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From Networks to Society: Pottery Style and Hegemony in Bronze Age Southern Italy

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During the last two decades, the use of network methodologies in archaeological studies of interaction has gradually emerged. In this paper I will explore the social significance of networks, advocating the explicit use of Marxist-inspired social theory to increase our understanding of the patterns recognized through graph-theory. Crucial in this will be the new concepts of Means, Relations and Modes of Interaction and the gramscian notion of hegemony. I will illustrate the potential of this approach, through a case study based in MBA and LBA southern Italy, focused on the sharing of stylistic features in pottery from Apulia in a period when the region was one of the loci of interaction with Minoan/Mycenaean Greece. Local pottery networks show the existence of intense interaction since the early phases of the MBA, before the main period of contact with the Aegean world. It is argued that such networks were influenced by the growing Aegean presence in the region and the overall hegemony of this wide cultural component. Through the later phases of the Late Bronze Age, the level of local interaction further increases, while at the same time Aegean-type pottery almost disappears, suggesting a less hegemonic role for Aegean groups involved and a re-balancing of interaction.

The age of the networks and archaeology

In the last 20 years the term interaction has gained a renewed popularity in archaeological discourse, replacing to a large extent other terms such as trade, exchange or migration (Cusick 1998; Knappett 2011; Oka & Kusimba 2008). This coming into fashion has easily recognizable historical reasons, the most obvious being the neutrality of its meaning, more in tune with the incorporeal exchange of data that dominates our lives in the age of the internet (Knappett 2013a). Predictably, this trend has been particularly important in contexts such as the late prehistory and ancient history of the Mediterranean, for which communication is a crucial factor (Blake 2014; Blake & Knapp 2005; Broodbank 2013; Knappett 2011; Malkin 2011; Tartaron 2013; Van Dommelen & Knapp 2010). Within this general trend, networks became the perfect metaphor to be employed. However, despite a long history of previous attempts (for a synthetic review, see Brughmans 2010; 2012; 2014), only in the last few years have network approaches acquired a wide popularity. This is because they responded to a parallel need that was developing at about the

same time in the archaeological community, i.e. that for a new paradigm which was long absent in archaeological debate (Bintliff & Pearce 2011). In the general quest for theories and concurrent methodologies that followed the apogee of interpretative approaches, network perspectives appeared as the ideal answer (Collar *et al.* 2015; Fulminante 2014; Knappett 2013b).

As highlighted in recent literature reviews (Brughmans 2010; 2012; 2014; Collar *et al.* 2015; Knappett 2013a; 2014), the main starting point of the network perspective in all its different facets is the primacy of relationships over individual parts. Individual components acquire a certain role only by virtue of their structural position in relation to other components and the overall network. The significance of this role has often (although not always) been assessed through the adoption of methodologies borrowed from a specific branch of mathematics called graph-theory. Graph-theory, however, is only a methodology, i.e. a means through which to analyse specific kinds of data, but does not suffice as a general theory, let alone as a social theory.

In this paper I will combine network methods with a stream of social theory that has had considerable importance in a recent and not-so-recent past: Marxist social theory. The main focus of this branch of scholarship has always been inequality and dynamics of power and, consequently this will be also the central theme of this analysis, exploring the way these articulate with the classic domain of the network analysis, i.e. intersocietal interaction. With a few possible exceptions (e.g. Flannery & Marcus 2012; Price & Feinman 2010), power and inequality have not been central to archaeological enquiry in recent times and it can be argued that the reason for this is that researchers are simply no longer interested in these questions. This is, however, to some extent paradoxical, especially in consideration of the fact that in the current historical milieu these are possibly the most pressing issues faced by global society. We all live in the most connected and one of the most unequal societies that have ever existed. If knowledge-productive activities have some relation with the societies in which they are situated, as I (following Bhaskar 2008) believe, then trying to tackle these problems (through the use of a network approach) is compulsory.

A relational materialist alternative

Addressing these issues requires an alternative approach to networks, hopefully highlighting their role within the social domain. Such an approach, in itself new, is based on a tradition of studies that has a long history, most notably Marxist social theory (for other archaeological applications, see Gilman 1981; Kristiansen & Rowlands 1998; Lull 2000; 2005; Lumbreras 1974; Spriggs 1984). It is legitimate to ask what is the rationale of looking back again at this set of ideas which is neither new nor trendy and which has had a very bad press in relatively recent times. Much can be said to this extent, but to justify my decision it is sufficient to note that Marxist approaches are

concerned in some of the problems with which we, citizens of the twenty-first century, globalized world are mostly concerned, since they affect us the most, namely inequality and how and why it develops. In this paper my focus will be not so much on networks within a given society, but rather on the inter-societal domain, although the two sides are indissolubly linked and therefore it will be necessary briefly to present how the working of internal societal dynamics is envisaged.

