Some Aspects of the Problem of Nomadic Cattle Breeding among the Tuareg of the Central Sahara.

By Johannes Nicolaisen.

The problem of the origin of nomadic cattle breeding has always been of special importance to anthropologists interested in historical reconstruction, and much has been done to indicate the true position of the various cattle breeding cultures in the scheme of cultural evolution. Nevertheless our understanding of this particular problem of cultural history is still far from complete, and rather different views are held by anthropologists of to-day.

In this brief account of the nomadism of the Tuareg of the Central Sahara I do not intend to expound any new theory of the origin of nomadic cattle breeding in general, but it is my hope that the present study may be of some importance for a discussion of the theories so far set forth. In particular I hope to show that we will have to base our assumptions on detailed field-material to a far greater extent than has been done by most anthropologists, who have contributed to the historical problem of nomadic cattle breeding.

My own knowledge of nomadic cattle breeding is due to five unfortunately rather short field-trips to the Algerian Atlas and Sahara. On these journeys I collected field-material among various cattle breeding peoples, notably the true Arab nomads of the Algerian steppes, the semi-nomadic Berber-speaking Chaouia of Aurès, and the Berber-speaking nomadic Tuareg of Ahaggar and Tassili-n-Ajjer. I have also collected some material among the sedentary Berber-speaking Kabyle of the Djurdjura Mountains, and among the agriculturists of the oases, where cattle breeding is practised

to some extent. However, as the cattle breeding of the Tuareg seems to be of special importance to the historical theories of nomadism, I shall concentrate on the culture of these peoples. Altogether I spent about eight months among the Tuareg, but I cannot, unfortunately, boast of having made a very detailed study in the field. There are several reasons for this. Firstly, eight months is much too short to obtain full knowledge of the rather complicated mode of livelihood of the Tuareg. Secondly, as I have only studied the Tuareg during the summer season from the beginning of May to the end of October, I have no personal acquaintance with their winter-life. With regard to this, I have to rely mainly on information obtained from the Tuareg in the field, but also to some extent on a vast and generally rather unprecise literature. Thirdly, it is extremely hard to carry out anthropological fieldwork in the Sahara during the summer season, as not only the anthropologist, but also the natives suffer from the very hot climate. Under such circumstances the problems of water and shade from the burning sun easily become more important to the anthropologist than problems of nomadic cattle breeding.

The Tuareg live in an extensive, unbroken area of the Western Sahara and the Northern parts of the Western Sudan. Thus the entire territory dominated by the Tuareg lies between the Latitudes 14° to 30° North and the Longitudes 5° West to 10° East. Generally speaking, all Tuareg can be divided into six main groups:—

1) *Kel Ahaggar,* in the mountains of Ahaggar, and adjacent regions of the lowland.

2) *Kel Ajjer,* in the mountains of Tassili-n-Ajjer, the Southern part of Tripolitania, and the South Eastern part of the great sandy desert Erg Oriental.

These two groups are often known as *the Northern Tuareg.*

3) *Kel Aïr,* in the Aïr Mountains south of the Kel Ahaggar.

4) *Kel Geres,* south of the Kel Aïr.

The two latter groups are also known as *the South Eastern Tuareg.*

5) *Kel Adrar,* in the mountains of Adrar-n-Iforas, west of the Kel Aïr, and south of the Kel Ahaggar.

6) *The Ioullemeden,* farthest south and west. This group is also known as *the Southern Tuareg, the Tuareg of the Sudan,* or *the Tuareg of the Niger.*

The four latter groups can, for practical reasons, be referred to as *the Southern Tuareg,* as distinct from *the Northern Tuareg,* who will be dealt with in more detail. The total number of Tuareg is estimated at about 240.000. By far the majority of these are found in the Sudan, or in the borderland between the desert and the savanna. The true desert region, which, broadly speaking, corresponds to the region inhabited by the Northern Tuareg, has only 6—7000 Tuareg inhabitants. The Northern Tuareg thus constitute less than 3 % of the total number of Tuareg.

As the Tuareg are scattered over such an extensive area, some points of cultural distinction between the various groups can be made. This is largely due to different natural conditions, and to contact with different peoples in the north and in the south. The differences due to culture contact are not so significant as might be expected, and this is mainly because of the caravan trading, which plays an important part in the economy of all Tuareg. The cultural differences due to varying natural conditions, however, cannot be so easily dismissed. The pastures of the country of the Northern Tuareg are only sufficient for camels, donkeys, goats, and sheep, but in the steppes and savannas of the Southern Tuareg, cows, and in the extreme south — horses, are also very important domestic animals. These differences in cattle breeding account for a somewhat different material culture in the north and in the south.

In spite of these differences in culture, the Tuareg may be said to form a fairly homogeneous group both culturally and socially. As far as the material culture is concerned, many Tuareg traits are not found in other North African cultures. Among such cultural elements, the small, red coloured tent of skin is the most important. This peculiar form of dwelling is evidently much more primitive than the wellknown black tent, used by most Arab bedouins in Africa and the Middle East, and also known farther east in Asia. Limited to Tuareg culture is also a special kind of alphabet, related to the form of script previously used by the ancient Libyans, and the veil worn by all adult males from the age of puberty. With regard to social structure and political organization, the various groups of Tuareg are, in many ways, very much alike. As among other nomadic cattle breeders of the Sahara and the Sudan, a highly developed class- and cast-system is found. This system may vary from one group to another, but the division of the true fair-skinned Tuareg into nobles and subjects as well as

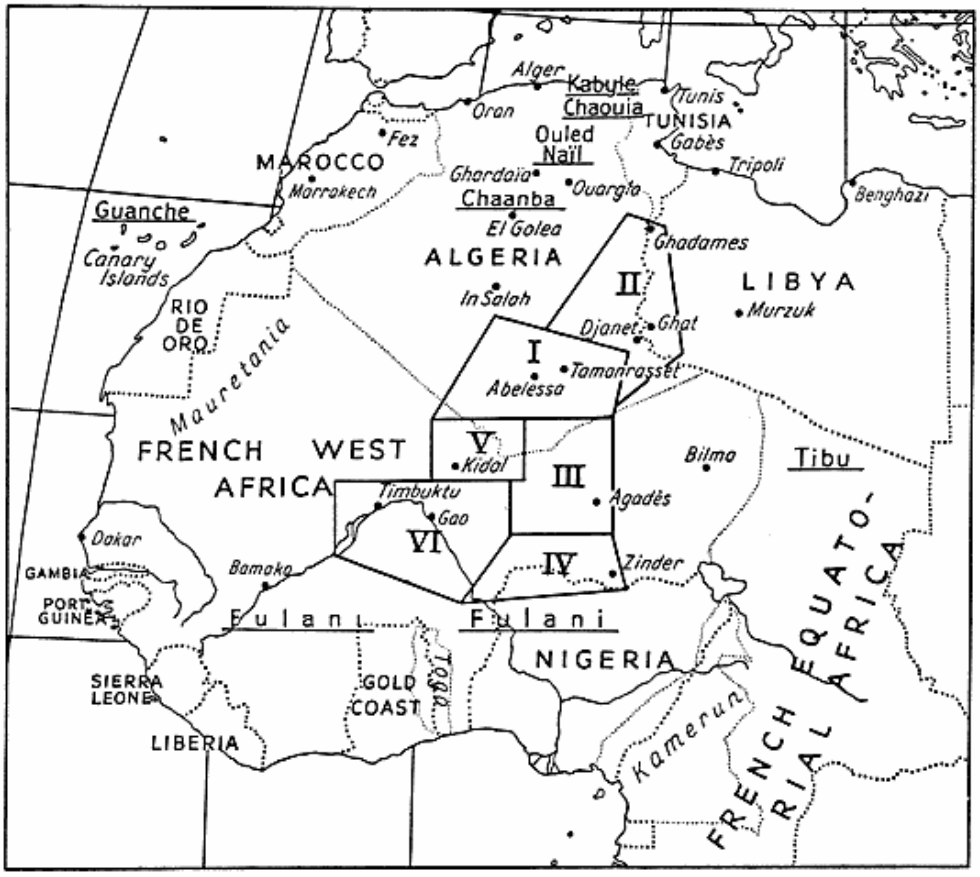

Fig. 1. Map of North-West Africa. Roman numerals indicate the territories of the six main groups of Tuareg: — I. Kel Ahaggar. II. Kel Ajjer. III. Kel Aïr. IV. Kel Geres. V. Kel Adrar. VI. Ioullemeden (mainly after Lhote). Names of other peoples mentioned in the text are underlined.

the black-skinned castes of agriculturists, blacksmiths, and slaves, is found within most groups.

The Tuareg of the Sahara north of the Sudanese savanna are mainly living in or near mountain regions, and four of the six groups listed above are named after the dominant mountains of the Western Sahara. Among these mountains those of Ahaggar are by far the highest with peaks up to 3000 m above sea level. The Tassili-n-Ajjer, are, in general, below 2000 m, and the Adrar-n-Iforas and the Aïr Mountains still lower. The Ahaggar Mountains consist predominantly of crystalline rocks, and of rocks from a relatively recent volcanic period. These are generally of a rather dark colour, and would make the country very monotonous and depressing if it were not for the formations of rugged ranges and isolated basalt peaks of the higher mountain region. Entirely flat places are extremely rare in the uppermost parts of the country,

and if found they are normally covered with boulders as are the less abrupt mountain slopes. As a network of dry river valleys runs all over the moutains, travelling in this country is not so difficult as might be expected. Structurally the Ahaggar Mountains consist of an archaic resistance area, and they differ in this respect from the Tassili-n-Ajjer Mountains, which, like the Tassili-n-Ahaggar to the south, are demolished mountain chains. In Tassili-n-Ajjer the surface consists mainly of sandstone and volcanic rocks. The river valleys of this region often form true canyons. This may make it difficult to cross from one river valley to another, and, on the whole, traffic seems to be easier in the higher and more rugged mountains of Ahaggar. The lower regions of the country of the Northern Tuareg consist of plains with scattered mountains of 500—1000 m above sea level. The complicated network of river valleys characteristic of the upper mountain regions is here united into a few very broad wadies. Where such wadies do not occur, flat, extensive plains covered with sand, gravel, and stones are common. Very extensive and completely barren desert regions of this kind are known by the Tuareg words *tenere* or *tanezrouft*. Finally there may be mentioned the true sandy deserts with their gigantic dunes. This type of desert is common in parts of the Kel Ajjer territory, but is comparatively rare in the country of the Kel Ahaggar.

It is characteristic of the country of the Northern Tuareg, as of the whole of the Sahara, that the summer temperature is very high, and the annual precipitation very low. The hottest months are July (farthest north), or June-May (farthest south). During these months the highest temperature may exceed 50 centigrades, and the average temperature is then 30°—35°, or even higher. The winter temperature, on the other hand, is comparatively low, and in most places averages about 10°. The absolute minimum temperature, however, is very much below this. Thus the village of Tamanrasset (1400 m) has in January an average temperature of 11°7, but an absolute minimum of ÷ 6°6. Frost is very common during winter nights, and even snow may fall during that season. On the whole, great fluctuations of temperature are common, and the changes between relatively cold and very hot temperatures, allied with inadequate dwellings and clothes, are responsible for pneumonia and similar diseases, which give rise to frequent deaths — especially among children.

