The City of Durres and its History, between Environmental Evolution and Cultural Transformations

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Abstract

The city of Durres – first a Greek colony then Roman, Byzantine, Norman, Aragonese, Venetian, Turkish and today an Albanian city – is a symbolic example of how urban evolution has been influenced by landscape modifications: how variations of sea level, long-term fluctuations which turned the lagoon either into soil or into a landing bay, and parts of hillsides being washed away and caved in, have often defined the intersections between differrent phases of ancient urban development. At present, the urban area of Durres has lost some of its ancient characteristics, though its subsoil is still rich with ancient remains.

After five years of careful urban research, with the excavation of the city amphitheatre, we currently have a GIS archaeological map on which, through the aid of three-dimensional models of the archaeological stratification morphology and depth data, we are attempting to reconstruct the relationship between landscape and urban variations. Hence we are going to relate several archaeologically acknowledged town planning phases with the evolution of the city's territory.

We are going to carry out this task as we are confident of acquiring essential knowledge of the city's history.

Keywords

Three-dimensional GIS, town-planning, archaeological map, morphologic transformations

Since 2002, Parma University has been conducting research in the ancient town of Durrës (Durazzo), a project of cooperation and technical scientific support for the preservation of the exceptional archaeological heritage of that city, founded by Greeks in 645 B.C., provincial capital in the Roman and Byzantine Empire, then a Venitian, Angevin and Turkish posession (www.progettodurres@unipr.it). The main purpose of this research is to analyse the city's urban development, to facilitate this a GIS-based archaeological map was created and is still being used and updated.

Durres is an area with a high density of archaeological remains, comparable – though much smaller – to Rome itself. Durrës has indeed been an urban centre since the seventh century B.C., the caput viarum on the Via Appia, municipium and then imperial city, and pre-eminent Byzantine fortress.

The recent Albanian situation, coming from decades of isolation, has caused Durrës archaeology to be short of funds and methodologically under-developed. Documentation produced by Albanian research institutes is often deficient in terms of form and reflects incomplete acceptance of stratigraphic digging methods. Besides this, in the last years, concurrently with consistent capital inflow coming from emigrants, Albania and especially Durrës is experiencing a wild building boom. Uncontrolled building of big blocks in the centre without any town plan is leading to systematic destruction of the underground archaeological heritage.

Archaeological recovery and documentation are thus entrusted to Albanian staff, who don't seem prepared enough, and most importantly are constantly forced to work in emergency conditions. The result is imprecise documentation, often lacking altitude indications and named stratigraphy. In order to remedy this situation, since 2004, in agreement with Albanian authorities, we have been working with a research team inside the town. The first step was the production of the archaeological map, whose first version was published on paper and in digital form in same 2004 (Santoro and Monti 2004, with complete bibliography on Durres). Like most archaeological maps, this one made use of all available information, in any format. Then a bibliographic review of the few national magazines (Illiria and Monumentet) was done, all available documentation in the archives of the Albanian Archaeological Institute and Institute of Cultural Monuments was

