GENERATION-SETS: STABILITY AND CHANGE, WITH SPECIAL REFERENCE TO TOPOSA AND TURKANA SOCIETIES

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Introduction

Generation- and age-set systems are found in many parts of the world. They are of particular importance in Africa, and especially in East Africa where some ethnic groups operate socio-political and cultural systems in which generation-sets play a dominant role. Ethnographic descriptions of generation-set systems abound,[1] but their theoretical understanding seems still to be inadequate.[2] With examples from the Toposa and Turkana,[3] this paper aims to contribute to the theory of generation-set systems. Moreover, the processes described and the ideas expressed may also contribute to the general theory of socio-political and cultural systems.

The main questions raised in this article are as follows:
1. What are the basic features of age-sets and generation-sets?
2. What distinguishes age-sets and generation-sets?
3. What is the demographic background of generation-sets?
4. Why and how does change in the structural lay-out of generation-set systems (or socio-political and cultural systems in general) come about? Is change a disruption of an otherwise stable situation, i.e., is it triggered by 'outside' forces, or is it an ever-active mechanism inside a given society?
5. Are there identifiable ways in which socio-political and cultural systems change from one state to the next so that structural and historical relations between existing systems can be traced?

All these questions can only be dealt with briefly and specifically in this paper. For more detailed information see Müller (1989).[4]

Demographic composition of generation-sets and their computer simulation

In all cultures, human life is divided into consecutive stages from birth to death, which we here call 'age-grades'. In our culture we distinguish infancy, adolescence, adulthood and old age. Each of these categories may be sub-divided; they may be more or less formalized, and transition from one grade to the next may be more or less marked by *rites de passage* (entrance into school, graduation, wedding, etc.).

When the entire population of a society is divided into consecutive groups of people each containing members of approximately the same age (coevals), these groups are termed 'age-sets' (cf. Radcliffe-Brown, 1929). Each age-set generally has a name of its own. The age difference inside age-sets varies in different societies and may vary between different age-sets of the same society if no fixed limits are prescribed. In the Toposa/Turkana case it varies between seven and ten years, but is most commonly closer to ten.

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[1] cf. bibliographies in Stewart (1977), Baxter/Almagor (ed., 1978), Bernardi (1985), Müller (1989).

[2] cf. Kertzer (1978). The situation expressed by Kertzer in 1978 is still much the same in 1990.

[3] Based on field research in 1982/83 among the Toposa (sponsored by the Free University of Berlin), 1986 (financed by the DAAD, German Academic Exchange Service), and 1987 among the Turkana.

[4] It should be mentioned that a good part of the present paper draws on passages from my earlier (1989) publication.

Whatever functions age-set systems may have in different societies, and whatever their *raison d'être* may be in the given circumstances of an ethnic group, they all have one thing in common: coevals are combined into individually named groups, generally through an initiation ceremony, and these groups have a consecutive hierarchy. The relative order of the age-sets does not change, but the absolute rank of each age-set increases in time, and any given age-set passes through each level of seniority during the life-time of its members. Within each group there is a strong sense of solidarity, and between age-sets there is competition and conflict as the older sets tend to emphasize their position of seniority towards the younger ones and these in turn resist their authority.

This paper deals with ' generation sets '. Age-sets and generation-sets are related to each other, as will be shown below. First, however, the basic structural principles of generation-set systems in general and of the Toposa/Turkana system in particular will need to be identified. In so doing we shall concentrate on the male sector of the population, as the data on female age-sets are still quite limited.

In all generation-set systems, there is at any one time a group of *grandfathers*, a group of *fathers* and a group of *sons*, and perhaps also a group of *grandsons*. These are mainly, classificatory terms, as it is, for example, difficult to say what ' sons ' are. Every male person is a son, and he may also be a father and a grandfather. But, if there is a fixed group of men who can, as a group, be called the ' grandfathers ', then all their sons are ' the fathers ', and all the sons of the ' fathers ' are the ' sons '. Generation-sets are groups of *brothers*, and each generation-set produces the next one, consecutive generation-sets being always in a father–son relationship. (This linear sequence may be somewhat blurred in the case where there are two or more generation-set *lines*, one inserted into each other, see below.)

As with age-sets, generation-sets are lined up, one after the other, like beads on a string, and there is a hierarchy between them. But whereas members of one age-set are coevals, this is not necessarily the case for members of one generation-set. Under the specific conditions of Toposa and Turkana societies, the age distance between sons and their fathers (*patres*) can be as much as 50 years (see below). The consequences are:

—*Grandfathers* and *fathers* may both produce children at the same time, as may *fathers* and *sons*. As a result, there may be *fathers* and *sons* of equal age or even *sons* who are older than *fathers*.

—Sons of older *fathers* may be of equal age or even older than the youngest *fathers*.

This illustrates in a simple way how intricate generation-set systems are. There will be a wide distribution of ages within any one generation-set, with the result that researchers dealing with generation-set systems have always found a considerable overlap in the age of the members of successive groups, and generation-sets seem to be a cradle of confusion. Fortunately, things become clearer when a graphic model is applied. For this purpose, a computer programme has been developed which can simulate the demography of consecutive generations in the male line. The model simulates the births of successive generations. The basic data set used in the computation is called the *Patri-Filiation Curve* and shows the difference in age between fathers and sons, i.e. how old men are statistically when their sons are born. The Patri-Filiation Curve is different for each society in the same way as marriage and other patterns influencing procreation are different.

