Worlds in Mind: the Experience of an Outside World in a Community of the Finisterre Range of Papua New Guinea

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ABSTRACT

This paper deals with how the Yupno's mental image of proper settlement patterns has been changed through the experience of an 'outside world'. The Yupno inhabit a rugged, extremely remote, mountainous region of the Eastern Finisterre Range in the Madang Province of Papua New Guinea. Teptep is the administrative centre. The region is one of the last unexplored areas of Papua New Guinea. The old Yupno grew up in an isolated world, which was bounded both externally (they knew only their own valley) and internally (the fenced-in dwelling house was the centre of the settlement structure). After the Second World War, however, the valley was 'opened': schools were established and some younger Yupno left their valley to visit the cities of Madang and Lae. This experience of the 'outside world' changed the mental image of their own settlement territory. When asked to draw their own area, i.e. to externalise their mental image in the sense of Piaget, the Yupno without 'outside'-experience (the old men and the children without school education) drew a closed, usually oval world with the Yupno river at its centre (the valley as the 'world'), whereas those who had 'outside'-experience drew an open, rectangular map laden with details.

OUTER LIMITS

In the traditional Yupno view, the world consists of three levels of earth and stones, each lying on top of the other. The lowest, subterranean layer is scarcely known. Of the topmost level, the 'upper place', however, the following is known: the ground is slightly vaulted (concave). Stones sit in the soil here and there. Two of them are very large and can move. All the others are small and stationary. The 'upper place' is the sky. The 'two large moving stones' (*tip mbamot madipnda akin*) are sun and moon, the 'small stones, which just simply are there' (*tip monjinda toñ*) are the stars. The middle region is where the Yupno live. They themselves live at the centre, whereas the neighbouring ethnic groups live at the periphery.

All three levels form an oval, surrounded by water. The topmost level, the sky, is concave like the upper part of a house; its edges lie on the water. The water which surrounds the middle level partly touches the edge of the sky, partly clashes with the ground of the middle level, and this is how the waves of the sea come into being. The Yupno know only the northeastern part of the water which surrounds them, the coast of Saidor (cf. map 1). In the traditional way of seeing things no Yupno had ever seen the other parts, since the access had always been barred by hostile neighbouring peoples. The
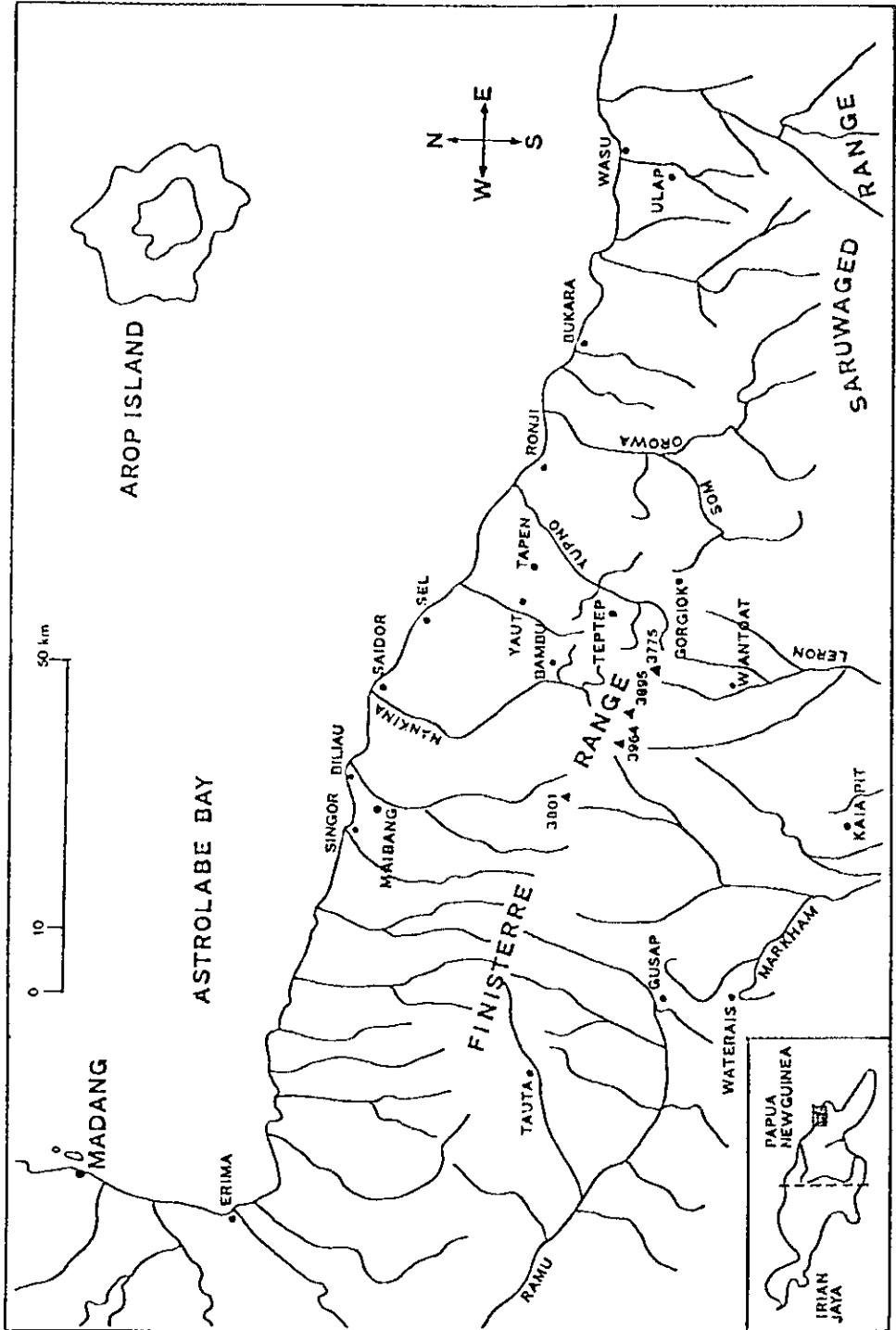
MAP 1: THE FINISTERRE RANGE

three-layered world lies as if 'in a wooden bowl filled with water' (*mpagmbe erap*). And it is from the water that wind and coldness approach. As a whole, the three layers of the world are 'hanging in a large tree'. When Morap, the creator figure, shakes this tree, he causes earthquakes and landslides.

Men live in all three regions of the world. Nothing certain is known about the people of the 'subterranean' world. The 'upper place', the sky, is the region where Morap, the creator figure, 'the one who dwells in abundance', lives together with the survivors of an ancient big flood of the Yupno river. These survivors reappeared in 1928 in the Yupno Valley as 'white men' in the guise of the missionaries K. Saueracker and W. Flierl (Wassmann 1992). The middle region is the place where the Yupno live, in a valley created by Morap, which lies at its centre.

Morap made the whole three-layered 'world' and thus caused the rise of man. Morap is a figure aloof from the everyday life of the Yupno. The only thing that makes him assume a definite form is his identification with the source of the Yupno river, indeed with the river itself. Morap is the Yupno, 'the one who washes ashore everything and deposits it on the banks'. He is the one who created man. The big flood, which had killed almost all of the former population (the rest of whom later returned as the 'whites') had washed down from the source some bamboo of the species *teet* and *kausa*. He deposited all on the banks, often far away from the present course of the river, because its water was dammed up by the gorges below Tapmañge (the place where the Yupno river meets with the Kewieñ river) and below Urop (the place where the Daldal river flows into the Yupno river). Everywhere, the first bamboo plants originated from the bamboo canes washed ashore. Later, the canes split up and two people sprang from each cane: the ancestors of two related clans. In those places grew the bamboo groves still visible today. And there, both ancestors of two clans built their men's house around which the houses of the two clans were to be grouped.

The present-day Yupno territory includes the whole valley, and the villages are situated, as a rule, on mountain ledges in the adjacent valleys. Three mountain crests (literally 'fences', *naal*) constitute the borders on three sides. The fourth borderline, towards the East, is formed by the last big gorge of the Yupno before the sea. The Yupno river is the centre of the area. It is the 'vital nerve': it is Morap. A finer structuring is effected by the tributary rivers: the Kewieñ, 'the one that grinds down the stones', the Daldal, 'the one that rubs itself on the stones' and the Tsetset, 'the one that is bilaterally split' (part of it flows the opposite direction into the Nankina Valley) (cf. photo 1).

Thus, the area of the Yupno valley, dominated by the river, is closed in by the mountain ridges, on the other sides of which live 'other people'. A proper noun for the Yupno does not exist. The term 'Yupno' had been introduced by the mission with reference to the river name and was taken over by the administration in the form of 'Yupna'. The 'other people' were known. The *Gwamak*, 'those who are as shy as a tree kangaroo' used to live to the north ('left side': when the Yupno speak of orientation, they think of a man looking downstream, i.e. east), in the valley which the administration and the mission today call Nankina after the river of the same name (cf. Keck 1992b). At the lower course ('in front'), the *Tap amin* followed, 'the people from the shore'. Only occasional direct contacts were established with them, mostly because the path down along the Yupno was blocked by hostile villages. They knew, however, of the island near the coast, Nomsa (Arop or Long Island), 'the thing which rises like a fern stalk from the sea'. The Yupno supposed that the islanders didn't have enough room for gardens and houses on their island, which looked so small in the distance, and that they were therefore

Photo 1

forced to carry their belongings with them: 'the people who have a terrible mess with their belongings in their houses (canoes)' (*kovan taap yut amin*). To the west ('behind'), lived the *Alip*, the 'naked asses' (today: Wantoat), so-called, because they used to be naked in former days. They were considered to be 'uncivilized'. From the *Alip*, the Yupno had learned that there was a big valley further to the south-west (Markham Valley), and that there the *Kanam nok*, the 'raw eaters' lived. They had not seen this valley with their own eyes, but the *Kanam nok* were feared as man eaters. Finally, in the south ('right side') of Yupno lived the *Yawan*, 'those who speak indistinctly, who mumble'.

