NEAR DOUTHY VILLAGE (DAMASSAK), NIGERIA

TRADITIONAL KNOWLEDGE DOES NOT DEFINE SEASONS RIGIDLY BUT ACCORDING TO DISTRIBUTION AND EFFICIENCY OF RAINFALL

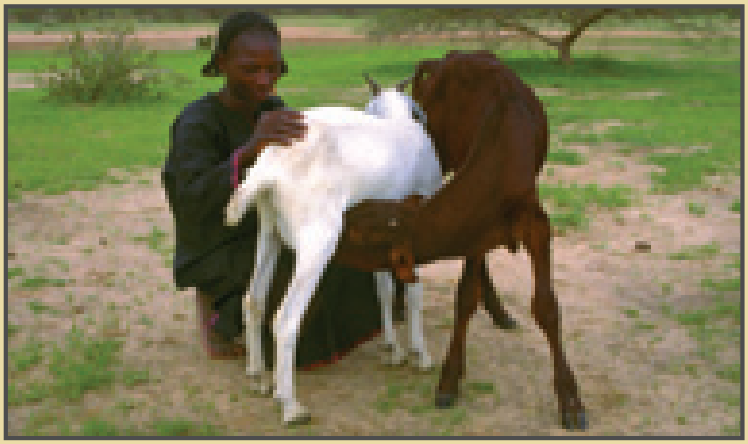
THE SEASONS

The pastoral year does not simply consist of three seasons, i.e. a winter season, a hot dry season and a rainy season. Nomads recognize some eight different seasons [2.11] and they move their animals to different grasslands according to these seasons. Like their ancestors before them, the herders need flexibility in order to adapt quickly to seasonal, annual and interannual variations in climate, labour availability, security, family, and the size and health of their herds. Their movements are inextricably bound up with the conditions of the grasslands; the quantity, distribution and efficiency of rainfall; and the water levels in the ponds, wadis and wells.

NEAR MALAM FATORI VILLAGE, NIGERIA

Nomadic cattle husbandry among the Woɗaaɓe in the Lake Chad Basin

by **Nikolaus Schareika** *



THE NIGER

PHOTO: COURTESY OF N.SCHAREIKA

A CALF THAT LOST ITS MOTHER IS FED WITH GOAT'S MILK. THE WODAABE HAVE AN INTIMATE RELATIONSHIP WITH THEIR ANIMALS

The Woɗaaɓe – a Fulani ethnic group – are spread out over many Sahelian and northern Sudanian regions in several West African countries. Those who live immediately to the west of northern Lake Chad, in the southeastern corner of the Niger, first began to arrive in the area in 1910. They came in a wave of migration (*perol*) from Damergu in central Niger and installed themselves in the clay plains of the region they call *Kawlaa*. The Woɗaaɓe are specialized herders of red Zebu cattle, which they keep supplied with grass and water by continuously moving both their herds and their families through the savannah land. Moving is the technique by which the Woɗaaɓe apply their sophisticated knowledge of nature and its processes to a specific task within their pastoral economy, i.e. to increase herd fertility. This goal is achieved by constantly optimizing the feed situation according to two related factors.

1. Seasonal variation in the resource potential of the Sahelian savannah.
2. Seasonal variation in the cattle's physical condition, which alternates from well fed to emaciated.

Soil quality is also a very important consideration in this pastoral strategy. At the beginning of the rainy season (*se'eto*), the herders move in a long seasonal migration (*ɓaartol*) from the clay plains (*karal*) in the east, where they spend the dry season, to the sandy dune areas (*ɲoolde*) in the west. They know that plants will sprout earlier and more quickly on sandy soils. To them, moving forwards in space is equivalent to moving forwards in time in terms of the availability of green fodder. With the first rains, the herb *Tribulus terrestris* (*tuppere*) appears, to relieve the exhausted animals from hunger. Next appears *Cenchrus biflorus* (*hebbere*). Once its shoots have "escaped from the ground", i.e. have become long enough to be bitten off without taking in sand, this species helps the cattle to regain weight after the privations of the dry season. The Woɗaaɓe state that, up to the stage of tillering, grass is much more nourishing than it is afterwards. Therefore they constantly follow the scattered rain showers in middle-range moves (*goonsol*) every two or three days in order to supply the herd with ever-fresh young shoots of *C. biflorus*.

