Title: "Complexity, size and urbanization."
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Source: In *Man, Settlement and Urbanism*. Peter Ucko, Ruth Tringham and G. W.
Dimbleby, eds. London: GeorgeDuckworth. p. 467-574.
Reprinted in Warner Modular Publications reprint series (No. 185) in Andover, MA,
in 1973. 8p.

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Complexity, size and urbanization

If we are to explore the dynamic relations of the terms complexity, size and urbanization, we must first distinguish their alternative meanings. Since size is clearly the simplest of these conceptions, we may conveniently discuss this first; and since the urbanization to which "complexity" and "size" refer in this essay relates to phenomena that characterize a given class of human settlement, it is to these latter that the concept of size attaches. What then does size denote in relation to such settlements? Their territorial extent, number and density of occupied buildings, number and density of population, or some unspecified combination of some or all of these variables? It is evident that criteria of size may be geographic, demographic or mixed. However, if I interpret correctly the continuing debate about the urban or other status of such pre-colonial Yoruba settlements as Ibadan and Oshogbo[1], sociologists and social anthropologists do not agree that simple territorial extent, number and density of buildings, population size and density, or any constant function of these variables provide unambiguous criteria or indices of urbanization. There remains the possibility that some probably variable combination of these measures is normally associated with urbanization, either as a requisite, a correlate or a consequence.

Dichotomies are beloved of typologists; comparative and theoretical discussions of urbanization abound in them. University courses and learned journals bearing such titles as Urban or Rural Sociology illustrate the assumption that these two classes of human settlement are clearly distinct and house generically contrasting systems of social organization. Despite their fertility, the validity of this dichotomy and its underlying assumptions remains doubtful. Even if we ignore the variety of rural settlements, for which the ecological axioms that underlie this dichotomy imply a corresponding diversity of social systems, it is not always easy to distinguish village from town or town from city. The "rurban" communities of North America mentioned below present other intriguing problems.

These difficulties arise because the urban units to which the concepts of urbanization and urbanism attach are simultaneously conceived as types of settlement and types of society. Sociologists have widely adopted the

geographers, empirical distinction between urban and rural settlements, and have employed this as the basis for two contrasting models of forms of social life. Empirical differences in the demographic size, density and divisions of labour that commonly distinguish urban and rural aggregates in Western societies are interpreted as evidence that the geographic, demographic and sociological features that identify and distinguish each of these models bear necessary relations with one another. Inadequate attention to urban aggregates in prehistoric periods and exotic lands has reinforced the axiomatic equations that underlie this antinomy. But since census classifications of settlements as rural or urban according to size and density of their population are patently unsatisfactory, and since parallel classifications that employ criteria of territorial extent or number of buildings would be equally indiscriminate, sociologists committed to the dichotomy that assumes these necessary relations seek their contrasting intrinsic features in social and cultural spheres. The greater complexity of urban social systems is then invoked without adequate attempts to demonstrate universal co-variations of complexity, population size, density or extent. Thus the material minima of urbanization remain obscure.

In part this obscurity reflects the obscurity of the notion of urbanization itself. The term has at least three distinct sets of meanings, which should be distinguished. Like stratification, organization and several other sociological terms in common use, urbanization simultaneously refers to certain types of social process on the one hand, and to certain conditions or states of affairs, presumably the products of such processes, on the other. It may also refer to individuals, social groups and categories whose "urbanization" need not involve their residence in a town[2]; or to settlements that experience the processes or exhibit the characteristics of urbanization, however those are defined; but as the "urbanization" of individuals, social groups, or rural populations presupposes an urban process or centre from which such influences radiate, I shall direct my remarks to the urbanization of settlements. This confronts us once more with the multiple criteria by which urbanization as a process or a state may be defined, namely those geographic, demographic or sociological indices cited above. For example, if urban units are identified geographically by a certain minimum extent and number or density of occupied buildings, urbanization as a process denotes the development of settlements to and beyond this minimum, while urbanization as a state denotes the characteristics of settlements having these attributes. If we define urban units demographically by certain population minima of size and/or density, then as a process the term denotes demographic expansion to or beyond these minima, and as a state or condition the characteristics of units with these attributes. In like fashion, if we define urban units by sociological criteria, urbanization as a process refers to the sequence by which local populations develop these attributes, while the state of urbanization denotes the condition in which such criteria are crystallized.

functionally specific personal relations, and those which are multiplex, many-stranded or functionally diffuse[9]. Multiplex relations are normally ascriptive, perduring and valued as ends in themselves, while single-purpose relations are commonly optional, transient and perceived as means to other ends. Thus while multiplex relations have greater content and complication than simple ones, social systems with high densities of multiplex relations must normally be simpler than those with equivalent densities of simplex ones. This is demonstrated by the fact that we need to take into account an exponentially increasing number of variables, situations and relations in order to understand or analyse any specific single-stranded relation as social systems increase in the number and diversity of these constituents. Thus complexity and complicatedness may illustrate a continuum in which the number, diversity and proportion of simplex interpersonal relations declines as their multi-plexity and complicatedness increases, together with the organizational simplicity of the social system. This ratio is obviously linked with the variable number of individuals with whom the average or typical male adult member of the social system interacts in institutionalized roles and situations. The fewer the number of differentiated roles and role-situations, the greater the ratio of multiplex perduring relations, the higher the complicatedness of the social organization and the lower the complexity of the social system.