A survey of the whole territory makes it clear that the Yupno hamlets had contact only with theneighbouring hamlets. The relations were on an individual level and were not institutionalised. Trading partners offered each other the opportunity to stay overnight; a partner was a 'man with a house' (*yuramin*), where one could stay overnight. Real 'human beings' (*amin*) were only those who lived in the neighbourhood settlements and spoke the same dialect (thus, only the Uskokop people for the Gua-settlers, only the Nian for the Nokopo people). Those Yupno who lived farther away were called 'friend people of the nearby hamlet' (*kokop kapat amin nutno*). Neighbouring groups were called 'far away people' (*njuwagakon amin*) with clear signals of their 'not-entirely-human' status. Beyond, the world ended.

INNER LIMITS

The present-day Yupno villages were built after the Second World War, following the massive pressure of the Lutheran (Neuendettlersauerian) Mission, which was in most cases tacitly tolerated or only weakly opposed by the Australian administration (see photo 2). The Yupno who lived in scattered groups, were to be moved to large villages, where it would be possible to establish a 'Christian Community'. A precondition for
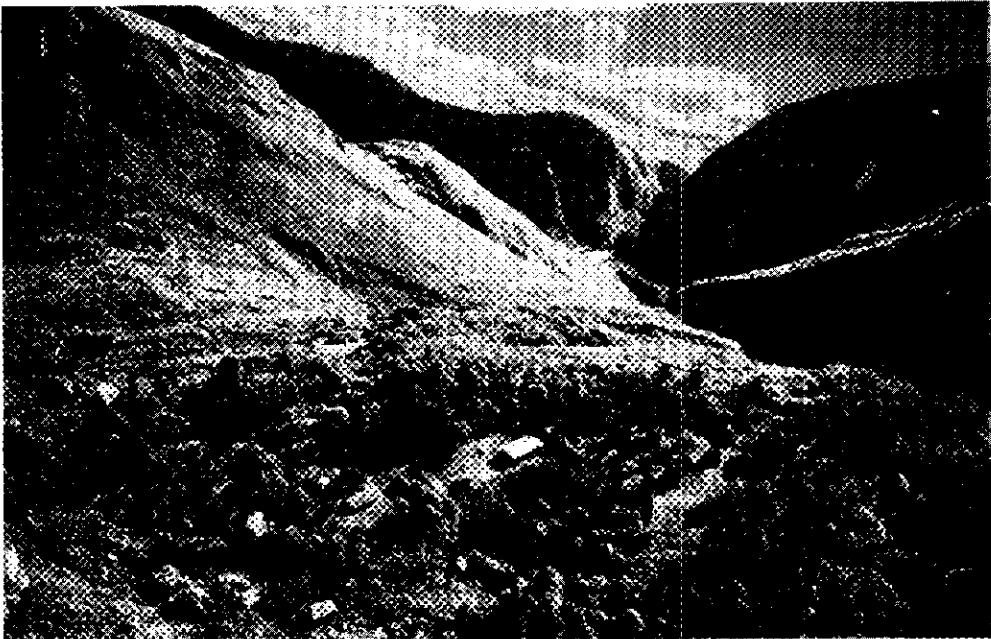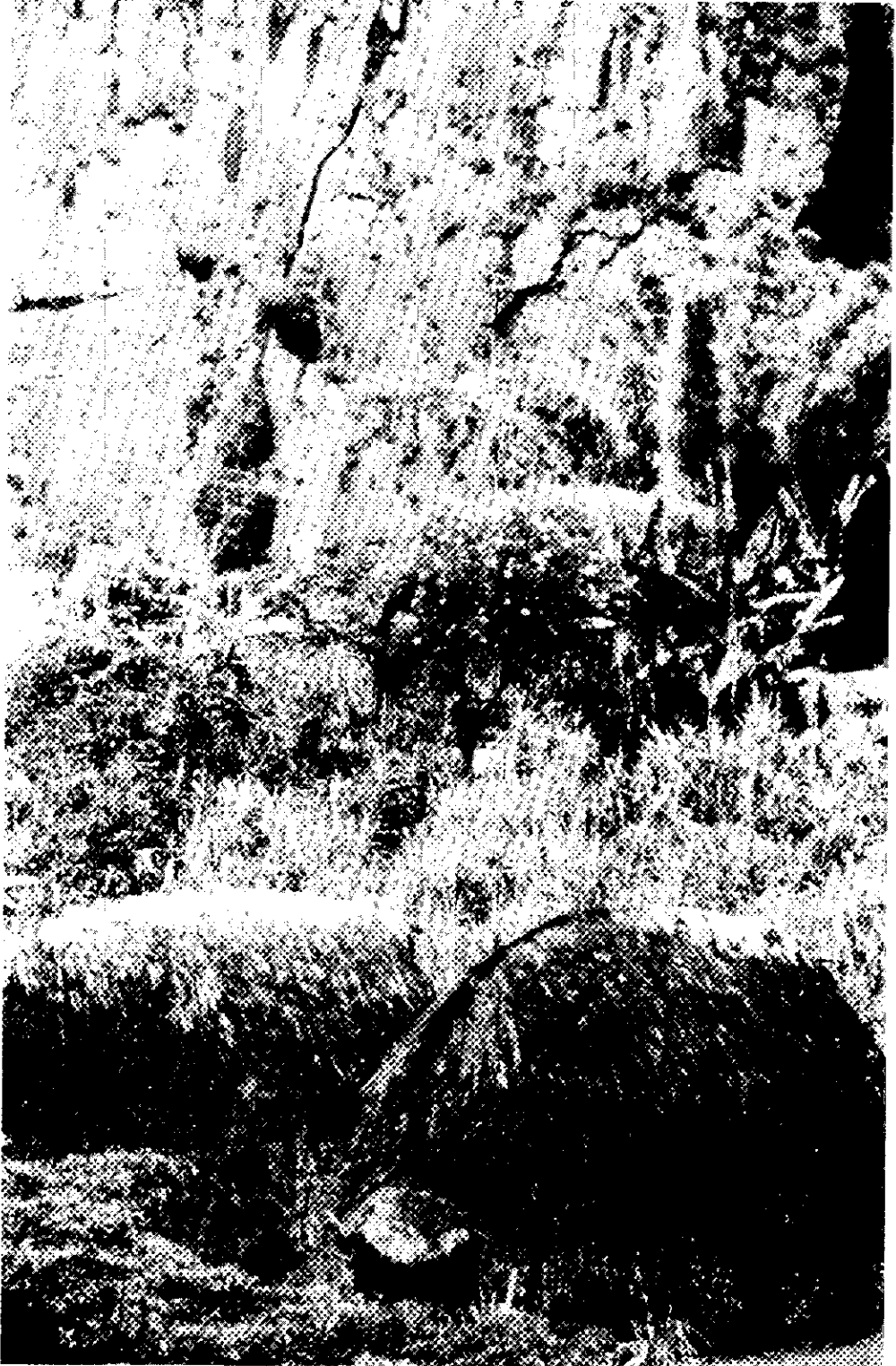

Photo 2

Photo 3

doing so, was, according to the view of the Mission, the destruction of 'sorcery'. And so it came about that, first of all, the men's houses as the centres of 'sorcery' were burnt down. The missionaries aimed at breaking with the 'heathen' past. This aim was not achieved.

Already in former times, the Yupno had settled in compact groups around their men's houses, and only parts of the hamlets were scattered. At the same time, the Yupno also usually possessed garden and bush houses, proper compounds where they stayed for a very long time (for months). This has not changed much until today. It makes sense to look back and ask how the settlement situation was when the valley was 'conquered' (i.e. immediately after the Second World War).

According to inquiries made in all fourteen Yupno villages at the upper course of the river, from the 'people of the upper bush' (*oskoron*), the following description of a typical Yupno village can be given.

The smallest and most important unit was the oval compound, a piece of land enclosed by a two metre high fence, where two or three dwelling houses were situated: it was here that a man lived with his wife (or wives) and children. The dwelling house looked like a huge longish haystack or bee-hive consisting of a scaffold of poles around which other flexible poles were horizontally fixed in rounds reduced towards the top. Grass was then put on top of the whole structure (photo 3). The oval house consisted of two rooms, a small anteroom at ground level and a large main room. A big fireplace was along the whole main room. Above it hung two or three racks where firewood and the nuts of the pandanus palm tree were dried. In earlier times, the Yupno built only ground floor houses; later, in the main room a raised 'floor' was added, which stood on short posts within the house. The door led directly into a small storage room from which the main room could be reached via a small staircase or a ladder. Such a house had an average length of 15 m, it was 7 m wide and 9 m high. Its construction type was extremely well adapted to the cold climate of the high mountain region (photo 4).