In East African societies of the Toposa/Turkana type, procreation is not considered as a purely biological phenomenon. In practice it is not the *genitor*

but the *pater*, the social father, who counts. In most cases *genitor* and *pater* are the same person but often they are not, as in the case of illegitimate children or levirate. Thus, the Patri-Filiation Curve correlates the ages of *social* fathers and their sons (who may continue to be born after the social fathers are dead).
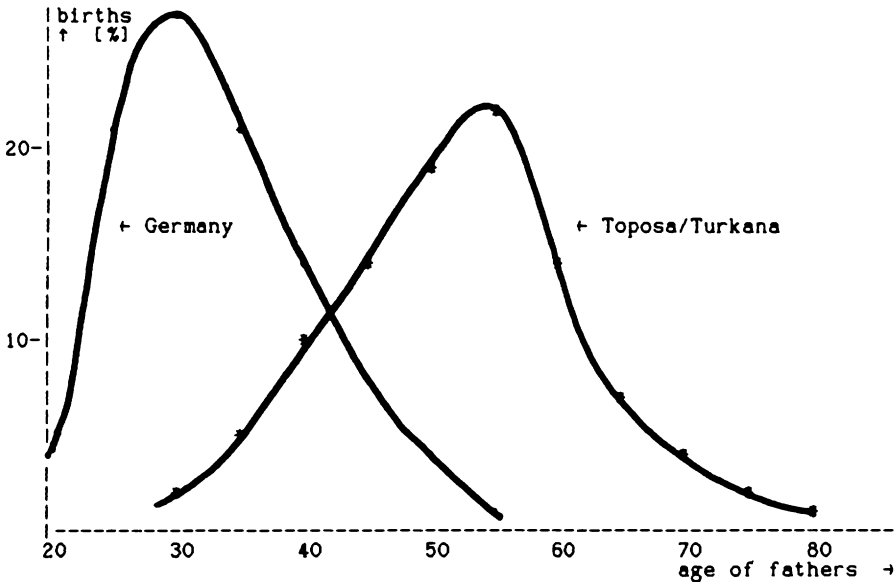

FIG. 1.   Patri-Filiation Curve: Federal Republic of Germany and Toposa/Turkana.

Fig. 1. shows the different procreation patterns of Europeans and Toposa/ Turkana. Europeans marry early, most children are born when fathers are aged about 30, and only a few men have children beyond 50. Toposa and Turkana marry later, and children are generally not born before fathers reach 30. Most children are born when their fathers are aged around 50, as this is normally the time when a man has acquired enough wealth to sustain a bigger family and to marry more young wives. If he becomes too old to fulfil his marital duties he may call in a relative or tolerate a lover. By the institution of levirate, procreation continues up to the age—or rather, in case the social father is already dead—' age distance ' of 80 years between social father and son.

The simulation model requires two inputs: the Patri-Filiation Curve and, as a starting point, the demographic composition of the first generation which is, however, of minor importance as it is soon (after a few generations) outweighed by the impact of the Patri-Filiation Curve. The simulation itself is quite simple: with

X_f (for $f = f_l$ to f_f) = years of births, fathers,
Y_f (for $f = f_l$ to f_f) = number of births, fathers, in years X_f,

X_p (for $p = p_l$ to p_p) = ' age of fathers ' in Patri-Filiation Curve,
Y_p (for $p = p_l$ to p_p = number of births at ages X_p of fathers,

X_s (for $s = s_l$ to s_s) = years of births, sons,
Y_s (for $s = s_l$ to s_s) = number of births, sons, in years X_{fs},
the algorithm is basically as follows:

For all s_l to s_s: $Y_s = Y_f × Y_p$ (for $f = f_l$ to f_f and $p = p_l$ to p_p), i.e., men born in a certain year X_f cause births in years X_s. This is calculated for all years X_f and

all resulting Y_s in equal years are totalled up. Thus, the first generation procreates in the form of the Patri-Filiation Curve thereby creating the second generation, which again procreates in the form of the Patri-Filiation Curve, and so on.

All Patri-Filiation Curves are bell-shaped, and so too are the birth curves of male generations. Various generation sequences have been computed (see Müller, 1985), and in principle they all look the same (see fig. 2).
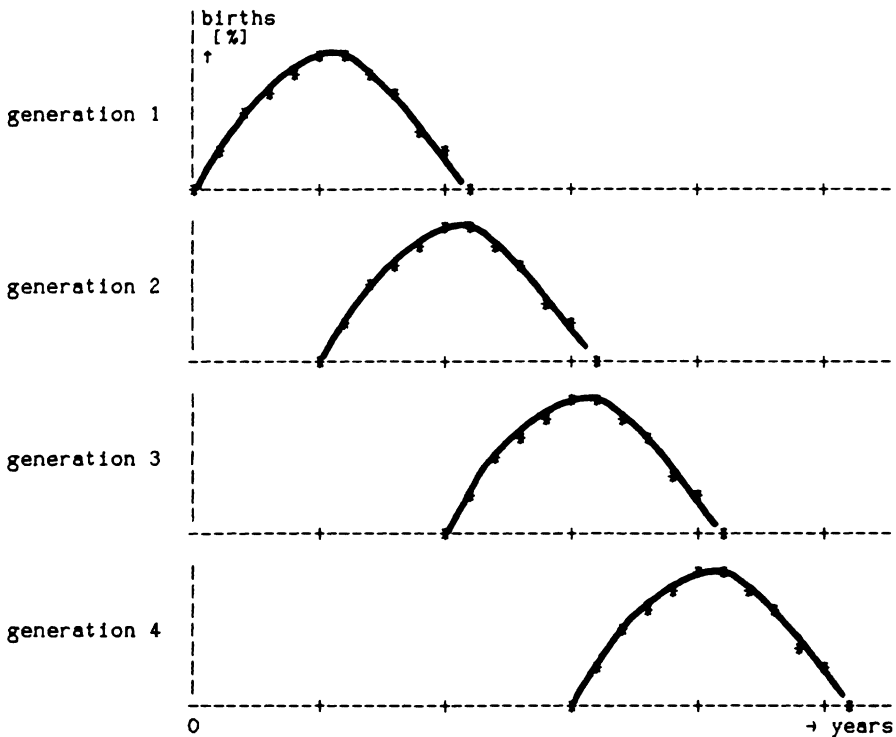

FIG. 2. Computer simulation of consecutive generations (births) (schematic display).

