

**ROTATIVE RANK HIERARCHY AND RECURSIVE ORGANIZATION: The Andean Peasant Community as a Viable System**

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## 1. Introduction<sup>1</sup>

Is Andean social and cultural organization, as expressed in modern peasant communities, compatible with the political and economic development of the region in the coming century? Or is Andean ethnology a sort of social archaeology? The question must be posed in terms of the contribution that Andean structure makes, or does not make, to the operational efficiency of the community as a viable social unit. As Flannery et al (1989:215-7) point out culture is not necessarily adaptively neutral.

This paper is exploratory in that it presents a particular cybernetic approach to the above question. This approach permits a wider interpretation of known data. Modern community administration by rotative office is shown to be coupled to and articulated through a hierarchy of nested systems. I emphasize the extended kinship phrased group level since it has received little explicit structural-functional attention in the literature and its contribution to communal viability is important.

At the moment there are some 5,000 peasant communities in Peru alone, and probably a similar number in the other modern republics whose territories are formed from the former Inca state. Organizationally, these communities are extremely heterogeneous. Many of them are Andean communities in name or by government recognition only, retaining little of their Andean cultural heritage. Others however, have undergone relatively little structural change since the Spanish Colonial Period and are usually referred to as "traditional communities"; but among these there is a wide diversity of organizational expressions. This local diversity has probably existed since remote antiquity as Zuidema has affirmed (1989d: 490) <sup>(1)</sup>.

Anthropologists have drawn attention to particular patterns expressed in the socio-economic and cultural organizations of both ancient and modern Andean social units. Among these characteristics are: the maximization of access to distinct ecological **pisos** (Murra 1975); the differentiation of socio-technological control in production zones created or developed from the ecological **pisos** (Mayer 1985; Fonseca y Mayer 1988; Mitchell 1980, 1981); the parallel management of different production cycles (Golte 1980); astronomical observation patterns and their calendrical application (Zuidema 1978a, 1978b, 1989c ; Urton 1981a, 1981b); socio-technological reorganizational procedures for maintaining agricultural productive stability in face of environmental perturbations (Earls 1989); symmetric marriage alliance; and the use of some basic ordering principles in a diversity of contexts to form a hierarchy of nested levels of social organization (Zuidema 1964 and elsewhere).

The principles of rotative order (Quechua **mit'a** and **suyuy**), duality (**saya**) and rank (extensively discussed by Zuidema) are expressed in the system of communal administration by rotating community members through the posts of one or more ranked hierarchies. These systems have both ritual and administrative functions but it is always quite clear to the modern day community peasants the predominantly civil nature of their office. In Perú those at service in the system are called **varayoq** (I shall use that term to designate these systems) because of the ornamented wooden staffs (**vara**) they carry and which distinguish each rank. In Bolivia they are called **mallku y jilaqata**.

I shall demonstrate the importance of this system for the viability of modern Andean community organization and show that the constraints it places on kinship practice leads to a more comprehensive understanding of the extended family groupings and their operation. I am only interested here in Andean institutions and will not discuss distinctly western innovations in the community administration systems such as the different state recognised and/or legalised governments of the communities. The various forms of **junta** integrated by groups of community members for such special purposes as irrigation control (**juntas de usuarios**) (Mayer 1985, Fonseca y Mayer 1988 among others), or for cattle management, etc., usually have an ephemeral existence or become integrated in the Andean system of communal control (Fuenzalida et al 1982 and others). This is not to deny their importance and of state politics in general for community viability, but for my purposes they can be regarded as "perturbations" that act on the community. My analysis centres on the Andean peasant community Sarhua, Río Pampas, Ayacucho, as an example of a community that makes effective use of native Andean strategies. How they are going to be used in a particular case is conditioned by many factors: the communities historical experience, geographic environment, size, etc. Not all communities make effective use of the same principles even should these be expressed. While the model developed here is based on one community its applications are quite general.

## **2.Cybernetic Analysis**

Cybernetics is hardly a new tool for anthropological analysis (Bateson 1938, 1972; Rappaport 1968, 1971a, 1971b amongst others) and for Andean society: W. Isbell (1978), Flannery et al (1989) and Earls (1976; 1989; 1991a; 1991b; 1992a; 1992b). It provides a precise technical vocabulary for the description and discussion of complex phenomena and processes such as will be addressed here.

Cybernetic analysis is necessary to evaluate the viability of Andean social organization just as modern astronomy is necessary to evaluate the achievement of Andean astronomy. I hold that organizational science (cybernetics) was well developed in the Andes, just as astronomical science was. This is how I interpret the position taken by Tom Zuidema in "Bureaucracy and Systematic Knowledge in Andean Civilization" (1989d). And it is the persistence of a tradition of effective organization in the culture which explains the continued existence of the Andean community. Platt (1987: 75-8) refers to Aymara social and territorial organization as expressing a conscious social engineering designed to maintain an equilibrium between the diverse vertical and horizontal forces generated within the society.

The cybernetic approach used in this study is based in the the Viable Systems Model of Stafford Beer (1972; 1975; 1979). In the immediately following paragraphs I describe elements of this model and other cybernetic concepts that will be employed for the analysis of the Andean community.

### **2.1. Variety and Control.**

The concept of variety is fundamental in cybernetics as a measure of the complexity of a system. It is defined as the number of distinguishable states possible in that which we wish to measure. Theoretically, the number of distinguishable states is something that can be counted though this is often very difficult in practice.