In the lower parts of the country of the Northern Tuareg the

annual rainfall is everywhere below 20 mm, but in the true mountain regions of Ahaggar and Tassili-n-Ajjer, as well as further south, the precipitation is bigger. For Tamanrasset the figure of 40.7 mm is given, and those for the upper parts of the mountains are, in all prohability, much higher, but unfortunately are not known. However, such figures tell us little of the desert climate, as it is a characteristic of the whole of the Sahara that rainfalls are very irregular, and several years may pass between two rainfalls at one and the same place. This is true especially of the lowermost parts of the desert country, but although the conditions are more favourable in the mountain regions, severe droughts may occur even there. Farthest north rainfalls are most common during the months of September-October-November. In the southern parts of the country the rainy season comprises the months af June-July-August, as in the adjacent regions to the south, but there may also be a rain-maximum in March-April-May. During the rainy season late in the summer a few showers will normally occur in some parts of the Ahaggar region, and heavy rainfalls accompanied by violent thunder-storms are not uncommon. Rains may even fall during the afternoon and night for several days; and a single heavy shower may change the dry river valleys into roaring rivers impassable to men and beasts. I have met with this phenomena all the three summers I have spent among the Tuareg. Thus, in August 1953 the Wadi of Abelessa turned into an impressive river of about a hundred metres across.

When a river valley has been flooded, water is found under its surface cover of sand for one or a few years, and wells can easily be dug. In a few places of the Ahaggar and Tassili-n-Ajjer Mountains water is found all the year round during the most severe periods of drought in small holes or ponds between the rocks. During droughts the Tuareg have to stay near such permanent waterholes or wells, but if rain has been plentiful they can camp over a much larger territory, and utilize more extensive pastures.

The most important result of the rainfalls late in the summer is the regeneration of the pastures of perennial and annual plants. In the country of the Ahaggar Tuareg a vegetation of perennial plants is, generally speaking, only found in the river valleys. In the very broad valleys of the lower mountains up to an altitude of 1700—1800 m perennial plants of many different species comprising grasses, herbs, bushes, and trees are abundant. The most

common trees of this region are *tabarekkat* (Tamarix articulata), *tabaurak* (Balamites aegyptiaca), *abser & tamat* (Acacia tortilis & Acacia seyal), *taggart* (Acacia arabica?), and *agar* (Maerua rigida). Most of these trees can, under favourable conditions, grow to a height of 5—7 m, and in the valleys of the lower country trees may grow over fairly large areas and bear a resemblance to savanna or open wood. In the upper parts of the Ahaggar Mountains trees become very scarce, and two species only are found in this region. These are *tahounek (Rhus oxyacantha),* and the wild olive *aleo* (Olea Laperrini sp. nov.). They are both evergreen like the *tabarekkat,* while all other trees mentioned are diciduous during the winter season.

As far as perennial grasses and herbs are concerned, the lower country is also the most favoured part of the mountains, as the species are here more numerous and of higher growth than in the upper mountain zone. Thus the lower country seems with regard to pastures of perennial plants and fuel to be the most valuable part of the Ahaggar Mountains, but the higher mountain zone has also many advantages to the cattle breeding Tuareg. This is mainly because of its pastures of annual plants. The stony slopes of the higher mountain zone are completely barren during the early summer season, but after rains late in summer, the country changes its character. Already a few days after heavy rain, the first tender shoots of the annual plants appear among the boulders, and if rainfall has been heavy all over the country, the mountain slopes are covered by a veritable curtain of fresh, green plants, some of which will be mentioned later. These plants form valuable food for the cattle, and they may remain green for four to five months under favourable conditions. Then they get dry, but if there is not too much wind, they will remain for another four months, and are even then excellent for cattle fodder.

Among the perennial plants acacias *(abser & tamat)* are of special importance. The young shoots of these trees are eagerly eaten by camels, goats, and sheep, and the Tuareg consider them the most valuable cattle food among all perennial plants. But although the cattle are said to fatten quickly on acacias and in particular on annual plants, it is not appropriate to let the animals graze the same kind of pasture for too long a time. A certain change is neccessary, and it is essential now and then to let the animals feed on perennial plants containing salt. Among some of the Southern Tuareg extensive annual migrations take place for this reason, and where such

Fig. 2. Tuareg with riding camels in the Ahaggar Mountains.

plants are not obtainable, salt has to be given to the animals. In this respect the Northern Tuareg are very well off, as pastures of salt plants are very common in their country. Most important among these plants is *aramas* (Atriplex halimus), but a herb named *issin* (Ar. *jel)*, and the tree *tabarekkat* (Tamarix articulata) of the lowland do also contain salt.

A description of the country of the Northern Tuareg would be very detailed if we were to give an account of the geography, climatology, and botany as known to the Tuareg. To nomadic peoples a comprehensive knowledge of the natural history of their country is highly necessary for cattle breeding, and that the Tuareg have such knowledge appears clearly from a study of their language. Thus they have more than 200 different names for plants, and their terminology for special pastures, wells and waterholes, weather

conditions, and conditions of the soil is also very impressive. A full knowledge of the country such as that possessed by all adult Tuareg could only be obtained if one was forced to live in the country as a cattle breeder for many years. Also impressive is the Tuareg terminology for time and space, and it would take us too long to enter upon a detailed description of the Tuareg conception of these phenomena. However, it may be appropriate to mention a few characteristics of time-reckoning. Although the Tuareg have adopted the Mohammedan lunar calendar with its twelve months, they still make use of a more primitive calendar system. The sequence of years is not counted from any fixed date, but each year is named after a special event, such as "the year in which the Ahaggar Tuareg raided the Ioullemeden in the valley of Ti-n-deran" (1871), or "the year in which there was plenty of tainast" (1903) (tainast is an annual plant). The Tuareg year resembles the European solar year, except that its beginning and end cannot be precisely stated, but may be defined as the period between two mid-winters. It is divided into four main seasons each having a special name. These seasons are:— *Aouellen* which corresponds roughly to the period from the middle of May to the middle of August. This is the true summer season when peoples are suffering from the burning sun. Little work is done among the nomads at this time, while the agriculturists are busy with their gardens. In the latter half of this season rains are most common in the Ahaggar. *Ameouan* corresponds to the period from the middle of August to the middle of November. At this time of the year people suffer less from heat, and the nights are cool in the upper mountain regions. If rains have been plentiful, the mountain slopes are becoming green with annual plants. This is the season for the beginning of caravan trading, and for the celebration of marriages. *Tagrest* from the middle of November to the middle of February is the winter season in which the acacias and other trees loose their leaves. People are now suffering from cold during the nights. *Tafsit* from the middle of February to the middle of May forms the transition period between winter and summer. The heat is gradually increasing, and butter melts in the containers. The annual plants are getting dry, while acacias and other trees become green.

The framework of the natural conditions, which have influence on Tuareg economy, has now been briefly outlined. In the following, a description of nomadic cattle breeding, and subsistance in general, will be given.

First of all, we will have to consider the nomadic migrations. The Tuareg of Ahaggar fall into a number of divisions generally termed tribes in the literature on the subject, although the term "clan" might be more adequately used. These tribes are again subdivided into sections. Most of the tribes have their own territories, and originally it was strictly forbidden to members of one tribe to graze their herds and flocks outside the tribal territory, but this rule is not always followed nowadays. Thus, camps from the tribes of Iklan-n-Taouset, Ajouh-en-Tehle, and the group of tribes termed "Isekkemaren", are often found in the territory of the Dag Rali tribe, as this latter tribe has a very extensive territory, which is mainly situated in the higher mountain regions, where pastures are rich after the rains. The Dag Rali is the only tribe, the members of which may be considered proper mountain nomads. Late in summer and all the winter they camp in the higher mountain region, and the pastures of annual plants may allow the members of a whole section to camp together. The camps will then comprize about 15 tents, which may remain at one and the same place for a considerable time. Thus the section of Kel Tamanrasset is said to have stayed at one place for eight months during 1952—53. In the summer, however, these camps of whole sections will usually disperse into lesser camps of a few tents each to graze their animals on acacias and various other plants in the lower parts of the country.

Camps from other tribes than the Dag Rali are found in the upper mountains during autumn and winter, but these tribes cannot be considered true mountain nomads. They do not carry out such annual migrations regularly, and many of the camps will remain in the lower mountain regions all the year round. However, it is often desirable to Tuareg camping in this part of the country to let their camels benefit from the fresh pastures of the upper mountain region, where their herds are guarded by slaves, while the flocks of goats remain with the camps tended by the women. Lowland camps are generally very small all the year round, and among the tribes of Iklan-n-Taouset and Ajouh-en-Tehle single tents are very often met with. This may be illustrated by an example from the Ajouh-en-Tehle. During my visit to this tribe in September 1953 the eight sections comprising 63 tents were divided into camps as indicated below:—

Sections.	*Number of Tents & Camps.*	
Ikenkaren	10	3
Kel Aguelella oua n Kel Tarahouahout	10	4 (5+2+2+1)
Kel Toues	4	3 (2+1+1)
Kel Tarien	6	4 (3+1+1+1)
Kel Rapsa	12	3 (6+4+2)
Kel Aguelella oua n Isandan	6	2 (4+2)
Kel Azernan	9	1 (9)
Kel Afrahauen	6	1 (6)

Contrary to what has often been held, the Tuareg of Ahaggar are not "grands nomades", that is nomadic cattle breeders carrying out regular, extensive migrations. Most camps move within a rather limited area all the year round, and when camps break up in search for new pastures or waterholes, the whole migration may take place in one or two days. However, if severe droughts occur and the pastures consequently are very poor, the Ahaggar Tuareg man have to migrate to pastures far from their own country with their camels, while the goats will remain in Ahaggar. A camel transhumance to places as far away as the Plains of Tidikelt, Adrar-n-Iforas, and the steppes of Tamesna to the east of the latter mountains was carried out already before the Tuareg were subdued by the French in 1904, and since then the pastures of Tamesna have been more systematically utilized for the herds of the Ahaggar Tuareg. Some of them have even settled permanently in this area, but most of them live in the Ahaggar Mountains, while their camels are guarded at Tamesna by their slaves. After very heavy rainfalls and consequently excellent grazing from annual plants in the upper mountains of Ahaggar, the camel herds may be driven to this region to utilize the fresh pastures and graze on perennial plants containing salt.

Goats are especially suited to the comparatively poor and dry mountain pastures in the country of the Northern Tuareg, and economically they may be considered the most important domestic animals, as the Tuareg would not be able to subsist in this barren country, if it were not for the products derived from the goats, which are relatively small of stature, and have very long hair of predominantly black colour although other colours are found as well. Their horns often have the form of scimitars, but other forms are also common, and goats born without horns are met with.

In accordance with the great importance of goat-breeding, different terms are used to designate the animals according to sex and age; these terms are given below:—

Age	*Female*	*Male*
New-born kid	amaroua	
Kid from its birth to the appearance of its horns	tereidet	ereid
Weaned kid with horns, and of bigger growth than above	touzzift	ouzzif
Weaned kid	tabunkelut	abunkelu
Animal not yet fully grown	taboulek	abouleg
— — — — —	tadaoualt	adaoual
Fully grown animal	tirse (pl. oulli)	ahoular

It is obvious that intensive goat-breeding necessitates a detailed terminology, the more so as the goats before the arrival of the French were the most important form of currency. Although money has now come into use to a great extent, goats are still used in payment as for example, to the blacksmiths for the making of bracelets, weapons, and various other implements, which the Tuareg are not able to make themselves. Goats are also used for certain duties due to the King from Tuareg of the subject tribes, and such duties are termed *ehere*. This word means literally a big flock of goats, but it may be translated as "fortune" or "money".