At the height of the rainy season (*ndunngu*, around the end of July) the nomads turn back east to the clay plains of *Kawlaa*. In a series of short- and middle-range moves they rove through various ponds (*weendu*) and floodplains (*karal maawam*), where the cattle build up weight with the by-now ripe grass species *Echinochloa colona* (*saɓeeri ngonngorsa*) and *Panicum laetum* (*kaasiyaari*). On elevated plains (*karal*) and flat sand layers (*ɲoolel*) people and animals find dry places to rest. Also growing here is *Chloris prieurii* (*geenal dimal*), which the Woɗaaɓe consider a delicious and nourishing fodder grass for cattle. Moving into the clay plains has at least three advantages.

1. The soil has a high content of salts and minerals, which cattle get directly from the plants. There is no need to feed natron (*kawwa*). The concept of "power" (*mbaawu*) refers to the particular nutritional value of plants on clay soil.
2. Grasses grow somewhat later and more slowly on clay than on sandy soils. Moving to clay therefore means that herds keep feeding on grass that has not yet come into ear. Moving backwards in space is now equivalent to moving backwards in time in terms of the availability of green fodder.
3. In the clay plains there are several herbs that supplement the grass. The Woɗaaɓe consider them *ballirɗum geene*, "something that helps the grass", and cite the following as interesting species: *Indigofera hochstetteri* (*jaa'oomaahi*), *Heliotropium ovalifolium* (*yaharehi*), *Cucumis melo* (*yamɓuruuwol*), *Colocynthis citrullus* (*layol gunaaru rimru*), *Ipomoea verticillata* (*amaseekel*) and *Corchorus olitorius/tridens* (*laalo*).

By the end of the rainy season the Woɗaaɓe achieve the balance of their herding success. The cows should be well fed and, as a consequence, ready to mate (*nagge ho'osa*). Every cow covered is registered as a bonus by its happy owner.

During the early dry season (*ɲaawol*) the Woɗaaɓe eagerly look for a special product of the clay plains: the reddish gleaming grass

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(called *kundeeri*) that withered at the stage of tillering, staying short and carrying no ear. The herders state that, in the case of *kundeeri*, a shortfall of rain prematurely interrupts the vegetative cycle of grass. Thus, before coming into ear and when still highly nutritious to cattle, it is preserved naturally to the pastoralists' benefit.

After the early dry season (at the end of October) the time of abundance comes to an end. The ponds dry out and the Woɗaaɓe have to resort to wells in order to supply herd and household with water. Protein-rich fresh fodder, or *kundeeri*, is no longer available and the animals have to live on dry grass. They first have to cope with periods of cold (*soorol* and *dabbunde*, from November to February) and then heat (*seeɗu* and *bajara*, from March to May). The herders' task shifts from getting their animals into shape – a precondition to mating – to getting them through the fodder-poor season (*feýýina na'i*) with the lowest possible weight loss. The nomads therefore limit the range of their movements in order not to exhaust the beasts. They exploit the pastureland around a well, moving in small stages (*sottol*) every seven to ten days. Only when the pasture is completely used up will they undertake a middle-range move (*goonsol*) in order to reach pasture around another well. During the cold period (*dabbunde*) the Woɗaaɓe look for woody depressions (*luggere*) to shield the herd from the chilly wind. During the hot period (*seeɗu*, *bajara*) they set up camp on open plains in order to catch any breath of fresh air.

The herders attach great importance to salty-tree browsing during the dry season. It is *ɗahatorɗum*, something that complements the staple food (*nyaamdu*) of cattle grass, just as a green sauce complements the millet porridge of humans. To the Woɗaaɓe, *Salvadora persica* (*kasassi*), which is widespread in *Kawlaa*, is the best tree for browsing. Other interesting *ɗahatorɗum* species that they mention are *Cadaba farinosa* (*karatiiyel*) and *Maerua crassifolia* (*senseni*). The disappearance of high-quality pasture is marked not only by the cattle browsing trees but also by the practice of watering the beasts only every second day (*degol e koorka*). At first the reduced water intake prevents the cold wind from "seizing" and "striking" the animals. Excessive intake of water would cause distension of the stomach and eventually lead to a loss of weight. During the hot dry season the Woɗaaɓe continue to water the herd only every second day and consequently accept lower milk yields. They say that in this way their cattle gain weight more quickly during the next rainy season.