I can not give an adequate account of variety in this paper, and the cybernetic literature on the subject is enormous (the seminal work on variety is that of Ashby 1964;1965). For biological and social systems variety manifests itself as uncertainty. The more complex a situation and the more factors that contribute to it, the greater is the uncertainty of what will happen and what to do about it. But adaptive action depends on having an appropriate response to whatever should happen and being able to carry it out in the time available. In cybernetics this is known as Ashby's Law of requisite variety:- in a viable system, the variety of control has to be equal to, or greater than, the variety of the system to be controlled. In common parlance a feeling for it is expressed as Murphy's Law:- Any thing that can go wrong will go wrong (and you'd better be ready for it).

The variety of control must be organized in such a way that it can not only match the known variety in the system, but also variety due to perturbations never anticipated by its designers. In this way, the system constantly adapts itself to changing environmental conditions. This is the property designated homeostasis.

### **2.2 The Viable System and Recursive Organization.**

Necessary conditions for variety control in a viable system have been elaborated by Stafford Beer (1972,1979). Any viable social institute or system has a recursive organizational structure. This is expressed in Beer's Recursive System Theorem: "In a recursive organizational structure, any viable system contains, and is contained in, a viable system". (1979:118)

The notion of recursion can be understood in terms of something that is composed of a simpler version of itself, and this of a yet simpler version, and so on. At each recursive level the corresponding system can maintain an independent existence, but its degree of independence is conditioned by the degree of coherence of the wider system in which it is embedded. The "totality" is simply a consensually defined piece of an infinite recursion, which is in possession of an identity, and occupied with the preservation of its organization (1979: 402-07). The "totality

piece" of concern here is the Andean peasant community. The notion of recursion is often expressed by analogy with Chinese boxes and Russian dolls. A family, **ayllu**, **curacazgo**, modern community, state, etc. are viable systems when they are composed of viable systems and are contained in viable systems. If the members of a family are suffering from inhabilitating sicknesses, i.e., they are medically inviable, or if the family belongs to some suicidal sect, it is not a viable family. The same constraints apply to the Andean peasant community.

In the Andean communities of the Río Pampas region, Ayacucho, Perú (Quispe 1969, Catacora 1968, Earls 1968; 1969; 1971, B-J. Isbell 1972; 1974; 1978, Palomino 1970; 1971; 1972, Pinto 1970; 1972, Araujo 1988) at least three and often four recursive levels are identifiable as viable systems: the community as a whole, the **ayllu**, the functional extended family (see below), and the elementary family or household. Viable systems may be formed at the level of production zones (Mayer 1985; Mayer 1979; Fonseca y Mayer 1988), moieties and other divisions (2).

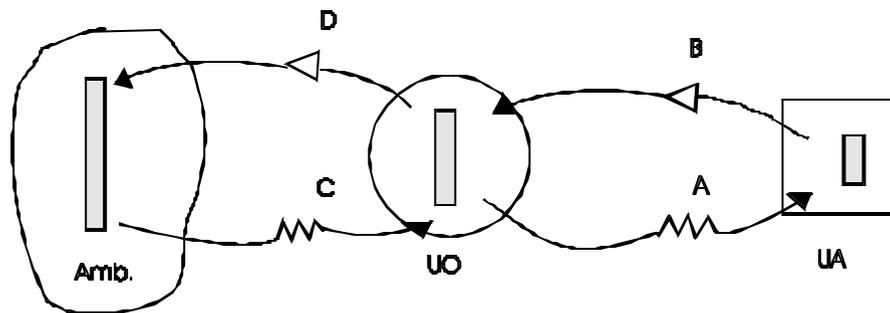
The viable system, at any level, is formed by the articulation of a group of elementary units of organization (EUO) into a single cohesive group, a System 1 (S1). This cohesion is brought about by the activity of a Metasystem which operates at the next higher level. Beer's model involves 5 distinct systems only one of which will be described here, the other 4 operating together to form the metasystem. For an account of the whole model applied to Andean society see Earls 1991b, 1992b.

### 3. Structure and Control in the Andean Community.

I shall begin with the elementary unit of organization (EUO) or operational element.

#### 3.1 The Elementary unit of Organization.

The EUO is composed of three interacting units, as depicted in Fig. 1 (Beer 1979:96): an administrative unit (AU), an operations unit (OU) and the environment (Env). The AU disposes of less variety for control than the variety which can be generated in the OU in which it is embedded. It thus must be capable of amplifying its control variety and reducing the variety that can interact on it from the OU. The OU is itself embedded in an environment in which the greatest amount of variety is generated. The OU must also be able to amplify its own variety while reducing that of the environment.



**Fig.1 La unidad elemental de organización (UEO)**

La magnitud relativa de la variedad en cada unidad es expresada por la longitud de la vara vertical.  
 B y D son amplificadores de la variedad  
 A y C son atenuadores de la variedad  
 A y B son manejados por la UA  
 C y D son manejadas por la UO.

The Elementary Unit of Organization

### 3.1.1 The Community as an EUO

At the highest recursive level administrative unit of the modern community is usually identified by the community members as the Communal Assembly or **Cabildo**. The Cabildo is formed by the assembly of all married male members who have complied with determined requirements, e.g. of having taken served in at least one of the rotative administrative hierarchy posts. It meets regularly, often weekly, and also for any situation of emergency that may occur. It is responsible for the overall functioning of the community and takes the decisions affecting the community as a whole: the agricultural calendar programmes for the different production zones (what to plant, where, when, etc.), the communal works (**faena**) to be carried out, problems of limits with neighbouring communities, etc. All decisions taken by the cabildo are arrived at by consensus, i.e. not by majority voting as in western democratic institutions, and every aspect of a problem is discussed. At first sight it difficult to understand how such an institution could ever function as an effective administrative unit given the potentially high disruptive variety that can be generated <sup>(3)</sup>. However, the Andean Communal Assembly is more than an aggregate of peasants. It is a very complex structure that is built around the **varayoq** systems and the synergy generated in its recursive organization.