In addition to the terms given according to sex and age, goat-terms given after colour or certain other characteristics are also used: e. g.

Characteristics	*Female*	*Male*
Black animal	tazordefut	azordefu
Red animal	tezegark	ezegar
Black animal with a red belly	takahamit	akahami
Animal white on the hind part, and black on the forepart of the body	tedjehe	(No term as he-goats never have this combination of colours).
Black animal with white colour on the lower parts of all four legs	tazebort	azbor
Black animal with a white blaze	tamaalat	amaala
Black animal with white colour on the ears	taharejt	aharej
Animal of any colour having very small ears	tatamedjut	atamedju
Animal of any colour having no horns	tabijauet	abijaui

The actual number of such terms is not known to me, and even the Tuareg say they are innumerable. A colour term connected with an age term will generally be sufficient to describe the appearance of any animal, but colour terms have also practical importance in another sense. They are, as the Tuareg put it, employed in the same way as names of men and dogs, and they are mainly used by the women to call individual animals to be milked. The names are then followed by a special sucking sound, which is used to

calm most domestic animals among the Tuareg. It is remarkable how intimately the goats are attached to their masters. If the flock, as often happens, is grazing alone at some distance from the camp in the evening after darkness, it will immediately gather round the tents, when a special cry is uttered, or if the dogs are barking. A special sound is also uttered by the guardian, when she wants the whole flock to follow her quickly. Indeed, one might say that the goats in many ways obey their masters more readily than do the rather rude and untrained dogs. There are probably several reasons for this intimate relationship between goats and men. Thus the animals are very well aware that they are protected against the numerous jackals by the Tuareg, and to this may be added that most ruminants become very tame if brought up in close connection with human beings. Among the Tuareg, young kids are often allowed to live in the tents in very much the same way as dogs and cats in European houses.

The duration of the period of suckling is dependent on the conditions of the pastures. If grazing is good, the kids will suck for two to four weeks only, but under severe conditions the period of suckling may be two months. As long as the kids subsist on their mothers' milk they are not driven out to graze with the flock, but remain in the camp all day. At the end of the suckling period, they begin to eat fresh shoots of accacias or annual plants, and weaning may take place in different ways. If kids are abundant they will normally be taken to special pastures away from the camp and they will then be forced to live exclusively on plant food. If there are relatively few kids this method is not practised, but a certain device is used to prevent the half-grown animals from suckling. This consists of a little stick placed in the mouth of the kid and attached behind its horns with a cord. The stick allows the kid to graze without any difficulty, but does prevent it effectively from suckling, and the method seems to have a very wide distribution among cattle breeders. Thus in North Africa I have also found it used by Arab bedouins and the Berber-speaking Kabyle and Chaouia. Among the Tuareg and the Arab Chaanba bedouins the stick may also be placed in the mouth of the kid in a very simple and apparently rather crude way, namely by piercing right through the cheek of the animal. Many Tuareg will claim that this method is the very best, as the stick cannot so easily fall out, and it does no harm to the animals.

During the suckling period the kids are not allowed to drink all

Fig. 3. Young Negro slave wearing a loin-cloth made from goat skin.

Fig. 4. Tuareg woman of the Ajouh-en-Tehle tribe. Islamic amulettes and Sudanese snail-shells hang round her neck. Her plaited hair is greased with butter.

the milk of their mothers. Milk is an important nourishment to the Tuareg, and they would be badly off if the kids were allowed to suckle freely. The first few days the newly born kids will have all the milk, but thereafter they will get only half. To prevent them from drinking more than their proper share, they are placed in enclosures made of stone or wood, or are tethered by the hind leg away from the flock of the mother-animals. On the whole, goat-breeding is organized in such a way that the maximum possible milk is obtained by the nomads. The period of gestation for goats is about five months, and most kids are born during the cold season, and especially in the months of December and January, when grazing is good. A smaller number are born during the summer, although conditions for goat breeding are less favourable at this season as the animals, owing to the poor grazing and the heat, give very little milk. Kids born in the summer will often suffer from lack of milk and fresh grazing for their age of growth, and the Tuareg

say that these animals are inferior to those born in the winter season. An effective goat breeding is in reality a question of an appropriate birth control of the goats. If a Tuareg family has a great many animals, they will usually be divided into two flocks. One of them will graze on pastures away from the camp together with the he-goats for mating, while the other consisting of the milch goats will be herded near the camp, where it rests during the night to be protected against the jackals, and to be milked in the morning and in the evening. If a family has very few goats, these will normally graze in one single flock together with the he-goats all the year round. In order to prevent the animals from mating a cord is often attached round the foreskin of the he-goats.

Most Tuareg have little milk at their disposal during the summer season, and some of them may have no milk at all for several weeks. During the cold season, however, milk is normally a prominent part of the food consumed. It may be drunk fresh, but a large part of the daily yield is always put into special skin-bags for churning butter, which is used as a sauce for various kinds of plant food, and as ointment for the hair. Many Tuareg are not able to make butter during the summer, when little or no milk is available, but in the cold season there is a surplus of butter, which may be stored for later use or sold to the sedentary peoples of the oases. Buttermilk, eventually mixed with fresh milk, is an esteemed beverage to all Tuareg, some of whom will refuse fresh milk, and only drink buttermilk. In the cold season milk is also turned into cheese, which plays a part as provision in the hot season and on journeys. Two kinds of cheese are made among the Northern Tuareg, and the most common of these is called *aullus (pl. iwelsan)*. It is made from buttermilk which is heated and poured into a special basket made from straw, where the mass of cheese only will remain. This mass is then formed into small, round pieces of cheese and left to dry. In time it gets very hard, and will have to be crushed in the mortar to be used for food. This kind of cheese is preferred by most Tuareg, because they are thus able to have butter and cheese from the same milk, while the other type of cheese called *takamart (pl. tikmaren)* is made from fresh milk by using part of the entrails of newly born kids as rennet. The distribution of these two different types of cheese in Africa and elsewhere is not known in great detail. Among the southernmost Tuareg and the Fulani the takamart-type is said to be the only kind of cheese made, while both types seem to be known to most

cattle breeders of the Atlas. However, among the goat- and sheep-breeding Chaouia of the Aurès in Eastern Algeria the aullus-type made from buttermilk is by far the dominating kind af cheese, while that made from fresh milk is not manufactured by the bulk of these peoples, who are said to refuse to eat it. Historically the buttermilk-cheese is, in all prohability, the older of the two types, but the whole question of the distribution and origin of cattle breeding products still awaits a more detailed investigation than has been done so far.

It has often been said that most nomadic cattle breeders keep their animals mainly to utilize the milk, and this holds also good for the Tuareg, who will do their outmost to save good milch goats, which suffer from severe illness. Although the veterinary methods applied to some extent seem to be characterized by superstition, it is not always easy to an anthropologist without special veterinary knowledge to judge their rational value. A common method of curing wounds consists of cauterizing with a redhot iron or with glowing camels dung, but as far as goats are concerned burning is only used for head-wounds as burning on the animal's body would spoil the valuable skin. If goats are suffering from stomach-diseases they are given a certain kind of red plant seeds mixed with milk, and if bitten by snakes they may be given fat from the female barbary sheep, or cuts will be made to let the poisoned blood out. A method, which is evidently effective, is that applied to broken legs. It happens now and then that goats break one of their legs among the numerous boulders in the mountains, and fractures of this kind are always cured by application of wooden splints.

He-goats and barren goats are normally the only animals killed by the Tuareg, but such animals are not always available, and it may often be necessary to reserve animals fit for slaughtering for feasts of a social or religious character. On such occasions there will always be plenty of meat, but meat cannot be considered a stable diet of the Tuareg. Some of the newly born male kids may be killed and eaten, and the main reason for this seems to be that there will be a bigger supply of milk, when such kids do not have to be fed. Other male kids will be allowed to live until they are half or fully grown, but very few he-goats are needed for mating. Castration is carried out, it is said, mainly to make the animals fat for slaughtering, and even fully grown animals are castrated for this reason. The methods applied are cutting with a knife or crushing with the heavy wooden pestle of the millet mortar.

Even if the Tuareg could live without eating meat the year round, they would have to kill a few animals annually, as goats' skin and hair are highly necessary to their domestic crafts. Compared with sedentary peoples, nomadic cattle breeders are often little skilled as craftsmen, but skin and leather work is generally of great importance and very often highly developed, as is the case among the Tuareg. The roaming life in the desert necessitates transportation of water, milk, butter, grain, dates, and the like, and skin containers are very appropriate for this purpose. Indeed, goat skin is so important to Tuareg craft that in speaking of the manufacture of most domestic implements of the Tuareg one can hardly avoid mentioning the word "goat". Thus, my fairly large collection of ethnographic specimens from the Northern Tuareg contains about fifty different containers and other household implements made entirely or to a very great extent from goat skin. Goat skin is also used for tents, although skins from other animals are often preferred for this purpose, and it is still used for the manufacture of certain articles of dress. Since the French occupation cheap European cotton stuff has come into use among the Tuareg, and entire garments of skin are not used by the Northern Tuareg of the present day. But a loin-cloth made from goat skin may still be worn by young boys of the subject tribes and the slaves, and a skin coat is used by adult subjects and slaves during the cold winter season, but sheepskin is generally preferred for such coats.

Goat's hair is almost as useful to the Tuareg as the skin. All goats have a fairly thick covering of long hair, which is cut once a year in the hot season, when the animals do not suffer from cold. The hair is spun into strong cords used for tethering animals, tying up caravan loads, and the like, but is also employed for a primitive kind of weaving, while true weaving is unknown to the Tuareg in contrast to the Arab bedouins. This simple weaving method of the Tuareg is used for the manufacture of small bags for personal provisions.

As goat-breeding is so all important to the nomads of the Central Sahara, it has been necessary to enter upon this subject in some detail, the more so as it is of extreme significance to our discussion of the problem of nomadic cattle breeding among the Northern Tuareg. Sheep are, on the whole, of little importance compared with goats, and as sheep breeding bears resemblance to what has been said about the goats, there is no need for an elaborate account of this. The Tuareg sheep all belong to the species of *Ovis longipes*

characterized by rather high stature, a long, thin tail, and a short coat of hair like that of cows instead of wool. Although wooly sheep are found among the Arab Chaanba bedouins to the north, they are never met with among the Northern Tuareg. The milk of sheep is used in the same way as goat's milk, but as sheep, owing to the rather poor conditions of the pastures, are not very numerous, this is not the most important aspect of sheep breeding. At the present time these animals are mainly kept for selling to the sedentary inhabitants of the cultivation centres, and for slaughtering at religious feasts. As mentioned above the skin of sheep is much preferred for cloaks, and it may also be used for the manufacture of tents. Most Tuareg seem to have only about one sheep to ten goats, but they take much more interest in the sheep, and the rams will frequently wear Islamic amulettes.