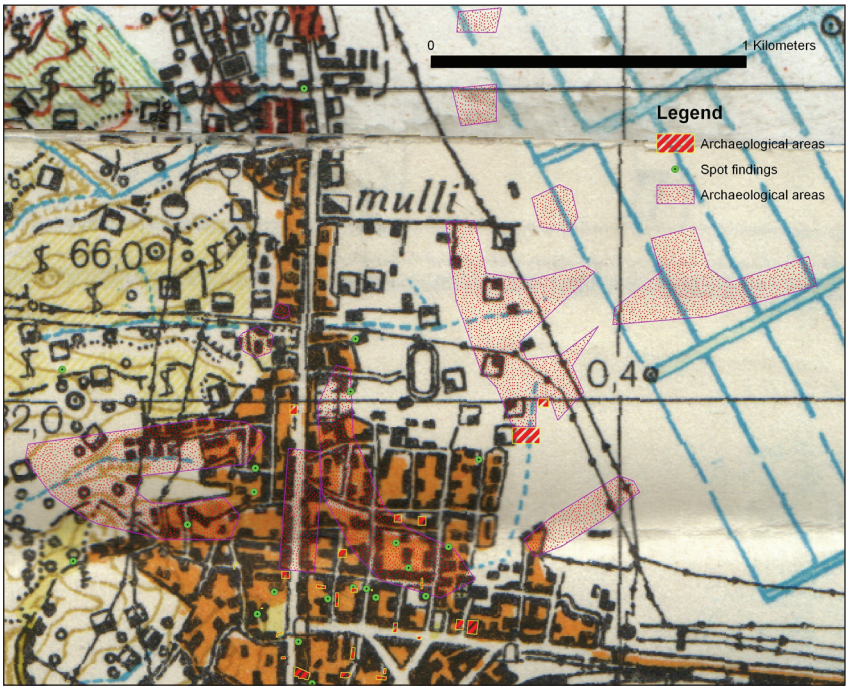

Fig. 1. Off-print of the archaeological map published in 2004: please note the typologies of evidence and the poor cartographical quality.

collected, and above all we tried to complete dig documentation, working side by side with local archaeologists. In that version, the map consisted of an archaeological sites' cadastre, in which evidence is grouped under four typologies: first, findings and monuments whose archaeological elements are known by their position, shape and volume (areal type). Of course this type includes monumental evidence still preserved in town as well. The second type assembles spot findings, whose position is known, but not shape and volume. In the third type we count archaeological areas, wide-open spaces with low density evidence diffusion, like necropolises. The fourth group includes hypothetical findings, whose existence is inferred from that of other better known evidence (*Fig 1*). Cartographic bases immediately posed big problems: the Albanian cartographic standard is not the European one, and it was extremely difficult to get usable material. As far as national scale topography is concerned, we had to settle for a simple small scale paper map, scanned and assembled with an A4 format scanner. A little better with the old town centre, since we found an official map realised by the City Hall: a 1:2000 scale cadastre map on a single big sheet that we scanned. Of course all the material was then georeferenced in UTM coordinates.

A big part of the research consisted of editing an archaeological risk map, based on detected evidence, concerning the destruction risk to which the archaeological heritage is exposed, and – to builders' advantage – the probability of a forced work stoppage when opening a construction site in the proximity (*Fig 2*).

Later, in 2004, the University of Parma started the archaeological park of Durres. With this project the safeguarding and protection of the archaeological heritage was not abandoned, but started to employ different technologies and knowledge introduced by the Italian archaeological mission. Three different research groups were activated: the archaeological excavation in the amphitheatre, the analysis of the fortifications of the city, and the documentation of the emergency

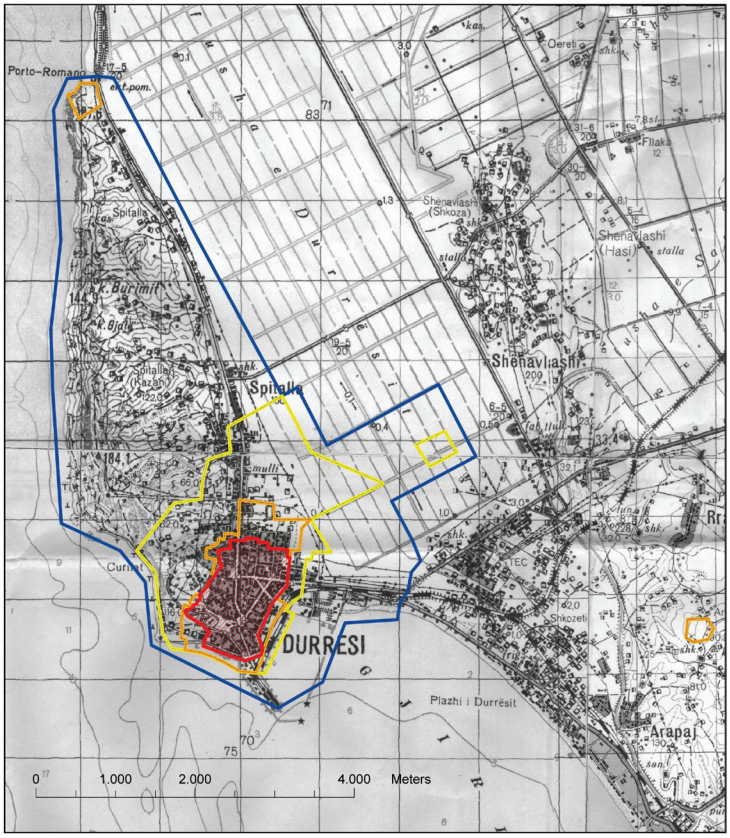

Fig. 2. One of the printed works which composed the map of 2004: the map of the archaeological risk level of the city and its surroundings.