Photo 4

The husband had a house ('men's house', *mbema yut*) and so had each of his wives ('women's house', *sak yut*). All buildings were enclosed by a two metre high fence, made of strong blades of grass. The fence thus established a closed area. The keyword for this space is *yi*: core, core of a thing, that which is inside, which is enclosed by a covering. Accordingly, *yut* means: house, thus the covered, marked off space, *yok*: net bag, the thing which covers the contents, *yire*: seed which covers a shoot, *yumakon*: compound (*yumakon* = *yimakon*, from *yi*: core; *ma*: fenced-in place; *kon*: locative), whereby the inside of the house is also *yuma*. Thus, *yut* (house) means: that which is covered, fenced-in; and *yumakon*: the space between house and fence which in colloquial language often is identified with the compound (that which is inside the fence). Both spaces, the dwelling house and the compound, had only one opening: 'the door which leads from the marked off room to the outside' (*yuma ulañ*).

The compounds of the members of one clan were situated next to each other, connected by one path only. Accordingly, the dwelling houses were termed 'rows of houses by the same path' (*yut kosit*). All the compounds of one clan were in their turn enclosed by a high fence. There were only one way of entering this living area of a clan: through an opening, which was closed by vertical bamboo canes fixed at the bottom and the top in a kind of 'guide rail'. This door was called by the same word (*jalap*) which also denoted 'clan'. Thus, a 'clan' was that group of people who lived within one 'gate'. Within one big fence stood the various dwelling houses in groups which were, in their turn, fenced-in. Beside them, there was always enough space within the big enclosure for a further house, which was also termed 'men's house', where the men (adults or bachelors) could sleep. This part of the enclosure was the 'men's place' (*wuli kokop*), and was as such opposed to the remainder of the dwelling houses, the 'place of the women's houses' (*sak yut kokop*), although the men could also sleep in their own compounds, i.e. their own 'private' men's houses.

Each of the approximately sixty clans in the Yupno area is paired with another; each pair is regarded as closely related, because, as already mentioned, their ancestors had sprung from the same bamboo plant. This relation was called 'pitfall, waste pit' (*ngapma ngapma*): the members of these two patrilineal clans feel and think alike, they 'find themselves in the same pit', they are related to each other. Consequently, the living areas of two patrilineal clans were situated next to each other as a rule. The groups settled separately and had their own gardens and parts of the bush, which, however, were always adjacent to each other. Both living areas could be enclosed by a further common double fence, a grass fence (inside) and a 'hot' cordyline fence (outside), a 'living fence', which had already been mentioned as a peculiarity by L. Vial (1938) and C. Schmitz (1958). Again, there was only one opening towards the outside, the 'great gate' (*jalap pap*). Two fence corridors led to it from the two clan gates. Outside the large common fence was the religious centre of the two patrilineal clans: the men's house proper which (not surprisingly), was also fenced-in.

Thus, the term *mbema* ('men's house') is used on three distinct levels: it was the expression used for the men's house in the compound. It was also used for the house on the level of the clans as well as the one which was the common possession of two related clans (*mbema* = *mbima*, from *mbi*: large tree species, Fagraea ceilanica, Loganiaceae, which grows beside the house; *ma*: enclosed place, thus actually: 'enclosed place next to the *mbi*-tree'). The whole *mbema* area around the men's house proper was surrounded by bamboo, i.e. it was usually situated in a bamboo grove. This was an attempt to establish a link with the mythical flood of the Yupno river. This zone was exclusively reserved to the

men. It was the religious centre and was considered to be 'hot' (*tepm*, cf. Wassmann and Dasen in press) and dangerous: it was 'different' (*tilagi* = *telakgi*, from *telak*: mark, *gi*: to be). The large, old tree next to the house (of the species *mbi* or *kulmuk*, Dacrydium nidulium, Popocarpaceae, or *mambak*, Ficus augusta, Moraceae) is supposed to be the 'mother' of all trees. It is also thought to be the place of the bush spirits *sindok*, which had a place of residence as the 'representatives' of the uninhabited bush here at the centre of the (human) settlement.

Slightly distant, in a corner of the men's house area, stood a little house, the 'different house' (*tilagi yut*), the actual centre of 'sorcery'. It was here that the 'hottest' and accordingly the most dangerous objects were kept. These were mainly the *kokop kirat*, literally the 'backbones of the hamlet': stones, bull roarers or mussels, which held 'vital energy' (*tevantok*) within themselves. In addition, there were stone bowls, black stones and conical stones. All these objects were kept watch over by an unmarried, i.e. 'hot' young man (cf. Wassmann 1993).

This 'hot' men's house proper had also a name (unlike the other men's houses), and it was this name that the whole settlement of the two related clans went by. The whole arrangement constituted the basic unit of the larger settlement structure. Several clan pairs at a time settled together, and the dwelling area of each pair was laid out according to the same pattern. Depending on the topography, they all lived close together or further apart, but always as a compact pair of clans. If they lived very close together, it was possible that the whole settlement was enclosed by a further fence (double fence). This settlement pattern had no designation of its own, and its composition was very loose and random. The clan pair remained the largest social unit. Two such settlements at a time were on particularly close and friendly terms with each other. They spoke the same dialect and intermarried. Relations with the other settlements (again two at a time) were often hostile or were marked by indifference. Whether this is the reason why there were so many fences, remains doubtful. It is more probable that the fences served as screens and had been set up for fear of certain 'sorcery' techniques (cf. Keck 1992a).

POSING THE PROBLEM

After the Second World War, the Yupno hamlets were gathered into large villages. The region was 'opened': the fences were pulled down, schools were established, young men, who wanted to leave the valley for the first time in order to search for labour at the coast, were supported.

The village of Gua (where the research was done) is mentioned for the first time by a patrol officer in an unpublished Patrol Report of 1952. It must be noted, however, that 'Gua' is neither the original settlement around the 'men's house of the millipede' (*Gua mbema*), nor the present-day village. It is an intermediate settlement above the present-day village.

> At first the natives (i.e. the inhabitants of other Yupno villages] were hesitant and shy, but after the first day they came forward quite boldly to have their names recorded [census]. The people of GUA proved less tractable. On my first visit only a few were present in the village, but on the second visit I recorded 123 names. There were undoubtedly many absentees . . . most people apparently are living still in their garden huts (Steven 1952/53a:4)

During a second visit to the settlement at the end of the same year, the patrol officer reports that some inhabitants had started to build a new village, the present-day Gua, further down the mountain slope:

> GUA and TEP-TEP, which were originally censused in June, have grown considerably. GUA in particular is now a sizeable village with about 20 houses. Some of the GUA natives have begun building on a more spacious site further down in the valley. The villagers were told to decide on one site and settle down there (Steven 1952/53b:4).

This is confirmed by the first white missionary of the valley, K. Munsel:

> Two bigger villages [Gua and Teptep] are being built at present in the Gua plain . . . on the suggestion of the government patrol officer, to gather the hundreds of scattered people who are living along the hill slopes (Munsel 1952:4).

By the end of the 1950s Gua had assumed its final shape. But obviously the Gua didn't give up their traditional way of life, as is shown by a short entry made by the patrol officer F. X. Alcorta in 1969:

> Sunday 30th November. . . . Afternoon-conducted census for TEPTEP, WASIKOKOP [Uskokop] and GUA. GUA was found completely deserted and overgrown with secondary growth (Alcorta 1969/70:3).

It is against this background that the question arises how the present-day inhabitants of Gua conceive of their settlement area as a 'space'. How is the Yupno conception of proper territory influenced by the formerly closed settlement structure, still experienced by the old inhabitants of Gua (a great number of whom still live in fenced compounds outside the village in the bush), and the contemporary partial dissolution of this structure, together with the experience of an 'outside world' by some younger Yupno?

This is the question of the 'models of macrospace' (Siegel and White 1975:21), of the 'mental map' (Hallowell 1955), of that which is referred to as 'environmental map' by geographers and urbanists (Appleyard 1970) or as 'spatial schema' (Lynch 1960). It is what psychologists call a 'cognitive map' (Tolman 1948, Downs and Stea 1973) or 'topographical schema' (Piaget *et al* 1960). By these 'cognitive maps' is meant the individual, internalised, cognitive representation of an external physical environment. This is, however, not just a static, visual image, but 'the symbolic and internalized mental reflection of spatial action' (Piaget and Inhelder 1967:454). It is the conceptual space, not the perception of 'space' in the sense of 'perceptual skills' (cf. Jahoda 1988, Deregowski 1989). This internal 'map' cannot be grasped directly. This can only be done by externalising it, i.e. by drawing it, building a model, describing it verbally or (especially) by using it (Tolman 1948, Downs and Stea 1973, 1977, Siegel and White 1975, Gaerling *et al* 1984, 1985, Steiner 1988, an early survey is given by Hart and Moore 1973).