The pastures of Ahaggar are not suited for the breeding of oxen. Such animals are in general only kept by the agriculturists, who use them as draught-animals at the irrigation wells. They are all zebus introduced from the Sudan. Donkeys are also important domestic animals for the agriculturists, and they are as useful to the nomadic Tuareg for transportation over short distances. Thus, when the nomadic camps break up in search of new pastures, the donkeys are generally the only pack animals used. But although donkeys in this way play a great part in nomadic life, little interest is taken in breeding them by the Tuareg. A few animals will always be kept near the camps, prevented from escape by a cord round their forelegs, and during the hot summer season they are used almost daily to carry water from the wells to the camps. If donkeys are not attached round their forelegs they will soon disappear and become wild, and, in fact, wild donkeys are common in some parts of Ahaggar. They are generally rather shy, and it is an impressive sight to meet a herd of about twenty animals galloping over the desert. To a great extent the Tuareg do still obtain their domestic donkeys by catching such entirely wild animals. Hunting takes place during the dry season, when water is scarce, and the animals have to come to the waterholes to drink. At such places they are caught by means of the so-called spiked wheel-trap, but it is said that they may also be driven into closed river valleys by men mounted on camels, and caught in that way. After one or two months, in which the animals get a rather crude treatment, they become sufficiently tame to be used as pack and riding animals. The Tuareg distinguish between the tame donkey (sing. *ejherd*),

and the wild ass (sing. *ahoulil*), but they are well aware that there is no real distinction between them. In fact, it seems often to be very much a question of opinion, whether an animal should be considered wild or tame. If many donkeys are needed to move the tents of a camp, they are often caught with great difficulty, and it may be necessary to catch the foals and tether them near the tents to get hold of the pack animals needed. An interesting example may also be mentioned from the Kel Ajjer. In some parts of the country of these Tuareg, the donkeys are left entirely to themselves during the summer season, but they can easily be caught, as in this region they depend on the Tuareg for water from the rather deep wells. Therefore the wells are always crowded by half-wild donkeys, which are never given much water, in order that they may not wander too far away.

While the domestic animals goats, sheep, and donkeys mentioned so far are mainly tended by the women, camel breeding is always the business of men. Camels play a very great part in Tuareg economy, as pack and riding animals, and their milk is also utilized. In accordance with this many-sided use of these animals, the Tuareg terminology for camels is very comprehensive, and if we were to mention all camel terms given after sex, age, use, colour, and various other qualities, we would need several pages in this journal. The colour terms for camels, like those in use for donkeys, are not true names as in the case of names for goats mentioned above, as camels will not respond to their use of names. Colour terms and terms given after other qualities have a certain practical importance, but they are also of great æsthetic value, as the Tuareg take an interest in camel breeding far beyond the practical use of these animals. The camel is the only animal used for riding by Tuareg men, and in former days it was of great importance for raiding and warfare. On the whole, the camel has very much the same esteemed position as the horse of Medieval Europe. It is strongly connected with men, war, and love, and these items are predominant in Tuareg poetry, where the beautiful riding animals are frequently mentioned, and camels have great influence on the whole social life of the Ahaggar Tuareg. Thus goats are considered the proper animals to be used as payments for various services or goods, but camels only can be used for bridewealth, bloodwealth, and some other social indemnities. Originally the fixed sum to be paid for a slain man consisted of one hundred she-camels of ten different colours, while only fifty animals had to be paid for

a slain woman. In reality, however, so many camels seem never to have been given, as this might deprive a smaller tribe of more than half of its stock. In case of murder the problem would be discussed in great detail until an agreement was made on the payment of a smaller number of camels by the relatives of the murderer. As far as bridewealth is concerned one to seven animals are given according to the status of the bride. The price of seven camels is only paid for women of the nobility, while among most other tribes only one camel is given. Among the noble tribes of the Kel Ajjer seven camels are also necessary to obtain a wife, but it is interesting that among the subject tribes of this Tuareg group the bridewealth is said always to be paid in goats. This may probably have been the case also for the subject tribes of the Ahaggar in ancient times, but at the present they are liable to hold the Kel Ajjer in contempt for this custom, although the price of the twentyfive to thirty goats normally paid for a wife among these tribes in actual value may exceed that of the one young camel paid among most tribes of the Kel Ahaggar.

As a milch animal the camel is of special importance to the noble Tuareg, and some Tuareg of the subject tribes keep only camels to use them as pack animals. Even for Tuareg who own a great number of she-camels it will not always be possible to make use of the milk to any great extent, as it may be necessary to keep the herd on pastures far away from the camp, and the milk will then serve as food to the herdsmen, who are usually slaves. If possible the milk of camels and goats is utilized in the camps at the same time, but if it is necessary or desirable to take the camels to special pastures far away, the camps of subject tribes will always remain with the goats, and there are two reasons for this. First, the goats are tended by the women, and second, it is important that a large part of the milk obtainable in the cold season is made into butter and cheese, which can be stored and used as provision at other times of the year. Camels milk, in contrast to what is often stated in the literature, is not fitted for such a purpose. It is never made use of for cheese, and butter from camels milk is only made for greasing the hair, if goat's butter is not available during the hot season. It is remarkable that such butter is then always made by the men in a rather primitive way: — A skinbag full of milk is attached to the saddle of a riding-camel, which is then ridden at very fast speed for some time, and the milk thus churned into butter. This method may well histori-

cally be the oldest method known to nomadic cattle breeders, but among the Tuareg it is only used in this special case, while goat's milk is always churned in skin bags by the women.

As she-camels will yield milk only if their calves are close to them, it may become necessary, if a calf dies, to deceive the mother-animal with the stuffed skin of its calf, and it is also said that a special treatment of the udder may be effective in this case. Very few she-camels will mate during the hot season, and mating takes generally place in winter. The period of gestation is one year, and most calves are brought forth during the cold season. A camel will, if not mated again soon, yield milk for about two years after the birth of a calf, but it is considered most appropriate to mate she-camels after a period of eleven months, and some milk may be obtained even then until six months after mating. When camel's milk is utilized it is generally drunk fresh, and never heated with hot stones, as may be the case with goat's milk. The calves are prevented from drinking all the milk by various devices of which the most common is a plaited pouch attached round the udder of the mother-animal. In connection with this method some calves which are particularly eager for milk, may be cut in two or three places on the bridge of the nose and also under the chin. On adult animals the scars from such wounds appear as small knots and a hanging patch of skin, and some Tuareg will claim that the scars are made predominantly for æsthetic reasons. Plaited muzzles are also said to be used for calves, but the method seems to be very rare.

Although great care is taken by many Tuareg to obtain as much camel's milk as possible, it has less economic importance than goat's milk because of its more limited use, and because it may be necessary to take the camels to pastures far from the camps. Other products of camels are also less valuable than products obtained from the goats. Camel's meat may be eaten at such social feasts as marriages, when a great many people come together, but normally camels are not slaughtered unless they are suffering from some disease. The hide is also of comparatively little value. It is not used for tanning, but is made into containers for butter, and strips are applied for lashing wood. Camel's wool is also of very little importance compared with goat's hair, and this is due, among other things, to the fact that most camels of the Kel Ahaggar have little wool, and some of the animals none at all, but only a coat of very short hair. The camels of the Kel Ajjer, however,

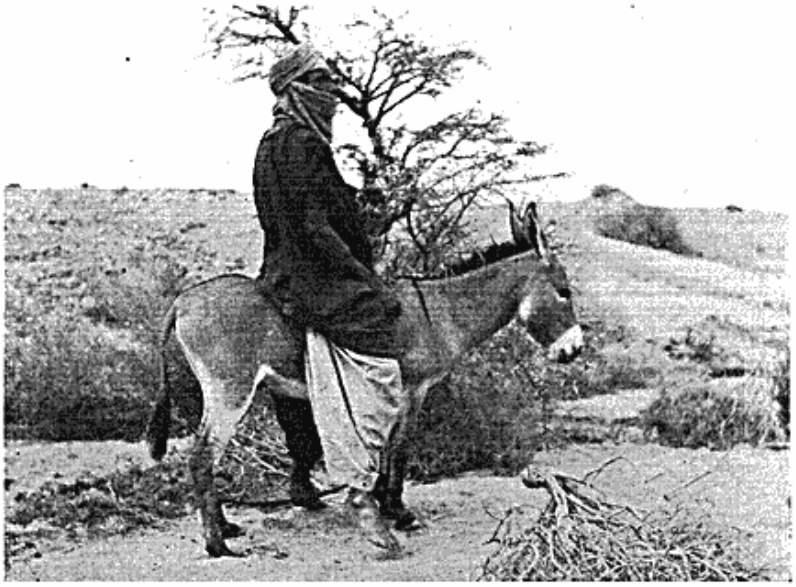

Fig. 5. Tuareg of the Ajouh-en-Tehle tribe mounted on young donkey caught by means of the spiked wheel-trap, and not yet fully domesticated. The men do generally not ride donkeys, but domestication of newly caught wild animals is their task.

Fig. 6. Young milkmaid of the Ajouh-en-Tehle tribe. Milking of goats and sheep is always done by the women as it is shown on this photograph, whereas milking of she-camels is done from the side of the milch animal by the men.

Fig. 7. Primitive wheat-plot in a river valley of the Tassili-n-Ajjer Mountains. Wild plants grow between the stubbles of which a single one may contain more than a hundred straw.

have often a coating of thick wool on the hump and the forepart of the body, but even among the latter Tuareg it is apparently used to a very slight extent. Generally it is only made use of for a few insignificant objects, eventually mixed with goat's hair.

The chief importance of the camel is, as already mentioned, as a pack and riding animal. Every Tuareg has his riding camel which enables him to undertake extensive journeys even in summer, when water has to be carried in skin bags. Normally he will not let his camel gallop, and a journey of more than 40—50 kilometers a day is unusual, but if necessary more than a hundred kilometers can be accomplished at a stretch. Such fast journeys had to be performed in former days during raids, and the military force of a tribe, or a federation of tribes, was dependent on the number and quality of its camels, and the ability of the men as riders. As horses, generally speaking, cannot subsist in the hot and barren country of the Northern Tuareg, raids which played a great part in Tuareg economy, could only be carried out by means of camels. At the present, camels are in particular valuable as pack animals for caravan trading, which will be described after a short account of some other activities of Tuareg subsistence.

Some Tuareg are very keen hunters, and although hunting by many is carried out as a mere pastime, it must be mentioned in some detail because of its special methods, and because it is of some importance to the economy of a few tribes. Nowadays the most common weapon is the rifle, but the ancient methods of hunting by means of traps, spears, and dogs are still in use. The bow, on the other hand, has apparently never been used by the Tuareg, as it is also unknown to most other nomadic cattle breeders of the African steppes and deserts. The spiked wheel-trap already referred to in connection with the hunting of wild donkeys or asses, is made in various sizes, and used for all bigger animals such as barbary sheep, antelopes, gazelles, hares, and jackals. A kind of torsion trap provided with a bow is also used to some extent for big animals, and particularly for barbary sheep, by the Kel Ahaggar, but seems to be unknown to the Kel Ajjer. To these two types may nowadays be added a steel trap like that used in Europe for beasts of prey. Such traps have been introduced from Europe or Northern Algeria, but are nowadays also made by native blacksmiths. Snares for partridges, and small torsion traps for pigeons are used mainly by the sedentary agriculturists of the oases, and are of little importance to the nomads. The Tuareg have

three distinct types of dogs: a kind of greyhound *(oska, pl. oskatin)*, a dog with fairly long hair *(aberhoh, pl. iberrah)* resembling the Kabylian dog of the Atlas, and a hybrid race of the former two types *(akhami, pl. ikhoumai)*. Greyhounds and the greyhound-like dogs particularly, are used for hunting barbary sheep, antelopes, and gazelles. The dogs may kill the game, but if not, the hunter will slay the animal surrounded and attacked by the dogs by means of his spear. Hunting with the spear without use of dogs is also practised in the rugged mountains, where the hunter can take game by stealth.