Albanian excavations, the latter activity in collaboration with Albanian institutions. With the passing of time, we have just reached the fourth year of the mission. Analyzing and interpreting data both of the excavations and of other settings excavated by the Albanian team, we have understood the real complexity of the history and evolution of the city. Transformations didn't occur due to social, economic and cultural changes only– a situation that Durres shares with all other ancient cities – but mainly in consequence of particularly consistent environmental transformations. Two phenomena especially transformed both the morphology and probably the urban organization of the city: the variation of the sea level and the collapse of the hillsides.

Durres owes its importance to a very particular topographical position: it rises, in fact, on the extreme south edge of a ridge situated on the coast, but separated from land by a basin, whose level is so low that it might be turned into a lagoon. Based on Latin and medieval literary sources, we know that this happened in at least in two periods: once during the war between Caesar and Pompey, in the first century B.C., and again in the epoch of the Norman siege brought by Roberto the Guiscardo, at the end of the eleventh century (*Fig. 3*). In this last phase, but perhaps also in the previous one, the lagoon was probably even navigable by ships with an increased tonnage, not only small vessels. However, we are also aware that in other periods, particularly in the Classical and Hellenistic ages, the basin was instead cultivated. Actually, it had to constitute the *cora*, that is the subsistance farming basin for the Greek settlement of Epidamnos, as also testified by various archaeological discoveries of Hellenistic age identified in the area. Such considerable variations had important effects on the placement of the city dock or docks, obviously taking into account the accessibility from the sea. The presence of a single dock located where the current port lies and the shifting of the lagoon's northern dock must have caused relevant changes in the city planning. Therefore, if we want to understand the urban changes through the ages we cannot fail to take into account important environmental changes.

The second transformation phenomenon, as important as the previous one, is related to the slow or traumatic shifting of great masses of soil from hills overhanging the city towards the valley (*Fig. 4*). There is clear evidence of that shifting: in some areas of the city the remains of classic age lie under

Fig. 3. Historical image from the early 19th, where medieval marshes located in the east side of the city are still visible.

Fig. 4. A clear image showing how powerful the colluvial blankets covering the city's Classical age stratigraphies are. Such blankets are much more numerous in the amphitheatre area.

several metres of sediment, in archaeological stratigraphy natural strata of colluvial origins are always present next to anthropic strata. The impressive fortifications set up to defend the city in the hills area have disappeared, including the "Teodoro Comneno Tower", built in the thirteenth century, of which nothing is left. The amphitheatre itself was described by European travellers until the fifteenth century; it then dissapeared and was only rediscovered following a massive excavation project during the 1960s. Such phenomenon was so important that it probably caused the closure of the north side main gallery of the amphitheatre, one of the two triumphal entrances typical of this kind of structure. For all of its almost seven metres that can be explored, the back wall of this gallery is made of colluviums. The upper levels of stratigraphy show the remarkable presence of ceramic fragments typical of African pottery, dated to the sixth-seventh century A.D.. Such presence reveals that in following ages exceptional mudslides must have obstructed the gallery. It is likely that exceptional mudslides also occurred in all the other areas of the city. Since environmental changes hold such an important place in the city's history, they must be taken into account. Therefore, the study of Durres has to be completed by adding environmental information to the archaeological one. Then we realised we already have the right tool to carry out such analysis: the archaeological map. This tool, which was meant to be a mere sites registry for quick and simple reference also for non-professionals, had turned into an effective research tool for the study of urban evolution.

The new GIS platform will be different from the old archaeological map in two main points: firstly, by implementing vectorial information levels rather than the raster ones, as previously represented by the cartographic base. Secondly and most important, by performing a three-dimensional data management. Actually, our effort will have to be concentrated not just on planimetric representations of environmental changes, such as the presence or absence of the lagoon or the position of docks, but mostly on significant changes in elevation, such as the increase in country plains levels or the reshaping of hill slopes. We are going to create a three-dimensional GIS platform on which to build, in outline at least, the surfaces of various evolutionary phases of the ancient city. They would be rendered into DEM, derived by TIN, with main points estimated according to the datable layers' levels, whose depths would be deduced either from available documents or by direct survey already performed or yet to be performed on site, or even by a survey of monuments still exposed. It's a threefold aim: on one hand, we have a tool to help perceive the differences, visually first and metrically after, both in horizontal and vertical locations of each known structure or article. The second aim regards prediction: linking the actual data points of various surfaces, thus combining the several gaps through a software interpolation which, though to a hypothetical and approximate extent, will allow us to find out the depths of those layers dated by the surfaces and situated in unexplored, unexcavated areas.