An important initial observation relates to the non-unitary nature of societies, a fundamental principle for Marxism, very much valid also for some of the most influential theoretical proposals related to Social Network Analysis (i.e. in the work of the so-called New York school, inspired by Marx as much as by Simmel and Weber: see Mische 2011; White 2008). According to the perspective that I will adopt, in every human society, not all groups and/or individuals are equally well placed in relation to the means that allow them social and material reproduction. These means are known under the name of Means of Production, while the relative position of groups is what is defined as Relations of Production (for a concise introduction to the meaning of these terms as they are intended here, see Friedman 2008; Patterson 2003, 20–23). Differences in Relations of Production promote the creation of two classes, one of surplus producers and one of surplus appropriators, although the degree to which this class difference (Saitta 2005) operates can vary considerably. Following Gramsci, the result of the confrontation between different classes can produce the hegemony of one group upon the other (Cospito 2004; Crehan 2002; Gramsci 1977, 1591; see Wesson 2008 for an archaeological perspective). Hegemony is a combination of coercion and consent (Anderson 1976, 21) with the role of coercion being inversely proportional to the institutionalization of power: the more power is institutionalized, the more important will consent be and, conversely, the less power is institutionalized, the more coercion and the threat of physical violence will play a role. As we shall see, in the perspective endorsed here, hegemony is not exercised only between classes within the same society, and this has important implications for the study of material culture that I will try to highlight.

Mode of interaction

So far the proposal more or less follows the tenets of classical Marxism, but what about interaction and networks? Inter-societal encounters always create a hybrid context, completely determined by the social relations of neither of the original groups involved and influenced by both. In this, the heterogeneity recognized at the level of the individual society has important effects at the level of interconnected units. Interaction is never enacted by all members of a society but only by segments of it. These segments might be grouped on the basis of different interests and not overlap perfectly with the

main two classes previously identified. In other words, they may produce a further class-division cross-cutting the existing internal Relations of Production. Among groups of people that take part in interaction, however, there are some substantial differences. This is because not all groups are equally able to access the means through which interaction takes place (Means of Interaction). These means can be either material, as for instance a ship that is equipped and used to move people and/or goods from one place to another (Broodbank 2010), and/or social, as for example the acknowledgement of a clan/family within a small international “club” as in the case (to take a LBA Mediterranean example) of the kings mentioned in the Amarna letters (Liverani 2002). Therefore, as with Relations of Production, different positioning of groups with respect of the Relations of Interaction creates a class division that transgresses the boundaries of individual societies. Such class division is mediated in concrete encounters between people, affected by psychological factors, including subjugation, ability to enthrall and impress and so on (Goffman 1956), as much as by technological ones. The interests of the two new classes need not be the same as those created by Relations of Production and, as a consequence, a contradiction emerges with the Mode of Interaction produced by the intersection in space of each society (Fig. 1).

<FIGURE 1 NEAR HERE>

The effects of interaction on each society will vary widely, depending on the results of the negotiation between these interests. When in one society Relations of Interaction favour the same class that is hegemonic in Relations of Production, it is possible to suggest that the result will be a reinforcement of the existing order. On the contrary, if the class which interacts and controls the Means of Interaction does not correspond to that controlling the Means of Production, and interaction is able to procure to this group a substantial amount of capital, then this may result in a modification of the *status quo*: that is, social change.

Material culture bears important clues regarding the nature of the Relation of Interaction. Indeed, if a class in Relations of Interaction is relatively hegemonic, then some of its cultural traits (including social practices and items through which these are performed) will tend to be appropriated by the relatively non-hegemonic group with which they establish interaction. This is because the adoption of such traits would likely communicate to the rest of society that does not take part in interaction the closeness of local partnership with their allies; i.e. what has been called *salient affiliation* (Schortman 1989; Stein 1999). Through archaeology it is rarely possible to access the very acts and practices of which social interaction is

composed, but we can see their material traces, and this is what will be discussed in the case study presented (Fig. 2).

This consideration might appear at odds with the position of one of the currently most influential theoretical approaches in Mediterranean archaeology, i.e. that inspired by postcolonial theory (Maran & Stockhammer 2012; Van Dommelen & Knapp 2010; Van Dommelen & Rowlands 2012). This has rightly tried to stir from the use of simplistic concepts of emulation and imitation in contexts of culture contact (Van Dommelen & Rowlands 2012, 74). However, in my view this disagreement is more apparent than real as, similarly to the perspective here proposed, postcolonial approaches have also demonstrated attention to dynamics of power (Van Dommelen & Rowlands 2012, 60).

<FIGURE 2 NEAR HERE>

The notion of hegemony in Relations of Interaction here suggested is not simplistic in that it does not assume an *a priori* active or passive role for either of the social groups involved but tries to make sense of *how* power exerts its effects in concrete social encounters. In order to understand this, however, it is necessary to keep in mind the fragmented nature of societies (i.e. class division), at the same time avoiding views that assert the existence of essentialist differences between groups taking part in culture contact (Chibber 2012).

The notion of a Mode of Interaction here suggested resonates with a number of approaches developed in the social sciences from the second half of the twentieth century onward. One is undoubtedly the definition of various types of exchange developed, following Polanyi, by substantivist economic anthropology (see Berthoud 1979, 129; Sahlins 1972, 196); another is the sociological idea of Mode of Exchange (Lie 1992). However, while this last concept is much more narrow, limited to what we would define as economic activity, the notion of mode of exchange of substantivists, with its attention to the connection between space and relations, is compatible to what has been proposed here, although for reasons of space it is not possible here to explore such a relationship.

Networks

What has been presented so far regards interaction between only two individual entities. However, when interactions involve many actors, things may change dramatically. In this change, the relative position and topology of connections acquire a remarkable importance.

Through multiple connections, groups that are not hegemonic in Relations of Interaction can re-balance their position. Connections, indeed, allow the introduction of new resources from a variety of different origins.