The barbary sheep are still fairly common in parts of the rather inaccessible mountains, and their importance to the Tuareg of these regions may best be illustrated by a brief account of the division of the tribal area of the Dag Rali into hunting-territories. Although the tribal territory is considered the property of the whole tribe, it is divided into eight sub-areas which are not grazing grounds, but areas of a certain value in other respects. They are officially owned by individuals and inherited according to matrilineal rules, but in fact they can be utilized by the members of one or two tribal sections if a certain duty is paid to the owner, who again pays an annual duty to the king of the Ahaggar Tuareg. One of the eight sub-areas named Interladj is of particular value for catching wild donkeys or asses, while the four areas of Akalararen, Isekram, Tahat, and Taesa are territories for hunting barbary sheep. Tahat and Taesa seem to be the best hunting grounds, and here special rules are maintained to provide good hunting and preserve the population of barbary sheep. Thus, nobody is allowed to enter these areas during three months of the year, and flocks and herds of domestic animals are never allowed to graze there. The Taesa Mountains are full of holes and caves, where the barbary sheep will hide from the flies, and it is possible to creep quite near to the game, which will not move until the hunter claps his hands.

The barbary sheep are hunted for their meat, which is often cut into pieces and dried, but equally important to the Tuareg are the hides, which, because of their size and strenght, are excellent for making tents. For the fine decorated and coloured leather-work such skins are not suited, but they are used for large transportation bags for wheat, millet, and the like, on caravan journeys. The big horns of these animals also serve as containers for butter. On the whole the Tuareg make use of the skins from all

animals killed by hunting. The fine, thin skin of gazelles is especially fitted for decorated leather-work, and skins from hares, jackals, and *arrata* (a big lizard — *Varanus. Duv.)* are made into bags for personal belongings. The arrata lizards are killed by the slaves only and never by the true Tuareg, as these lizards are said to be maternal uncles of the noble Tuareg. The members of noble tribes will never eat lizards, fish, birds, and eggs, but this does not apply to Tuareg of subject tribes or to the various black-skinned castes. The arrata lizards, however, are not considered proper for eating, but another kind of lizard named *aggezzaram (Ar. dobb — Uromastix acanthinurus)* is eaten by a great many people. Apart from the noble Tuareg, the peoples of the Central Sahara seem in no way to be squeamish, and even meat of beasts and birds of prey is consumed to a very great extent.

When locusts swarm, they are collected by all peoples of the Sahara, and in this the Tuareg are no exception, but to them the collecting of edible wild plants is more important. The number of wild plants, which yield edible seeds, roots, stems, or fruits, is very large, and seems to comprize more than thirty different species. However, it is not possible from this to judge the importance of collecting, as most of the plants are only eaten as a kind of dessert or during times of famine. Again, all edible plants are not generally found within one and the same tribal territory, and members of different tribes may utilize different plants. The green parts of certain plants eaten occasionally are probably of importance because of their vitamin C content, which is not found to any great extent in the daily food of the nomads. Economically, however, it is essentially the seeds of grasses and herbs which are useful to the Tuareg, and five of these plants will be mentioned: — 1) *alora* — an annual herb growing in the upper mountains after the rains; 2) *taouit (Aizoon canariense)* — like the former an annual plant of the upper mountains; its small, black seeds are highly appreciated for bread; 3) *afezou (Panicum turgidum)* — a perennial grass growing in large tufts in the lowermost country, where are also found 4) *abedebet,* and 5) *toulloult (Ar. drinn — Aristida pungens),* which is mainly made use of by the Kel Ajjer. This latter plant is a perennial grass growing in tufts over extensive parts of the steppes and deserts of North Africa, and its seeds are collected by various other peoples of these regions. The collecting of seeds takes place during the months of spring, when the seeds are entirely ripe, and the *toulloult*-grass may be cut by

means of an iron-sickle like that used among the black-skinned agriculturists. Even if the Tuareg have a large supply of wheat and millet, many families of the Kel Ahaggar and the Kel Ajjer will collect the seeds of *taouit* and *toulloult* for baking bread, but collecting seeds is of limited value to Tuareg economy compared with agriculture, although the Tuareg, generally speaking, are not agriculturists themselves.

The peoples of the Sahara may be divided into two main economic groups; namely, settled agriculturists and nomadic cattle breeders. To these two groups may be added the seminomads, who are mainly found in the northernmost part of the desert. As a rule, the settled agriculturists of the oases are more numerous than the nomadic cattle breeders. This appears clearly from the figures given by the French geographer, Capot-Rey *(Le Sahara Français. Paris 1953. p. 247)*, for the whole of the Sahara: —

Settled agriculturists	63.4 %
Semi-nomads	8.8 %
True nomads	27.7 %

In the area dominated by the Northern Tuareg, however, nomadic cattle breeding becomes much more important, while, generally speaking, the semi-nomads do not exist. For agriculturists and true nomadic cattle breeders of the country of the Northern Tuareg the following figures are given by Capot-Rey: —

	Kel Ajjer.	*Kel Ahaggar.*
Agriculturists	4.000 (52 %)	4.500 (41 %)
True nomads	3.700 (48 %)	6.500 (59 %)

In these figures for true nomads are included the Negro slaves, who live in the camps to take care of the domestic animals.

Although cattle breeding tends to be the dominating mode of livelihood in the country of the Northern Tuareg, it is clear that agriculture is by far the most important industry of the whole of the Sahara. However, neither of these two industries is entirely self-supporting, but are interdependent, and the agriculturists of the northernmost oases keep a few goats and sheep, as the true nomads of this region practise agriculture. Shifting cultivation by means of the plough is important for the subsistance of some of the Arab bedouins (e.g. the tribe of *Ouled Nail)* in the north, and where plough-cultivation is carried out in the desert,

it is practised particularly by the nomads, who sow wheat and barley. In the central parts of the Sahara agriculture without artificial irrigation is not generally possible, but a kind of primitive shifting cultivation is practised by some nomadic cattle breeders. Thus, in the country of the Kel Ajjer the Tuareg will sow wheat in some river valleys, if rain has been abundant, and this sowing is carried out in a very simple way: — Holes are dug in the sandy soil, usually with no other implement than the hand, and a handful of seeds is put into the holes. The wheat grows in tufts with a space of 30—50 cm between each, and the small plots cultivated in this way are left completely to themselves until harvest, when the wheat is cut with a sickle. Threshing is done by beating with a stick, which is the method also used by the true agriculturists of the Central Sahara. This kind of primitive agriculture is not known to the Ahaggar Tuareg, but similar methods are used, for example, by nomadic cattle breeders of Mauretania and Eastern Africa.

Some tribes of the Kel Ajjer and two tribes (Dag Rali, Iklan-n-Taouset) of the Kel Ahaggar, exploit half-wild date palms, but it is a matter of opinion, whether one should use the word "cultivation", or "collecting" in speaking of these palms, as irrigation is unnecessary, and they are only visited by the Tuareg during the harvest season in August-September. The dates of these palms are of a quality much inferior to dates grown by the sedentary peoples of the oases, and they are only used for local consumption.

By collecting and primitive agriculture the Tuareg are able to provide for a small part of their plant food, but by far the greater part of plant products needed are obtained from the black-skinned agriculturists. Although the black population of the Sahara is due to a great extent to the slave trade, which started mainly after the Arab conquest of North Africa, there can be little doubt that a black-skinned population was found in the desert long before that time. Thus, in some of the oases a Negro population with characteristics never found among the Sudanese Negroes is common, and the agriculturists, who lived in the Sahara in neolithic times were, in all probability, predominantly Negroes. In time the Negroes of the Sahara, whatever their origin may be, have been mixed with the white population of Arabs, Tuareg, and other Berber-speaking peoples, and transition types between black and white are very common at the present time. In the oases of the Mzab and adjacent regions at the outskirts of the desert in the North, the population consists mainly of fair-skinned Berbers or Arabs, although a black-

Fig. 8. Skin tent from the noble Kel Rela tribe of the Kel Ahaggar. The tent is of the type (3) described in the text. At each side of the two central arches is found a pair of vertical posts connected with a cross-bar. These posts are hidden behind mats, which can be drawn round the tent.

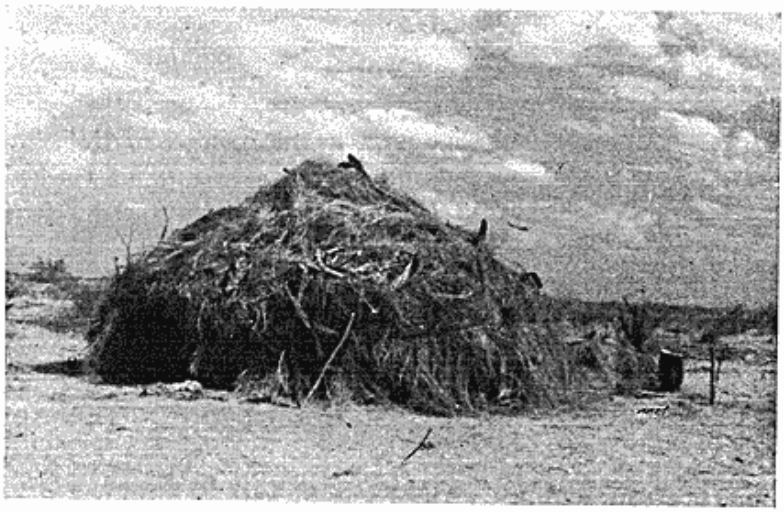

Fig. 9. Straw-hut from the Kel Tarourit tribe (Isekkemaren) of the Kel Ahaggar. The construction of this hut is equal to that of a primitive round house with a central post, but this cannot be seen because of the very thick covering of toulloult grass (Aristida pungens).

Fig. 10. Watering of goats (Kel Ajjer). In the hot summer season goats are generally led to wells or waterholes every two days. In this case water is drawn from a deep well by means of a leather bucket and poured into a hole dug in the clayey soil. — The small Tuareg goats yield little milk in comparison with European breeds.

skinned element is found everywhere, but in the oases of the central parts of the Sahara by far the greater part of the inhabitants are of Negro type. However, it must be added that even there a fair-skinned, settled population, not only of Arabs, but also of Berber-speaking peoples, is found in some places. Even a population of settled Tuareg agriculturists live in the oasis of Ghat in the eastern part of the country of the Kel Ajjer, and we do not know how and when this establishment of Tuareg agriculturists took place.