In an often cited study, K. Lynch (1960) asked the inhabitants of three cities how they conceived of their city, and classified the spatial elements mentioned thereby as 'landmark, node, path, edge, district'. He also noticed that the mistakes made in the description (mistakes with regard to an 'objective' city map) were seldom of a topological nature (attachment of spatial elements), but rather of the metrical kind (distances). Ten years later, D. Appleyard (1970) analysed drawn maps and noticed the high frequency of highly structured sections (the ones relevant for the particular individual), which were

only loosely connected with each other. J. Pailhous (1970) showed how taxi drivers visionalise their urban space in order to orient themselves with some certainty. Finally, A. Siegel and S. White (1975) pointed out that the acquisition of spatial competence by the child is similar to the acquisition of the spatial structure of a new environment by adults.

The most comprehensive theory of how such a cognitive map is established and developed by the individual has been presented by H. Werner 1948 and especially by J. Piaget (Piaget *et al.* 1960, Piaget and Inhelder 1967). When in an unfamiliar environment, an adult starts by making a mental note of the visually significant places or those places which have an emotional value for him/her. He/she establishes a landmark knowledge by moving actively in this environment. Later, he/she learns to remember routes by connecting landmarks to sequences: 'A route is learned if one is able to anticipate all the landmarks of a certain trajectory' (Steiner 1987:204).

It is thus possible for me to predict what will come next, but this does not necessarily mean that I know the distances, or — if the distances and time sequences are known as, for example, with bus riding — that I can correctly indicate the directions. In a final stage, however, these routes are combined and thus result in a spatial 'survey' — knowledge. This knowledge is holistic and possibly takes the form of a network. If I am in possession of this survey knowledge, I can choose alternatives in order to reach a point X faster (e.g. if I am caught in a traffic jam). It is obvious that the whole map can only come into being correctly, if a simple system of reference allows a hierarchical integration of the partial spatial structures. Such a system of reference may consist of a very few, extremely well-defined spatial elements, such as a main axis with a few landmarks or a river with a highly conspicuous form. The development thus leads from a 'landmark knowledge' through the 'route knowledge' to the 'survey knowledge'. R. Hart and G. Moore formulate it as follows: the development goes 'from action-in-space to perception-in-space to conceptions-about space' (1973:255).

This process particularly also applies to the child, who actively builds up his/her own 'space'. But here, it is not only the kind of topographical representation that is different (landmarks, routes, survey), but also other spatial elements, such as the system of reference, which is connected in a special way with the child's environment. At first, the system is egocentric: the body serves as sole point of reference for ordering objects in space. This has the disadvantage that, as the child moves, the system of reference moves as well. Then, the environment acquires fixed points and directions, but only one single perspective or journey is possible, and movement can take place in just one direction. Finally, the system of reference is coordinated, i.e. the fixed points become accessible from all directions. They may be cardinal points or a road system. Moreover, the nature of the spatial relations available undergoes a change. At first, they are topological: the spatial relations comprise neighbourhood, separation, sequence, enclosedness, i.e. the internal relations of the parts to the whole are grasped, but not the relations with the 'outside'. Then, they are projective. The key words are: projection, perspective, i.e. there is a growing understanding of the fact that the same object, when perceived from different perspectives, can be seen differently. Finally, the spatial relations are Euclidean. The key words are: parallels, distances, angles, i.e. the spatial relations between several objects are understood by building up a system of reference, an external system of coordinates.

What an internal map looks like can only be grasped, however, if it is in some way externalised. This poses a problem, because this making visible for the external observer presupposes certain additional faculties, which may be lacking. Whether a conceptual

map is drawn (the most frequent form of externalisation) or the inner 'space' is described verbally (or a model is built or spatial knowledge is actually used), the required competence (graphic or verbal etc.) always poses a problem. For 'these externalized products are, in essence, "re-representations"' (Siegel 1981:168). Small children are, for example, generally regarded as spatially incompetent in the literature, but, nevertheless, they usually act competently in everyday life situations (cf. Arnold in prep.). Thus, children only four years old manage to walk about safely in the neighbourhood (Siegel 1981). It seems that '[the] task of externally representing spatial knowledge is much more difficult than spatial orientation within a setting' (Hart 1981:199). This contradiction is termed the 'competence/representation incompetence paradox' by A. Siegel (1981). But it may not just be a question of difficulty so much as one of relevance.

Within cross-cultural psychology, there exist only a few studies about spatial thinking (Bovet 1971, Dasen 1975, deLemos 1974, Bovet and Othenin-Girard 1975). But they demonstrate what was to be expected: spatial thinking is highly developed where the cultural requirements, which, in their turn, can be dependent on the environment, are also high. It seems that certain cultural features particularly stimulate spatial thinking. Such cultural features are given:

(1)   if the norms guiding child rearing allow the children to leave their parents' house in order to experience their environment (Munroe and Munroe 1971 on the Logoli children in Kenya, Nerlove *et al.* 1971 on the neighbouring Gusii; Dasen 1988 notices with regard to this that it is not so much the distance which matters, but rather the difference between the places visited);

(2)   if, for example, in addition to counting and measuring, geometrical figures, which are drawn and communicated about, play a role. In this respect, I should like to mention the study by J. Gay and M. Cole of 1967, which reports on the difficulties for the Kpelle in Liberia of tackling Western geometry. The traditional Kpelle culture is definitely well-acquainted with geometrical figures. But these figures are of the topological (not Euclidean) type. Or if, for example, one handles objects in the sense of 'manipulatable surfaces', as in the manufacturing of receptacles, where such spatial relations as straight line, angle, quadrangle, proportions are involved (cf. Hallowell 1942 on the manufacturing of bark container by the Saulteaux Indians, or Prince 1969 on the conservation of surfaces in Papua New Guinea;

(3)   if, for example, communication about space or orientation in space is necessary and therefore maps or routes are drawn (Munn 1973 and Lewis 1976 on the Central-Australian Aborigines; Bagrow 1948 and Carpenter 1955 on the Inuit).

The last examples show very clearly that whether 'space' becomes a topic or not depends on the culture and the requirements of the environment. A Temne in Western Africa, for example, neither needs particular spatial thinking nor does he have to draw maps: the paths through the jungle are given (Littlejohn 1963). Things are different with the navigators of Pulawat in Micronesia. T. Gladwin (1970) describes how the Pulawat are able to steer precisely for an island over 500-600 miles of open sea. They can find their way in an environment which is almost completely devoid of fixed points.

The environment of the Yupno does not make these demands. A Yupno does not usually leave his clan area. And, if he does so, he follows the given paths which he is not supposed to leave. There are a few geometrical notions, but they are of little importance and they are of a topographical kind (straight line = 'path', circle = 'fruit', angle = 'elbow'). Moreover, the Yupno do not produce objects with manipulatable surfaces. Nor do they draw maps or routes (not even in the soil).

Nevertheless, since the region was 'opened', some Yupno have left their place for some time and come to know the 'outside world'. Some children go to school today. Does this influence the 'cognitive map' the Yupno have of their territory? To investigate these issues, data were elicited as follows.

EARTH DRAWINGS

The question asked was: 'Please draw on this ground the territory where you live, where the people live who talk the same language as you' (Literally: Look out/on this/open surface/pattern/scratch/do/settlement area/on this/within/you/stand/and/all/stand/to be/here/speak/same/talk/as you; *yangisok/oñ/kwaran/kalda/gogok/asal/kokopkaa/ oñ/vulangan/ngak/yagobmi/minda/amnda/yagobmot/aban/gen/onda/yon/ngakon*).

Although the Yupno do not traditionally draw in the soil, nor mark short routes in the soil in order to support a simple route description, all men, without exception, complied with the request without problems. Women, however (girls excepted) could not be moved to participate in the task. All participants drew their territory with a little stick on an even soil surface. As a rule, they were alone; no conversations were allowed. No help was offered, neither by the anthropologist nor by any fellow Yupno. At most, the question was repeated once. Later, the anthropologist powdered the carvings with flour so as to be able to photograph the patterns. When the drawing was complete, the meanings of the different parts of the drawing were inquired about. The position of the person who was drawing during the task as well as the sequence of the elements drawn were also observed. The persons who did the drawing could not be moved to repeat their representation later as first planned, so that the individual consistency of the model might have been proved. They politely pointed out that they had already accomplished their task.

The following persons participated in the drawing task:

A six old men (who had never left their territory);
B four old men (who had been at the coast once for a short time);
C seven men ranging from middle-aged to young (who had all been in the cities for one or two years or had worked on plantations);
D four children without school education (between 14 and 16 years old, three girls, one boy);
E seven schoolchidren ('grade two', between fourteen and sixteen years old, two girls, five boys).

The total of 28 earth drawings are shown in Figure 1. They are copies of the photographs of the original drawings. Since the drawings were all photographed from the front and from a slightly elevated position, the copies are slightly distorted in perspective (reduced towards the back). The anthropologist added numbers and letters to the copies:

— The numbers (1-20) identify the twenty Yupno settlements from map 2. Further non-Yupno villages are marked by 'D'.
— The most important rivers (see map 2) were given the letters a to g (e.g. a = Yupno river), further rivers are marked by 'F'.
— 'W' means path; 'Q': spring; 'M': sea; 'B': mountains (fences).