The pattern of generation sequences as displayed in Fig. 2 is, of course, known. As early as 1928, Lotka had calculated generation sequences in a mathematical way, and Stewart (1977) as well as Spencer (1978) present similar diagrams. Lotka's and Stewart's calculations are based on USA data, however, which renders their results inadequate for the present purpose. Spencer's 1978 article has been a major incentive for this study.

What varies the most between generation sequences of different societies is (1) the duration of generations, depicted in the breadth of each curve at its base, and (2) the extent of overlap in ages between adjacent generations, seen in the overlap of curves on the time axis. Two results of general relevance are:

1. The distance between consecutive generation, i.e., the mean age-distance between fathers and sons, is about 30 years in European societies but about 50 years in societies like the Toposa and Turkana. This can be seen without further computation in the Patri-Filiation Curves. The generation distance is the mean value of the respective Patri-Filiation Curve. The generation distance can also be seen in the birth curves where it is the distance between equivalent points in each curve, e.g., the distance between the respective maxima (see below fig. 4.).

2. Consecutive generations overlap each other and this overlap increases over the years, though rather slowly (for details see Müller, 1985). Generation-set systems tend to be stable in this respect, and they do *not* automatically break down because demographic inadequacies (which has often been assumed in the relevant literature; cf. Müller 1985.)

In general, generation-sets are divided into age-sets. The reason for this is quite clear: within any generation-set, there is a broad spread of ages, with very old and very young members alive at any one time. For everyday life, they assemble themselves into groups of coevals, i.e., age-sets. As the generations overlap in age, men of the same age are in both generation-sets (dotted sections in fig. 3). As a result there may be, for example, two age-sets of men aged 40: one in generation-set 1 and one in the following generation-set, 2. This can be shown schematically as in fig. 3 (age-sets a, b, c . . . are indicated by vertical lines).
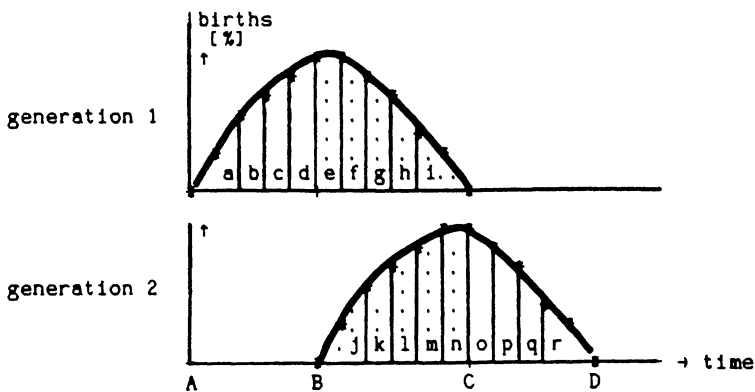

FIG. 3. Age-sets inside generation-sets.

It should be mentioned, however, that the limits between age-sets are not as clear-cut as they might seem to be in this model. Age-set membership is not exclusively a matter of age, and thus there may be some overlap in the age of members of adjacent age-sets.

The model displayed here may be taken as describing a basic type of generation-set system. It is not merely an academic reduction but can be found in East African societies such as Toposa, Dodos, Jie, Turkana, and others. The traditional political system of these societies is decentralized, i.e., there is no fixed leader, and power is shared amongst the group of elders of the leading generation-set.

There are other societies in East Africa with generation-set systems which have a hereditary political leadership, as in the 'Gada' systems. Their generation-set systems display considerable variation from the basic type outlined here. They can to some extent also be explained in terms of our model (see below).

Stability and change in generation-set systems

As an example, the simulation of Toposa generations[5] (births) will be illustrated (see fig. 4). All generations have been combined into one diagram.[6]

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[5] With a few exceptions, Toposa and Turkana social generations (see above) are identical with their generation-sets, so that with a very small degree of inaccuracy the two terms ' generation ' and ' generation-set ' can be used interchangeably.

[6] In fig. 4, the first births of each generation occur approximately 50 years after the first births of the preceding one. According to the Patri-Filiation Curve, births can already be expected after 30 years, which assumption is correct; there are, however, only a few cases of this sort, they are statistically irrelevant and thus do not feature in the diagram.
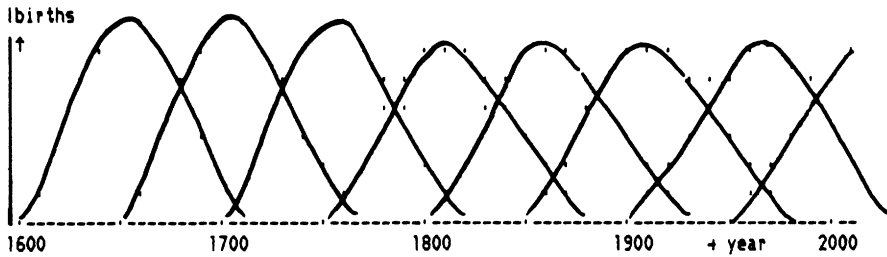
FIG. 4. Toposa generations (births)—computer simulation.

Figure 4 covers a period of 400 years. Within this period the duration of generations and their age overlap increases, but rather slowly. In the first generation, members are born throughout a period of 110 years, while the births of the sixth generation cover a time span of 130 years. This increase is not insignificant and may lead to consequences, but certainly not to the general breakdown of the system.