These resources increase the overall surplus available to the group and thus the portion that can be invested to improving its position in Relations of Interaction. In network approaches to archaeology a similar consideration has been already put forward by Coward (2010) and partially echoes developments made in a branch of Social Network Analysis devoted to examination of structural differences between partners in exchange networks named Network Exchange Theory. According to such a theory (Markovsky *et al.* 1993; Walker *et al.* 2000), the structural (i.e. topological) position of actors involved in a number of exchanges larger than that of their partners favours them within negotiations.

From a graph-theoretical perspective there are a number of centrality measures able to capture the structural advantage of well-connected nodes (Borgatti & Everett 2006). Since in this study we are primarily interested in the effects of connections on individual nodes, I have selected Weighted Degree Centrality (for the concept of degree see Freeman 1979, 219–20; for the specific weighting adopted in this study see below). This (like other ‘volume centralities’; see Borgatti & Everett 2006, 471), counts only the *number* of connections available to each node and thus helps us to assess what nodes were, at least potentially, able to draw resources from multiple contacts.

<FIGURE 3 NEAR HERE>

Apulia during the Middle and Late Bronze Age

It is now time to put the approach so far presented to work in a specific case study. This relates to the Middle and Late Bronze Age (roughly 1750–1000 BC: Table 1) interaction in the Central Mediterranean. During this period this area was the locus of an intense relation connecting the Minoan and Mycenaean world of Greece with local southern Italian societies. This relation (witnessed chiefly by imported and locally imitated Aegean-type ceramics) has been the focus of much attention from the part of scholars of both Aegean and Italian prehistory (e.g. Bettelli 2002; Jones *et al.* 2014; Van Wijngaarden 2002; Vianello 2005). Despite such attention, however, the broader social implications of these phenomena as well as their relation with local dynamics of interaction have seldom been explored (among the few exceptions are Cazzella 2009; Cazzella *et al.* 2006; Levi 1999; Recchia 2008; Van Wijngaarden 2002), and this will be the main focus of this analysis. The specific part of the Central Mediterranean on which I will focus corresponds to the modern Italian region of Apulia. This region (Fig. 3), located at the southeastern extremity of Italy facing both the Ionian and the Adriatic Sea, effectively bridged the Aegean networks of interaction with European ones. At the level of analysis of the individual community, special attention will be devoted to the record from

the coastal site of Roca. This is one of the best explored sites in the region, as well as the one that has produced the largest evidence for long-range interaction with the Aegean world, mostly in the form of copious imported and locally imitated Aegean-type ceramics (about 5000 finds, corresponding to about a half of the total amount recovered in the whole Central Mediterranean: see Blake 2008; Pagliara 2005).

<TABLE 1 NEAR HERE>

Pottery networks

Given the abundance and variability of local ware in the Apulia, I will focus mainly on pottery. There are several reasons why local pottery is the perfect choice in order to explore networks of interaction at a regional level. Being completely non-recyclable, pottery is more frequently preserved in all kinds of contexts while other categories of evidence (such as metals) tend to be re-used and appear in depositional contexts only rarely. A second, no less important factor relates to the very nature of pottery as a widespread medium, accessible to a large portion of the population of a Bronze Age community of southern Italy, and highly sensitive to stylistic change. Because of this, pottery is ideal for a bottom-up approach like the one undertaken here.

Pottery has been analysed through the creation of four networks corresponding to the successive periods/cultures of Bronze Age Apulia through the second millennium BC (Table 1). In the graphs (Fig.s 4–7), each node corresponds to a site, while edges between nodes represent shared stylistic features.¹ The graphs are non-directed, which means that the direction of connections is not specified, so as to reproduce the indeterminacy of the archaeological data, for which we rarely possess such information. A weighting has been added and this is based on the number of features shared (with only 1 feature shared the weighting=1, 2 shared=2, and so on). These stylistic features were different at different times of the overall period analysed: during the Protoapennine and Apennine period they were incised motifs, while in the Subapennine were plastic decorations and in the Protovillanovan were painted designs and patterns. Intriguingly, this fundamental difference seems not to influence much the overall trend recognizable in measuring the networks through time (see below).

Stylistic features appear particularly useful as a means of assessing interaction in that, at one level, the aim of these elements is exactly to be noticed and to convey agency of the decorators/producers simply through sensory recognition (Gell 1998, 73–7). Therefore, while the specific circumstances in which motifs are shared elude our observation, the very nature of decoration puts us, the external modern observer, in a condition not

completely unlike that experienced by past actors. Each motif/stylistic feature shared can potentially stand for one or more real-life social encounters, creating on a small scale the same dynamics of hegemony and appropriation previously suggested. Many social occasions were potentially responsible for such encounters and I will try to hint briefly at what these might have looked like in the different time-slices analysed.

The analysis proposed here is based on published pottery assemblages only, inclusive of both excavation and survey material (data are available in the tables in the Appendix). Needless to specify, this information is inexorably affected by the general exploration bias that influences what we know about southern Italian Bronze Age sites, with coastal and semi-coastal (up to 5 km inland), long-lived sites that are better known than those in the interior. This bias cannot be avoided altogether, although the decision to use decoration instead of shapes should contribute to reduce the over-representation of better investigated sites, since decoration can be easily distinguished even in minute sherd material from surveys, and is often used to date sites.² Geographical distance is not taken into account, although it is indeed possible to notice a certain correlation between spatial closeness and the number of stylistic features in common (expressed by the thickness of the line connecting each node). Comparing site-names in the map (Fig. 3) with those in the first graph of the series (Fig. 4), it can be observed that sites very close spatially (e.g. Porto Perone – Satyron and Scoglio del Tonno) share a relatively large number of features. This is something expected in a real-world situation, where people are likely to enter more frequently into contact with inhabitants of nearby communities, and hints at the fact that the exploration bias in the overall sample on which graphs are based, although present, is perhaps not overwhelming.