The third aim is linked to a specific issue of Durres research: the fortifications. The powerful and elaborated defensive perimeters are well known; approximately two thirds of the original structure survives, mainly in areas where the defences were constructed on areas of flat land. Whereas the defences in the most important locations, such as the "main acropolis" at altitude 98, the ridge which joins it to the "minor acropolis" (altitude 59) and the ridge with the Teodoro Comneno Tower as its main point, have all completely disappeared. However, all these areas have probably been modified by the morphological changes caused by the collapse of the slopes and the following disappearance of the structures.

The analysis of information levels already present on the archaeological map can be of some help. Either the available areas images, or especially the topographic map, both dated to the beginning of last century thus before the important variations caused by recent urban development, can be studied to search for geomorphological traces of slopes' collapses, with particular reference to massive reshaping phenomena such as landslides. Besides, thanks to detailed surveys carried out by French and Austrian geographers between the late 1800s and the early 1900s, we already have a draft three-dimensional model obtained by digitalizing their cartography. Obviously, it is not a very detailed model, though if integrated with the data we are collecting, it can be used as a useful basis for further developments. With this and with the aid of a tested methodology we hope to modify the surfaces so as to make them similar to the ones of the phases we are interested in.

Within another study framework, we are developing a study of fortifications named functional tactic analysis, based on the extensive use of three-dimensional GIS to define and predict the presence and functions of ancient and medieval defence

complexes (Monti 2007). Such method is based on the close relation between typology and entity of each defensive structure of the complex and the morphological characteristics of their location. In order to succeed, such analysis will have to be based on at least two types of data: those relating to the fortifications or those describing morphology. In the case of Durres, we only have a few traces of both. Interpolating 3D surfaces in the GIS may be the solution. Although data on stratifications depth are few, by modelling some well-defined surfaces at the base of the hill we may be able to assess the changes in elevation between them. Since these volumes would be mainly represented by colluvial soil, especially in some locations, it may be possible, on a geological and topographic basis, to deduce at least an approximation of the surface of the city hills area where the lost fortifications lay. Then, through a tactical functional analysis we will define a more precise assessment of location, characteristics and extent of the defences.

Concerning issues submitted in this workshop, we put our trust in GIS three-dimensional models. This trust is backed up by the "measurability" characteristics of these models and which are peculiar to GIS. Contrary to virtual art or augmented reality fields whose final interpretation is always linked to an empirical evaluation of a modelled reality performed by the analyst, the GIS 3d models supply measurements with a precision linked to the detail provided by the models' data. Therefore, the GIS tool, thanks to its potential for three-dimensional analysis, seems extremely useful in representing ancient reality as required by our analysis. Significant considerations concerning the level of detail and approximation required by models arise. Their precision and consequent amount of measurements and interpolation techniques to be used are still under discussion. The answer we have found is that the acceptable precision level to be applied should not be assessed on the basis of geometrical rules or topographic rules, but is part of the archaeologist's work. Actually, we believe that what we are trying to reproduce is not the "precise" reality but the one perceived and considered important in relation to human activity. We reckon that the usability of models is directly proportional to the ability to reproduce the most significant and explanatory characteristics of human actions. For example, should the model of a mountain represent the actual mountain with metrical precision or is it enough to reproduce the human's mental image that urged its creation? Perhaps, though the model may present metrical distortion compared to reality, as long as it doesn't turn a mountain into a hill, with all its consequences on behavioural terms, its precision will match our goals, which basically are to understanding human actions.

In conclusion, we have been trying to demonstrate that the archaeological map of Durres is a tool at quite an advanced stage and it is going to continue to develop in the future. Such a leap forward is surely related the implementation of 3D surface modelling in GIS. We have put our trust in it not just to follow the current trend but on critical and methodological considerations which are part of our work as archaeologists. Reflections and experiments go on.

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