This raises the question of why different theories have been put forward on this issue, and why so many authors have assumed ' malfunctioning '[7] and the eventual breakdown of the generation-set systems in question. First, some authors[8] have postulated an incorrect generation distance of around 30 years— in reality its length is, however, between 50 and 55 years, as stated by Spencer (1978: 146) and as shown in the model presented here. It is, of course, not surprising that malfunctioning and inevitable breakdown of generation-set systems has to be predicted when basic assumptions concerning their demography are wrong. Secondly, it has been widely assumed that the existence of ' over-aged ' members in a generation-set system must be a considerable stress for the society concerned (cf. Spencer 1978: 139 ff.). The ' over-aged ' are those who are born early in a generation, at the same time as there are still children of the preceding generation being born. In the context of the generation-set system, the ' over-aged ' are always ruled out by equally aged or even younger men of their fathers' generation. However, in the process of transmitting the power from the leading generation-set to their potential successors, the ' over-aged ', in my opinion, play an important role, and they are by no means social misfits, even if they may individually feel as if they are.

Transmission of power from the leading generation-set to the next is always a critical moment in societies of the Toposa/Turkana type where the moment of succession is not laid down. This can also be put the other way round: no fixed-time intervals after which succession takes place need be laid down as the transmission of power is regulated by the changing demographic balance between the two groups. For the benefit of the society, it must be ensured that the succession takes place before the members of the ruling generation become too old and too few for satisfactory common action. As they are reluctant to retire from their position, someone has to force them out. It is at this point where the ' over-aged ' play their role. Of course, some of them die of old age even before their generation-set has reached the highest status. But the number of over-aged men increases, i.e., there are more and more elderly and wealthy men of the succeeding generation who, at a certain point, are strong enough to force their fathers, few and old as they are, to retire. Hence it can be said that the over-aged do not reflect a malfunctioning of the generation-set system but, quite the contrary, ensure its functioning.

[7] Dyson-Hudson (1963: 389).
[8] e.g. Peristiany (1951: 296), Jensen (1954: 12), Dyson-Hudson (1963: 359), Gulliver (1953: 148).

Stating that generation-set systems are stable from a demographic point of view does not mean that they do not change. Stable systems have to be flexible, otherwise they would break down; a lesson which can be learned from systems theory.[9] In fact, the lay-out of generation-set systems changes a great deal, and two examples will be given below. When we do not erroneously attribute changes in generation-set systems to non-existent deficiencies in their demo-graphic structure, we are able to examine their real causes, and we may discover, as I shall propose, that they react in an astonishingly flexible way to forces external to the system and processes within the society concerned. It may be even more satisfactory to express this the other way round: a generation-set system of the Toposa/Turkana type does not impose arbitrary rules on people but adapts itself to circumstances already given. The agents in these processes are of course the people who constitute the system by their actions.

Two examples: the Toposa and the Turkana

The Toposa and the Turkana are two predominantly pastoral people inhabiting the very south-eastern region of Sudan (Toposa) and the north-western part of Kenya (Turkana). Because of the very low rainfall, which is also localized and unpredictable, they are forced to be highly flexible in order to exploit the restricted and locally variable ecological resources. In the Turkana case especially, where environmental conditions are even harsher than they are for the Toposa, people have to be highly mobile, and even families split up in order to meet the different needs of their animals. In the dry season, part of the family may remain in the hot plains with their camels and goats while the remainder have to find grass for their cattle and thus migrate to the mountain ranges. The people's social structure has adapted itself to these circumstances, and it seems that an age-set or generation-set system is a flexible framework well capable of meeting the needs of a changing and spontaneous social organization (cf. Gulliver, 1958). Furthermore, it also seems to me that the generation-set system does not have a rigid organizational structure and does not prescribe social behaviour according to a set of fixed rules, but is in itself an outcome of the social process and the actual need for organization.

It has, for example, been argued by Gulliver (1963) and Tornay (1986) that initiation is only the ritual confirmation of a change of status already achieved by the individual.[10] In actual fact, young Toposa and Turkana men 'initiate themselves' informally by spearing their first animal. In the same way, the generation-set system confirms and uses ordering principles which existed prior to itself: generation-sets are based on the natural succession of generations, and age-sets are based on the formal recognition of existing cliques, i.e., bands of youths of approximately the same age.

The actual organizational lay-out of Toposa/Turkana generation-sets may be easily changed because of several factors:

1. Generation and age-sets are formalized groups, but the processes in which they participate (e.g., discussions and the formation of opinions) are similar to those in informal groups (see Spencer, 1965: 183, and Homans, 1950) and thus highly flexible.

2. Because of the systems' decentralized structure, opinions on certain topics may diverge locally. Individual elders always try to keep the way free for their

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[9] cf. Luhmann (1987: 554).
[10] ' The ritual events tend to set a seal on an already achieved change' (Gulliver, 1963; 46, for the Arusha), and ' Les hommes s'initient eux-mêmes en sacrifiant du bétail, des ennemies. Les rites, *asapan* ... sont pas de l'ordre de l'initiation, mais de la *confirmation*' (Tornay, 1986: 87, for the Nyangatom).

own decisions, and the 'council of elders' may thus often be a forum for *not* taking binding decisions (Jean Brown's paradox, for the Turkana, in Brown, 1979).

3. There are no central institutions, either internal or external, which control processes inside the generation-set system. Each actor knows only as much about the system as he is likely to need. As there are no codified regulations concerning the system, *ad hoc* decisions which are 'wrong', i.e., which differ from the normal procedure unknown to the actor concerned, may alter the system partially.

With the insight that it is the actors themselves who react to the given circumstances, some generally-posed questions become obsolete, such as the question of who controls the generation-set system, and the need to find a supervising or central institution such as a specific clan or a territorial section vanishes.

Let us now examine how changes took place in the Toposa and Turkana generation-set systems. (In the study which this article is based on (Müller, 1989), I have backed up my field research by computer simulations of the demographic processes connected, but here I shall refrain from overloading this text with computer diagrams.)

Toposa recall their generation-sets as set out in fig. 5.