The operational unit of the community is composed of all the community members, including those who participate in the Assembly, acting as a unit. This role duality in itself is a powerful variety attenuator since the common knowledge of what decisions were taken and why, reduces destructive variety that results from ambiguity and discord. Also, it is not formed by its members as individuals, but as members of recognised subsystems, the **ayllus**. <sup>(4)</sup>

### 3.1.2 Community and Environmental Variety

Ecologically, the Andes is a very high variety environment.<sup>(5)</sup> Peru alone has the highest number of ecological life zones per unit area in the world -- 84 of the 104 life zones (Holdridge 1947) in the world (Tossi 1972). High Andean environmental variety is also generated by frequent and highly energetic ecoclimatic perturbations. The profound influence of this high variety on Andean social organization has been analysed cybernetically by W. Isbell (1978) and Earls (1976; 1989; 1991a; 1992a; 1992b).

These perturbations, in the form of late frosts, late rains, early rains followed by dry spells or droughts, locust, parrot or mice plagues, etc., oblige partial or complete reprogrammings of productive activities at very short notice to avoid large scale crop loss. To dispose of requisite variety means to be able to perform rapid and highly coordinated reorganizations of the agricultural cycles. Ecoclimatic variety of the Andes is attenuated and control variety is generated by an ingenious socio-technological organisation and efficient information processing techniques (Earls 1976; 1982; 1986; 1989; 1991a; 1991b). The organization of the environment into a small number of relatively homogeneous production zones (Mayer 1979 ;1985, Fonseca y Mayer 1988) or "technoenvironments" (Mitchell 1980), each one with its particular crop associations, resource management regimentation and technological infrastructure, characterises variety management in the Andes. The articulation of the production zones' agricultural calendars is managed at the communal level (Golte 1980), increasing environmental structure at every lower level (Platt 1978).

## **3.2 Recursive systems at lower levels: The Functional Extended Family**

The **varayoq** are associated with moieties, **saya**, or other major organizational segments, **ayllu**, of a community. <sup>(6)</sup>

The major **ayllu** divisions function as the EUOs (the System 1) of a higher level system in the political organization, in the present context it is usually the community. However, the functioning of the **varayoq** systems and **ayllus** must be understood in terms of the organization at a yet lower level of recursion.

An elementary unit of organization can be identified in the groups of cooperating elementary families that I have designated as "functional extended families" (FEF), which essentially correspond to the "**ayne** groups" of Golte (1980) and de la Cadena (1986). This is a semi-autonomous group composed of a number of elementary families or households that are linked by **ayne** and other relations, and whose lands are located in neighbouring or nearby chacras (fields) in sectors of the same and different production zones. The families are linked by real and fictitious kinship ties. The FEFs are not ego centered kindreds, nor corporate patrilineages (except perhaps for the patrilineal **castas** of Ancash, Vázquez and Holmberg 1966, Stein 1961). The core of each FEF is made up by a group of real or classificatory siblings symmetrically married with other similar groups of the same moiety or **ayllu** (Platt 1978, Webster 1973, Araujo 1988, Ossio 1992). However FEF composition and operation cannot be defined in terms of the kinship system alone. Real siblings can and often do belong to different FEFs. Only those kin ties which are consonant with the functional coherence of the FEF are activated, while FEF-functional non kin are soon converted into afines or **compadres**. Attendance on ceremonial occasions is a good guide to FEF composition. The joint action of inheritance practices, the symmetrical pattern of the kinship system and the tendency to renovate alliances in alternate generations, along with the needs of group cooperation in the common dispersed environment, induce a degree of stability in a group's component family composition over time (see Fig.2). They are not discrete mutual exclusive formal groups, but owing to the difficulties of divided loyalties, (belonging to various groups simultaneously) people tend to manipulate the kinship system to minimize ambiguities. The patrilocal sibling groups of the Macha seem to be formed on the same principle (Platt 1978).

Ossio points out that in any labour or ritual context family context, afinal and potentially afinal kin along with ceremonial kin are the most assiduous cooperators (1992:205-10). Ossio did careful work in Andamarca (another community of the Río Pampas cuenca) and shows a high statistical correlation between the extended family groupings and the spatial clustering of their village houses (1992). Araujo (n.d.) has found that in Sarhua the families comprising these groups are painted on the long boards, **tablas**, that are ritually placed on the inside of the village houses. She indicates that the average size of a group is nine families with a range of 5 to 16. In communities of the Q'anyohawira river, Prov. of Camacho, La Paz, I was told that between five and twelve families try to have their chacras nearby "so as to help each other".