In the central Sahara and in parts of the northernmost desert, the gardens are in many cases not owned by the cultivators, but by the nomadic cattle breeders. This holds good for the Arab Chaanba bedouins, who own most of the date palms in some of the oases, and as far as the Ahaggar Tuareg are concerned, they are the true owners of most gardens cultivated in their country. However, agriculture carried out in Ahaggar at the present seems to have been introduced as recently as about a century ago by the immigration of black-skinned agriculturists from In Salah and other oases of the Tidikelt. Although this immigration started before the French occupation most of the Negro agriculturists (Ar.: *Haratin* — sing. *Hartani.* Tuareg: *Izzegaren* — sing: *Azzegar)* have immigrated since the pacification, and a fairly strong immigration of Haratin agriculturists is still going on at the present day. Some of the Haratin live in small settlements of mud houses, as do most agriculturists of the Sahara, while others have only huts covered with straw or palm leaves, and old people say that such huts were the only means of habitation known to the agriculturists before the French arrived.

Apart from the primitive kind of shifting cultivation carried out among the Kel Ajjer, agriculture in the country of the Northern Tuareg is practised by means of irrigation according to various systems. The simple method of making use of natural springs is known at the oases of Djanet-Ghat, while artesian wells are unknown in the proper territory of the Tuareg. In Ahaggar the foggara-system has been introduced by the immigration of the Haratin from Tidikelt, and it is by far the most common method applied for irrigation. The foggara of Ahaggar, however, cannot be compared with the large extensive subterranean aqueducts of Tidikelt and elsewhere in the Sahara. They are not very deep and generally only one or two km long, and they differ from the true foggara of the north in their whole arrangement, as they are dug

into the sand of the dry river valleys, where water is near the surface. The advantage of this system is mainly that water flows into the gardens near the river bed without further work, when the aqueducts have first been dug, but there are also disadvantages in this system. If the wadies after heavy rains change into roaring rivers, the foggara may be completely destroyed, and it will normally be necessary to give up a foggara-system after some years, as it must be cleaned at certain intervals, and in time it becomes too dangerous to work in the subterranean aqueducts. If the river valleys are not flooded at all for some years, it may also become essential to move to another more favourable place to make a new foggara there, and deserted foggara are a common sight all over the country. Apart from the foggara, two other systems are used by the agriculturists of Ahaggar, namely the well-known *shaduf*, by which the water is raised by human power, and the drawing of water from wells by means of oxen. Of these two methods the latter is the most common within the territory of the Northern Tuareg.

Whatever the system in use, cultivation is carried out in very much the same way. Date palms are grown to a slight extent in the lowermost oases, and fig-trees and the like are found in the cultivation centres of the mountains, while wheat, millet, tomatos, melons, and other vegetables are cultivated in most gardens. The main crops are wheat and millet. Millet and sorgho, which is less common, are summer crops like most of the vegetables, and sowing is done in June-July, while harvest takes place in September. Wheat, on the other hand, is a winter-crop sown in October and generally harvested in April. Whereas millet, sorgho, and vegetables are mainly grown by the agriculturists for their own use, wheat is cultivated especially on behalf of the Tuareg. In general a few members of a tribe, and often from the same tribal section, will unite to make arrangements with a group of agriculturists to cultivate their gardens and carry out the necessary foggara-work. The leader of the Tuareg group in question will appoint a socalled foggara-chief, who is responsible for the proper maintenance of the irrigation-system, and who is allowed to cultivate a garden of the same size as that of a Tuareg for personal use. But apart from this common arrangement, every Tuareg has to make a special agreement with the agriculturist of his garden, and this agreement will normally follow a fixed system of right and duties, which is also known in many other parts of

the Sahara. The Tuareg will have to give a certain amount of seed-corn, wheat and millet as nourishment for the agriculturist during six months, and a hoe. After harvest 10 kg of wheat will be given to the king of the Ahaggar Tuareg, and the bulk of the yield will be divided according to the agreement. Originally the Tuareg would receive 4/5 of the yield, but this system seems to have disappeared in recent time, and nowadays 2/3 or ½ of the yield are returned to the Tuareg. By this system of agriculture the Tuareg of Ahaggar obtain all the wheat, which constitute a part of their nourishment, and they will even have wheat for export to the oases of Tidikelt during caravan trading.

Our description of various activities of importance to Tuareg subsistence may adequately be concluded by a brief account of caravan trading. Over large areas of Northern Africa and adjacent regions of Asia, caravan trading has declined in recent years owing to the establishment of railways and especially the building of roads and the introduction of trucks. Among the Tuareg caravan trading still plays a great part economically, but there can be no doubt that in time it will suffer the same fate as among the Arab bedouins in the north, where caravan trading has lost most of its former importance. In fact, the extensive trans-saharien caravan trading with gold, ivory, ostrich-feather, salt and slaves had declined long before the Sahara was occupied by Europeans, and this was mainly due to the establishment of shipping routes between Europe and the Sudan. The slave trade was carried out until the arrival of the Europeans, and was still flourishing in Libya as recently as twenty-five years ago. The salt trade has remained of importance to the Tuareg, and it has increased because of the arrival of the French, who brought the perpetual wars and raids between the various groups and tribes of nomads to an end.

The Tuareg of Ahaggar do not undertake extensive annual migrations between distinct grazing grounds, as is the case among many Arab bedouins in the northern parts of the Sahara, and caravan trading is entirely independent of nomadic migrations. The camps of the nomads will remain in the Ahaggar Mountains all the year round, while the caravans during the cold season will go to In Salah and other oases to the north, and to certain towns of the Sudan as far away as Zinder. The caravans will leave Ahaggar as soon as the very hot season comes to an end in September—October, and a great many Tuareg will be away from their camps for most of the winter. For caravans going to the Sudan,

salt mined at Amadror in Ahaggar is the all important trading article. The distance from the administration center of Ahaggar, Tamanrasset, to Zinder as the crow flies, is about 1200 km, and this journey is never performed at a stretch. Many caravans will stay about one month at Tamesna to let the camels rest and graze on the excellent pastures in this region. At least one month is always spent in Zinder, where salt is exchanged mainly for millet, but various Sudanese articles such as indigo-cloth, sandals, camel-saddles, and special household implements of superior quality to those of the Tuareg in the north, are also bought, together with butter and cheese made from cow's milk.

The caravan route to In Salah is much shorter than that to Zinder, about 700 km, but the route is rather difficult as no vegetation is found for some days, and fodder has to be carried for the camels. While trading with the Sudan is mainly undertaken to obtain millet, the main object of the northern caravans is to exchange wheat, dried meat, butter, cheese, and various Sudanese articles for dates. The caravan journeys are of extreme hardship to the Tuareg and their camels, of which many die owing to overwork and lack of water and fodder. Caravan trading, however, is not only profitable to the nomads, who for one load of salt or wheat will obtain at least three loads of millet or dates, it is also of extreme necessity to their subsistence.

The caravan trading of the Ahaggar Tuareg, as briefly outlined, is a rather complicated phenomena, and an activity which to a great extent is carried out independent of cattle breeding. Thus, salt and wheat grown by the agriculturists are the main trading objects of the nomads, whereas cattlebreeding products are less important. The salt trade is of very great age among the Tuareg, although the caravans before the French occupation seem to have stopped at Agadez in Aïr owing to almost incessant warfare with the Ioullemeden Tuareg further south. We may well assume that salt, which is highly necessary to both nomads and agriculturists of the Sudan, for many centuries has provided the Tuareg of Ahaggar with a large annual supply of millet. Trading with wheat cannot be older than the immigration of the agricultural Haratin from Tidikelt, but it is safe to say that caravan trading with the oases of Tidikelt is also very ancient, and that the immigration of agriculturists to Ahaggar started as a result of agreements made between Tuareg and Haratin during the stay of Tuareg caravans in the oases. At that time the prominent trading objects

of the nomads probably consisted of slaves bought or taken during warfare in the south, and various Sudanese articles.

Among the Kel Ajjer, caravan trading seems to be less developed at the present than among the Kel Ahaggar. Some of the Ajjer Tuareg may carry out salt trade with the Sudan, but the greater part of them will trade with oases of the central and northern Sahara only. Thus they visit In Salah, Fort Flatters, Ghadames, the oases of the Fezzan, and Djanet-Ghat. They may go further north than Ghadames into Tunisia and Tripolitania, and their trade seems mainly to be based on the exchange of wheat and dates. To this may be added various articles made by Arab craftsmen of the oases of Tunesia and Tripolitania, while Sudanese objects such as indigo cotton, bracelets, weapons, camel-saddles, and the like may be bought in Tamanrasset if not fetched directly from the Sudan by the salt trade.

The Tuareg of Ahaggar obtain their wheat from their own gardens cultivated by the Haratin, but among the Kel Ajjer the Tuareg generally do not possess gardens of their own. Haratin agriculturists or peoples working for the Tuareg according to a fixed system of rights and duties as mentioned for the Kel Ahaggar, are not found in the Tassili-n-Ajjer. The main oases of this region, Djanet-Ghat, are inhabited by agriculturists of predominantly negroid type, although fair-skinned agriculturists, as mentioned above, are also found, and these will cultivate date palms, wheat, barley, and millet for their own use. As the nomadic Tuareg have no gardens they have to obtain their supply of wheat in various other ways. A very small quantity is achieved from the primitive kind of agriculture carried out in the river valleys after the rains, and some wheat, barley, and millet may be had from the agriculturists by a special symbiotic relationship. All sedentary peoples of the oases are very keen on the animal products of the nomads, as they are not able to keep domestic animals themselves to any great extent, and some of them may have goats guarded by the Tuareg for a certain payment, which consists, among other things, of agricultural products. However, the Tuareg of Tassili-n-Ajjer obtain their main supply of wheat and other plant products of importance to their nourishment from the markets of the oases.

We will now briefly reconsider the whole economic system of the Ahaggar Tuareg in order to examine the relative importance of the various activities of subsistence.

Fig. 11. Woman of the Ajouh-en-Tehle tribe churning butter by means of an inflated skin bag. Churning as shown on this photograph is done in summer when little milk is available. When milk is plentiful in the cold season a larger skin bag attached to a pole is used. Before churning the milk is placed in the sun in a special skin bag for one day. The newly churned white butter is generally heated in an earthen pot together with parts of a plant named ajnesnis, but meal from dates or horns of barbary sheep may also be added.