Formerly, Toposa generation-sets succeeded each other in a single line, but around 1880 the Toposa generation-set system faced a considerable change to its structural lay-out when the generation of sons of Ngitukoi broke apart. Originally, they were all called Ngimor, but then the younger brothers broke away calling themselves Nguwana. The reason for this separation is still unclear—all that I came across was a 'standard explanation'[11] for internal quarrels: it was said that a fight over meat had taken place between the older and younger members of the set. In any case, whatever the real cause was, after
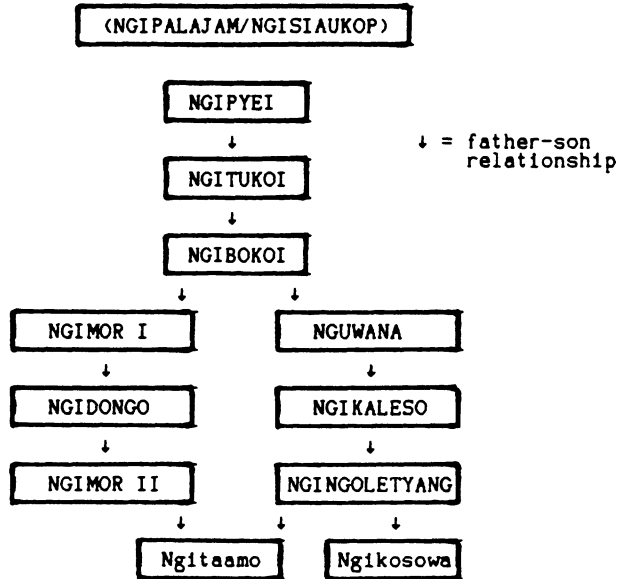

FIG. 5. Toposa generation-sets.

[11] c.f. Lamphear (1976: 29).

heavy fighting between the two groups, the division established itself and was accepted by their fathers, the Ngibokoi. The friction between the two groups must have been much greater than the usual tensions which lead to an age-set of youngsters forming and breaking away from their older brothers. Ngimor (I) and Nguwana were still looked on as brothers but were so estranged from each other that they even gave their children's generation sets different names. The children of Ngimor (I) were called Ngidongo, while Nguwana called their children Ngikaleso. Thus two *generation-set lines* were created. The separation continued into the next generation: with Ngimor (II) on the one side, and Ngingoletyang on the other. At present, it is still not quite clear whether the separation of the two generation-set lines will be maintained. Ngimor (II) have named their children Ngitaamo, and Ngingoletyang, the younger brothers of Ngimor (II), seem yet undecided as to whether their children should also receive the name Ngitaamo or, continuing the break, Ngikosowa.

In the Turkana generation-set system, changes have taken place in quite a different way—Turkana recall their generation-sets as shown in fig. 6.

At the beginning of the eighteenth century, young Jie (western neighbours of the Turkana) migrated down the Rift Valley escarpment. As the separation from their people became permanent, they became the core group of what is nowadays called 'Turkana'. They were probably called Nginya. The next generation, called Ngipyei, started to expand their territory outwards. Driven by a devastating drought, part of the Ngipyei moved eastwards to the lake region, evicting and incorporating other ethnic groups and acquiring camels, most probably from the Rendille. They were able to build up their herds again, but this process must have taken a long time, during which most households could not afford to give away animals for bridewealth. (It has to be mentioned how essential the distribution of bridewealth animals is to enable a man to build up his support network. For this reason, it would not have made sense to lower the bridewealth.) This particularly affected the young Ngiputiro who were reaching the age where they would otherwise have been getting married and
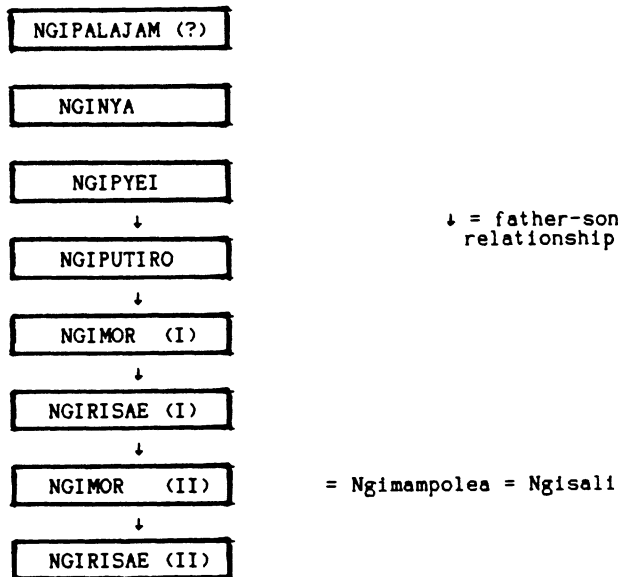

FIG. 6. Turkana generation-sets.

establishing their own families. The women were still there though, and in this situation many Ngiputiro established 'illegal' families and had children without waiting until a bridewealth was ready.

In the societies under consideration each child always has a social father, even if the physical father is not known. If a child is born outside a legal marriage, the social father is held to be the mother's father, that is, the child's biological grandfather. When the child is a boy, he takes his generation-set membership from his social father, which means that he joins the generation-set succeeding the latter's. Illegitimate sons may thus be members of the same generation-set as their physical fathers (where they are of the same generation as the mother, which is not necessarily so) and ranked one generation-set higher than their legitimate brothers. This leads to an increase of overlap in ages between consecutive generations.

For the Ngiputiro who illegally set up family with the daughters of Ngipyei, the somewhat paradoxical situation arose, that the sons born were counted as sons of Ngipyei—thus Ngiputiro had produced Ngiputiro. After things had recovered, and bridewealth animals were again available and legal marriages were possible, legitimate sons of Ngiputiro were born who then became a new generation-set called Ngimor (I). This may be better illustrated by a diagram (see fig. 7).