The original earth drawings were usually of a size of 2 x 2 m, which corresponds to the size of the surface at their disposal.
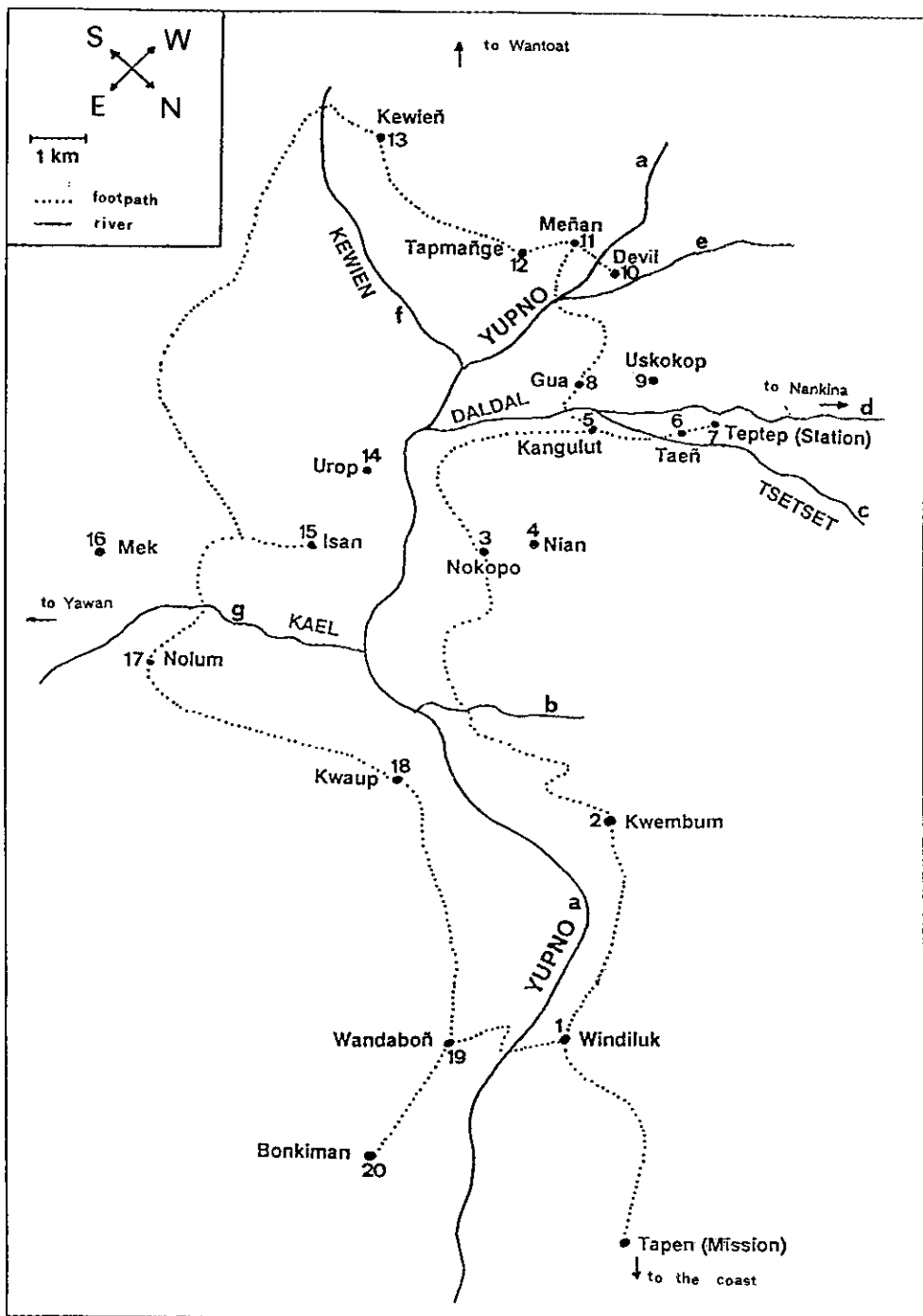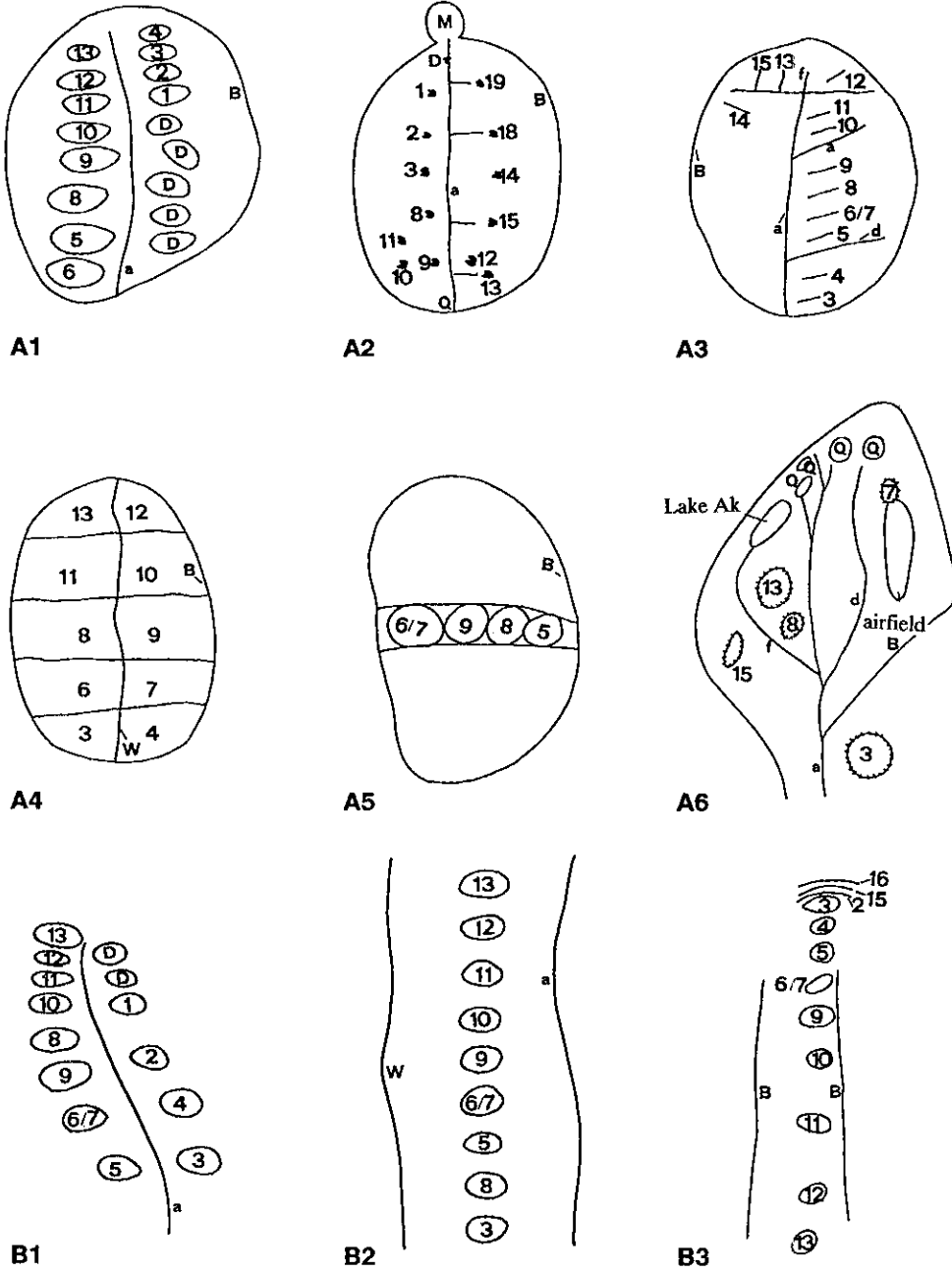
MAP 2: THE YUPNO VALLEY

Figure 1: The 28 earth drawings

In a clear, unexpected way the drawings show systematic variations. I shall now comment on the drawings, at first, in a simplified way and in groups, later in more detail according to particular topics.

