

Agriculture and Development Processes: Critical Aspects, Potential and Multilevel Analysis of Periurban Landscapes. Part I

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ABSTRACT

This paper deals with the complex, intricate issue of the landscape features of the portions of land lying between the city and the countryside, which inherit from them and from their interaction, both strong points, potential and opportunities and factors of pressure and consequent critical elements.

Several variables and aspects contribute to defining the quality of the landscape in these areas, as demonstrated by the many disciplines involved in analysing and planning them. The paper analyses the main landscape resources that characterise these territories, the productive and social-economic processes that involve such resources, which simultaneously fashion them and are conditioned by them, and the consequent territorial and landscape repercussions. This treatise, part of a broader study based partly on specific quantitative analysis of the development systems of appropriate sample areas, therefore focuses on analysing the critical aspects of agricultural areas on the urban fringe. This kind of area is increasingly assigned the essential function of improving the quality of life of urban populations, given the various environmental and social roles that agriculture has always played and continues to do so, albeit in different ways depending on specific local conditions, in addition to its purely productive roles.

Moreover, many of the issues examined in the study for what concerns suburban areas are no longer a prerogative of periurban spaces and also extend to several rural situations with a low development density, where new dynamic and modestly-sized agricultural landscapes are arranged like tiles over the pre-existent rural - agricultural frame.

Although the issues discussed do not cover all aspects of this question, they nevertheless fully embrace it, being inter-related to the other questions of an agricultural, town planning, environmental, architectural, social and economic nature. These considerations are essential for establishing strategic lines of development for these fringe areas, in which agriculture plays a key role in contributing to a balanced development of both urban and rural contexts.

The analysis performed would suggest attributing agricultural and built-up areas equal status as a basis for policy making, in the awareness that each transformation of the former into the latter should be considered irreversible and entails environmental and social implications that should be carefully considered and pondered by planners.

Some of the instruments needed to innovate and evolve the current approach to planning are already known and used in the sector. However, they are not always applied systematically within an organised model for the planning of periurban spaces, and not always duly supported by economic programming tools.

These considerations therefore highlight the strategic and fundamental role of integration

between spatial and agricultural economic planning policies and instruments. This goal of integration is of great topical relevance, also in light of the inclusion of landscape considerations within the strategic Community guidelines for awarding eec subsidies aimed at promoting rural development in the period 2007-13.

Keywords: Periurban landscape, periurban agriculture, urban sprawl, landscape planning, Italy.

1. FOREWORD AND AIMS OF THE STUDY

In recent decades, territorial systems and specifically those in European countries, have been significantly transformed, especially as regards the areas that lie outside the compact urban fabric of cities. In these so-called “periurban” settings, the landscape has assumed highly distinctive features typical of both built-up areas and rural ones used primarily for farming.

We therefore believe it appropriate to reiterate certain conceptual references relating to the macrotopics of the landscape and areas between the city and countryside. As regards the former, following a lengthy period during which interpretations were either inadequate from a disciplinary and conceptual standpoint or even contrasted with one another, a mature, shared concept of landscape was achieved in the European Convention (Council of Europe, 2000), that was recently ratified and fully implemented by the Italian government with Law no. 14 of 9th January 2006. In the European Convention, the landscape is defined as “*an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors*”, according to a meaning that therefore covers the whole of the territory. Even those territories free of exceptional landscape features and the places of degradation that often constitute the ordinary landscapes that most of the population lives in, for a long time neglected and almost considered “non-places” to be sacrificed, must thus rather receive the same careful design and planning attention to upgrade and promote them, as dedicated to natural areas and historical urban fabric, which have long since been given the attention they deserve. This need becomes all the more urgent when, as we all well know, the landscape has been recognised as a true economic resource for some time, in that it acts as a catalyst to the productive potential of a given territory.

This attention should be focused on both urban and rural landscapes, which are highly interconnected to one another and for which periurban territories constitute that “hinge” that is called on to simultaneously perform the delicate role of separation and act as joining element.