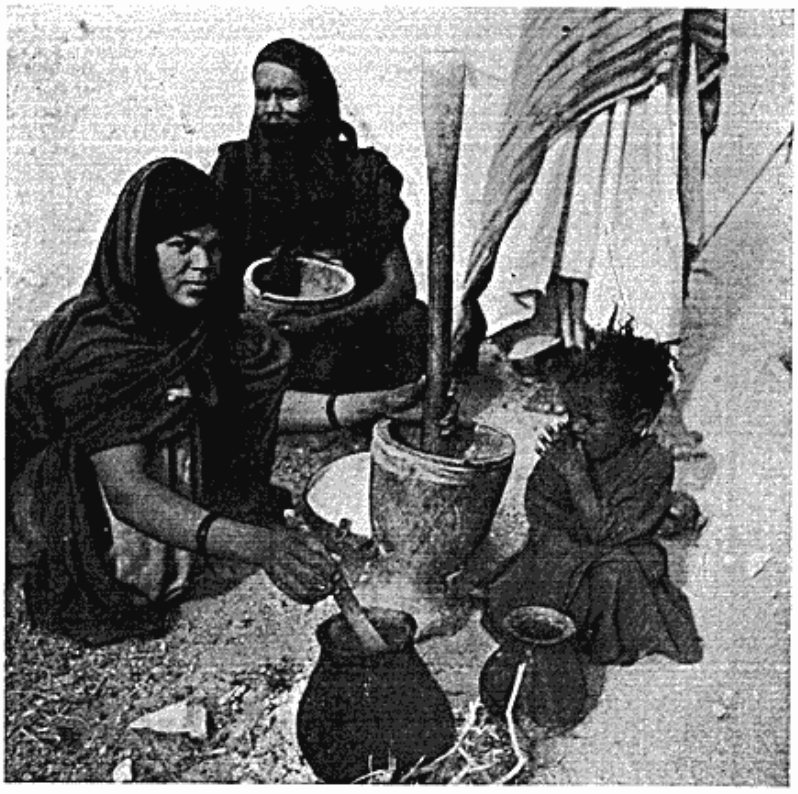

Fig. 12. Preparing the meal in an Ajouh-en-Thele camp. The large wooden mortar is used among all Tuareg mainly for grinding millet, dates, cheese, locusts, and the like, while wheat is ground on saddle-querns. This wooden mortar is of Sudanese origin, and this is also the case with the two cooking-pots shown. The Northern Tuareg do normally obtain their earthen pots from settled agriculturists of their own country, but pots are also imported from the south because of their superior quality.

Statistical material on the ownership of cattle among various nomads of the Sahara seems to indicate that most nomadic households have rather small flocks except for some nomads of the steppes and savannas in the south. To illustrate this the following table has been compiled from figures given by Capot-Rey *(Le Sahara Français.* Paris 1953. pp. 250—302): —

	Goats & Sheep	*Camels*	*Oxen*
Doui Menia (Semi-nomads of the Algerian Department of Oran) (1945).....	ca. 6	2	
Beni Zid (Semi-nomads of the District of Gabes, Tunisia) (1945).....	15	2	
Ouled Sidi Cheikh (True nomads of the steppes of Northern Algeria) (1952)...	25 sheep	1.3	
Arbaa (True nomades of the steppes of Northern Algeria) (1952).....	25 sheep	1	
Tuareg of Ahaggar (1948).....	15 goats	10	
Tibu (Teda Ouria & Gouroa) (1949).....	6—7 goats	4—5	
Tuareg of Kidal (Adrar-n-Iforas) (1948)...	74 sheep & goats	7	16—17
Kel Fadeï (Tuareg tribe of the Kel Aïr) (1945).....	75 sheep & goats	?	?
The Eastern Arab Kountat-tribes of Bourem near the Niger (1949).....	32 sheep & goats	3—4	8—9
Ouled Gheïlan (Mauretania) (1943).....	20 sheep	3	

Statistics on cattle ownership, however, must always be regarded with some suspicion, as it is extremely difficult to obtain data. It is not only most inpolite to ask nomads about the size of their flocks, but it is, on the whole, inproper to show any strong interest in their cattle, and some nomads will claim that although they know all their goats by name, they do not know, or never mention, the total number of their animals, as this is believed to bring bad luck. To this may be added that it is difficult to judge cattle ownership by merely watching the flocks of a camp, as the inmates may have animals grazing on other pastures. The figures for goats of the Kel Ahaggar for 1948, given in the above table, may be true on an average, but normally the subject tribes of Ahaggar have bigger flocks. In his book on the Ahaggar Tuareg, Lhote gives the figure of 10—12 animals per person *(Les Touaregs du Hoggar. Paris 1944. p. 252)*, but has later stated that the number of animals, under ideal conditions, is 35—40. If they increase above this, the surplus is slaughtered or sold to the sedentary peoples *(La chasse chez les Touaregs. Paris 1951. p. 9)*.

A consideration of certain social payments also proves that most Tuareg of subject tribes possess bigger flocks of goats. Thus, among the Kel Ajjer, bridewealth, as already mentioned, consists of 25—30

goats paid by the groom and his parents, and although the total number is not generally paid at once, this price would be too high for a family owning only fifteen animals. Among the subject tribes of the Kel Ahaggar bridewealth is normally one young camel, but two are given among the Dag Rali, and three among the Kel Azernan section of the Ajouh-en-Tehle tribe. The camels are given to the bride's parents, but they, in return, have to give their daughter a dowry, which among the Dag Rali consists of a tent with all the necessary household implements, 5—6 donkeys, and 10—40 goats according to the size of their flock.

It is said that households among the Dag Rali may own even 100—200 goats, but this tribe is extremely rich in cattle, and the average number of goats per households among subject tribes may probably be estimated at 40—50.

It is certain that fifteen goats could produce only a very insignificant part of the nourishment necessary to a Tuareg family, but even with bigger flocks the amount of milk obtainable during the hot summer season is generally not very considerable, and, as has already been stated, some nomads have no milk at all at this time of the year. Various beverages are then made as a substitution for milk. One of these consists of crushed cheese mixed with water to which meal from dates may also be added. If cheese is not available a beverage is made by mixing millet flour with water. This is, as a Tuareg woman once put it, "the summer milk of the Tuareg". In summer bread, porridge, and the wellknown national dish of the Berbers, the kous-kous, are by far the most important kinds of food. Milk-food is of extreme importance in the cold season, but it must be added that the size of flocks and the quantity of cattle breeding products are constantly changing with the climate, and the nomads may even loose most of their animals as a result of very severe droughts. Unfortunately I have no statistical material on this from the Tuareg, but elsewhere I have given an account of the consequences of drought periods among true nomads farther north in Algeria *(cf. Nomadismen i det centrale Algérie (Le nomadisme en Algérie centrale). Geogr. Tidsskr. L. København 1950, p. 48—91)*. Pure pastoralism is characterized by a high degree of instability. What can be gained from hunting and collecting among the Northern Tuareg is at present rather in significant even under normal conditions, and both hunting and collecting are activities of subsistence as dependent on climatic conditions as cattle breeding.

The quantity of agricultural products annually consumed per person among the Kel Ahaggar is estimated by Lhote at 187 kg millet, 15 kg dates, and an amount of wheat for which no figure is given. For Arabs of the Sahara the quantity of vegetable food is estimated at 180 kg wheat, and 75 kg dates annually per person *(Les Touaregs du Hoggar, p. 231 f.)*. It is evident that such amounts of vegetable food cannot be obtained from collecting. Under favourable conditions some nomads may be able to acquire their main supply of wheat, millet, and dates by selling a surplus of cattle and cattle breeding products, but during periods of drought, when agricultural products are of extreme necessity, there will be no such surplus for selling. Vegetable food and milk-food seem to be equally important to the Tuareg, and if either of the two different kinds of food predominates, it is the former rather than the latter. A certain amount of agricultural products is necessary to the subsistence of the nomads. It cannot always be obtained by selling cattle and cattle breeding products, and the nomads are thus dependent on agriculture (practised by the nomads themselves or on behalf of the nomads by settled agriculturists) and caravan trading with non-nomadic products.

In the above we have ruled out the importance of camel's milk for food. We have dealt in particular with Tuareg of subject tribes, and peoples of this social class of the Kel Ahaggar do generally not utilize camel's milk to any great extent. It is not fitted for butter and cheese, but is drunk fresh, and as it is not always possible to keep camels and goats on the same pastures, camel's milk will often serve as nourishment for herdsmen (usually slaves) guarding the she-camels away from the camp. The herdsmen may subsist mainly or entirely on camel's milk for weeks, but they easily get tired of this constant milk-drinking and long for bread and porridge, which they consider more proper food. Camel's milk, however, is in very high esteem among the noble Tuareg, and a short description of Tuareg society and traditions will show that the culture of the Northern Tuareg of to-day is made up of two different nomadic cultures.

The word *"Tuareg" (sing. Targui)* has come into use among Europeans through the Arabs. It is never used by the Tuareg, who call themselves *"Imohar" (sing. Amahar)* — a term which comprizes all fair-skinned nomads, who are divided into the following four main classes: — 1) *Ihaggaren (sing. Amahar)* — he dominating group of tribes referred to above as the nobility. 2) *Ineslemen*

(sing. Aneslem) who consist of religious Marabut tribes especially found among the Kel Ajjer, whereas only a few families live among the Kel Ahaggar. 3) *Isekkemaren* of whom several tribes are found among both groups of Northern Tuareg. They trace their descent from unions between Arab men and Touareg women, and the word "Isekkemaren" means literally "peoples of mixed race". 4) *Kel Oulli (sing. Ag Oulli), or Imghad (sing. Amghid).* These are the true subject tribes constantly referred to in this paper. For our historical analyses the tribes of Ineslemen and Isekkemaren are of little interest, as they form comparatively recent classes the members of which are more influenced by Arab culture and Islamic religion than the nobility and the true subjects.

The noble Tuareg of the Kel Ahaggar consist of 400—500 individuals only, and the noble class is thus composed of 10—12 % of all Ahaggar Tuareg, who elect their king from the most dominant noble tribe, the Kel Rela. Before the French occupation, it was the duty of the noble tribes to protect all other classes and casts against raids by Tuareg from other groups, or by Arab beduins. The noble tribes were especially camel breeders, but as a military group they did not have much cattle in their own camps. They used to roam, looking for enemies who, at any time, might raid the camps of the subject tribes, or the settled agriculturists in the oases. All the noble tribes, however, possessed herds of camels which they were not able to take care of themselves; these herds were always watched by the true subject tribes (the Kel Oulli), who also traded with their masters camels on their behalf. The dominant noble tribes of the Kel Ahaggar claim descent from a common ancestress named Ti-n-Hinan, who is said to have immigrated to Ahaggar from the north, and a huge prehistoric stone building containing several graves is believed to be the tomb of Ti-n-Hinan.

The subject tribes of the Kel Ahaggar are not all matrilineally related, as some of them have immigrated from other Tuareg groups, but a matrilineal relationship exists between the tribes considered the oldest among all subject tribes, and two different traditions are told about their origin. One of them is connected with the tradition of the origin of the noble tribes: — When the ancestress of the nobility, Ti-n-Hinan, immigrated to the Ahaggar region, she had with her a servant girl named Takama, who became the ancestress of the oldest subject tribes. This tradition is especially told by men of the nobility. Some Kel Oulli men agree that

they descend from Takama, but they claim her to be the sister of Ti-n-Hinan, and not her servant girl. Not far from the huge stone buildings believed to be the tomb of Ti-n-Hinan, is found a small simple stone grave, where Takama is said to have been buried.

