional and chronological interpretation of each settlement. Emphasis has been placed

A

B

Fig. 17 Gallo-Roman *villa* of 'Pironin' (Espirat).
A Extension of surface artefacts.
B Spatialization of noteworthy architectural elements.

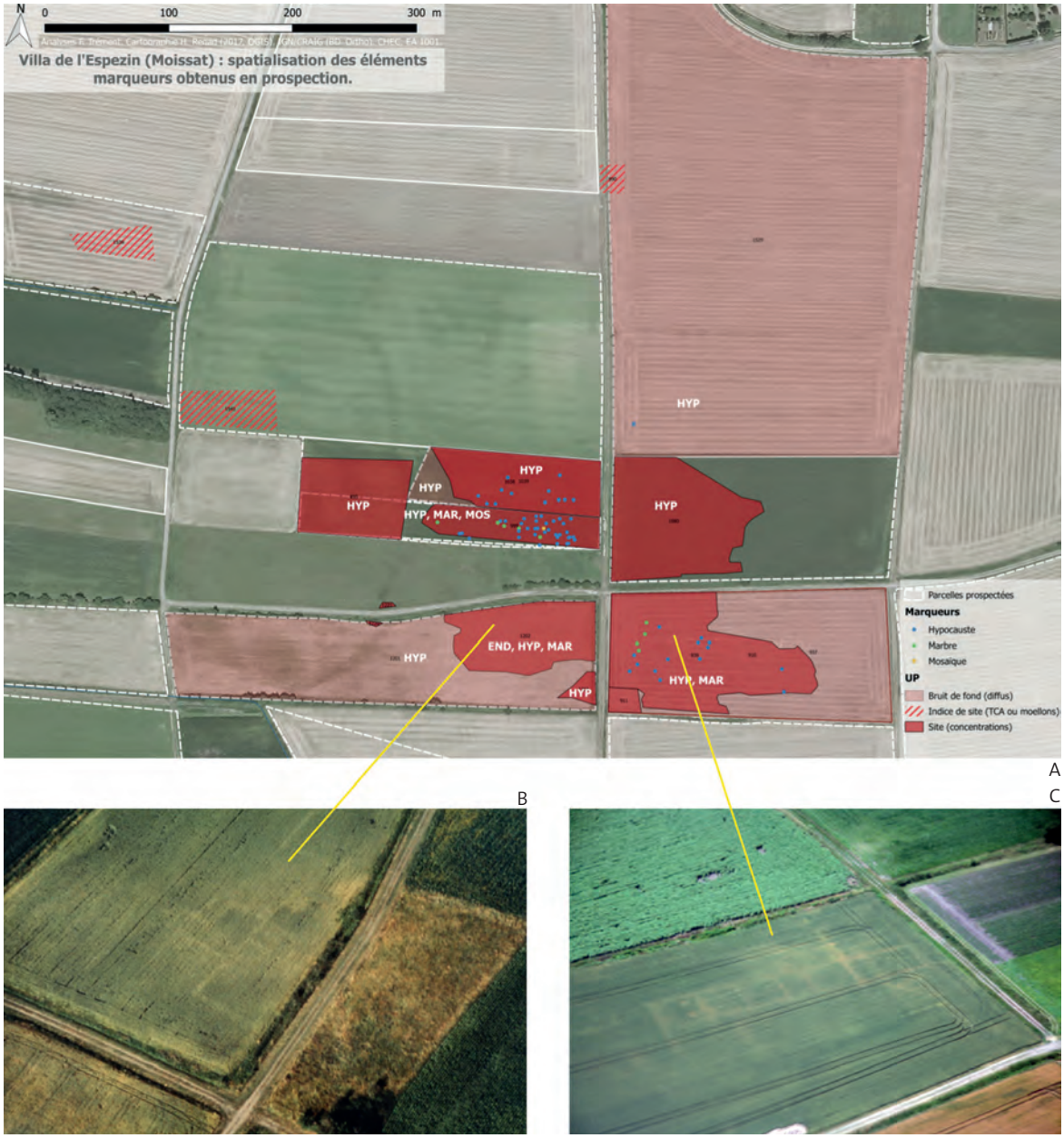


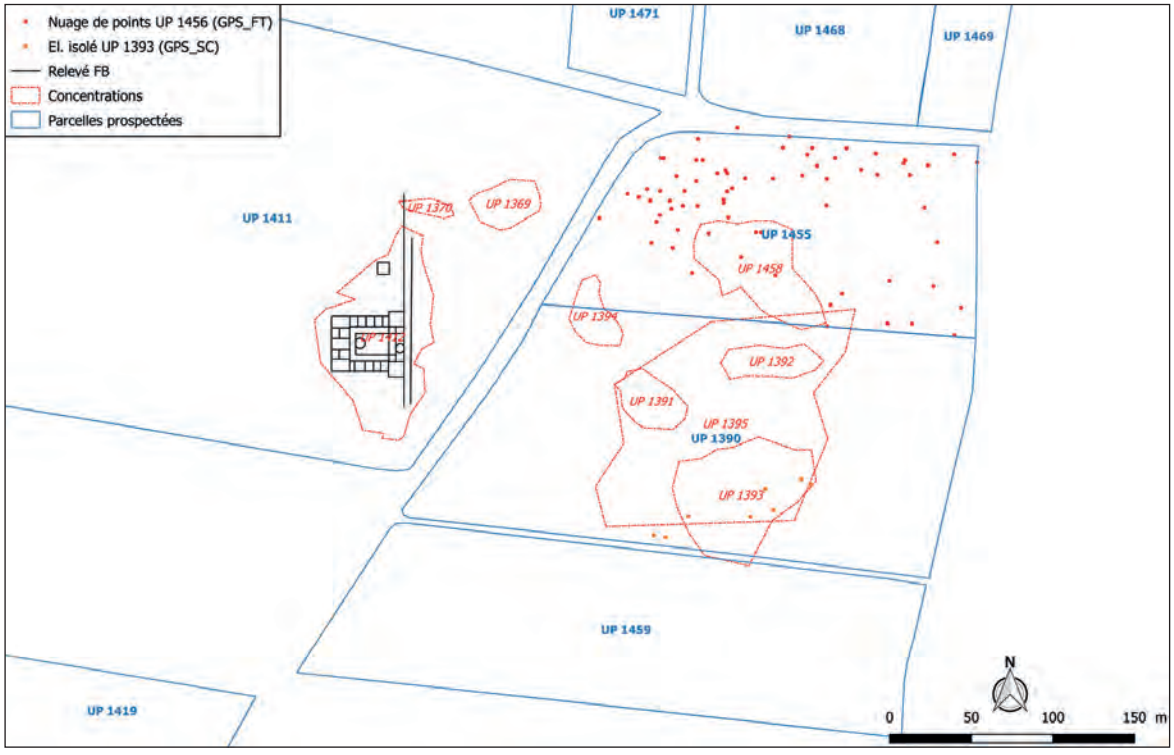
Fig. 18 Gallo-Roman *villa* of 'Espezin' (Moissat).
A Spatialization of noteworthy architectural elements.
B Aerial view of the *pars urbana* taken from the north-east.
C Aerial view of another part of the *pars urbana* taken from the north-west.

on the most important *villae*, but thorough work will have to be conducted on all forms of housing, more modest *villae* of rank A2 and B, farms and sanctuaries, as well as on the ancient road network.

In the case of the A1 rank *villae*, the excellent match between ground survey and aerial data will be emphasised. In most cases, the *pars urbana* of these large establishments is clearly identified by both methods. But it is nonetheless important to insist on the complementarity of these two methods. In most cases, the *partes rusticae* do not appear on aerial photographs, probably because they are built in a less massive and monumental way than the *partes urbanae*. The case of the *villa* of 'Pré Gilbert' also highlights the major role which the recovery of building materials plays in the case of on an enduring occupancy of sites.