<FIGURE 4 NEAR HERE>

Middle Bronze Age

Until recently, very little was known regarding Apulian Bronze Age communities. The intensive surface investigations in the Brindisino by Recchia and Ruggini (2009) have recently highlighted some of the main features of territorial occupation. We cannot, of course, generalize the situation encountered here for the whole region, but there are hints that similar dynamics were occurring also in other parts of Apulia, often following frequentation dating to earlier periods (i.e. Neolithic in some areas of the Tavoliere as well as in the Tarantino, sometimes also with traces of continuity in the Copper Age: see Corrado & Ingravallo 1988; Tunzi Sisto 1995; Tunzi Sisto & Monaco 2010). Settlement seems to be organized in a dense net of small hamlets dispersed in the landscape. Dolmen mounds are the main (but

not the only) type of burial through the region during the MBA and credibly functioned as territorial markers placed at some distance from sites, while caves were used for a variety of purposes, including burying the dead.

The last and best-known type of Bronze Age site is that of fortified settlement, mostly relatively limited in size (although larger than hamlets) and located in a coastal or semi-coastal position, often surrounded by lagoons and marshy environments. Coastal sites of Apulia have been the focus of intense debate. While in the past scholars linked them with the influence of the Aegean (Malone *et al.* 1994; Whitehouse 1973), new evidence has made clear that they pre-date the main period of interaction with the Aegean world in the region (Cazzella 2009; Cazzella & Recchia 2013b). According to Cazzella (2009), internal competition over maritime exchange is to be considered the principal rationale related to the emergence of these sites and it is possible that this competition occasionally degenerated into warfare, as supported also by the occasional recovery of direct traces of violent events, e.g. at Coppa Nevigata (Recchia 2010). Fortifications can be quite remarkable and often adopt building techniques that we find in other kinds of contexts (e.g. funerary dolmens), as in the example of Roca (Scarano 2011).

The local pottery network analysed provides information on the relationship between broadly contemporary sites in Apulia. According to the perspective adopted here, the number of potential connections (Weighted Degree Centrality) in which a community is involved can inform us about the range of potential sources from which this could draw surplus by means of various forms of exchanges, an aspect that, in turn, feeds back into the ability of a community to invest more in interaction. The graph presented in Figure 5 illustrates the co-attestation of Protoapennine motifs in pottery from Apulian sites (data in the Appendix, table 1, are after Cocchi Genick *et al.* 1993; Scarano 2006; for a complete bibliography, see Iacono 2013b). Although it cannot be considered a comprehensive depiction of local networks of interaction, it should still provide a reliable estimation of interaction within the region. It is plausible that in Apulia, like in many ethnographic examples, early production of handmade pottery was connected to female activity (Carlton 2008). If this was the case, it is at least potentially possible that the co-attestation of similar motifs also mirrors, along with a variety of real world inter-community activities, mobility as a result of exogamous marriages, as suggested for other ethnographic and archaeological examples (Hanna 1984; MacEachern 1998). In any case, whatever the processes behind these interactions were, the site that appears to be most central in Apulia according to this measure is Scoglio del Tonno (144) while Roca (135) has a score that is slightly above the average. This is quite interesting in the light of the fact that Scoglio does not have Aegean-type material dating to this period (Table 1) and that in the subsequent Apennine the site starts to be intensely frequented by Mycenaean sailors (see Fisher 1988, 120). However, at a network-wide

level, the Average Degree Centrality (that is, the average number of connections) is higher in sites that have traces of contact with the Aegean, indicated mostly by finds of fine wheel-made Aegean-type pottery (Table 2). What this analysis tells us is basically that, as probably happened in other areas too (perhaps in the Aeolian Islands: see Bietti Sestieri 1988, 39; Castagnino Berlinghieri 2003, 60–78), Aegean frequentation was particularly aimed at sites that were already central in local networks, and that it tried to tap into this local connectivity. The level of interaction between the Aegean world and Apulia at this stage, however, was definitely not very high, as the material remains of this activity are pretty scant and constituted by the few pottery sherds recovered in various sites along the Ionian and Adriatic coast of the region. As a consequence, it becomes difficult to assess hegemony within these early cross-cultural encounters.

<FIGURE 5 and TABLE 2 NEAR HERE>

The next graph (Fig. 6, data in table 1 in the Appendix) is based on the circulation of Apennine motifs in Apulian sites and describes the evolution of the situation in the subsequent time-slice. A new pattern seems to be visible. Confirming a trend previously recognized by others (Recchia & Ruggini 2009; Scarano 2006), the sites that are more central (i.e. that share more motifs) appear to be located definitely in the north of the region while Apennine pottery has a sparse distribution to the south in Salento. Also, in general, sites with finds of Aegean-type pottery do not seem to be more central than others (Table 2). To this extent it is significant that the site with the highest score is Coppa Nevigata in the north, that in this period does not have any Aegean-type finds, although as shown by the work of many scholars (Cazzella & Moscoloni 1995; Recchia 2002) all of this region enjoyed many linkages with the Balkans. The graph has a lower Average Weighed Degree than the previous one, which means that motifs were shared less frequently in the network than in the Protoapennine period (Table 2).