However, whereas the landscape features of urban settings on the one hand, and rural ones, on the other, are generally clearly recognisable and can be subject to planning and design choices organised into specific categories, in the case of periurban landscapes, the most suitable directions of intervention have yet to be defined as clearly. This can be attributed to the fact that the role of interface between urban landscapes and rural ones significantly complicates territorial analysis and the consequent repercussions on planning. These areas must however become the focus for specific attention and assigned to competent planning and design experts, given also the profound change that periurban landscapes have been subject to over much of Europe.

The study therefore has the general aim of exploring some of the main critical aspects of these periurban areas, and specifically those involved by development processes and their interaction with the local agricultural structure and its natural and cultural primary resources.

This general objective was developed through both qualitative and quantitative analysis of the territorial systems in question. Quantitative analysis was performed using specific processing methodologies and their application with varying levels of detail to case studies representative of the Italian territory. This analysis, which supports the evaluations dealt with in this treatise, is not discussed in this paper for brevity's sake. It has been dealt with in a separate publication (part 2, Tassinari et al., 2007b) with the specific objective of analysing development system transformations and land use changes in general and providing elements useful for interpreting urban fringe evolution.

Whereas the general objective of the study primarily deals with the topic of the interaction and interference between urban and agricultural spaces and functions and the generation of structurally and functionally complex residual rural spaces, the specific objective of this study is to provide an outline of the main prospects and potential of the agricultural productive sector in these areas and the relative action strategies that can be implemented.

Although the following considerations are also supported, as it has already been mentioned above, by processing carried out on Italian study areas, and photographs that are included mostly refer to Italian areas, the discussions described in this work have more general validity and can thus be extended to most European areas.

2. STATE OF THE ART: INTERPRETATIONS OF PERIURBAN SPACE

The many definitions adopted in the past with the aim of identifying these transitional pieces of landscape semantically, some of which are listed briefly below, demonstrate the issue's physiognomic and interpretational complexity and consequently the difficulties in identifying them spatially.

Periurban landscapes are a relatively recent and highly dynamic form of land organisation, which assumes extremely diverse configurations in the various national and regional cases. Below is a brief report on the aspects that emerged from an analysis of the state of the art as regards the numerous definitions put forward by various sector experts to identify these areas, according to the diversity of the forms of establishment and evolution of such areas and of the complexity of the connected relationships and factors.

One particularly effective solution is that of "diffused city" (Indovina et al., 1990), which identifies low-density urbanisation characterised by a high content of horizontal connections. Other authors (Racine, 1967 and Dematteis, 2003) define "periurbanisation" as the process of urban sprawl that generally follows suburbanisation and counterurbanisation. These development trends are also summed up with the concept of "metropolisation" (Camagni, 1999), which interprets the mechanisms of "diffuse metropolisation", "concentrated metropolisation" and "fusing of urban and regional networks" observed on a European level.

The formation of vast periurban areas is inevitably accompanied by the cancellation of a clearly identifiable boundary between city and countryside (Antrop, 2004), originally constituted by city walls and identifiable subsequently despite the expansion of cities outside their historical nuclei. This limit between two distinct territorial entities, the urban area and farm- and woodland (Cervellati, 2000) can be identified in a brusque variation in the density of built-up areas, and a separation between various territory-connected economic functions:

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whereas the urban area is used for residential, tertiary businesses and industrial production, outside its boundaries, in its various configurations, lies the agricultural and woodland, used for farming, livestock and silviculture. The diffusion of low-density built-up fabric outside the compact urban area has in many cases invalidated this dichotomic classification of territory into rural and urban, as the latter has been invaded and contaminated by numerous scattered developments, destined primarily for non-agricultural homes (see figure 1) and associated, in certain regions, with family-run manufacturing businesses.



Figure 1. Periurban landscapes in Basilicata (a) and central Veneto (b, from Indovina et al., 2005), Italy.

As city boundaries become less clear, the territory may be interpreted on a regional scale no longer as a dual urban-rural system, but rather a unitary one, which could be termed “megalopolis”, as proposed by Gottmann (1964). This is the case of the “Padanian megalopolis” of northern Italy, identified by Turri (2000), as shown in figure 1b. A megalopolis is therefore an urbanised space with a lattice-like continuity that overlaps the pre-existing geographical matrix, constituted by elements with a dot-like distribution.