The A-group (old men without 'outside'-experience) possess a simple, closed and comprehensive image of their own territory, which is, at the same time, the 'world'. This
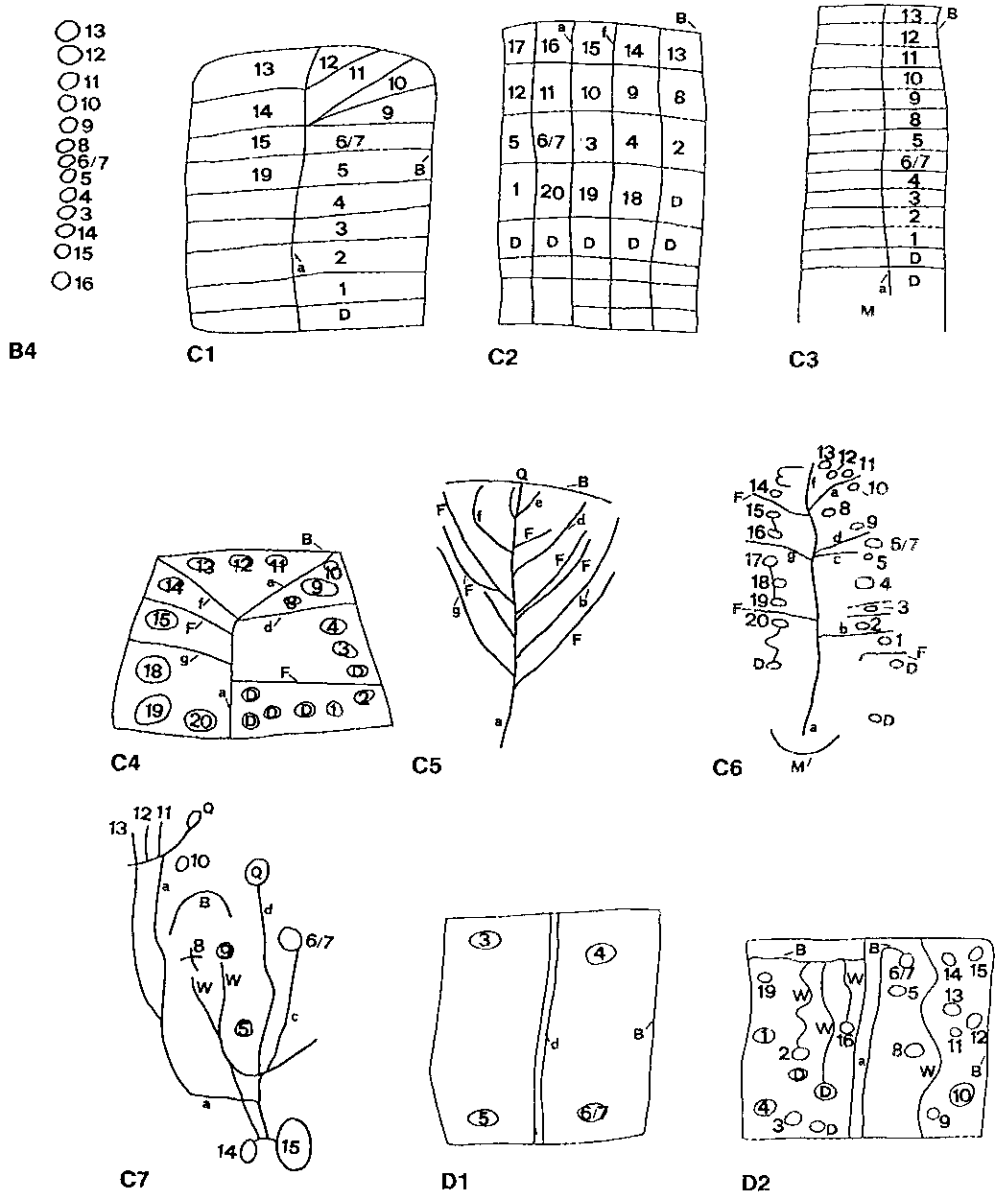
Figure 1: The 28 earth drawings

'world' is enclosed (by mountains, literally: fences'). The central point of reference is most usually the Yupno river (a), which is also the creator figure Morap. In this 'world' are situated the villages which are, as a rule, represented as fenced-in ovals (see photo 5).

The B-group (older men with a short 'outside'-experience) perceives the world as more 'open': the frame ('fence') is lacking. The Yupno villages are represented on one line as a row of ovals (see photo 6).
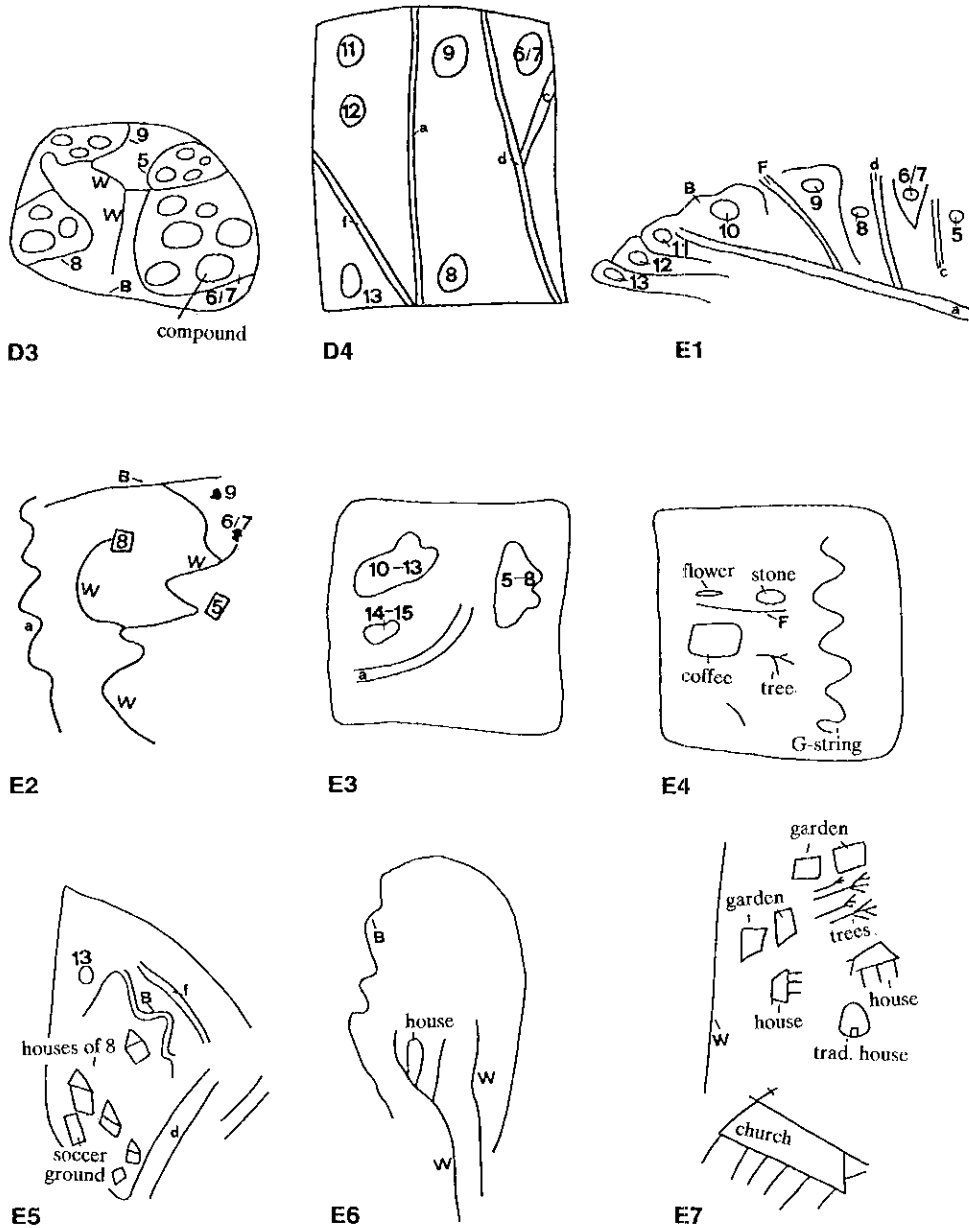
Figure 1: The 28 earth drawings