Some writers discuss these issues as aspects of social scale[10]. But since scale has unavoidable connotations of size, the term complexity is preferable, and not only because it more directly describes the system properties under discussion, but also because it avoids any positive implications about the relationships between complexity and size of social units. Nonetheless, if social systems vary in complexity as a function of the number and variety of single-interest role relationships and situations they embrace, and if these functionally specialized relations increase in number and variety with the size and density of the interacting population, social complexity should correlate with the size and concentration of social aggregates, and thus with urbanization. We may thus reformulate the general problem of the relations between complexity, urbanization and size to ask what conditions underlie or are associated with sufficient increases in the number and variety of single-stranded relations to exemplify urbanization.

Sociologists have offered several answers to this general question. These answers include the relative decline of ascriptive roles and increase of contractual ones; relative increases of the material and moral densities of social units, increases of secularization, mobility and so on. Since differentiation, heterogeneity, individuation and the division of labour are merely alternative aspects or descriptions of social complexity, they may be employed to measure or illustrate it but not as explanations. While the degrees of differentiation, heterogeneity, secularization, mobility and contractuality that characterize pre-industrial cities are normally less than those to be found in contemporary industrial ones, they are considerably greater than those that characterize

If sociologists and anthropologists are correct in rejecting material criteria of a demographic or geographic kind as adequate indices of urbanization, they none the less disagree about the particular social and cultural criteria that distinguish the concept as process or as state, and also about their fit with the empirical data. To summarize and exhibit the greater organizational complexity of urban communities, social scientists elaborate polar models that contrast the mobile, secular, differentiated or heterogeneous *gesellschaft* qualities of urban society with the immobile, isolated, sacred, weakly differentiated *gemeinschaft* qualities of non-urban units[3]. Durkheim's powerful contrast between social systems characterized by mechanical and by organic solidarity, and Max Weber's contraposition of traditionalistic and bureaucratized (legal-rational) societies are also relevant[4]. But so too is the distinction that Sjoberg draws between pre-industrial cities in which the contexts, forms and degrees of differentiation, mobility and secularization vary widely, and industrial cities in which, until *apartheid* at Johannesburg demonstrated otherwise, it was assumed that these qualities were necessarily more developed. If we admit the critical relevance and variable socio-cultural organizations of pre-industrial cities for the study of urbanization, we can provisionally reformulate our problem to ask what degrees of differentiation, mobility, secularization and contractual freedom distinguish urban from rural units, and how do these minima relate to such factors as demographic size, density, geographical extent, or the division of labour. This reformulation neither assumes the validity of the conventional rural-urban dichotomy, nor the association of demographic, geographic and socio-cultural variables that underlies it.

Differentiation, mobility, secularization and contractuality are commonly linked with one another as correlates of an advancing division of labour; and division of labour itself is often employed as an exact representation of the levels of social complexity. We must therefore consider whether complexity in social organization provides an appropriate index of urbanization as a process or a state, and try to indicate the conditions that promote or generate it. But to what does such complexity initially refer ? Culture, social relations, economy, technology or society ? Citing Raymond Firth's exceptionally fine and detailed reports on the Polynesians of Tikopia, Max Gluckman remarks that "The organization which was required to hold together a thousand people on a South Sea island was almost as complicated as that which rules a city like London . . . even though these island societies . . . did not have a cultural apparatus as complex as ours'[6]. Thus Gluckman contrasts complicatedness of social organization, conceived as "networks of social relationships"[7], with complexity of culture, conceived as "the content of those relations . . . the . . . accumulated resources, immaterial as well as material, which the people inherit, employ, transmute, add to and transmit"[8].

We may combine Gluckman's casual distinction between complexity and complication with another that he draws between simplex, single-stranded or

the rural populations of the societies to which these pre-industrial cities belong. None the less, it seems unlikely that the role-structure of many pre-industrial cities exceeds those of "rurban" communities in contemporary industrial societies in the number and variety of their differentiated relations. If so, we have to deal not with a dichotomy but a continuum of societal complexities scaled in terms of role components and situations, as some sociologists have argued[11]. This simplifies our problem in several ways and suggests that the relative complexity of social systems is neither an invariable nor a simple function of density and size; for if the "rurban" sectors of contemporary industrial societies are more complex than pre-industrial cities in role structure and organization, neither urbanization nor demographic and geographic factors are directly requisite for such complexity, however commonly associated with it.