As part of the analysis conducted to distinguish between the various territorial systems, therefore, not only is there an absence of a univocal (Paddison, 2001), widely shared definition of urban space¹, but also interpretational and methodological difficulties exist connected to the even more complex definition of periurban territories and, more generally, of those affected by development diffusion, where the landscape takes on very diverse, often disorderly and sometimes contradictory characteristics.

Urbanisation today is no longer exclusively expressed in the form of the geometric growth of a compact urban fabric, but rather also strongly involves the remaining territory², primarily

¹ Cfr the considerations of Antrop (2004) on the shortage of reliable data for understanding urbanisation phenomena. The author points out that two criteria are generally used to define urban space: number of inhabitants and the spatial distribution of residential buildings. For example, in USA, a settlement with more than 2500 inhabitants is considered urban; in France, the threshold is 2000 inhabitants, and in Portugal some 10 000.

² The phases of the urbanisation process recognised by many sector experts (Klaassen et al. 1981, Camagni, 1993; Champion, 2001) are those of urbanisation (growth of the urban core greater than that of the peripheral ring), suburbanisation (growth of the ring greater than the core), disurbanisation (loss

through the development of residential, commercial or industrial areas (figure 2) and the construction of transport infrastructures.

These processes, combined with the diffusion of urban culture, lifestyles and architectural models in rural areas (Tassinari, 2006; Tassinari et al., 2007a), mean that varying sized portions of extraurban territory are considered, in an urbanocentric sense, as a resource to serve the increasingly urgent needs of cities and the consequent demand for land for development, even somewhat distant from their centres.



Figure 2. Example of high land consumption settlement model: urban development in the periurban area of Marseilles, France (from Indovina et al., 2005).

It is no coincidence that the most frequently used of the many definitions formulated to indicate areas of spreading development place greater weight on the urban component of the territory, which is thus likely to become the only prospective with which it is possible to give a sense to periurban spaces. In addition to those listed above, we can therefore mention the expressions “city-region” (De Carlo, 1962), “urban fringe” (Bryant et al., 1982; Gibelli, 2003), “urban nebulosa” (Lanzani, 2002) and “intermediate city” (European Economic and Social Committee, 2004) and, on the other hand, “periurban agroecofabric” (Socco *et al.*, 2005).

As regards the potential use of the agricultural areas outside the compact urban fabric, or parts of them for development purposes, and conversely, the need to protect and promote agricultural, environmental and landscape customs and values of the same, the land use and protection law in force in the Emilia-Romagna region (Emilia-Romagna Region, 2000), for example, specifies that the boundaries of “urbanisable territory” be geographically established by municipal town planning bodies in a long-term strategy perspective. Emilia-Romagna region represents one of the first in Italy to have shown full awareness of the importance of a rational use and management of territorial resources and to have translated this sensitivity into pioneering territorial protection and usage laws starting from the 1970s. For the rural territory that remains after the current urban areas and those subject to future developmental alterations

of urban area inhabitants and diffusion of extraurban development), reurbanisation (recovery of the urban centre’s ability to maintain and attract residential functions).

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have been removed, the above-mentioned law also envisages a specific structural organisation, within which “periurban agricultural areas” are explicitly envisaged. This highlights the need to devise specific objectives and action policies for these areas as envisaged by the same regional law.

An objective characterisation of the main critical aspects of periurban territories calls for a qualitative and quantitative study of the mechanisms of urban growth, which necessarily entails the use of numerous variables, the most important being those suitable for quantifying the different forms of land use and consumption and demographic pressure on the territory and their evolutionary mechanisms.

The description of the above phenomena of urban growth for a long time referred to the definition given by Tisdale (1942), according to which it can be identified as the degree of population concentration. In this sense, the indicator best suited to describing the process is *population density*, calculated in reference to appropriate areas. This indicator is commonly used to distinguish rural areas according to different criteria, including those indicated by the OECD (1994, 1996).