## *FEFs in Production Zones*

### *Distrib. of segmented environments*

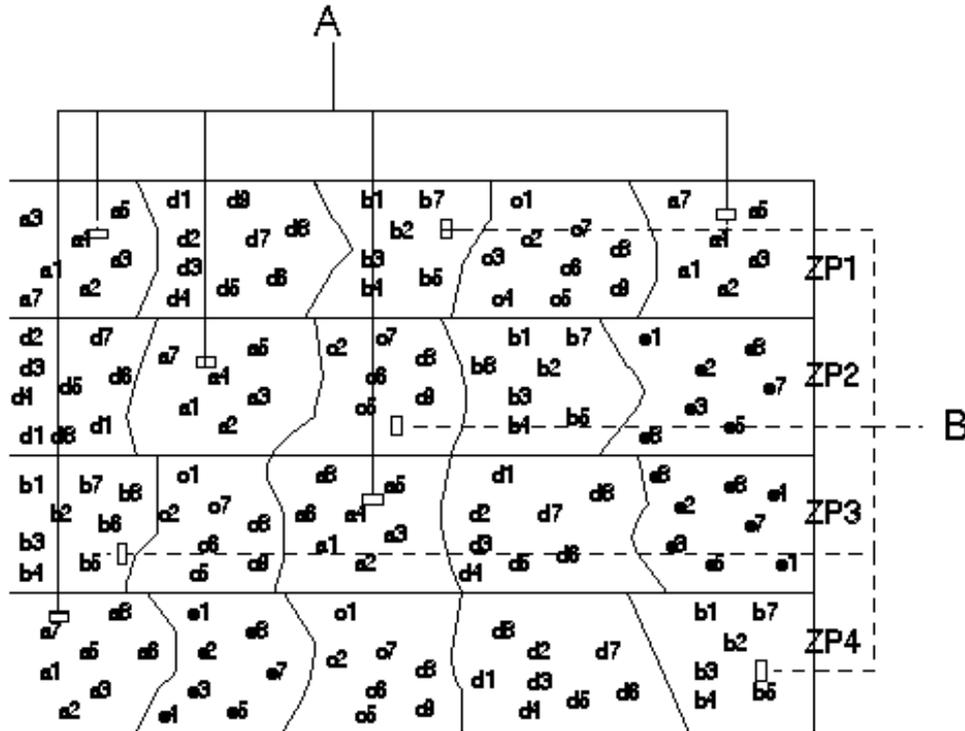


Fig. 2.

Functional Extended Families A, B,... composed of elementary families a1, a2,...,b1,...,c1,..., share common dispersed environments distributed through and within the production zones PZ1, PZ2,..., Connections through A and B are drawn to illustrate the complexity involved in effective co-ordination.

The administrative unit of the functional extended family is comprised of the heads of the individual elemental families as a council (**consejo or junta**). The family head who has accumulated the greatest prestige through effective participation in the civil administration hierarchy generally represents the FEF at higher levels: the **ayllu**, moiety, community, etc., and his voice carries most weight within the group. As a face-to-face group the heads programme and reprogram their own agricultural activities limited only by the constraints accorded at higher levels. All planning at this level involves the careful accounting and balancing of all the **ayne** (owing and owed) relations between the component families and their members.

Its operative unit is formed by all the families' members including the respective heads. It shares a common segmented environment within and between the production zones (see Fig. 2). Activities in environment segments are frequently carried out by subgroups based on age or sex drawn from most or all component families, e.g., in the Río Pampas communities with both agricultural and herding **pisos** the day-to-day pasturing of the animals in the high puna or **sallqa** zone is generally conducted by the group of unmarried girls. Important tasks involving the continued presence of only one or two adults are often rotated through the component households of the FEFs for weekly or monthly turns.

Group relevant information that is obtained by any of the elementary family units is rapidly transmitted through the group to the administrative unit in the form of a meeting. If a plan is then made or remade, this information is similarly communicated back to the set of elementary families. In this way wider scale community planning becomes simpler and more efficient, since it leaves problems that only concern these semi-autonomous units to be managed by them without bothering wider groupings. The simplified situation represented in Fig. 2 will indicate what this means in terms of total variety reduction.

A fundamental function at the FEF level is the programming of tasks for the group in those years in which one or more conjugal pairs are to serve **cargos** in the administrative and/or religious systems of the community. Rights to cultivate communal lands are usually allotted to those serving in the posts of these systems. However the time and work involved in these posts make it very difficult for an elementary family to work these or their own lands (B-J Isbell 1974: 129 makes a similar point for the **varayoq** in Chuschi). An efficient work programme is essential for the extended family to provide the support for member families currently serving in the **varayoq** system.

### **3.3 System and Metasystem.**

As mentioned above, the set of elementary organizational units acting with a coherent coordination is the System 1 of Beer's cybernetic model. The system which acts to assure this coherence is metasystemic to S1 in that it operates at a higher level, in both the social and logical senses of the term. The metasystem can always "talk" (in the sense of hierarchy of logical types of Russell and Whitehead - cited in Bateson 1979) about the totality of the EUO comprising S1, and it is able to project downwards to each unit of each EUO a "sinoptic" view of its particular operation with respect to the entire S1 (Beer 1979:202-212). It lets the parts have access to a vision of the whole without overwhelming them with volumes of superfluous information or variety. In cybernetic terms it acts as both a filter and a transducer. The structure of the metasystem is complex and cannot be described here.

Andean peasants are extremely aware that their group identity is founded in their unity. They are very explicit on this point. Many units of social organization express this parts-to-whole unity in anthropomorphic or zoomorphic symbolism (see Albó 1972; Zuidema 1989c amongst others). The cohesive unity is enabled by the metasystem in its use as a sort of interlevel "auto-viewer". It lets any unit "see" in what way any unit's behaviour contributes to the cohesion of the unity or to its desegregation. In the latter case the unit will normally then undertake appropriate self-corrective measures. Coercion rarely needs to be used, though it can be and may be quite drastic.

The functional extended family is metasystemically related to the group of elementary families which together form its S1. Each component family is an elementary organizational unit at the next lower recursion level. The administrative unit is the married couple; these with their offspring and any coresident dependent relatives, form the operative unit. The environment is as depicted in Fig.2. The set of functional extended families is an S1 to a metasystem at a yet higher level.

In situations of ideal and significant moiety or **ayllu** endogamy, common in Andean communities, the FEFs function as the S1 of these units. Consistent endogamy is rarely possible in practice in units of a few hundred people, but given the nature of Andean kinship and marriage systems (Zuidema 1989b, Earls 1971) and the widespread modern practice of surname exogamy, it "forces" a predominance of one moiety or **ayllu** over the other(s) that may be present in a FEF. Members of one moiety will become "wife takers" to the other when they lack balanced access to communal resources.