To indicate the structural requisites of increasing role differentiation and systemic complexity, we need only contrast the bases of multiplex and simplex relations current in contemporary complex societies. There, most multiplex relations are familial, kin-based, and restricted to the domestic or private domain, while most simplex relations are occupational and economic components of the public domain[12]. Such considerations led Durkheim to identify the developing division of labour as the source and condition of social complexity; but perhaps the reverse is nearer the truth, as Maine's epigram— "the movement of progressive societies has hitherto been a movement from *status* to *contract*"[13]—suggests.

Maine exemplified social systems in which status and role were prescribed by corporate kinship groups by the patrilineal organization of early Rome. He went on to show how these corporations lost their legal sovereignty as their members were emancipated by the development of legally valid procedures and criteria for the differentiation of personal status and roles. The displacement of kinship by territoriality as the basis for political community illustrates one aspect of those general processes of societal transformation and development which accompanied the evolution of the city-states of classical antiquity. It facilitated immigration, and thus the material growth of these city-states, while converting their lineage consociations into stratified orders whose central law regulated individual rights and preserved individual opportunities for the creation of further rights by contractual relations or other procedures of role differentiation. Maine's argument and insights may help us to clarify the tortuous relations of complexity, urbanization and size if they are supplemented by the observations of Ibn Khaldûn and Vico.

Ibn Khaldûn and Vico independently stress the prominence and consequences of social stratification within archaic cities.[14] Vico shows how the population of ancient Rome expanded by attracting immigrants who were differentiated categorically by culture and social conditions as plebs from patricians, and individually as clients from patrons. Ibn Khaldûn attributes the creation of cities to the power and wealth of ruling dynasties; but he

dwells at length on the consequences of conquest for those invading groups that impose themselves as ruling strata on cities subjugated by force of arms. In either case the initially rigid stratification of patricians and plebs, of rulers and ruled, erodes as linguistic and cultural assimilation develops within a context of increasing competition for support, prestige and advantage in either stratum. In consequence, as Ibn Khaldûn remarks, "genealogies become confused," thus dissolving the initially exclusive ascriptive division of the community into two structurally distinct blocs, which were either endogamous or aligned by hypergamy. Dissolution of these exclusive strata proceeds by the gradual extension of symmetrical connubium throughout the population, by the gradual if incomplete extension of legal and political rights and obligations to all as citizens, and by their ultimate incorporation in a common cult. Thus, whether the original concentration of population arose through synoecism or voluntary immigration, granted the juxtaposition and interaction of two markedly unequal and closed social orders within a city, their continuous co-operation in economy, defence, and the enforcement of order generates novel interests, activities, situations and social relations which are inconsistent with the original rigid separation of these strata in connubium and kinship.

At Rome the kinship groups whose transformation and dissolution proceeded simultaneously with the growth of centralized city-state were originally exclusive corporations whose members were ascriptively regulated in their internal and external activities by particularistic genealogical relations. Their kin-bound role structures were no less proscriptive than complicated, perduring and multiplex. They restricted individual capacities for independent action because they subsumed and regulated all the essential requirements, interests and rights of individuals as lineage members in such matters as residence, inheritance, succession, property, personal security, socialisation, cult, association, representation and dispute settlement; and since such structures were replicated among all units of identical base, they effectively excluded the differentiation of personal relations by voluntary individual action oriented to other situations and interests. None the less, internal pressures and the exigencies of their continuing association as an exclusive stratum together modified these ascriptive and all-encompassing patrician lineages by eroding the bases of the particularistic and multiplex relations that underlay their mutual exclusions, while generating alternative or supplementary bases and forms of social relation.

As new scope for voluntary and conditional individual association outside the traditional contexts of kinship and marriage developed, so did the number and variety of differentiated roles, situations and procedures for interpersonal association, and with this the complexity of the social systems of which they were increasingly common and prominent components. The ultimate effect of these developments was to render individual identifications with, or obligations to, the previously prescriptive corporations based on kinship

and differential status conditional on such factors as individual volition, experience, opportunities and the development of public law. As individuals gradually recognized that the traditional corporations, whether based on kinship, jural status, locality, cult or occupation, were clearly conditional, they also realized their new capacities to create other types of corporation and association to subserve interests of a specifically economic, social, educational, religious or political kind by allocating resources and designing role structures for these particular ends. Thus the prescriptive corporations of uniform base and type that initially encapsulated individuals from cradle to grave in per-during nets of mutually exclusive and multiplex relations were initially supple-mented and then supplanted by instrumental, voluntary associations of dyadic or multilateral kinds which individuals were variously free to join, modify, develop or dissolve according to their particular interests. Clientage was a particularly important mode of contractual association. As such processes generated new roles and situations, the range, variety and specificity of interpersonal relations proliferated, together with the diversity in the normative and technical components of these relations, and the complexity, lability, and integration of the system that embraced them. In pre-industrial populations, urban milieux, defined as unusually large and dense concentra-tions of people, provided the typical matrix for these developments, which normally proceed at rates that reflect the relative strength of the internal and external forces at work to promote and obstruct them.

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