The interpretation of the physical expansion of cities, on the other hand, presupposes the use of different basic variables, in which a key role is played by the *urbanised area*, obtained by analysing land use with a suitable level of detail and whose values vary according to the various calculation methods adopted. The need for a satisfactory spatial and interpretational definition of the databases used makes creating territorial databases on urbanised areas able to provide consistent information on effective land consumption particularly laborious. In the specific case of Italy, this type of information base is not available in a homogeneous way for the entire country (Frisch, 2006), but rather for certain regions only. The indicator that synthetically considers the incidence of land consumption for urban use of a given nation or region is the *urbanisation ratio*, namely the portion of urbanised areas of the total area of the region. Several studies (Astengo and Nucci, 1990; Romano and Paolinelli, 2007) have shown that it is particularly interesting to consider the two basic variables described thus far, the size of the populations and the extent of the urbanised surfaces, jointly by introducing the additional indicator of *per capita land consumption*, defined as the ratio between the urbanised area of a given territory and the respective number of residents.

The evolution of this ratio, the urbanisation ratio and other parameters useful for establishing the spatial structure of the development matrix, provides complementary qualitative and quantitative indications that are also suitable for measuring the level of efficiency of the development model of said matrix.

3. TERRITORIAL RESOURCES AND PROCESSES: ANALYSIS OF THE CRITICAL ASPECTS

The transformation of periurban and rural land caused by urban diffusion gives rise to a situation of difficult to manage territorial and environmental precariousness that presents a complex tangle of critical aspects. In periurban and, more generally, megapolitan settings, the infrastructures, residential lot distribution, commercial and industrial areas and logistic centres overlap with the rural landscape matrix to create an amalgamation of extensive conurbation, in which the agricultural landscape is highly fragmented. In these slivers of landscape, the albeit partial permanence of agricultural features and sometimes even traditional landscape

elements constitutes a strong distinctive character and potential strong point and, at the same time, one of the largest and most complex challenges for contemporary design and planning: knowing how to interpret these spaces by overcoming an urbanocentric concept in which agriculture is attributed residual and ancillary roles, without refusing their strong urban ‘contaminations’.

Periurban contexts are characterised by a very broad, diverse spectrum of landscape resources, an identity heritage of a historical and cultural nature, connected to the past rural society and the organisational structures of its social life; irreproducible or poorly reproducible primary goods such as the land, surface and ground water, the air, natural reserves and biodiversity; and morphologically and environmentally diverse conditions, and agricultural vocations and traditions. Even when, as is often the case, these factors are only present on a residual level, they make this kind of context as interesting and sought after as it is fragile, due to the development pressures it is subject to.

Due to an insufficient consideration of the strategic character of these resources and connected values, such areas are frequently subject to the pressures exerted by primarily urban process that cause both a quantitative erosion and a completely or partially irreversible qualitative impoverishment (figure 3), with significant repercussions on the overall quality of the environment and landscape. For some of these processes, most notably those connected to new residential development, the abovementioned resources constitute a conditioning sublayer or, in some cases, an authentic driving force.



Figure 3. Periurban area of Bologna, San Lazzaro di Savena, Italy (from various authors, 2005).

Consequently, excessive land consumption for development purposes, especially when poorly planned, causes the deterioration of entire periurban settings, resulting in the known effects of sprawl (see European Environment Agency, 2006), fragmentation of the agricultural fabric and competition and friction between urban and rural spaces, activities and functions.

These critical aspects in turn generate further secondary outcomes, due to ecological impoverishment, environmental and social effects on the broadest scale, the gradual loss of

the identity and the creation of chaotically arranged, standardised and characterless periurban and fringe areas, in which disorder assumes a structural condition.

The continuity of both metropolitan and agricultural spaces is thus replaced by a fragmentation of the landscape, which could be effectively described as a “cloud of colliding fragments” (Secchi, 1999). It should be stressed that this is no longer a prerogative of periurban spaces and also extends “... *to rural situations with a low development density, where new dynamic and modestly-sized agricultural landscapes are arranged like tiles over the pre-existent rural - agricultural frame which, despite being simplified and impoverished, is nevertheless often still visible ...*” (Lanzani, 2002), to form a variegated, sprawling mosaic. Consequently, the regional frameworks that were visible until the 1950s (cfr. Gambi, 1950 and Sereni, 1961, in particular) have been replaced by many partial landscapes, which often overlap and combine locally without creating easily recognisable overall structures.

Furthermore, centripetal processes such as the excessive consolidation and specialisation of central areas are associated with centrifugal mechanisms such as decentralisation from large urban areas to smaller towns, resulting in an undifferentiated and unselective distribution in rural areas. This causes an increase in the real estate pressure on agricultural land in periurban and fringe areas and the burden on the fragile environmental matrices.