In Sarhua, with some 250 elementary families and an average of nine families per FEF (Arayjo n.d) the association of each FEF to an **ayllu** gives each **ayllu** an S1 of some 15 units each. While the Sarhua **ayllus** are nonlocalized patrilineal moieties, the same endogamic operator will also work to force an inclusive FEF- moiety relation in communities with localized **ayllus** or other units. In communities like Pacarictambo (Cusco) with a population about equal to Sarhua's but with ten **ayllus** split between two moieties (Urton 1984), endogamy below the moiety level may be impossible even as an ideal.

In Fig. 3 the interactions between any three EUOs and the metasystem are shown as in Beer (1979) in accord with the conventions of Fig.1. The metasystem is understood to be equally connected to all the S1 EUOs. There is much variety generated in the interactions between all or any of the operational units of the same level and which must be managed within the system (Platt 1987 shows how this is done through the structural battle cycle

tinku/chaxwa). The environments of each unit overlap which is always a potential source of explosive variety at every level, though structural regulation operates in some way at every level.

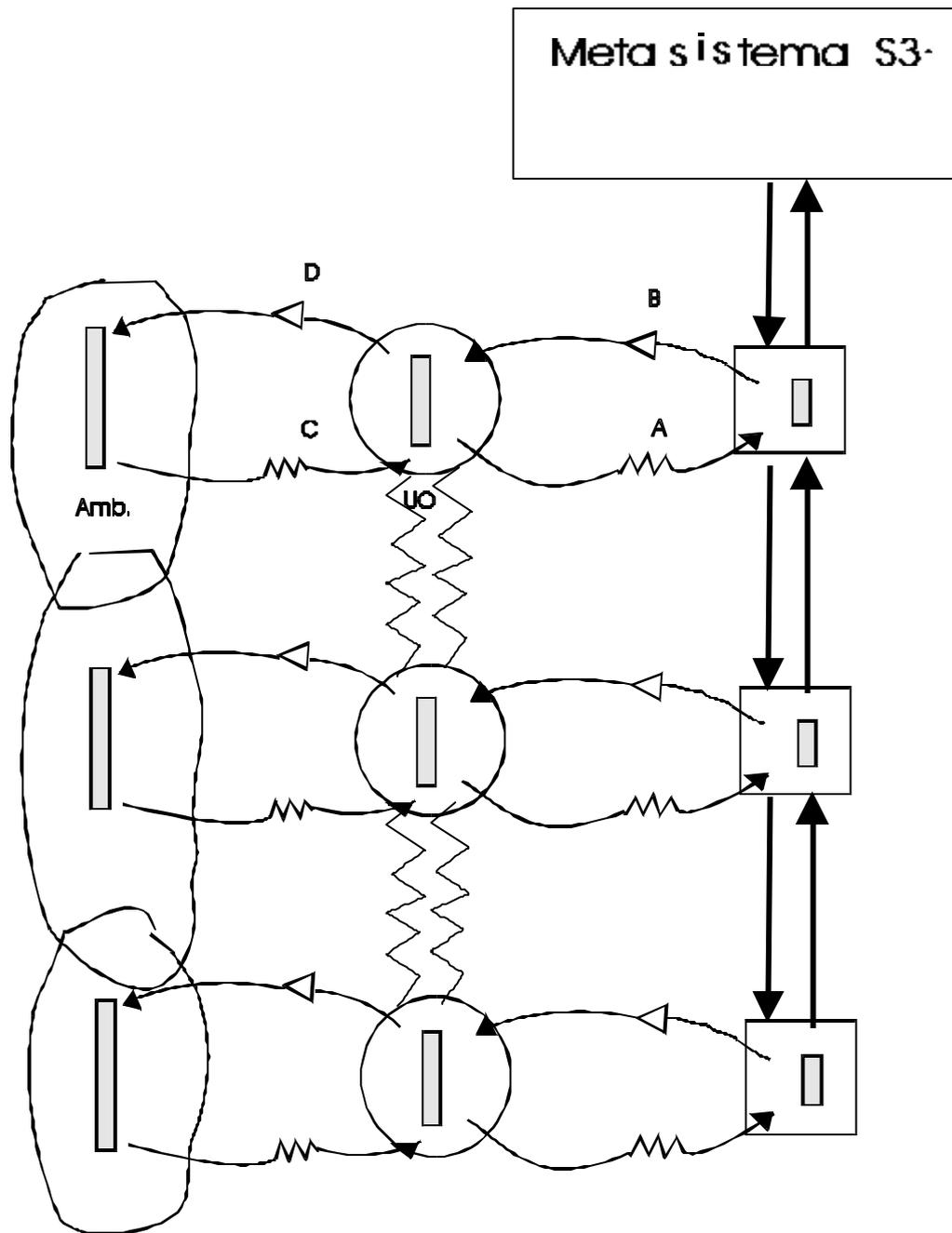


Fig.3 Tres elementos operacionales en su relacion a un metasistema y entre sí.

Fig.3.

### System 1 and Metasystem.

As was seen above metasystemic regulation at the levels of the elementary family and the elementary extended family is carried out by the corresponding family heads at each level. At higher recursive levels, metasystemic regulation assumes more institutionalised expressions, this is the case at the production zone or higher **ayllu** levels. Here the authority is expressed in special purpose **juntas**, in the **varayoc** systems, or in the **Cabildo** itself. In most communities the two moiety **ayllus** function as an S1 unit level of the community under the direction of the **varayoc** for the ritual cleaning of the irrigation water canals, the reparation of production zone infrastructure, and other vital communal tasks. At all levels consensually agreed on plans are sanctified (Rappaport 1971a; 1971b) by relevant offerings to the ancestor mountain spirits. It is highly significant that in Cabana Conde (Arequipa) these spirits, called **Wamani** or **Apusuyu** in the Río Pampas region, are themselves called **Cabildo** (Gelles 1990). They are organized in a rank order of power which is isomorphic to the recursive hierarchy of society itself (Earls 1969).