<FIGURE 6 NEAR HERE>

Moving beyond the material pattern in the attempt to evaluate what this trend might mean in reconstructed social terms, there are some interesting implications. For instance, considering the situation of Coppa Nevigata in northern Apulia, with a high production of motifs and variants but a relatively low level of circulation of the same (Table 2), supposing that at least some of the motifs originated in this site, the pattern indicates that Coppa was relatively hegemonic, triggering phenomena of appropriation from??on?? the part of other Apulian communities. If we hypothetically assume that the number of motifs is a proxy for the number of social units (i.e. family or

enlarged kin-unit) and therefore of the relative prosperity of the communities, the pattern produced by the network analysis may be read as related to a fairly rich agrarian community with a relatively low incidence of exogamy. It is indeed probable that northern Apulian communities were able, possibly through mechanisms of bride-payment and dowry (as witnessed by the circulation of decorations), to gather a certain amount of surplus that was funnelled into interactions via Gargano with Balkan communities on the other side of the Adriatic, as attested by the links present in metal, pottery and other products. These, again, might also have occurred through gift exchanges and other forms of prestation, as well as the movement of individuals and small groups for reasons difficult to identify.

Given these considerations, it is possible to understand the important role played by two areas placed at the interstices between the Tavoliere and other territorial zones (using a graph-theoretic terminology, these two areas were likely to have had a high betweenness score, although this has not been formally analysed here). The first to the north includes the Gulf of Manfredonia and Coppa Nevigata, at the junction with the maritime-oriented Gargano area, through which probably most of the interactions with the Balkans were mediated. The second is Trinitapoli, where are located the lavish underground tombs with multiple inhumations of S. Ferdinando and Madonna di Loreto (Fig. 6, no. 71), that was the junction with the hilly Murge area to the south, which probably had a lower agricultural potential but plenty of other resources, among which were certainly wool and other secondary animal products (Di Rita & Magri 2012, 44). Also, the south had a more favourable geographical position with respect to Mediterranean trade networks, and this explains the large number of exotica present at Trinitapoli that are not connected with the Balkans, among which are ivories (Tunzi Sisto 2005), swords similar (but not identical) to objects found in the cargo of the Ulu Burun shipwreck (Bettelli 2006), as well as some faïence beads (Tunzi Sisto 1999, 264). The relatively high level of continuity at Trinitapoli (funerary frequentation was protracted over *c.* 250 years; see Peroni 1999) suggests that here, perhaps, the process of surplus accumulation had already started to transform the class of surplus appropriators into something different, akin to the so-called chiefly lineage described by Friedman and Rowlands (1977), the first step towards the institutionalization of power relations and creation of a tributary society (Wolf 1997, 79–82) of the kind of those diffused in the Aegean.

While the Apennine network flourished in the north and in the Gargano, the situation in the south appears to be less complex, at least for what the circulation of local decorated pottery seems to suggest. Aside from the effect of possible exploration biases, this might be, at least in part, the result of increasing Aegean presence that might in some ways have curtailed local networks. In this early period, Aegean partners exerted hegemony in

Relations of Interaction with their Italian counterparts. This hegemony was undoubtedly favoured by the use of a technology like sailing. To this extent, however, it was not so much the greater efficiency of the sailing ship to produce such an imbalance, but rather the way southern Italian communities made sense of it. The crucial factor resided in the magic ability of Aegean sailors involved in these exchanges, through the use of sailing ships, to appear on the horizon with large vessels and to connect distant places, gathering material from the most disparate sources. It was the mastering of a mysterious technology and the related social prestige of travelling more than any perceived technological superiority that formed the basis for the hegemonic role of Aegeans in Relations of Interaction (a point made also for many other contexts; see Broodbank 2000, 249–53; Helms 1988, 94–110). In the whole region, contact with the Aegean world started already in the Protoapennine, when Aegean mariners were mostly on the way to the Tyrrhenian. During the Apennine /LH IIIA, corresponding to the palatial period, indeed Aegean frequentation in Apulia seems to be less dispersed, more focused on a few nodal points (Iacono 2013b, 152–8). The only site that has abundant Aegean-type material dating to this period is Scoglio del Tonno in Taranto, while Roca (before suffering violent destruction) has only a limited number of finds belonging to this horizon (Guglielmino in Scarano 2012).

Recent Bronze Age

Moving to the RBA, there is unfortunately a dearth of contextual evidence dating to this period from Apulia. Many fortified settlements, particularly those on the coast, continued to be occupied but there seem to be few traces of the dense lattice of small hamlets encountered at the beginning of the MBA and certain sites are clearly abandoned (Bettelli 2002, 39; Recchia & Ruggini 2009, 55, who however suggest the existence of possible problems with the way Subapennine frequentation is identified in the field). As for funerary contexts, the RBA is characterized by a multiplicity of rituals. The underground tombs of Trinitapoli (Tunzi Sisto 1999) and the incineration cemetery of Pozzillo (Lo Porto 1997) continued to be occupied at least for the early part of the RBA, while dolmens were no longer in use. Other isolated chamber tombs can be found at Torre Castelluccia near Taranto (Gorgoglione 2002). This area also included one of the most enigmatic finds that, according to many, is probably to be dated to this period. This is the notorious apsidal hut from Scoglio del Tonno, a large building from which apparently came the majority of Aegean-type finds recovered at the site, yet for which, unfortunately, virtually no contextual details are known (Bietti Sestieri 2010, 148–9; Peroni 1996, 292).