The main environmental consequences of such processes are increases in vulnerability of soil, ground water and waterways, widespread pollution and greater soil sealing.

The detailed quantitative calculations performed as part of the broader research project this treatise belongs to and presented in a separate publication (Tassinari et al., 2007b), have contributed to providing useful elements for describing and interpreting the phenomena of the birth and evolution of periurban spaces. These are both economically and ecologically strategic and fragile areas to which territorial planners must attribute a productive and environmental character, or rather the future assimilation of the city’s development expansion needs. Figure 4 shows the current development situation in the city of Imola, one of the study areas considered in the aforesaid detailed analyses. The territory illustrated, which is representative of the situation in numerous Italian cities, is characterised by its vast periurban and extraurban areas with widespread low density development and wedges of farm land inserted between residential districts or recently built industrial or tertiary estates and punctuated by road infrastructures of varying degrees of importance. The landscape matrix is dotted with and often perforated by scattered buildings, that can only rarely be considered as rural and are mainly used for residential purposes, in the form of newly built houses or renovated farmhouses whose destination of use has been changed.



Figure 4. Aerial photograph of the city of Imola, Italy. In the foreground, the periurban area to the south of the city (from Buganè and Vianello, 2003).

Therefore, if periurban territories are, on the one hand, places where urban sprawl has significant effects on the countryside, on the other, they are also contexts in which, with the services it provides on account of its multi-faceted value, agriculture plays an essential role, which it should aim to consolidate and promote. Agriculture can therefore make a crucial contribution to the qualification and conservation of the identity of such contexts and, more generally, of the periurban spaces and urban belt, which are interconnected to varying degrees and with the “deep” rural territory, which link and at the same time separate both different parts of the city and the city and countryside. In situations of this kind, agriculture and rural settlements still constitute the main form of land use and provide the strongest aspects of productive and development character of the territory, despite the fact that its structural matrix has been transformed and altered within the contemporary landscape mosaic.

4. PROSPECTS AND POTENTIAL OF PERIURBAN AGRICULTURE: POSSIBLE STRATEGIC DIRECTIONS

Agriculture undeniably plays a fundamental role as regards the quality of urban fringe landscapes in the type of expansion whose main critical elements are discussed above.

The particular environmental, social and ecological functions farming offers are often partially or wholly unexploited, due primarily to the ongoing erosion of farm land for development, which is often highly profitable. Property market speculation concerning periurban areas also penalises farmers needing to buy more land.

Albeit in this kind of context characterised by highly invasive and dynamic exogenous processes and consequently by the precariousness of the primary productive sector, periurban farmland is an important resource that provides a natural oasis for the city, with the potential to play an active role in improving the urban microclimate. As is well known, agriculture can

offer city residents tourism, education, training and leisure facilities. In periurban areas, farming's traditional productive function could also exploit the opportunities offered by the nearby vast urban consumption market, by selling their produce directly to consumers. This kind of trading could have beneficial repercussions on the economic sustainability of agricultural activities and consequently on their likelihood of consolidating their market position; on a social and cultural level, by upholding and passing on farming and produce processing traditions, and on a general environmental level, through a reduction in the costs and environmental burdens associated with long, geographically vast supply chains.

Periurban areas where agriculture still plays a vital productive role, where ecological issues are coherently developed and maintained and the deep structure of traditional farming arrangements is preserved, compatibly with contemporary productive techniques and the need for infrastructures, could contribute to defining a high-quality, balanced landscape mosaic as well as benefiting the way they are perceived by the community (figure 5).



Figure 5. A portion of land outside Milan, Castellazzo di Bollate, Italy (photograph by Stefano Topuntoli, 1993, from De Carli et al., 2006).

Consequently, landscape and development planning must dedicate adequate consideration to the creation of instruments that make a tangible contribution to exploiting the multi-faceted value and environmental role of agriculture and its status as a strategic element for upgrading periurban areas.

In more general terms, the analysis we performed and the findings that emerged from our critical analysis of international literature on the subject, would suggest attributing agricultural and built-up areas equal status as a basis for policy making, in the awareness that each transformation of the former into the latter should be considered irreversible and entails environmental and social implications that should be carefully considered and pondered by planners. The assumption of this principle requires the somewhat arduous reconsideration of the well-established concept according to which, on a practical level, a higher value is attributed to urbanised areas than farmland.