With the middle-aged and younger men who have had a marked 'outside' experience, the C-group, two contradicting tendencies are discernible. On the one hand (C1-C4), the world is represented as an angular, closed grid (where the units are supposed to represent villages; only C4 additionally used ovals) (see photo 7). On the other hand (C5-C7), an almost photographic precision of representation of their own area is aimed at. The conceptual 'fence' is entirely lacking (see photo 8).
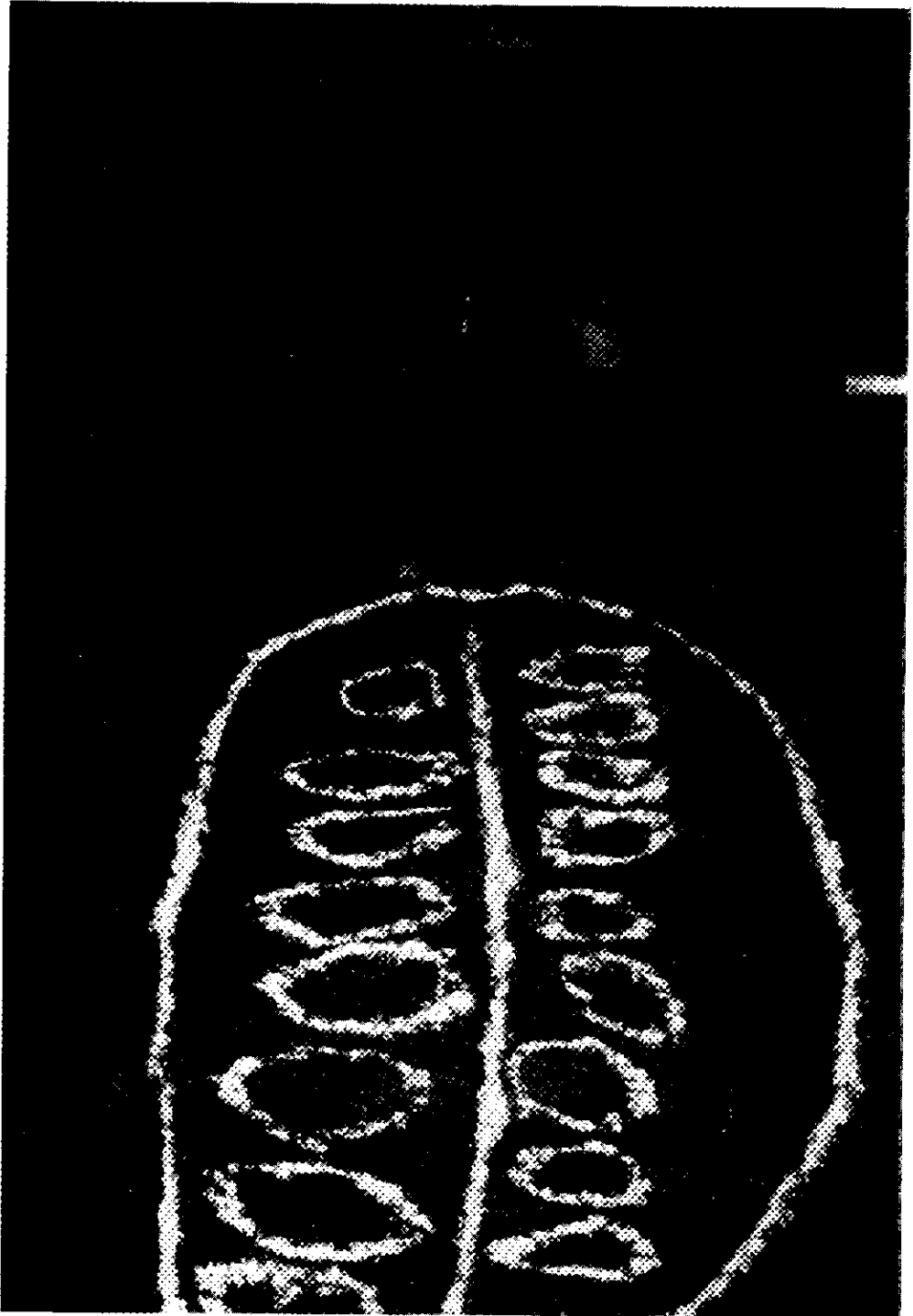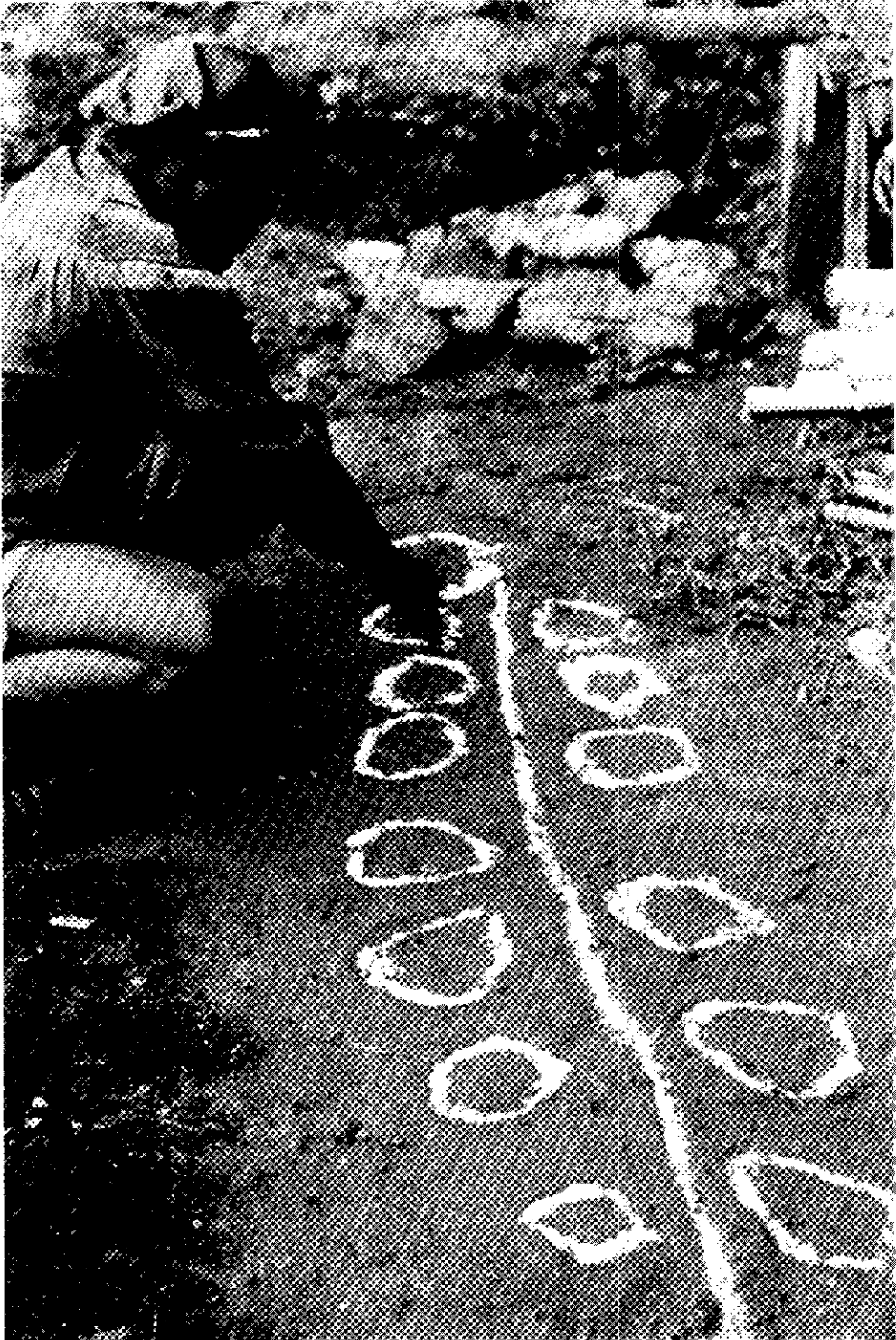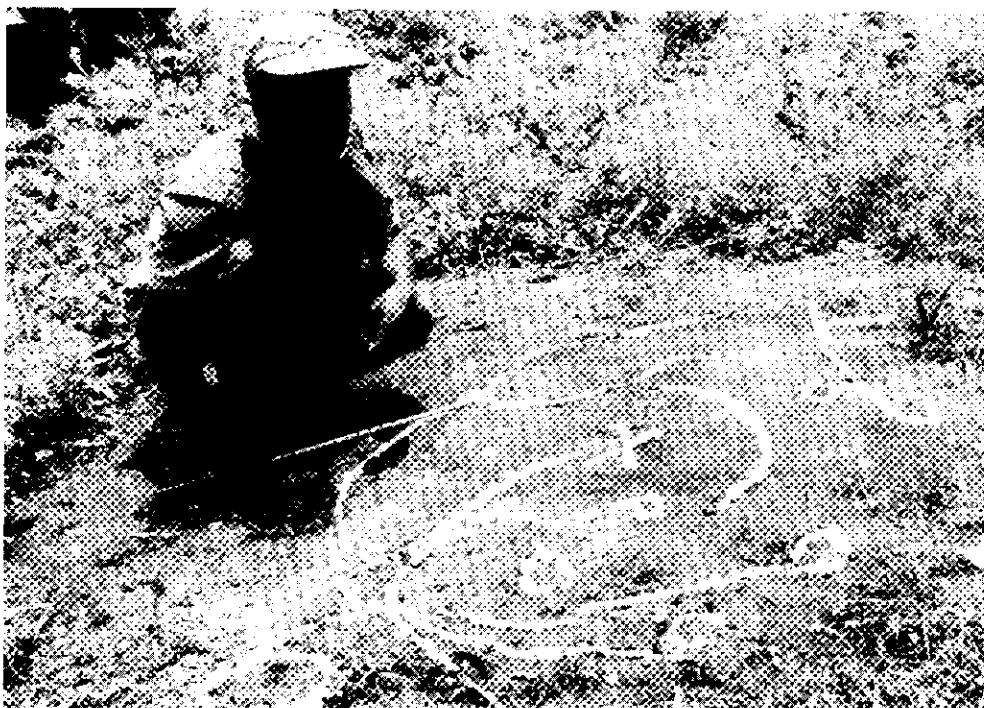
Photo 5

Photo 6

Photo 8

The D-group's (the unschooled children's) representations are similar to those of the old men, presumably because both lack 'outside'-experience: the 'world' is enclosed, if 'smaller' and fenced-in in an angular way (see photo 9).

Finally, the view of the schoolchildren (E-group) is limited to the representation of concrete details, such as (modern) houses, trees, mountains, rivers. There is no overall frame (see photo 10).

So much for the general tendencies. Now, I will consider the details.

What is represented?

For the A-persons the 'world', as a rule, consists of the upper Yupno valley (where the village Gua belongs), the villages of which are more or less completely represented. Only A1 and A2 mention lower course villages. They also mention some non-Yupno villages (D): A1 mentions the missionary station Tapen as well as four settlements of the culturally related Nankina, A2 refers to Tapen. The village Taeñ (6) and the administrative center Teptep (7), which are adjacent, are combined by many drawers. The five villages 5, 6/7, 8 and 9 pose a problem. They are not situated in a parallel with the Yupno river, but lie in a side valley of the Daldal. This is why they are often combined or 'forgotten'. Only A5 limits his 'world' to precisely these five villages, of which one is Gua (8). The focus is the Yupno river (except for A4 and, naturally, A5). The B-drawers, too, usually draw the upper Yupno villages, but sometimes the Yupno river and the 'mountains' are lacking. The C-drawers provide contradicting solutions. In most cases, many villages are represented (sometimes only those on the left bank, or only those at the upper river course, sometimes also coast villages [D]), but, in some cases, also tributary rivers, paths and mountain crests are drawn (C5 draws only the river system). The D-group has a smaller world picture. Generally, only the Daldal side valley (where Gua belongs) is represented. For the first time also single houses are drawn (D3). The world of the schoolchildren (E) is still more limited and more private: there are houses, trees, gardens, but also a football field, a church, a store, a G-string (!), and so on (E7 illustrates this is an interesting way).