The general relation between system and metasystem is given in the recursive interlocking between alternate levels. The system 1 of a given level is metasystemic to the elementary units of organization at the level below -- the S1 at that level. The metasystem of an S1 at any given level is located in the next level above, and at that level it is the EUO of an S1 whose metasystem belongs to the next higher level, and so on. It is context and function which establishes the system/metasystem focus at a given level.<sup>(2)</sup>

#### **4 The Rotative Administration System**

These systems are an adequation of ancient Andean rotative organisation, based in age grades (Zuidema 1964), moiety and submoiety inherited authority and rotative practice (Platt 1987), and the acquisition of authority by service to a higher authority (Zuidema 1989d; 1989e), to the 16th century Spanish municipal administration order imposed by the Viceroy Toledo. Relations between alternate ranks are often expressed in kinship categories (Palomino 1970, Earls 1973, Zuidema 1989e); each rank is "father- mother" to the lower ranks, and all these are his "sons". Through the mathematical theory of categories I was able to demonstrate a homeomorphic relation between this administrative system (for Sarhua), and that of the royal Inca panacas (Earls 1973).

The survival of the **varayoc** is due to their capacity to bring about such an organizational cohesion and to their resilience in the most adverse circumstances. Others have called attention to the democratic (Albó 1972; Araujo 1988), redistributive (Fuenzalida et al 1982), spiritual (Marzal 1972) and organizational (Platt 1978; 1987) functions. All these factors have contributed to the continued existence of the system. In many communities, such as those of the Cañete Valley, Peru, they are not now called **varayoc**; they carry ball-points and notebooks instead of staffs but their functions are the same (personal communication Enrique Mayer). The posts are rotative, hierarchical and obligatory. Most ethnologists have tended to view these systems as ritualistic survivals on the verge of extinction and for this reason there is relatively little detailed study of their day to day activities.

#### **4.1 Varayoc: Information Processing and Control**

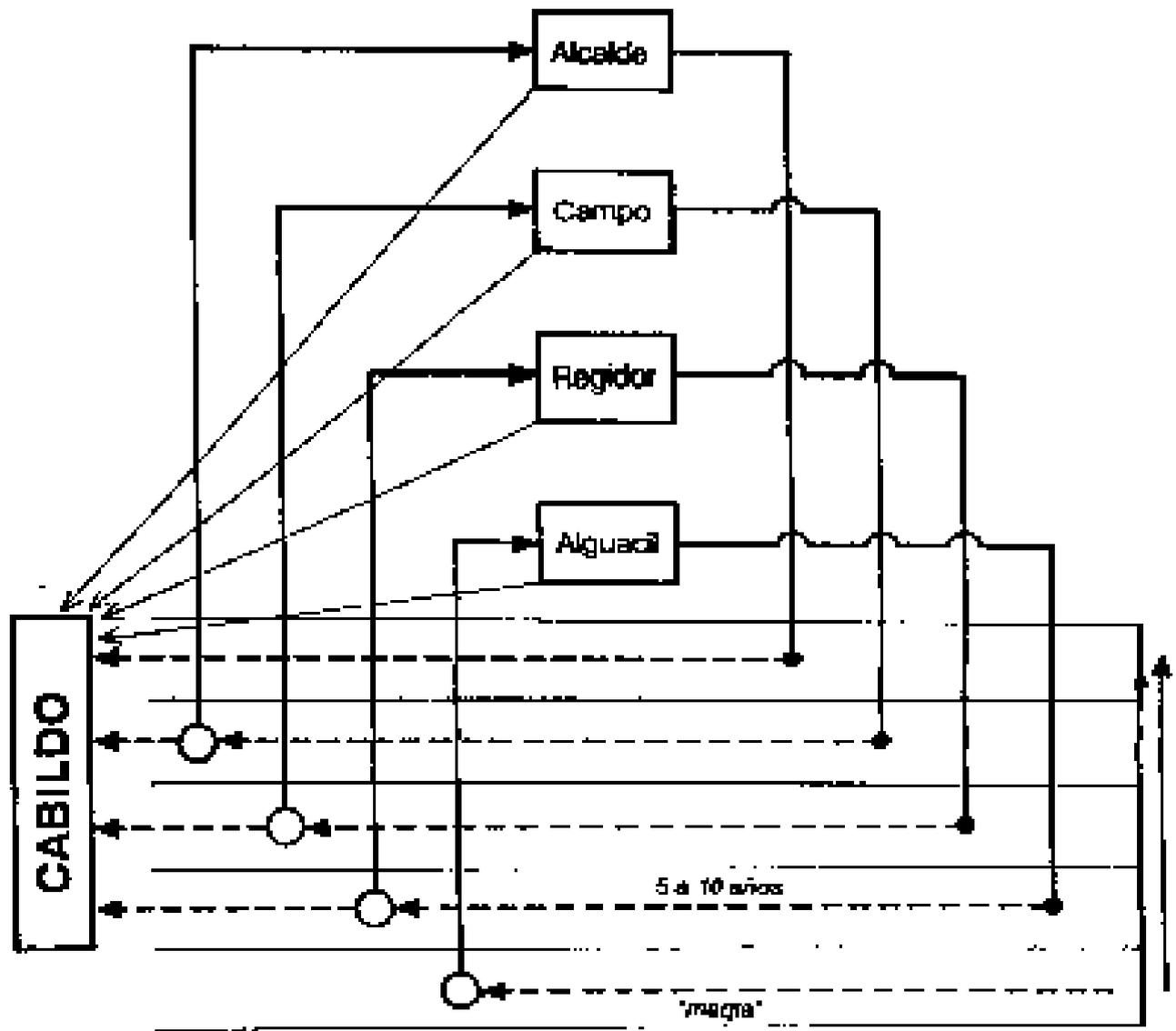
The problem of consensual decision taking at the community level can now be addressed. Participation or "service" in a **varayoc** system is usually for a one year term; and one begins at the lowest rank in the system. After a spell of 5-10 years he reenters the system in the next highest rank. The actual functioning of these systems is extremely heterogeneous, even between neighbouring communities of the Río Pampas (for Sarhua see Palomino 1970, Earls 1973, Araujo 1988; 1989 and for Chuschi B-J. Isbell 1972; 1978).