The first of the Ngiputiro were illegally married, and their sons were also called Ngiputiro. The Ngiputiro who married legally had sons who were called Ngimor (I). Biologically Ngiputiro (IS) and Ngimor (I) were on the same genealogical level, but their status in the generation-set system was different: Ngiputiro (IS) were one step higher than Ngimor (I). This paradox continued into the following generations. The result was a considerable overlap in age between members of consecutive generation-sets.

By some point around 1850, all the 'original' Ngiputiro, i.e., the sons of Ngipyei, had died out, but the Ngiputiro who were physical sons of the original Ngiputiro were, although old, still about in large numbers. At the same time the generation-set of Ngimor (I) had reached the status where it would under
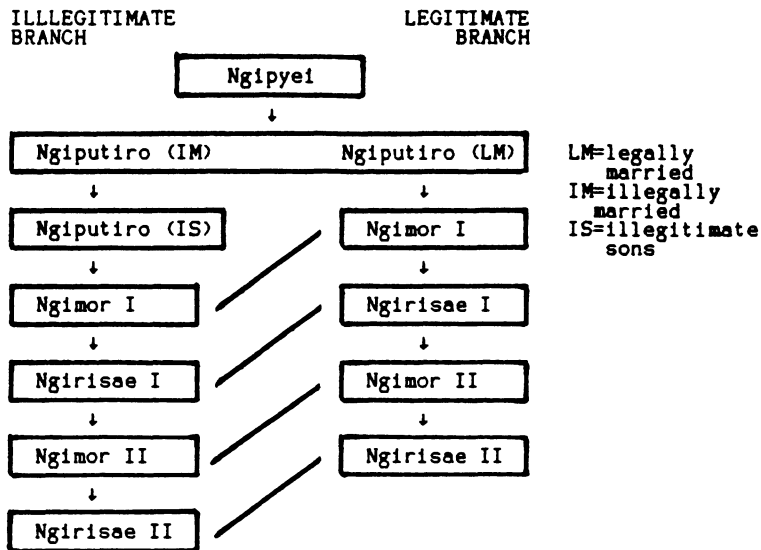

FIG. 7. Turkana generation-sets, legitimate and illegitimate branches.

normal circumstances have become the leading generation-set. However, their way was blocked by the remaining Ngiputiro who, although illegitimate, were nevertheless strong, and held the higher status in the generation-set system. Physically, Ngimor (I) were 'brothers' of Ngiputiro (IS), but they were deprived of the elders' privileges by a rule which in this case gave those privileges to the illegitimate.

Eventually the situation must have become intolerable, and sometime around 1870 to 1880 it resulted in the remaining Ngiputiro deciding to share their privileges and ritual power with Ngimor (I). The most common manifestation of the generation-set system was altered accordingly: the Ngiputiro decided that they would have their meat feasts together with Ngimor (I).

Two factors had changed the Turkana generation-set system considerably: first, the increased overlap between generations caused by the large numbers of illegitimate sons in the Ngiputiro generation. Second, and in reaction to this, the experience of two nominally successive generation-sets sharing power diminished the importance of generation-sets generally: all elders now had access to power and meat, regardless of their generation-set.

When at the beginning of this century the British colonized the Turkana, a simple method often used to break resistance was to take away large numbers of animals. In the case of the 1918 Labur Patrol especially, this was the cause of considerable suffering amongst the Turkana. In addition to this, what cattle were left then died from a cattle disease which struck in 1919. This lack of stock must have again lead to a large number of illegitimate children and exacerbated still further the overlap of ages between the generation-sets. Again, in 1934, there was a severe drought which deprived the Turkana of up to three-quarters of their herds. In this situation the whole system of initiations, generation and age-sets must have collapsed. Nowadays, we can find a great variety of different forms of the Turkana generation-set system. In the north in particular, the generation-set system has survived in its ' traditional ' form, while the increasing overlap of ages between adjacent generation-sets has led to a total overlap in the ages of the generation-sets in some parts of southern and central Turkanaland. There, the number of elders in Ngimor and Ngirisae has become almost equal. In some places, members of Ngimor and Ngirisae are even initiated into common age-sets. Here, the former generation-set system has developed into an age-set system with a dualistic ' moiety ' aspect.

Change and structural relations

Two examples of change in a generation-set system have now been presented, if with an attempt to show why and how these changes came about. Thus among the Toposa, current conditions had changed in such a way that tensions between two groups of the male population, the older and the younger part of the Ngimor (I) generation, had become unbearable. The generation-set system offered a way of resolving this problem without affecting the society as a whole. Tensions within a group were removed by dividing it. This mechanism did not need to be invented for the purpose—it is used generally to resolve tensions: age-sets are formed in this way, by the younger part breaking away from the older.

In the Turkana example, conditions had changed in a different way. Not internal conflict but stress from without was the triggering force in this case. Extensive loss of animals resulted in the proliferation of illegitimate children and thus in a change to the structural background of the generation-set system. The increased overlap in ages between generation-sets produced a situation where the seniority principle became over-worked: the elders faced too many

men of equal age. That it was illegitimates who ruled over legitimates only added insult to injury. This situation could not be resolved by the system's usual mechanisms, and so the Ngiputiro consciously changed the system. The consequences of this action can still be seen today, in that the Turkana generation-set system is gradually changing into an age-set system.

This change is not unique; it can also be detected among the Labwor. Abrahams (1978) describes the Labwor system as an age-set system with two alternations where sons always belong to the alternation opposite to that of their fathers. The Labwor system is, however (as is also, indirectly, the Turkana one), adapted from the Jie generation-set system. This shows that generation-set systems may lose, under certain circumstances, their generational aspect and develop into purely formal dualistic systems. It also poses the question whether other dualistic systems (see Jensen, 1953) may not also be local remnants of a previous generation-set system.

The Toposa example illustrates another possible line of development in the lay-out of generation-set systems, which may be displayed schematically in diagram form (see fig. 8).