How are things represented?

At first, the closed oval, bisected by a line (the Yupno river), prevails. To the left and right are situated the small ovals of the villages (A6 even fenced them). Then follows the sequence of ovals (villages) without exterior frame (B-group). Finally, (for the C-group), the 'world' is represented either as an angular grid (the central axes in C1 and C3 were later added), or as a 'photograph', a precise copy of the area. The drawings of the D-group are similar to those of the A-group, yet, the oval no longer prevails, but the square. Rivers are no longer represented as (abstract) lines, but more concretely, as two parallel lines. The schoolchildren (E-group) finally, draw in a highly figurative, concrete manner. An enclosed square (E3, E4) is not a 'world-fence', but the margins of the sheet (as known from school).

Which system of reference is used?

At first, for the A-group, the system of reference consists of the 'world fence', and the central axis established by the Yupno river. For the B-group, only the central axis exists (river, parallel mountains, a straight path for the first time). The C-group refers to

Photo 9

abstract, angular grids or orients itself by the rivers (Yupno and tributary rivers). For the D-group, the same is true as for the A-group. Finally, for the E-group, there is a total lack of any fixed point of reference (consider, for instance, the orientation of the houses in E7). All drawings, from the A- to the D-group, are centred as a whole: the person drawing stands (during the experiment) in front of the anthropologist's house with his/her back to the Yupno river, i.e. he/she stands 'below', in the place where the Yupno river, which is being drawn, flows to (only A2 and B3 are 'upside down' in this respect). Contrary to this, the drawings of the E-group are uncentred. The system of reference (fence, river) was always drawn first by the people of the A- to D-groups.

How are the villages arranged?

The arrangement of the villages with respect to each other and with regard to the river differs. With the A-drawers, a global symmetry prevails, which is often not a 'copy' (A1). The Yupno river is not a straight line, but turns to the right in its upper course. A straight line is only formed by the Yupno river and its tributary river Kewieñ. This might be the reason for the fact that the position of the upper four villages (10 to 13) vis-à-vis the river Yupno is often 'incorrect'. With the B-drawers, the arrangement of the villages is often not correct at all. B1, for example, first draws the ovals of the villages, and names them afterwards: from top left (Kewieñ, 13) down the river and then up again (in almost correct order), so that on the picture Kewieñ, the highest-situated village lies next to Malalamai (D), a coastal village. C-drawers are very precise, especially regarding the left/right arrangement of the villages vis-à-vis the Yupno river. For D and E, the question naturally does not arise.

<center>DISCUSSION</center>

Function

The Yupno traditionally have probably never drawn on the soil. They certainly needed to communicate their spatial knowledge in some ways, but not in the shape of 'maps'. Nevertheless, the question arises what function these internal, cognitive maps might have for the individual. Hart and Berzok (1982) rightly criticise the use of drawn maps for analysis in the literature when no account is taken of their actual function. Implicitly, their purpose seems to be quite obvious for most authors: cognitive maps serve path-finding. This might, at first sight, be reasonable, but cannot account for all possibilities. For the Yupno, it does not hold.

Every Yupno, when in his/her valley, even today still lives in an extremely narrow and limited space, which, for him/her is characterised not only by topographical features, i.e. by a clearly marked off territory, but also by social relations. It is a socially defined space (the term 'social space' was introduced by E. Durkheim and M. Mauss in 1903, cf. Evans-Pritchard 1940). People live where their relatives live. What lies beyond, is 'foreign' territory through which given paths lead which are not supposed to be left. Even detours are accepted, if passing through other clans' territories can thus be avoided. Where no paths exist, the Yupno get lost (as in the dense underwoods of the bush, *kadim*, literally: confused). Between a village A and a village B, only one path exists, there is no alternative. On these paths, even the resting places are given. Obviously, the right way need not be 'found', it is already there (Wassmann n.d.). And this 'route-knowledge' is probably acquired when the parents have their children accompany them on these paths at an early age.

Photo 10

R. Downs distinguishes two models of 'cognitive maps' (1981:160): the structural ones ('end products') and the process-oriented models by which problems can be solved, such as finding the right route (as was described by Goodenough 1953, Gladwin 1970 or Lewis 1972 with respect to the Polynesian and Micronesian seafarers, cf. Gell 1985). What is depicted by the Yupno drawings, is neither the one nor the other. Rather, they show how the proper valley (the 'world') is understood: they are static, global world pictures. Their function is more holistic: '. . . we mentally map the environment to surround ourselves with a known, and hence, more secure or safe world' (Hart and Berzok 1982:149). The 'world' picture of the Yupno is not used for route finding, it is a representation of the world, which provides emotional and intellectual security. In this sense, the earth drawings presumably reveal 'meaningful totalities' (Steiner: 1987:205).

Symbolic Meaning

The cognitive maps (above all those by the A-men) represent the world as a closed oval with the Yupno river at its centre as the main axis, and the various villages as small ovals to its left and right. Paths do not usually occur. Symbolic meanings are linked with the space sketched. It is not only a conceptual or a representative space, but a 'mythic space' (Cassirer 1955 cited in Liben 1981:6).

The large oval is the world, beyond which everything ends. The Yupno river, which is at the same time the creator figure Morap, flows through the world and provides it with an orientation. The source is 'above'; men originate from there; they had been washed ashore by the river in bamboo canes. 'Below', where the river enters the sea, lies the country of the dead. 'Above' is considered as 'good'; the 'bad' comes from 'below'. The source of the Yupno river is behind and above, its mouth is in front and below. The system of coordinates corresponds to the axis of an imagined body who looks down the river. To the right is the active, 'hot' side (the right hand stretches the bow with the arrow). To the left is the passive, 'cold' side (the left hand only carries the bow). This view of the world is repeated in the traditional house: it is oval, has one single opening towards the front, along its central axis lies the long fire place, on the right side of which sit the men, on its left the women and children.

The Yupno thus correspond to a pattern well-known in anthropology. Directions are very often not judged according to the cardinal points, but the course of the rivers (cf. Jensen 1947/48) or according to the contrast between inland and seaside (cf. Barnes 1993) or between downhill and uphill (Levinson and Brown 1991, cf. Heeschen 1982, Wassmann in press). (For a counter example see Haviland 1991, who describes the use of an absolute system of fixed cardinal points in Northern Australia.) The qualitative interpretation of space is also widespread. Two examples can serve as an illustration: the equation of the village with the human body, which is found with the Dogon in the Sudan (Griaule and Dieterlen 1954), and the distinction between coastal and mountainous regions, which is copied in the house and mirrors the anatomy of the human body among the Ainu in Northern Japan (Ohnuki-Tierney 1972, cf. also Cunnison 1959, Gluckman 1965, Turner 1969, Beidelman 1971, Eliade 1984).

The Experience of the Outside World

The cognitive maps of the Yupno, as they were made visible in the earth drawings, are a kind of 'cultural knowledge' (Holland and Quinn 1987) in the form of 'image schemata', and, more precisely, an implicit knowledge made explicit by means of a

graphic representation. The models drawn vary greatly — but in a systematic way. How can this be explained? Ontogenetic factors must be excluded. The youngest participants ranged in age between fourteen and sixteen years, moreover, also the drawings by school-trained and unschooled children vary greatly. Those who have seen a city with houses entirely different from the ones in the Yupno valley, and long, straight streets which cross each other in right angles, and who have learnt from it that their own village is only a small part of Papua New Guinea, see the proper 'world' with different eyes. But also the schoolbooks convey 'other' worlds and thus influence the notion of the proper world. A compoarison of the drawings made by those who lack 'outside'-experience (A, D, the old men and the unschooled children) with those who have had this experience, reveals considerable changes which are characterized as transitions from

(1)   the (traditional) oval (world, village, house) to the (Western) square;
(2)   the closed form (the Yupno valley as the 'world') to open, not delimited representations to which other, alien things can be added;
(3)   the abstract representation type, which focuses on the essentials, to the obsessed-with-details type showing a 'photographic' precision (with mountain crests, tributary rivers and paths);
(4)   the symbolic (the oval as 'village') to the figurative forms (such as a house, a football field, a garden, a tree).

That which is represented has not changed. It is still the Yupno valley, whether more fully represented, as is the case with the middle-aged men, or more partially as with the children. What has changed is the manner in which it is represented. Particularly conspicuous is the systematic variety of the models delivered by the two groups of children of the same age (but different exposure to the 'outside'-world). The drawings of the unschooled children are of the predominant traditional type of representation — comparable to those made by the old men (A). Contrary to this, the models of the school-trained children — marked by an egocentric style and the listing of things without inner order — appear very 'childish'. Perhaps as the result of their efforts to meet the supposed requirements of the (white) anthropologist, their drawings look like the pictures for children in the (Western) schoolbooks.

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