In general, except for small communities with few or no subcommunity levels, the **varayoc** systems are related to the moiety or other divisions that exist in the community and in certain ways they also relate to the administration of the production zones. In Sarhua they form two parallel hierarchies one for each moiety. Each is composed of 4 ranks: 4 members in the lowest rank (**alguaciles**), two **regidores**, two **campos** and one **alcalde vara** at the head of each group (18 in all). In Chuschi there are 27 posts distributed between three systems of three ranks each. In general, **varayoc** are to be present where ever work is in progress and watch that the work is being carried out in line with the programme agreed on in the Assembly.

All ranks are concerned with gathering all information that could possibly impact on the operating agricultural calendar: any peculiar behaviour observed in the meteorological indicators; the presence of more locusts than usual in a determined zone or sector; the magnitude and damage produced by a frost in the different chacras; the rates of maturation of the crops in the production zones, disputes arising between families or extended families that escape management at that level, etc. The varayoq function as sensors of incipient instability, that is, of potentially explosive variety acting on or generated within the system that cannot be dealt with by the semi-autonomous sub-systems and threatens the coordination of activities at wider levels. The higher ranks, especially the **alcalde varas**, "process" this information, often in consultation with the Mountain spirit priests (**pongo, paqo**, etc), weighing the different factors in accord with their impact on the communal order. The processed information gives a synoptic view, free from unnecessary detail or "noise", which is transmitted back down through the levels to the extended family heads and from these to the individual families. In this way every community member has a continuous and near to real-time overview of the state the community as a whole.

For Sarhua, Araujo (1988:149-50) reports that the real authority of the upper ranking **varayoq** lies in their capacity to obtain a consensus in the predictions and expectations on the nature and progress of the agricultural year, and upon which a coherent planing can be based. They listen to the opinions of all the community members as to how things should be arranged and work out feasible alternatives that are concordant with the observations and predictions offered. In this way the varayoq function like a nervous system which interconnects all the community members via nodes at the levels of **ayllus**, production zones and extended families. This network allows the issues to be talked out and a consensus to be arrived at before the Assembly actually meets and a decision taken on the base of reliable and relevant information. The on-line structure puts the decision making apparatus in process the moment a potential problem is detected, and before it grows and gets out of hand.

Araujo (1988) has analysed the **varayoq** system as an education system. On passing through the ranks of the system the community members are able to learn and understand the overall rationality of the elaborated strategies for the preservation of the communal system as a whole. The upper rank officials always take pains to teach all they know to the younger lower ones. As Pask (1972) has shown the learning process itself is a powerful amplifier of control variety. Each time a person passes through a **varayoq** rank he augments his own control variety and also that of his functional extended family. At the same time his learning is an essential part of the continuous self-production of the Cabildo and of the community as a whole (see Fig. 4).



Para Sarhua, Araujo ha averiguado que la autoridad real de los vari

Fig. 4.

Varayoc and Cabildo self-production in Sarhua.

#### 4.2 Varayoc and community

We have seen how in a moderate sized community (using Sarhua as a model) the cycling of the **varayoc** through the system involves a "lining up" of semi-autonomous systems at four levels of recursion: i) the elementary family, which must meet the requirements for the office, ii) the functional extended family, which must be effectively organized to cope with the extra work and time involved, but which also benefits from the greater influence that derives from having a member's influence at higher levels, iii) the moiety ayllu, which needs its **varayoc** to maintain

itself in complementary competitiveness with the other moiety, and iv) the community as a whole whose viability depends on the recursive viability of its subsystems.

In the communities of the Ayacucho region the relation of the **varayoc** and other similar authorities to the production zones is indirect rather than direct as in the Cañete Valley (Mayer 1985; Fonseca and Mayer 1988) but the overall operational pattern is the same. The relations of the **varayoc** to **ayllus** and production zones vary from region to region, though as Mayer points out there is always an expression of the relationship of the **varayoc** to both sorts of divisions, even if only at the symbolic level <sup>(7)</sup>. In communities where the system does not exist or only exists as a rudimentary survival and where the kinship system has lost its functional character, processes of desaggregation are usually apparent. Communal viability is threatened.

Many of the Río Mantaro (Central Perú) communities described by Mayer (1979) were no longer viable, at least as Andean communities, particularly those of the broad valley bottom plain along the river. Individual production zones were breaking away from to form separate commodity specialised "microcommunities". Little communal coordination remained as the bland low-variety (by Andean terms) topography facilitated the introduction and acceptance of Western capital intensive "packet" technology. Land holdings were being concentrated both spatially (the dispersed pattern of Fig.2 was being substituted by the contiguous "farmer-type" arrangement) and socially, while permanent wage farm labour was increasing. At the same time energy intensive use of machinery, fertilizers and insecticides were giving rise to now-familiar problems of diminishing yields per unit cost increase (see also Earls 1992a). It is significant that in this very region one result of the violence of recent years has been to undermine this incipient western style market articulation and its accompanying "national" political system. Thus many such fragmented communities have now reunited, and long abandoned **varayoc** systems and other patterns of Andean organization, have been reinstated for communal defense (personal communication Carlos Condori).