The cross-examination of the data reveals that the size of these A1 rank *villae* is generally between 20.000 and 50.000 m² (Fig. 21A). The case of the site of 'Fiole', with its vast area of 100.000 m², appears exceptional. As concerns the area of the *partes urbanae* themselves, it generally lies between 10.000 and 20.000 m².

A



B

Fig. 19 Gallo-Roman *villa* of 'Pré Gilbert' (Moissat).
A Vertical view.
B Spatialization of archaeological data.

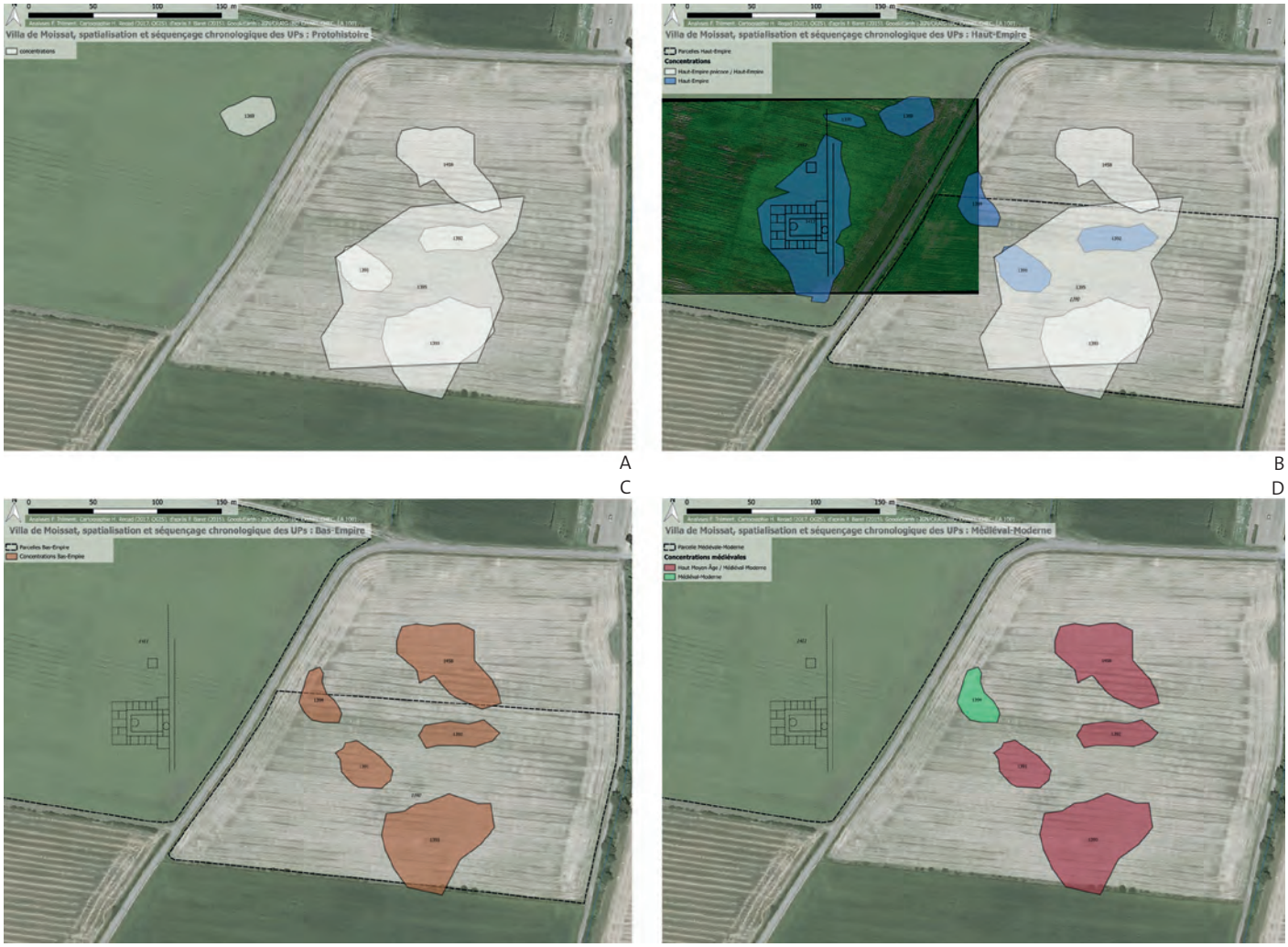


Fig. 20 Gallo-Roman *villa* of 'Pré Gilbert' (Moissat). Spatialization of data by period.
A Iron Age.
B Early Empire.
C Late Empire.
D Middle Ages and Modern Era.

A

Villa	Total surface m²	Pars urbana m²
Les Valots	20,000	
La Prade-Nord		20,000
Fiole	100,000	
Les Guérins	28,750	11,250
Pironin	22,500	
Espezin	50,000	
Pré Gilbert	50,000	1,845

Fig. 21 Typo-chronological characteristics of the A1 rank villas.
A Surface of the site and of the *pars urbana*.
B Quantity of dated elements and proportion by period.

B

Villa	Total number of dated elements	Protohistory %	Early Empire %	Late Empire %	Early Middle Ages %
Les Valots	578	4	38	47	10
Fiole	2565	4	56	29	11
Pironin	1199	4	48	24	23
Espezin	2842	11	39	49	2
Pré Gilbert	1082	18	60	20	3

With only 1.845 m² and a very typical layout plan, the site of 'Pré Gilbert' seems to be a special case.

Another characteristic of these establishments lies in their remarkable longevity. According to the cases, 4 to 18 % of the dated ceramics collected on these sites suggest an occupation dating back to the end of the Iron Age, 20 to 49 % refer to Late Antiquity and 2 to 23 % to the Early Middle Ages (Fig. 21B). Late Antiquity, in particular, appears to be better represented on the establishments of the Billom area than in the

basin of Sarlièvre and in the Grand Marais, attesting the strong dynamism of this part of Limagne during the 4th–6th centuries AD. In general, the number of rural establishments of all typological categories occupied during Late Antiquity is remarkably high, and the quantity of pottery collected from their surfaces is greater than elsewhere. We also know from written sources of the existence of an important *vicus* in Billom at the same time, while another one is known to have been situated in Lezoux.

The present analysis confirms that the A1 rank *villae*, which formed a regular network with a spacing of between 1 and 2 km, constituted the framework of the settlement system of the Limagne plain from the end of the Iron Age to at least the beginning of the Middle Ages (Fig. 22).[23] In addition to their large size, their layout, and their ostentatious luxury, these establishments display a remarkable characteristic: their longevity. A full third present indications of an occupation as early as Late La Tène, all are occupied during Late Antiquity, and two thirds are still active in the Early Middle Ages.

In the foreseeable future, an analysis of the environment of these settlements and of their relationship with other forms of rural housing should provide further valuable information on the organization of the countryside in Roman times, allowing us (in particular) to attempt a network modelling.