Some of the instruments needed to innovate and evolve the current approach to planning are already known and used in the sector. However, they are not always applied systematically within an organised model for the planning of periurban spaces, and not always duly

supported by economic programming tools. In this sense, certain key actions can be identified that, although they do not provide an exhaustive solution to the question, nevertheless contribute to achieving the abovementioned aims.

Geographical mapping and morphological and functional classification of periurban agricultural areas, which are inevitably linked to the broader subject of the classification of peculiarities of the non urbanized areas (see part 2 of the work, Tassinari et al., 2007b), is of priority importance and paramount to identifying the extent of such contexts and evaluating their effective planning potential.

This kind of mapping has been gradually simplified by the information made available by the archives of public organisations and remote sensing platforms providing ever-greater quantities of valuable, highly accurate up-to-date and updatable spatial data and the application of analysis tools that allow an integrated consultation and interpretation of it. The availability of appropriate methods for processing such data is then the specific subject of part 2 of the work (Tassinari et al., 2007b).

The objective of considering urban fringe agriculture as a multifunctional system should aim to encourage farm improvements and diffuse initiatives that integrate business, education and transmission of farming's role. This can be accomplished, for instance, through channels such as farm holidays, teaching farms and farm open days and by establishing service markets and the definition of a general strategy of integrated redestination of farmland to useful territories.

The simultaneous pursuit of ecological rebalancing, environmental upgrading and nature conservation objectives could also generate a reduction in the biotic deficit and the vulnerability of the water supply and soil systems.

5. CLOSING REMARKS

Deep, wide-reaching transformations have eroded and obliterated the historical layout of cities. In Europe, this has given rise to many areas of metropolitan or megapolitan development, in which the cities often become part of even vaster development systems with different structures. These conditions are associated to processes of transformation of agriculture and the rural landscape that are significantly affected by the social-economic and environmental pressures connected to urbanocentric forces and inertias.

In particular, the work allowed us to examine from a conceptual point of view the category of periurban landscape, based on the recent historical developments this category has undergone in relation to changing patterns of main settlement models and therefore of the relevant landscapes.

Due to the gradual dissolution of the monocentric town model and of the polycentric settlement system, which have characterized the European landscapes until the first half of the past century, and whose characters remain today altered and included in the more recent chaotic developments, the discussion of the issues of suburban areas and therefore the identification of their landscape characteristics call for a necessary evolution of the former concept of periurban area itself. Actually, the pervasive processes connected to urban sprawl cause such concept to be no longer appropriate to the interpretation and representation of current situations. The study has therefore developed a contemporary point of view in the

study of periurban landscapes, by suggesting their role as an interpretative key for what concerns the urban sprawl processes and related dynamics of agrarian mosaics.

The aspects explored in this treatise, part of a broader study based on a quantitative analysis of development system evolution and its current characterisation based on case studies on varying territorial scales, introduce thus the concept of the pre-eminent centrality of landscape quality in devising territorial policy and intervention measures for the city and countryside. The outcome of the analysis performed may provide keys for interpreting the contemporary mechanisms in which periurban agriculture may constitute a correct and concrete challenge for the city. As regards the subsequent and essential planning interpretation, the need to consider the landscape as a higher scale category to the city and countryside, suited to representing the complex structure of relations between them is of paramount importance. The final definition of landscape adopted in the aforesaid European Convention may to this end be identified as the main essential inspiration for overcoming past concepts that have on occasions favoured harmful voids of planning thought, with the fundamental objective of rebuilding forms of balanced weights and shapes between urban and rural areas.

These considerations also highlight the strategic and fundamental role of integration between spatial and agricultural economic planning policies and instruments. This goal of integration is of great topical relevance, also in light of the inclusion of landscape considerations within the strategic Community guidelines for awarding Community subsidies aimed at promoting rural development in the period 2007-13. Such integration, as a consequence of what we have discussed above, plays a strategic role in periurban areas, where the strongest pressure related to urban processes, on one hand, and the production and environmental needs of preserving agricultural land use, on the other hand, meet each other and are often in conflict.

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