The starting point is the basic lay-out of a generation-set system as represented by the Toposa system in the eighteenth and nineteenth century (generation-sets A and B). The system then divides into two generation-set lines

<pre>
A   1 generation-set line
↓   (basic system)
B
↓
C1 → C2   2 generation-set lines
↓   ↓   (Toposa, Konso)
D1   D2
↓   ↓
E1   E2 → E3   3 generation-set lines
↓   ↓   ↓   (Dasanec)
F1   F2   F3
↓   ↓   ↓
G1   G2   G3 → G4   4 generation-set lines
↓   ↓   ↓   ↓
H1   H2   H3   H4
↓   ↓   ↓   ↓
I1   I2   I3   I4 → I5   5 generation-set lines
↓   ↓   ↓   ↓   ↓   (Boran)
K1   K2   K3   K4   K5
↓   ↓   ↓   ↓   ↓
L1   L2   L3   L4   L5
↓   ↓   ↓   ↓   ↓
...   .
</pre>

<pre>
──→ I1 ──→ I2 ──→ I3 ──→ I4 ──→ I5 ──┐   Baxter's "time worm" of 5
   ┌─────←───────←───────←──────←──┘   generation-set lines
   └─→ K1 ──→ K2 ──→ K3 ──→ K4 ──→ K5 ─┐
      ┌────←───────←───────←──────←──┘
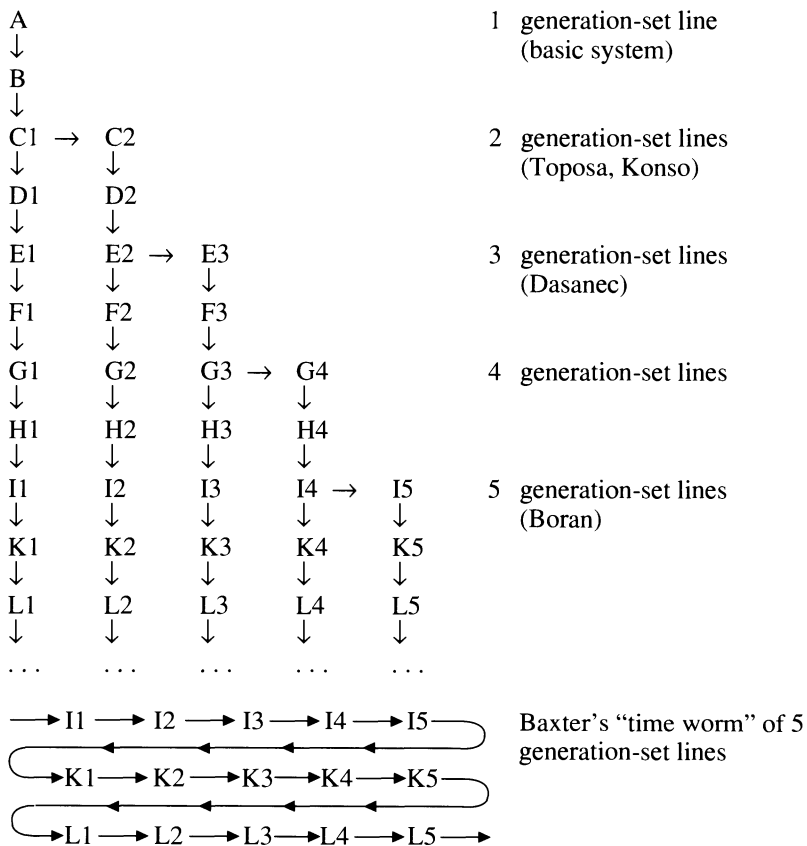   └─→ L1 ──→ L2 ──→ L3 ──→ L4 ──→ L5 ──→
</pre>

Fig. 8. Modification of generation-set systems by fission.

(C1/C2, etc.). We have seen how this division took place among the Toposa. But what happened once could also have happened twice or more, splitting up the generation-set system into three or more generation-set lines.

Two generation-set lines can also be found among the Konso (Hallpike, 1972), and the Dasanec provide an example of a system operating with three generation-set lines (Almagor, 1978*a,b*). Even the *gada* system of the Boran which has always been a puzzle to social anthropologists (Legesse, 1973; Baxter, 1978), could be explained in these terms, as a system of five generation-set lines all inserted into each other. That this is not purely a researcher's fantasy is evidenced by the fact that the Boran themselves have the notion of generation-set lines; they call them *gogesa*. Baxter's 'time worm' (1978: 158) is just a different way of displaying part of fig. 8. Inside each generation-set line the first basic principle of generation-set systems (a man always belongs to the set which follows that of his father) is maintained. Thus, astonishingly enough, even such intricate systems as the *gada* operate with basically the same principles as comparatively simple ones such as those of the Toposa—although the introduction of fixed-time intervals brings the former system an additional quality which cannot be discussed here.

Summary and conclusions

In brief, the five questions raised at the beginning can be answered as follows:

1. The basic feature of age-sets is their coevality, i.e., people of approximately the same age are grouped into units succeeding each other in time and seniority. The basic feature of generation-sets is genealogic equality. Every person is, by birth, a member of the group succeeding the one of his father. This basic principle does apply to all generation-set systems. In some cases it is blurred, however, by the fact that two or more generation-set lines are inserted one into each other.

2. Criteria for forming age-sets and generation-sets are different: age and generation. Age-sets house coevals per definition while the span of ages within one generation-set may be quite considerable. Thus, the analysis of generation-sets must be qualitatively different from that dealing with age-sets.

3. Generation-sets overlap each other on the time axis in the form of bell-shaped curves. The amount of overlap is fairly stable in time; it does, however, lead to certain consequences and is responsible for the dynamic qualities of generation-set systems.