By the end of the dry season (from May to June) pasture becomes very scarce (*meheri woodi*). There are some tree resources that can relieve the cattle's hunger, but they can never replace grass as a source of energy for any length of time: the young leaves of now-budding trees, such as *Boscia senegalensis* (*amjahi*), the fruits of *Maerua crassifolia* (*senseni*), the palm fronds of *Hyphaene thebaica* (*gellewol*), the flowers of *Acacia seyal* (*ɓulɓi*), the foliage and fruits of *Acacia albida* (*saski*) and the leaves of *Diospyros mespiliformis* (*nelɓi*). In the 1910s, when the Woɗaaɓe discovered *Kawlaa*, it appeared to be ideal bushland for cattle. Now a combination of reduced rainfall and intensive pasture usage by many different groups of herders has changed the situation (the Woɗaaɓe say *ladde waatii*, "the bush is dead"). Some highly valued grass species, notably *Andropogon gayanus* (*raýýere rimre*), have become extinct. Even more serious, in many years there is not enough grass for the herds to survive. Under such conditions it is of the highest priority for the nomads to have access to areas of retreat. These areas are the state of Bornu south of the Komadugu–Yobé in northern Nigeria, the dry Lake Chad Basin (*Saadi*) southeast of Bosso, and the dune valley Dillia (*Diriyaawol*), which stretches in a northwesterly direction from N'Guigmi to the massif of Termit [2.12], [2.13], [2.14].

THE PASTORAL ZONE

Woɗaaɓe principles of animal nutrition and pastoral techniques

by **Nikolaus Schareika**

PRINCIPLES OF ANIMAL NUTRITION	PASTORAL TECHNIQUES
Fresh green fodder (*kessum*) is better than dry fodder (*jo'oruɗum*).	Lengthening green-fodder period (*ndunngu*); shift between sand dunes and clay plains by seasonal migration (*ɓaartol*).
Adjust the cattle's rumen from dry to green fodder at the beginning of the rainy season (*nagge horsina*).	Feeding natron, which has a laxative effect; looking for the leguminous herbs *Zornia glochidiata* (*dengeere*) and *Alysicarpus ovalifolius* (*gadaji'ire*) – these may provide the nitrogen that the rumen bacteria need for processing the now higher quantities of cellulose.
The nutritional value of grass is best before it has come into ear.	High frequency of middle-range moves (*goonsol*) on sandy soil following the rain (*tokka duule*). From sand back to clay (*ɓaartol*).
Look for what animals like and avoid what could reduce their appetite (particularly a bad smell of dirty grass).	High frequency of camp site transfers.
Successively exploit floodplains and ponds for *Panicum laetum* and *Echinochloa colona.*	High frequency of short-range camp site transfers (*sottol*).
Some species of herbs and creepers help grass to nourish the cattle (*ballirɗum geene*).	Staying on clay plains during the late rainy and early dry season.
Fodder plants of the same species can vary with regard to their nutritional value as determined by the content of minerals, salt and vitamins (*mbaawu*).	General choice of clay plain (*karal*) through yearly seasonal migration (*ɓaartol*) and historic migration from central Niger (*perol*).
Exploit dry but protein-rich short grass of the kunɗeeri-type on salt- and mineral-rich soil.	Middle-range moves (*goonsol*) between, and short-range moves within, pasturelands of the clay plains (*karal*).
Supplement dry and poor fodder grass by salt-rich trees (*ɗahatorɗum*), such as *Salvadora persica* (*kasassi*).	General choice of clay plain (*karal*) through yearly seasonal migration (*ɓaartol*) and historic migration from central Niger (*perol*).
Don't let animals be caught by a cold wind.	Camp site transfers (*sottol*) between woody depressions (*luggere*).
Adjust to poor fodder by reducing exertion for animals.	Short-range camp site adjustments (*sottol*) around a single well during the dry season.
Adjust quantity of water to reduced fodder quality and quantity, thereby preparing for fast weight gains during the rainy season.	Watering the animals only every second day (*degol e koorka*).
Cattle cannot survive for a long period without grass.	Being prepared to move to zones of retreat (Bornu, Lake Chad Basin) in case of drought.
There may always be a better pasture than the one being used at the moment. Constantly look out for the better.	Trying to get as much information on pasturelands as possible by first questioning any other herder and then personally inspecting promising areas (*seewtunde*).
Pasture quality can never be fully assessed by the herder's inspection.	Keeping herd and household mobile in order to judge pasture quality from the animals' reaction to it (milk production, coat, breathing, etc.).