Up to a few decades ago Sarhua had four **ayllus**, with their respective **varayoc** systems, but two disappeared when their lands were sold to cover costs in a boundary dispute with a neighbouring community. Palomino (personal communication) has heard that recently the two lost ayllus have been reincorporated in the community, probably due to greater needs for control in this period of uncertainty. Variety calculations show that this is good cybernetics. Sarhua's viability is indirectly indicated by the fact that during the worst years of warfare in the Río Pampas area, when great battles were fought and thousands of peasants died and some neighbouring communities completely obliterated, only three isolated violent deaths occurred. I have heard many reports of intense "reandeanization" in other communities of the region.

While the hierarchic modular structure in combination with an effective rotative administration, are necessary for effective organization in the Andes, they are not sufficient in themselves. The iconic expression -- in paintings, ritual layouts, architectural designs, etc. -- of basic organizing principles at successive recursive levels in their respective contexts amplifies control variety. For example, the ordering principles laid out in Pachacuti Yamque's diagram of the Qorikancha are ironically expressed in at all levels of Andean social organization. This effectively functions as an "epidietic display", letting people know what the general situation is, what is expected from whom and in what order. It is expressed in the ritual positioning of the varayoc ranks according to moiety, and from which the whole structure can be "read" (Earls 1973).

Finally, we must look once more at the recursive viability theorem. Is the Andean community contained within a viable system, the modern Andean nation state? Contemporary political and economic developments suggest that it is not. As seen from the point of view of Andean native society, the state operates outside of agreed rules and organising principles, generating spurious variety which obstructs communal stability (Earls 1991a: 91-106). It has no metasystemic cohesive function for the communities (and it has little notion of what these are). It has to be treated as part of the environment, a source of arbitrary perturbations which must be "managed" just as the frosts and droughts must. And the governments see the communities and Andean institutions in precisely the same light, as annoying sources of variety to be "managed" (in practice this often amounts to "repressed").

For 12 years Peruvian peasant communities have suffered the disruption of a cruel insurgency. Now they are undergoing the most intense "westernization" politico-economic process since the extirpation of idolatrias and at the same time experiencing a second year of extreme drought. In this situation they are subject to massive disruptive variety at an unheard of intensity, and many observers, including anthropologists, are talking of the final breakup of the Andean community. However the question must be posed as to whether any viable alternatives to

Andean organization in the Andes presently exist or are likely to emerge in the coming years. I can see none and no one suggests any. The many communities that have been abandoned will be annexed by adaptively viable neighbours. That these in some future time could be run by **varayoq** with lap-tops whose homes in the puna have solar powered califaction and parabolic dishes (and some do) in no way means the end of the Andean community. On the contrary, precisely those communities which do manage to preserve their Andean viability in time will become "symbols of progress and modernity". With this I think Tom Zuidema will most certainly agree.

### **Notes**

(1) I do not propose that the modern Andean peasant community as such corresponds to the social units of prehispanic times, only that many prehispanic organizational principles are operating in a lot of modern peasant communities. While Tom Zuidema has published little on modern Andean social organization he has always been deeply interested in their historical process and their potential for contributing to a viable future in the modern nation. My reference communities are those of the Río Pampas we first studied with him in the 1960s.

(2) Platt 1978 identifies 6 levels of recursion "like Russian dolls" for the modern Macha of Bolivia, the Macha are a wider grouping formed of many "communities" and other units. Zuidema 1989e uses the "boxes" figure to express the kin-phrased dyadic- triadic nested ranking of Inca nobility. It is significant that both authors use these figures, so common in cybernetic explanation, as means of describing the nature of hierarchy in Andean society.

(3) This is not a trivial question. Everyone pushes for decisions that are most favourable to his or her own interests, and many interests are frequently conflictive. In western society consensus is usually only achieved when either all interests are equally affected or when no one's are. For this reason in the West important decisions are always taken statistically, i.e. by vote. (4) From ethnohistorical sources Zuidema (1989f) describes an early colonial "Cabildo" in the Lake Titicaca region. The moiety structure, staff carrying officials and rank ordering resembles the organization of cabildos in modern Sarhua. (5) Here I limit the discussion to the physical eco-climatic environment. In reality the environment is multiple entity made up of social, political, economic, and other dimensions as will become clear below.

(6) I shall use the term **ayllu** for all such major groups including those with names such as **barrio, cuartel, parcialidad**, etc. and which are usually renamings or transformations of the major autochthonous units -- however such units are often absent in small communities of less than a hundred families. Note that the precise meaning of **ayllu** is also governed by context, see Fuenzalida 1976: 235-40; the smaller units to be discussed here are also called **ayllu** in the Ayacucho region.

(7) In my opinion there is no fixed relation between the **ayllu** system and the production zone system; they are two coexisting but separate structurally coupled systems whose interactions are flexible and contextual. This contextual flexibility is fundamental for the dynamic adaptivity of Andean society, and allows for local "state determined" variability in the cultural expression of the basic Andean organizational principles. For this reason all attempts to map the two systems onto each other at a global level must necessarily be "fuzzy"; their interactions must be studied on a case by case basis. The FEF arises from the interaction of kinship principles and production zoning principles at a specific level: that of the ayllu as a kin group with a common ancestor and that of the "sector" sub unit of production zones (see Earls 1989). At higher levels of organization the two principles interact to produce the larger segmented units discussed by Murra (1975) and Brush (1974) in the way that Platt (1987) describes for the Macha and ancient Aymara groups.

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