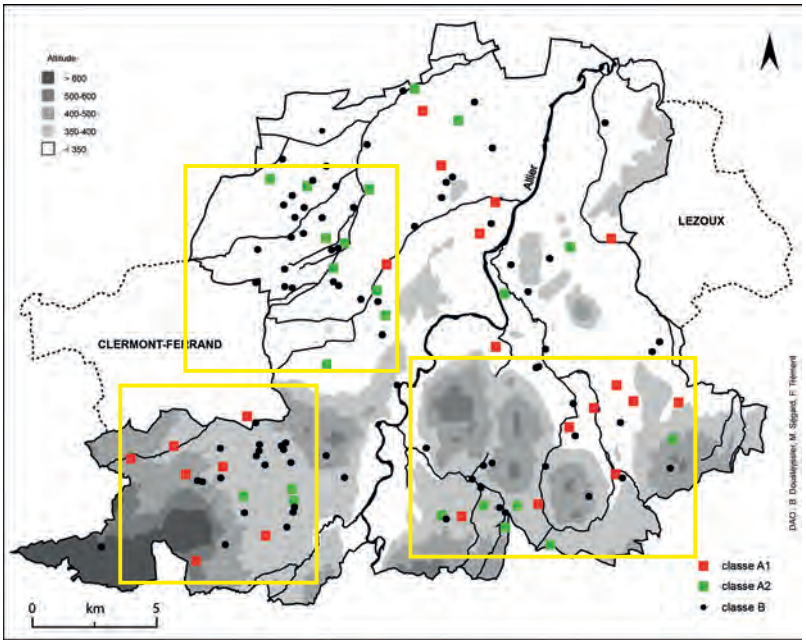


Fig. 22 Typo-geography of the *villae* of the Grande Limagne in the Early Empire. The three areas of systematic fieldwalking are shown in yellow.

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Credits

1; 6–8; 10–12A, 13A; 14A; 17–18A; 20 Fieldwalking: F. Trément. GIS: H. Regad

2–4; 13C; 21 F. Trément

5 Fieldwalking and photo: F. Trément

9 Fieldwalking: F. Trément. Quantification: H. Regad

12B Photo: B. Dousteyssier 2006–04 / NUM I-265, in: F. Trément / B. Dousteyssier / M. Segard / J. Trescarte (eds.), La région de Billom (Puy-de-Dôme). Étude diachronique de l'occupation du sol en Limagne des Buttes (II). Rapport de prospection systématique 2006. Opération n°5793 (Clermont-Ferrand 2006) sheet n°9. – B. Dousteyssier, Survols archéologiques au-dessus de la plaine de la Limagne (Allier, Haute-Loire, Puy-de-Dôme) (Clermont-Ferrand 2006) sheet n°45

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15A Dousteyssier et al. (Ref. 21) 135, Fig. 15)

15B; 18B–C Photo: CERAA

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16D Photo: CERAA 1997, in: Dousteyssier et al. (Ref. 21) Fig. 12, n°1

19B Fieldwalking: F. Trément. GIS and reconstruction of the pars urbana: F. Baret

22 Updated after Dousteyssier et al. (Ref. 21) 125, Fig. 5

Feldbegehungen sind seit über 100 Jahren ein fester Bestandteil des Methodenkanons archäologischer Prospektion. Zunächst meist für die Entdeckung bislang unbekannter Fundstellen genutzt, dienen sie heute zur Beantwortung eines weiten Spektrums unterschiedlicher Fragestellungen, das von kleinräumigen Analysen des archäologischen und bodendenkmalpflegerischen Potenzials bis zur Rekonstruktion archäologischer Landschaften reicht.

Neue technische Möglichkeiten, sich wandelnde methodische Vorgehensweisen und Auswertungsmöglichkeiten waren Anlass, Anwenderinnen und Anwender aus den unterschiedlichen Teilbereichen der archäologischen Prospektion im Rahmen einer Fachtagung zusammenzubringen. Der Band legt nun den Großteil der Beiträge und Präsentationen dieser 2017 bei der Fritz Thyssen Stiftung in Köln veranstalteten Tagung vor.

Unter vier Themenschwerpunkten – ephemere Fundplätze, Prospektion und präventive Archäologie, Landschaftsarchäologie in Südeuropa sowie in Mitteleuropa – berichten Autorinnen und Autoren aus zwölf europäischen Ländern über Erfahrungen und neueste Ergebnisse aus ihren aktuellen Prospektionsprojekten.

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