The other tradition about the origin of the oldest subject tribes is only told by peoples of the subject tribes themselves. This tradition probably contains an element of historical truth, and it is most interesting because it explains how the present relationship between noble tribes and subject tribes might have come into existence:— Long before the noble tribes immigrated from the north the country was inhabited by the ancestors of the oldest subject tribes. These peoples lived then as goat-breeders, and they did not know the camel, which was introduced into the country by the immigration of the noble tribes, who conquered the ancient inhabitants and made them their subjects. That the subjects did not originally know the camel is not only stated in this tradition, but it also appears from the whole relationship between noble Tuareg and their subjects, as it existed before the French arrived. Even to-day, as frequently mentioned above, the subjects are in particular goat-breeders, and this we may also see from the two Tuareg terms for subjects. The term "Imghad" is derived from a word, which means "a little goat", while the term "Kel Oulli" means "the goat people". When and how the subjects also became camel breeders with animals of their own cannot be precisely stated. According to Pere de Foucauld this change in their economy took place 100—150 years ago *(Dictionnaire Tuareg-Français. II, p. 534)*. Whatever this may be there can be no doubt that the origin of the class division among the Tuareg is due to the introduction of the camel, and this may possibly also be the case for similar class systems elsewhere in Northern Africa, as class divisions very often arise, when two economically different cultures meet.

The camel was not common in Northwestern Africa until the second century A.D., and it came, in all probability, still later to the central parts of the desert. Before that time an ancient goatbreeding people lived round the mountains and in the river valleys of the country of the Northern Tuareg. Racially these peoples were like the subject Tuareg of the present day, and they spoke a Berber dialect strongly related to the language of the immigrating camel breeders. But what was the culture of the ancient goat-breeding nomads like? Their goats were probably of the same kind as still

found among the Northern Tuareg, as this special breed according to Lhote has a wide distribution also in the remote mountaineous regions of Aïr, Adrar-n-Iforas, and Tibesti *(Les Touaregs du Hoggar, pl. XIII, p. 288)*. Sheep of the Ovis longipes type, which is considered the oldest known breed of sheep, may also have been of some importance, and donkeys were used as pack and riding animals. We may assume that churning butter was done by means of a skin bag, and that cheese of the aullus-type was made from butter-milk. We cannot be sure, however, that true cheese of the takamart-type was known. This kind of cheese together with more developed methods for churning butter do apparently not belong to the old goat-breeding complex. Most other traits of Tuareg goat-breeding of the present day were probably also known to the ancient goat-breeders of the Central Sahara:— e. g. castration by means of crushing, the stick pierced through the cheek of the kids to prevent them from suckling, stone enclosures for kids, the cord attached round the foreskin of he-goats to prevent mating, and various veterinary methods. There were only few superstituous customs connected with the use of milk, which was heated by means of hot stones. It is not very likely that pottery was made by the goat-breeders themselves, but cooking-pots may have been obtained from settled agriculturists as among all Tuareg of to-day. Seeds were ground by means of simple saddle-querns, while rotating hand-mills were unknown. The latter have come into use among a few Tuareg households only in very recent time. Some methods of trapping as well as the method of taking game by stealth were practised, and we must add in this connection that elements of an ancient hunting culture are nowadays found in particular among the subject tribes, who, in contrast to the nobility, do not abstain from eating fish, lizards, birds, and eggs. But although hunting and collecting may have been more important than among the modern Tuareg, the ancient goat-breeders were probably dependent on agricultural products for their subsistence. Archaeological material shows that agriculturists lived in these regions of the Sahara before the camel was introduced, and the descriptions of Libyan cattle breeders by the authors of Antiquity seem to indicate that the economy was also then assured only by means of settled agriculturists living in oases *(cf. Oric Bates: The Eastern Libyans, London 1914, p. 30 f. 91 f. and D. J. Wölfel: Die Hauptprobleme Weissafrikas. Arch. f. Anthrop. Neue Folge VII. Braunschweig 1941, p. 124)*. It is even possible that the nomads themselves practised a

kind of primitive agriculture, and they used subterranean silos for storing grain. This type of silo, which is still in use among some of the Northern Tuareg, is most probably an agricultural element. Garments and various household implements were made from goat skin without which a nomadic people could not live in the Sahara, and goat's hair was used for making ropes and the like. It is also possible that a kind of primitive weaving was known, but we cannot be quite sure about this. With regard to social and political conditions the original patterns of the old goat-breeders were most certainly changed by the immigration of the dominating camel breeders. Before the camel was introduced goats had a high social value, and were used for bride-wealth as is still the case among the subject tribes of the Kel Ajjer. Finally we may mention that the ancient goat people were, in all probability, predominantly matrilineal like most Tuareg of to-day and the Libyans of Antiquity.

This brief description of the goat-breeding culture in the country of the Northern Tuareg before the camel was introduced has mainly been based upon the economic system of the subject Tuareg of the present day, the conditions of economic life as we know it from the authors of Antiquity, and our general knowledge of distribution and evolution of cultural traits. We have ruled out all elements about which we have no knowledge according to the methods used. We have left out also the question of types of dwellings, but only to take up now this very important problem in more detail.

The types of dwellings of the Northern Tuareg consist of tents and huts. The subject tribes of the Kel Ahaggar generally use tents all the year round, but they will often camp under rocks or trees during the hot summer season, as the tents made from skin are very unpleasant dwellings at that time of the year. In summer many noble Tuareg of the Kel Ahaggar live in huts made from straw like those of the agriculturists, and such huts are apparently used by all Tuareg of the Kel Ajjer as summer dwellings, while tents are used during the winter. According to Duveyrier the noble Tuareg of the Kel Ajjer live in tents even in more permanent camps, whereas straw-huts are used only by subject tribes *(Les Touareg du Nord. Paris 1864, p. 403 f.)*, but this is not true of the Kel Ajjer of the present day, and among the Kel Ahaggar the noble Tuareg seem generally to obtain their tents from the subjects, who make them from skin of barbary sheep, goats, and sheep. Among

all Northern Tuareg tents are transported by means of donkeys, and there is, on the whole, no obvious reason for the assumption that skin tents originally belonged to a culture, which knew the camel. The scattered distribution of skin tents in the area of the more developed black tent seems also to indicate that such tents are of very great age, and we know that skin was used for movable dwellings among cattle breeders of Northern Africa before the camel was introduced *(cf. St. Gsell: Histoire Ancienne de l'Afrique du Nord. Paris 1913 f. V. p. 216 and Oric Bates: The Eastern Libyans. London 1914, p. 168)*.

A description of various types of Tuareg tents is given by Feilberg *(La Tente Noire, p. 139 f.)*, and much new material has appeared since then. Thus a map of distribution of the main types has been published by Lhote *(Comment campent les Touaregs. Paris 1947, p. 40—41)*. By means of these and other recent sources and my own material from the Northern Tuareg we shall briefly discuss, some problems connected with Tuareg dwellings.

Broadly speaking the following types of tents are found among the Tuareg:—

(1) a skin tent with a central T-like post connected with a system of ropes. The central post is not fixed into the ground, but rests upon the surface. This type is known among some Tuareg of the Ioullemeden, Kel Aïr, Kel Geres, and also among the Northern Tuareg, where it seems to be rare. I have never met with this kind of tent among the Kel Ahaggar and the Kel Ajjer.

(2) a skin tent with three (or four) parallel pairs of posts each pair being connected with a horizontal crossbar. The central pair (the two central pairs) of posts is higher than the two other pairs. All posts are placed in 30—40 cm deep holes in the earth. This is the most common type of tent among the Northern Tuareg, and it is also known to Tuareg of the South, where it is used in particular by the Ioullemeden. During the rainy season the central pair of posts may be replaced by a single higher post with a crossbar.

(3) a skin tent similar to the above type, but with the back post of the central pair replaced by an arch (or both posts of the central pair replaced by two arches connected with a crossbar). Where this type is met with the arches are generally placed at right angles to posts connected with crossbars, but accordig to Lhote two arches may be placed between and parallel to two pairs of posts with crossbars. This type of tent is known to the Kel Ahaggar only, and

is at present rare, but is said to have been more common in ancient times.

(4) a skin tent with pairs of parallel posts each pair being connected with semi-arches. This type is known to the most western Tuareg round Timbuktu.

(5) a dome-shaped tent with a covering of mats used in particular among some Kel Aïr (Kel Oui) and Kel Geres.

Dome-shaped and barrel vaulted tents and huts seem at present to be strongly connected with breeding of oxen, and are only found among the Southern Tuareg. Dwellings of similar constructions may, however, formerly have been in use among the Northern Tuareg as tents of type (3) bear resemblance to such types. Transportable barrel vaulted huts are also believed by some authors to have existed among the ancient Libyan nomads *(cf. Ch. Le Coeur: Les "mapalia" numides et leur survivance au Sahara. Hesperis XXIV. Paris 1937, p. 29—45. — Bates: The Eastern Libyans, p. 168 f. — Feilberg: La Tente Noire, p. 202 f.)*, while Gsell considers the "mapalia" of Antiquity related to a span-roofed house *(Histoire Ancienne de l'Afrique du Nord. V, p. 217 f.)*. The tent of type (1) is far from primitive, and related to certain black tents of Northern Africa *(cf. Feilberg: La Tente Noire, p. 143)*. It is probably a fairly recent type among the Tuareg, whereas tents of the types (2) and (3) may be of very great age. In the construction of the latter types we may see a connection as well with a dome-shaped or barrel vaulted hut *(cf. Feilberg: La Tente Noire, p. 169 f.)*, as with a span-roofed house *(cf. Gudmund Hatt in Geogr. Tidsskr. IIIL. København 1944—45, p. 258)*.

The straw-huts used among the Northern Tuareg during the summer season vary greatly with regard to shape and construction, but they are very often entirely akin to the wellknown round houses with conical roofs. Such dwellings are still common among agricultural peoples living north and south to the Tuareg, and we do also know that they were used by the Libyans of Antiquity *(cf. Bates: The Eastern Libyans. p. 169 f.)*. Round houses with conical roofs have a very wide distribution. They are in particular used by primitive farmers *(cf. Kaj Birket-Smith: Kulturens Veje. København 1948. p. 313)*, and this type of dwelling is most probably an agricultural element in the culture of the Northern Tuareg.

We shall now finally touch upon the problem of the origin of nomadic cattle breeding in the light of Tuareg nomadism. Some writers claim that cattle breeding originated from a pure hunting

culture, while others believe it developed within a culture which already knew farming. I think that my material from the Northern Tuareg is in agreement with the latter theory, but I am well aware of the great complexity of the problem, and wish to emphasize that we cannot expound theories about the origin of nomadic cattle breeding in general from our knowledge of one special nomadic culture. If we do not want to make a laughing-stock of historical anthropology we must give up mere speculation, and base our assumptions on facts. The facts available to me from Northern Africa point to an old connection between goat and sheep nomadism and primitive agriculture. Everywhere in these regions goat and sheep breeding nomads are highly dependent on agricultural products for their subsistence, and they do even practise primitive shifting cultivation. As far as archaeological knowledge goes a connection between goat and sheep nomadism and agriculture has existed since ancient times, and we may add to this that domestication of sheep and goats apparently took place in the same mountaineous regions of Asia, which were also the cradle of wheat and barley growing *(cf. Gordon Gilde: Man makes himself. London 1936)*. It is true that we cannot entirely rule out the possibility that goats and sheep were domesticated by pure hunters, but the facts available from Northern Africa seem to bear evidence to the agricultural theory.

A few anthropologists have claimed that goats and sheep are the oldest domesticated cattle. This may be true, but it cannot be discussed in a paper like this, and I do not want to set forth any final theory about the evolution of nomadism in general. What has been attempted in this study is no more than to throw some light upon sheep and goat nomadism by means of material from Northern Africa. It is my hope that this material may prove of some importance to future discussions of the nomadic problem.