4. Why and how the Toposa and Turkana have changed their generation-set system has been described. The examples given are certainly not applicable to other societies in a direct way, but they may show in an exemplary way how people are not bound by a socio-political and cultural 'structure' but create and shape that structure according to their needs. Generation-set systems are able to channel tensions within a society by dividing opposing groups (the Toposa example). In case of need, groups may also be united (the Turkana example). Thus it can be said that in the Toposa/Turkana case the organizational lay-out does to a certain degree reflect the society's state and condition. As conditions inside the society change, its organizational lay-out may change also. Triggering inputs may come from 'inside' or 'outside' the society concerned.

5. A comparative study of East African generation-set, age-set and dualistic systems may be able to reveal how these systems are connected, whether through common origin or cultural borrowing, or whether they are merely accidentally similar for structural reasons. In any case, the current lay-out of

these systems may have involved a process of the kind described in this paper whereby basic models developed into the present variety of systems.

REFERENCES

Abrahams, R. G. 1978. ' Aspects of Labwor age and generation grouping and related systems ', in *Baxter and Almagor* (ed.), 37–68.

Almagor, Uri. 1978(*a*). *Pastoral partners: affinity and bond partnership among the Dassanetch of South-West Ethiopia*. Manchester: Manchester University Press.

Almagor, Uri. 1978(*b*). ' Gerontocracy, polygyny and scarce resources ', in La Fontaine (ed.), 139–58.

Baxter, P. T. W. 1978. ' Boron age-sets and generation-sets: Gada, a puzzle or a maze? ', in *Baxter/Almagor* (ed.), 151–82.

Baxter, P. T. W. and U. Almagor (ed.) 1978. *Age, generation and time: some features of East African age organizations*. London: Hurst.

Bernardi, B. 1985. *Age class systems*. London: Oxford University Press.

Brown, E. J. 1979, *Turkwell Gorge Multipurpose Project: socio-anthropological survey*. Feasibility Study, for Republic of Kenya, Ministry of Water Development (Norconsult A.S.).

Dyson-Hudson, N. 1963. ' The Karimojong age system ', *Ethnology*, II/3: 353–401.

Gulliver, Ph. H. 1951. *A preliminary survey of the Turkana*. (Report compiled for the Government of Kenya.) University of Cape Town, School of African Studies, New Series, no. 26 (repr. 1963).

Gulliver, Ph. H. 1953. ' The age-set organization of the Jie tribe ', *Journal of the Royal Anthropological Institute*, 83: 147–67.

Gulliver, Ph. H. 1958. ' The Turkana age organization, *American Anthropologist*, 60: 900–22.

Gulliver, Ph. H. 1963. *Social control in an African society: a study of the Arusha, agricultural Masai of Northern Tanganyika*. London: Routledge & Kegan Paul.

Hallpike, C. R. 1972. *The Konso of Ethiopia: a study of the values of a Cushitic people*. Oxford: Clarendon Press.

Homans, G. C. 1950. *The human group*. London: Routledge & Kegan Paul.

Jensen, A. E. 1953. ' Dual-Systeme in Nordost-Afrika ', in *Anthropos*, 48: 737–59.

Jensen, A. E. 1954. ' Das Gada-System der Konso und die Altersklassensysteme der Niloten ', *Ethnos*, 19: 1–23.

Kertzer, D. J. 1978. Theoretical developments in the study of age-group systems ', *American Ethnologist*, 5: 368–74.

King, G. R. 1937. ' The Topotha ', in *Nalder* (ed.), 65–81.

La Fontaine, J. S. (ed.) 1978. *Sex and age as principles of social differentiation*. London: Academic Press.

Lamphear, J. 1976. *The traditional history of the Jie of Uganda*. Oxford: Clarendon Press.

Legesse, A. 1973. *Gada: three approaches to the study of African society*. New York: Free Press.

Lotka, A. J. 1928. ' The progeny of a population element ', *American Journal of Hygiene*, 8: 875–901.

Luhmann, Niklas. 1984. *Soziale Systeme: Grumdriß einer allgemeinen Theorie*. Frankfurt a. M.: Suhrkamp.

Müller, H. K. 1985, *Alter und Generation: Generationsklassen-Theorie und demographische Hintergründe am Beispiel der Toposa, Südost-Sudan*. Berlin.

Müller, H. K. 1989. *Changing generations: dynamics of generation- and age-sets in southeastern Sudan (Toposa and northeastern Kenya (Turkana)*. Saarbrücken and Fort Lauderdale: Breitenbach.

Nalder, L. F. (ed.) 1937. *A tribal survey of Mongalla Province*. London: Oxford University Press (repr. 1970 by Negro Universities Press, New York).

Peristiany, J. G. 1951. ' The age-set system of the pastoral Pokot ', *Africa*, 21: 188–206, 279–302.

Radcliffe-Brown, A. R. 1929. ' Age-organization—terminology ', *Man*, 29, no. 13.

Spencer, Paul. 1965. *The Samburu: a study of gerontocracy in a Nomadic tribe*. London: Routledge & Kegan Paul.

Spencer, Paul. 1978. ' The Jie generation paradox, in *Baxter/Almagor* (ed), 131–50.

Stewart, F. H. 1977. *Fundamentals of age-group systems*. (Studies in Anthropology.) New York, London: Academic Press.

Tornay, Serge. 1986. ' Une Afrique démasquée. Initiation et sacrifice chez les pasteurs d'Afrique orientale ', in eentlivres, P. and J. Hainard ed.): *Les Rites de passage aujourd'hui*. (Actes du colloque de Neuchâtel, 1981.) Lausanne: Editions L'Age d'Homme.

Tornay, Serge. 1989. ' Un système générationnel. Les Nyangatom de l'Éthiopie du sud-ouest et les peuples apparentés. ' (Thèse d'État, Laboratoire d'ethnologie et de sociologie comparative, Université Paris X, Nanterre.)