>> RIGHT: PASTORALISTS HAVE A SOPHISTICATED KNOWLEDGE OF NATURE AND VEGETATION DYNAMICS

NEAR KABELEWA VILLAGE (N'GUIGMI), THE NIGER

PHOTO: COURTESY OF N. SCHAREIKA

PASTORALISTS USE A COMBINATION OF TRADITIONAL AND MODERN VETERINARY PRACTICES

ETHNOVETERINARY REMEDIES

For centuries, pastoralists have observed the effects of treatments based on native plants and natural resources on their livestock when they fall sick. Today many of them use a combination of traditional and modern veterinary medicine, depending on the condition they are treating, their own financial situation and the availability of imported drugs.

It is a fact that ethnoveterinary remedies are often the only ones available in remote pastoral areas, where imported drugs either fail to arrive or are too expensive.

Statistical information on the percentage of pastoralists using ethnoveterinary remedies is not available, but there is no doubt that it must be very high, if only because, today in Chad, over 80 percent of the population still uses traditional medicine for human treatment. Although many pastoralists combine the use of traditional and modern drugs, collaboration between veterinarians and traditional practitioners is still erratic.

Since most information is transmitted orally to the younger members of the families, rather than being systematically codified in written form, and because the types of treatment may be very different according to animal breed, season and plant availability, it is quite difficult to collect information in a systematic way and to test the effectiveness of these methods scientifically.

Some efforts have been made to cross-reference traditional knowledge to scientific classification of diseases. For example, Maliki [2.15] has described three Woɗaaɓe disease categories: "hot", "cold" and "contagious". An animal with a "cold" disease stops grazing and does not gain weight, and Maliki suggests that this is

because of parasites and nutritional deficiencies of pastures. On the other hand, diseases that the Woɗaaɓe call "hot" cause quick death and could be endemic, such as anthrax and blackleg.

Some 240 references related to ethnoveterinary medicine are listed in the annotated bibliography of Mathias-Mundy and McCorkle [2.16], many of them based on long years of activities with farmers and pastoralists. Descriptions of medicinal plants and their uses for traditional veterinary medicine in sub-Saharan Africa have been prepared by the International Prélude Network, Subnetwork "Health, animal productions, environment" [2.17], and a databank related to sub-Saharan Africa, with some 14 000 cards related to plant species, country, illness symptoms, recipes for the preparation and use of medicinal plants, and animals treated (cattle, camels, poultry, fish, pigs, etc.), is available on the Internet [2.18]. The information recorded comes from scientific articles, books and congress reports.

Ethnoveterinary medicine deals not only with drugs and treatments but also with folk beliefs, skills, methods and practices of health care of livestock. For example, Nigerian Fulani appreciate the role of insects in the spread of disease, correctly observing that *sammore* (trypanosomiasis) is linked to tsetse-fly bites [2.19]. They also wash their animals with an infusion of *Sesbania aculeata* before passing through a tsetse-fly belt. Fulani responses to foot-and-mouth disease are to move upwind in order to prevent the disease from spreading, or to move downwind in order to expose their animals to the disease so that they become immune [2.16]. The Fulani know that they must refrain from grazing on pastures infected with endemic diseases, such as blackquarter or anthrax, for two years.

It is important to note that many ethnoveterinary remedies are directed at prevention rather than treatment, evidencing good management of the herd and adaptation to environmental conditions.

As in Western veterinary science, not all ethnoveterinary practices provide effective solutions to animal health problems. Ethnoveterinary therapies are largely ineffective against infectious diseases such as rinderpest and foot-and-mouth disease. On the other hand, many ethnoveterinary techniques seem acceptable and may, on occasions, prove effective, even according to Western standards of medicine. These techniques include obstetrical measures (e.g. the Woɗaaɓe, using a razor blade, cut the perineum of an animal that is about to give birth if the birth canal is not sufficiently wide), rumen trocarization in cases of bloat [2.15], and lancing of abscesses, as well as anthelmintic treatments, correction of physiological malfunctions (such as pH imbalances in the rumen), wound care, basic surgery and treatments for skin diseases, nutritional deficiencies, respiratory illnesses and insect damage (e.g. fires are lit near the animals to control insects) [2.16].