In Area IX of the site of Roca, to the north of the main gate of the settlement (Pagliara *et al.* 2008), there is a long sequence of deposits and

crushed limestone pavements. At the bottom of this sequence are located two particularly interesting deposits, which record the highest concentration of Aegean-type vessels in any Central Mediterranean site. Directly on top of these are located a number of large portions of animals which, according to taphonomic analysis, were buried without their meat being consumed (Rugge in Pagliara *et al.* 2008, 270). Many clues suggest that this context may represent a rare example of a feasting context involving the presence of two distinct cultural spheres. One is the Aegean world, hinted at by the specific reference to the use of wine attested in the ceramic repertoire of Aegean-type pottery that includes numerous deep bowls and craters (see Iacono 2013b). The other is the local Apulian one, suggested by the very nature of the 'ritual' component entailed by this social event, involving in particular a non-burnt animal sacrifice, which is virtually non-attested in the Aegean world but has parallel in practices attested in northern Apulia at the Hypogea of Trinitapoli (Guglielmino 2009). Using the theoretical tools previously introduced, the introduction of a non-local social practice like feasting and of a large amount of Aegean-type pottery indicates that, during these phases, the position of groups from Roca in Relations of Interaction, at least with regard to long-range Aegean partners, was considerably unbalanced in favour of the latter, although there are hints that this situation was changing. As we said, for this change to take place, a non-hegemonic group had to undertake with other partners relationships able to increase the amount of surplus and therefore the portion of it dedicated to Means of Interaction.

Contemporary with this Aegean linkage, many Apulian sites experienced the effects of interaction with another area, namely Adriatic northern Italy. Sporadic connections can be recognized already during the Apennine period, but they become consistent only in the RBA. These connections are to be identified in the circulation of metal and pottery types and features. Apulia actually represents an intermediate point in this overall northern connection and not its final terminus. Indeed, in this same period similar pottery and metal types (the so called Urnfield Bronzes and Barbarian or Handmade Burnished Ware) are attested across the whole Aegean area (Bettelli 2009; D'Agata *et al.* 2012; Iacono 2013a; Jung *et al.* 2011; Jung & Mehofer 2013).

Also, during the RBA the fabric of local interaction has become more intense than in the previous Apennine period, and this further improves the position of Apulian groups in relations with their Aegean partners. The graph (Fig. 7) is drawn according to the same general rules as the previous ones, but is based on the co-attestation of the main stylistic elements of Subapennine pottery (e.g. relief and plastic decoration, grooved decoration, plus others; see Iacono 2013b). The most immediately obvious difference is that nodes are fewer and connections much more frequent. As in the Protoapennine, the most central sites are again those interacting with the Aegean world (Table 2).

Among these is Roca, which has by far the largest assemblage of Aegean-type pottery in the region and scores pretty high in the network, although it is less central than Coppa Nevigata (which also has abundant Aegean-type materials; see Vagnetti *et al.* 2012) and a handful of other sites. In overall regional terms, Aegean-type pottery findspots at this time are much more widespread than in the past, and also overall quantities increased sensibly (Iacono 2013b, 222–3, 509, fig. 5.3.12). There is, however, another important change. As the long-lasting research project by Vagnetti, Jones, Levi and others has clearly demonstrated, contrary to what happened in the MBA, in southern Italy the majority of Aegean-type pottery recovered in a RBA timeframe is actually not imported but of local production (Jones *et al.* 2014, 407–16). Therefore, if at the beginning of the RBA frequentation at Roca we could still conceive of Aegean-type pottery as indicative of direct Aegean influence, by its end this seems not to be necessarily valid any more (Iacono 2013b).

<FIGURE 7 NEAR HERE>

Many hints in the evidence from Roca suggest that, towards the end of the RBA, abundant surplus was being produced, accumulated and made available for a variety of purposes. The fortification wall of the settlement was now reconstructed with a new costly technique involving the use of quarried stone blocks instead of fragments of the surface crust of the bedrock, as was the case for the previous phases. Also, a large hut has been excavated and this yielded abundant Aegean-type material, along with the remains of what looks like the oldest workshops for ivory carving in Southern Italy (Pagliara *et al.* 2007, 326–7).

Finally, local production of wheel-made pottery was not limited only to Aegean-type fine wares but involved also another class of material that started exactly in this period and that is even better attested in the subsequent FBA, namely wheel-made pithoi (or *dolii* in the Italian terminology; Guglielmino 1999). These are large storage jars of local shape wheel-thrown in segments and then assembled before firing by specialized craftsmen. The exemplars from FBA Roca could contain 600 litres of liquid, most likely olive oil, documenting a level of accumulation of agricultural surplus previously unprecedented not only in the area, but in the whole of southern Italy. The increased importance of olive oil is also documented indirectly by the increased attestation of remains of these plants in the pollen record from the Alimini lake near Otranto, with a main peak corresponding exactly to the end of the RBA (Di Rita & Magri 2009, 301).

The start of specialized craftsmanship (with the local production of wheel thrown pottery) and isolated contexts with concentrations of valuables (i.e. the hypogea of Trinitapoli) suggest that the very beginning of this surplus

accumulation is to be located at the end of the previous MBA (for a similar perspective, see Peroni 1999; *contra* Bietti Sestieri 2003) although it is likely that this process acquired momentum only towards the end of the Subapennine and in the Protovillanovan, as implied by the fact that in various areas, many indicators of accumulation increase in this period (e.g. deposition of metals, recovery of pithoi: see Iacono 2013b, 220–21, 248–50; as for pithoi, the situation at Broglio in Calabria seems also to be similar: see Levi 1999, 148). At present it is difficult to assess if surplus of Apulian communities was evenly distributed or controlled by certain groups. Undoubtedly the fact that at Roca a precious material like ivory has been recovered only in one area (Area X; see Pagliara *et al.* 2007) can hint at some form of disparity within the community. Likewise, at Coppa Nevigata, the excavators have suggested a shift in the way that agricultural surplus was stored from the communal to the household level, a shift potentially suggesting the existence of a form of social differentiation (Cazzella & Recchia 2013a).