All the experience related to traditional veterinary medicine cannot be simply ignored. Additional research and development in the field of ethnoveterinary medicine are recommended because they could well contribute to the enhancement of the value of grasslands and the promotion of low-input, sustainable agropastoral systems. The knowledge and use of ethnoveterinary medicine should be further documented and efforts made to evaluate traditional prevention and treatment practices scientifically and to combine them with the use of scientifically established pharmaceutical products.

BALATUNGUR MARKET (BOSSO), THE NIGER

TRADITIONAL MEDICINES FROM GRASSLANDS SOLD AT THE MARKET

How to treat cattle diseases

Interview with
Maï Inoussa Maï Manga *

"I own more than 500 head of Kanuri cattle, which I care for and vaccinate with traditional methods that give excellent results."

"For an animal with heart problems and internal haemorrhages caused by fights, we burn some natron (sodium bicarbonate) and stuff it deeply into the animal's nose, so that it breathes it in."

"For pneumonia, we have no vaccine. If an animal catches the disease, we kill it and remove the infected lung. The lung is soaked for three days before being cut into small pieces. Then the whole herd is vaccinated in the following way: a cut is made on the muzzle of the animal and a piece of lung is inserted in it and kept there for three days. The wound swells for a further three days. The piece of lung is then removed and the wound is cauterized with hot metal. If the piece of lung is not removed after three days, the animal's head swells, it goes blind and dies. My animals treated in this way are vaccinated against pneumonia."

"We also vaccinate animals against anthrax by cauterizing two parallel lines on their skins at the level of the kidneys, one on each side of the animal."

"To protect animals from pasteurellosis, we pound fresh garlic in a cup of fresh groundnut oil. This dose is enough for three adult animals. The oil and garlic mixture is diluted in hot water and the animals are made to swallow the solution – the animals' mouths are forced open and the liquid is poured into the back of the mouth. This treatment is repeated once a week for three weeks."

"If an animal gets a thorn (mainly from *Prosopis*) it should be treated with *Calotropis* milk. Three days later, the thorn comes out and leaves no infection."

DOUTHY VILLAGE (DAMASSAK), NIGERIA

HERDERS CARE FOR THEIR ANIMALS AND TREAT THEM WHEN NECESSARY IN ORDER TO PRESERVE THE HEALTH OF THE HERD

NEAR N'GUIGMI, THE NIGER

ACCORDING TO MAI INOUSSA MAI MANGA, PREVENTION IS BETTER THAN CURE

* Canton Chief of N'Guigmi, the Niger

KABELEWA VILLAGE (N'GUIGMI), THE NIGER

MOST INFORMATION ON ETHNOVETERINARY REMEDIES IS TRANSMITTED ORALLY, RATHER THAN BEING SYSTEMATICALLY CODIFIED IN WRITTEN FORM. THIS IS WHY IT IS QUITE DIFFICULT TO TEST THE EFFECTIVENESS OF THESE REMEDIES SCIENTIFICALLY

KABELEWA VILLAGE (N'GUIGMI), THE NIGER

TREATMENTS DIFFER ACCORDING TO THE BREED OF THE ANIMAL, SEASON AND PLANT AVAILABILITY

NEAR N'GUIGMI, THE NIGER

MANY ETHNOVETERINARY TECHNIQUES, SUCH AS RUMEN TROCARIZATION IN THE CASE OF BLOAT, SEEM ACCEPTABLE TO WESTERN VETERINARY SCIENCE

Making butter with the Woɗaaɓe

12 October 2001
N'Gortogol, N'Guigmi,
the Niger

We arrive at the camp of a Peul Woɗaaɓe family before dawn; the air is cold and the light grey. We are led by Gorgio Birima, a well-known Woɗaaɓe guide, who settled down years ago in the nearby village of Kabelewa. At one point we left the asphalt and then, without a road, without a track, and with no apparent signs, we arrived at the camp. They are all sleeping except, of course, the mother of the family, who we see leading a calf in search of fresh foliage. Though Gorgio had previously made arrangements for us to document the preparation of butter, we do not wish to intrude. So we park at a distance, in order to allow the family members privacy and time to get ready at their own pace.