Final Bronze Age

During the subsequent Protovillanovan (FBA) period, at a region-wide level, a process of gradual infilling of the landscape starts. Such a process has been often considered as commencing later, in the Iron Age (e.g. Burgers 1998, 186–90 for the southern-central part of the region), but it is possible that instead it had commenced already during the Protovillanovan. Many of the sites that had been settled during the Protoapennine period again bear traces of occupation, while new settlements were also established (Iacono 2013b, 246–7; Recchia & Ruggini 2009, 55–7).

The FBA is the phase that has been more extensively explored at Roca, primarily because it has been preserved by a vast burnt destruction spread over much of the site. The greater part of the area of the promontory of Roca seems to have been occupied by the remains of large buildings several tens of metres wide, represented by evenly spaced postholes. In one of these, four wheel-thrown pithoi with an overall capacity of about 2400 litres have been uncovered (Guglielmino 1999). The largest of these buildings is located in the same area as the possible earlier animal sacrifices and feasting activities (Area IX). The overall area measured 40×15 m, and since it has not been possible to detect coherent divisions inside this space, it has been postulated that it belonged to a single building which also contained some five pithoi (Malorgio & Maggiulli 2011; Pagliara *et al.* 2008). The archaeological material recovered in this area was particularly rich and encompassed, along with abundant local ceramics, some Aegean-type materials, and two metal hoards. One of these comprised various precious objects, among which are also some gold foil discs finely decorated with a motif reminiscent of the so-called solar-boat (Maggiulli 2006). The other included a large number of ingots together with

fragments coming from a variety of objects such as axes, ingots and sickles, many of which are of northern Adriatic type (Maggiulli 2009).

Along with Roca, one of the best explored settlements in Apulia is Punta Meliso at the very tip of the region (Benzi & Graziadio 1996). On top of the remains of the Subappennine village, the Protovillanovan settlement was characterized by a type of habitation well attested since the MBA in Apulia, i.e. small semi-underground huts (some 3–4 m in diameter, with only one slightly larger example). A relatively abundant set of Aegean-type material has been recovered in the deposits belonging to these structures, and together with Roca this is the only site in Apulia where Late Aegean-type material (i.e. LH IIIC middle/late) is present.

Beside long-range interaction with the Aegean world, the local network reveals, if not a further increase in interactions (the total Average Weighted Degree score goes from 29.6 to 36.1), at least the retention of a level of connectivity similar to that of the RBA. The network analysed for this period is based on a new category of material; namely Southern Italian Protogeometric pottery. This class of purely local, handmade, painted fine ware was starting to replace wheel-thrown Aegean-type pottery completely in southern Italian assemblages. Such a process of replacement indicates that while sites in Apulia, and in particular in its southern portion, retained a certain level of interaction with the Aegean world also in the FBA, in these relations the Aegean world played a definitely less hegemonic role than in the past, as local communities did not feel the need to continue to reproduce an exogenous style. The conscious nature of this choice is indicated by the fact that isolated aspects of Aegean-type pottery were selectively retained in different local wares. Dark-on-light paint continued to be used on Southern Italian Protogeometric, while the use of the potter's wheel persisted in pithoi and basins (these last objects are a hybrid class of material constituted of half-pithoi painted with the motifs typical of Southern Italian Protogeometric).

The graph (Fig. 7) is constructed like those shown previously, only it is based on the presence of the same painted motifs in the whole of Apulia. Roca is the most central site in the region while the site of Salapia was also a main node. There are of course some important differences in the social dynamics, which underpin the pattern shown in the graphs analysed in this study (for the material from Roca, see Ronca 2005). Indeed, while for the MBA it is credible to postulate that Protoapennine and Apennine pottery was of domestic production, this is no longer tenable for the subsequent RBA and FBA. As suggested by many scholars, and in particular Sara Levi, in the later phases of the Bronze Age pottery production definitely moves toward specialization (Levi 1999, 258–62). The presence of specialized craftsmen necessarily implies the existence of a certain amount of agricultural surplus destined to sustain specialists. The fact that Southern Italian Protogeometric is quite rare (overall as rare as Aegean-type pottery in the earlier phases of the

BA) indicates that this surplus was not evenly distributed, but was controlled by a smaller subset of people within the wider communities. At Roca, this differential distribution of surplus is also confirmed by the different number of pithoi recovered in the various buildings excavated dating to the FBA (5 in Area IX, 2 in Area X, 4 in Area VI: see Iacono 2013b, 272, 296).