NEAR N'GORTOGOL (N'GUIGMI), THE NIGER

THE CALF IS BROUGHT NEAR ITS MOTHER IN ORDER TO STIMULATE MILK PRODUCTION

We notice that the camp is virtually divided into two sections: protected by a bushy sand dune is the area where the family lives, while facing it is the work area. The separation is marked by a long rope fixed to the ground, to which about ten calves are tied. In the middle are the smouldering remains of a minuscule open fire. The living area is defined by a bed with a canopy, where, on our arrival, the two younger children are asleep. The older members of the

NEAR N'GORTOGOL (N'GUIGMI), THE NIGER

VERY EARLY IN THE MORNING

NEAR N'GORTOGOL (N'GUIGMI), THE NIGER

IN WODAABE SOCIETY, MILKING IS PERFORMED ONLY BY WOMEN

family apparently sleep on mats next to the only bed. The father, as our guide points out, respects the space set apart for the older daughter. Only an invisible line separates the daughter's "room", but the father takes care never to step over it as he moves around. At the foot of the bed, piled up on a platform, are all the kitchen utensils for the production of the butter: mostly *calebasse* (gourds) of all sizes, many of them decorated, including the ladle, the vessel for milking, and the gourd with a stopper of woven fibre for storing the milk.

The father gets up from his "bed": one animal skin as a mat, another as cover. Next to him, with other hides for covers, lie the two older sons. The man puts on his clothes and comes to greet us; his name is Buba and, like most nomads, he is tall and lanky. We get acquainted. His wife's name is Suri; her noble, dignified face, softened by a shy but lively look, is thrown into relief by the black of her clothing. There are four children: the first, about ten years old, is named Peruji (as we will learn only later, since tradition forbids pronouncing the name of the first-born until adulthood); next come the two girls, Bamo and Tobo, and finally the youngest, one-year-old Bandi.

The older boy goes to fetch the cattle, which have been left grazing nearby during the night. The mother, Suri, continues to look after the calves;

NEAR N'GORTOGOL (N'GUIGMI), THE NIGER

DAUGHTERS HELP IN BUTTER PRODUCTION

Bamo and Tobo keep warm by the small fire; Buba, the father, prepares tea; and Bandi sleeps peacefully in his bed. In the soft, golden light which slowly floods over us, the small family seems to exist in a dream-like, happy limbo.

As the herd returns from the pasture, the cows approach spontaneously. Suri unties the calves one by one, in order of arrival, and lets them join their mothers to suckle. After a few pulls at the udder to suck a drop of milk, the calf, gently but firmly, is pulled away by Suri. She ties a rope around the cow's hind legs and begins milking, crouched at the side, almost under the belly of the animal, holding the large gourd tightly between her legs. With rapid movements of her hands, Suri deftly squirts the milk into the waiting calabash: it seems like a miracle, even though the quantity, compared with what we are used to, is quite meagre. To help her mother, Bamo keeps the cow calm by scratching it under its tail. One after the other, Suri milks all the cows, using the same ruse with each calf, which runs to suck a drop of milk and thus prepares the udder for milking.

After receiving milk from about ten cows, the calabash is full. It may contain 4 or 5 litres, which includes the yield from the previous evening as well. Some of it will be drunk right away: the gourd is passed from mouth to mouth. This is often all the family will have in the way of sustenance until evening. The remainder is poured into another vessel, which is closed with a stopper and placed firmly on the sandy ground. For a good 20 minutes, the gourd is shaken back and forth with a rhythmical movement, until the milk, as if by magic, solidifies into creamy white butter. Carefully kept in the calabash, the butter will later be taken by Suri to the nearest market, where it will be bartered for millet or another cereal. Meanwhile, with the last traces of butter that have remained at the bottom of the calabash, Suri oils her daughter Bamo's hair, leaving the small plaits soft and shiny.

NEAR N'GORTOGOL (N'GUIGMI), THE NIGER

A STAGE IN BUTTER PREPARATION. THE BUTTER WILL THEN BE SOLD OR EXCHANGED AT MARKET TO BUY CEREALS AND OTHER GOODS

NEAR N'GORTOGOL (N'GUIGMI), THE NIGER

BANDI, THE SMALLEST CHILD, HOLDS HIS PASTORALIST'S STICK