If we argue (as suggested by Recchia 2008) that the group of seven people recovered in the debris of the destruction of the MBA fortifications at Roca (Scarano 2011) is representative of a typical family nucleus, then the sheer increase in the size of any building dating to the FBA at the same site might be indicative of an increase of the unit of co-residency. Larger groups were more efficient in collecting surplus (for a similar point in another context, see Grier & Jangsuk 2012, 10–12) and it is extremely likely that people living at Roca invested a relatively large proportion of it in increasing their maritime capability. This is hinted by the existence of a ship depiction on one of the blocks of the ashlar fortification dating to the end of the RBA, as well as by the noteworthy improvements in carpentry suggested by intensive use of timber in the large FBA buildings and the direct presence of tools for woodworking in one of the hoards recovered (e.g. Maggiulli 2009, 313, no. 1.27). The adoption of sailing in this portion of the Mediterranean has recently been suggested as occurring approximately in this same period (Broodbank 2010). In terms of the theoretical approach adopted here, the improvement of Means of Interaction corresponds to an increase of the position of groups from Roca in their Relations of Interaction with the Aegean as well as other (i.e. local and northern Italian) partners.

Conclusion

In this study I have tried to present a novel approach to the study of networks in archaeology, which openly promotes the use of an explicit social model for the analysis of past social realities. This is based on Marxist social theory although, in a rather unorthodox way, its use has been extended to the domain of interconnected realities with the adoption of the concepts of Means, Relation and Mode of Interaction. The starting point of this perspective is that inter-societal interaction creates new transient structures of power in which actors are considerably influenced by a) the very conditions in which encounters occur (social, psychological and material, including technology and the way this is perceived) and b) the way each group involved conducts its existence and reproduces (both physically and socially). Such a model has been adjusted to account for the considerable modifications produced when multiple entities come into play, through the introduction of some basic concepts from Social Network Analysis.

Through the developments witnessed in the case study from southern Italy, it has been possible to illustrate how the perspective presented here

might help to improve our understanding of past interactions, highlighting the implications of networks and connectivity. A contextual assessment of the existing evidence and the formal analysis of a number of graphs based on the co-existence of the same stylistic features in pottery from broadly coeval sites around the region have shed new light on the dynamics occurring through the second half of the second millennium BC in Apulia.

While during the MBA Apulia was populated by a variety of settlements with different functions, the communities inhabiting them were embedded in a network of mutual relations, which have left some material traces in the ceramic record of the area. In this dense web are to be located the earliest contacts with the Aegean world in this area. At this time I have suggested that the relationship between Aegean mariners and local Apulian communities was articulated in unequal terms, with the first playing a hegemonic role. This hegemony translated in the acquisition first, and local production later, of goods of Aegean origin/inspiration. It is only at the end of the MBA and in the RBA, and most notably with the intensification of interaction with the Minoan/Mycenaean world, however, that this interaction began to have serious effects on the social structure of Apulian communities. The surplus accumulated as a result of interaction allowed groups within communities to devote a larger portion of surplus to increase their ability to play an active role in interaction (that is, to improve their position in Relations of Interaction, according to the terminology used here). This process, in turn, modified long-range interaction phenomena at a Mediterranean-wide scale, opening the southern gates of Europe and putting this area in communication with the broader Mediterranean. The class division emerging in Apulia became even more evident in the subsequent FBA, particularly at Roca, where it triggered the re-definition of the most basic unit in the community as well as phenomena of capital accumulation and craft specialization.

Notes

1. Data are in the three tables in the Appendix and are based on the main existing catalogues for each class of ceramics (e.g. Cocchi Genick *et al.* 1993; Macchiarola 1987; Peroni 1959; Yntema 1990) with some updating (e.g. Ronca 2005; Scarano 2006; see Iacono 2013b for the complete bibliography). The distinction of features and their grouping have been left mostly unchanged as identified in each work with a (very) limited number of modifications (see Iacono 2013b, 135–6 for details). Networks have been realized and analysed with the aid of the open-source software Gephi (<http://gephi.github.io/>).
2. The information on the basis of which the network has been constructed is purely qualitative, as the quantitative dimension (i.e. how many stylistic features of the same kind are attested at each site) is very often not provided in publications.

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<captions>

Figure 1. *Modes of Interaction as the intersection in space of two societies.*

Figure 2. *Interaction through time between two hypothetical societies (A, B). As time passes cultural traits from the society hegemonic in Relations of Interaction (A) are likely to be appropriated by the one that is non-hegemonic (B).*

Figure 3. *Sites mentioned in the text and figures.*

Figure 1. *Network representing the distribution of motifs in Protoapennine pottery in Apulia. An example of a vessel is at upper right (after Scarano 2006). The size of the node is directly proportional to its Weighted Degree Centrality (see text and Freeman 1979). Sites that yielded Aegean-type pottery are indicated by a diamond symbol (data in table 1 in the Appendix).*

Figure 2. *Network representing the distribution of motifs on Apennine pottery in Apulia. An example of an Apennine vessel is at upper right (after Lo Porto 1997). The size of the node is directly proportional to its Weighted Degree Centrality (see text and Freeman 1979). Sites that yielded Aegean-type pottery are indicated by a diamond symbol (data in table 1 in the Appendix).*

Figure 6. *Network representing the distribution of stylistic features on Subapennine pottery in Apulia. An example of a Subapennine vessel is at upper right (after Pagliara et al. 2008). The size of the node is directly proportional to its Weighted Degree Centrality (see text and Freeman 1979). Sites that yielded Aegean-type pottery are indicated by a diamond symbol (data in table 2 in the Appendix).*

Figure 7. *Network representing the distribution of painted motifs on Southern Italian Protogeometric pottery in Apulia. An example of a vessel is at upper right (from Roca, courtesy R. Guglielmino). The size of the node is directly proportional to its Weighted Degree Centrality (see text and Freeman 1979). Sites that yielded Aegean-type pottery are indicated by a diamond symbol (data in table 3 in the Appendix).*