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HANDBOOK

for

SPECIAL OPERATIONS

SUDAN

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HANDBOOK FOR SPECIAL OPERATIONS
SUDAN

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FOREWORD

This Handbook is designed primarily to support operational planners, unit commanders, and personnel who may be involved in special operations such as guerrilla warfare, counterinsurgency, civic action, or allied activities in Sudan. The purpose of the Handbook is to present essential background material, some or all of which will be necessary for those planning and carrying out special operations. The Handbook is not designed for support of any specific operation or for support of any particular type of special operation. It is intended to supply basic essentials to which can be added more specific and more current details immediately prior to any operation.

Secondarily, the Handbook is designed to be useful as briefing, training, and familiarization material for those who do not have the time or need for more detailed reading. It will also serve as an introduction to Sudan for those who need further, more specialized study.

The principal sources used in the preparation of individual chapters of the Handbook are listed at the ends of the chapters. Users of the Handbook are encouraged to refer to these sources for more nearly complete coverage of the subject material.

Place names are spelled in the text in the way they normally appear in newspapers and popular periodicals. They are spelled on the maps according to the US Board on Geographic Names transliteration system. A comparative spelling list is included at the end of the Handbook for the user's convenience.

The cutoff date for material contained in this Handbook is 15 August 1963.

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HANDBOOK FOR SPECIAL OPERATIONS -- SUDAN

I. Introduction

Sudan, the largest country in Africa, is divided into a Moslem north and a south populated by Negroes who are pagan or Christian. The Sudanese Government is attempting to integrate these southern peoples with the northern majority through a policy of stressing Arabic as the official language and Islam as a religion. This policy is meeting with resistance, and disturbances may result. The southern dissidents, who are allied by race and outlook to their black African neighbors in countries bordering Sudan, hope to win the sympathy of the peoples of these countries. Sympathy has already been gained among the governments and peoples of Chad, the Central African Republic, and the Republic of the Congo, but its strength is difficult to assess. For diplomatic and political reasons and because of their own internal problems the governments of the East African nations, including Uganda, will probably show little interest in supporting the dissident movement despite cross-border tribal affinities and even the sympathy of their peoples. The dissidents, however, want to get the attention of the governments of these countries and of the United Nations, and they may use force to do so. Unless the government in Khartoum acts quickly, southern Sudan may become the scene of chronic disturbances and brigandage.

The cleavage between north and south is not only a matter of politics but also basically one of culture, race, religion, and language. There are marked economic and geographic contrasts as well. The north, particularly in the areas around Khartoum, Port Sudan, and the Gezira, has made economic progress in the last few years, while the economy of the south has progressed little and remains one of primitive hunting, fishing, and subsistence agriculture. Very little foreign aid is channeled to the south. The north makes the money with which to run the country, mostly from cotton; the south is an economic drain on the north. The north is a rock and sand desert, and much of the population is concentrated along the Nile and its tributaries. In the south, on the other hand, water is plentiful most of the year, there are great swampy areas, and the people are spread more evenly over the landscape. The difference in the two types of landscape is reflected in the varied problems of movement and survival in the two areas.

All of these differences between north and south must be understood and taken into account in planning and undertaking Special Operations in Sudan.

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II. History, Politics, and International Relations

A. History

1. Sudan Under Egyptian Rule

Sudan is divided by culture, language, religion and political awareness into two distinct areas, the Moslem-Arab north and the predominantly pagan, non-Arab south. Sudan did not become a political unit until 1820 when Mohammad Ali, the Ottoman governor of Egypt, invaded and occupied the country in order to secure an abundant supply of slaves for his army.

During the Ottoman-Egyptian occupation of Sudan (1820-85) many Sudanese from the northern towns were educated in Cairo and became oriented toward Egypt and the Arab-Moslem culture of the Middle East. However, Egyptian control over Sudan weakened as the century progressed. Local administration was oppressive and corrupt, and the slave trade became increasingly barbaric. The fact that the slave traders -- the middlemen who sold to the Egyptians and others -- were mostly from the northern Sudan and that the victims of their enterprise were from the south is one of the principal reasons for the mistrust with which the south regards the north to this day.

Resentment against the Egyptian administration culminated in 1885 in the revolt of the "Mahdi," or Messiah, a Moslem zealot with a fanatical following whose aim was to get rid of alien rule in order to establish an independent state based strictly on Islamic principles. He was opposed by the educated townspeople but was able, nevertheless, to expel the Egyptian forces from Sudan and impose his own government.

Since Sudan straddled the upper reaches of the Nile on which Egyptian agriculture depended, the country had become important to Britain, which was now in control of Egypt. A combined British-Egyptian campaign was launched, and Sudan was conquered after 13 years of Mahdi rule.

2. Sudan Under British Rule

Anglo-Egyptian authority which was established in Sudan (1899) was a condominium (joint government) but one in which virtually all the controlling administrative and military positions were held by the British. Under this essentially efficient administration the country improved in the fields of agriculture, communications, health, and education; and a modern administration was established with many Sudanese participating at the lower levels. The south was not fully integrated into the administrative system, however, until 1927, and its slower progress toward modernization widened the contrast between north and south. The British followed a policy in the south of leaving responsibility for local government in the hands of native tribal

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chiefs, while virtually all educational and medical work was carried out by Christian missionaries.

3. Sudan Since Independence

Sudanese nationalism developed in the 1920's in opposition to British rule and was first promoted by the educated townsmen who tended to side with Egypt in its recurrent disputes with Britain over control of Sudan.

Sudan was granted self-government in 1954 and full independence on 1 January 1956. Democratic government did not operate easily in Sudan because of unfamiliarity with the democratic process and the irreconcilable divisions among the various political groups. The corruptibility of many politicians also made it possible for Egypt to exert undue influence on Sudanese policy. The government was overthrown on 17 November 1958 by a bloodless military coup, with little popular opposition. Parliament was dissolved, political parties were banned, and all authority was given to a Supreme Council of the Armed Forces, headed by Lt. Gen. Ibrahim Abboud, who later assumed the presidency of Sudan. The Supreme Council has continued to maintain its authority through its control of the civil administration as well as of the army and the police.

B. Politics

1. Domestic Policies of the Military Regime

The domestic policies of the military regime are (1) to reshape the government into a modified form of constitutional democracy, (2) to develop a sound economy through industrialization and agricultural diversification, and (3) to foster Islamic culture throughout the whole of Sudan as a factor for national unity.

A gradual program for restoring constitutional government was announced in November 1961. This calls for the establishment of a Central Council to which some members will be appointed and the rest elected by provincial councils which, in turn, will be appointed in part and elected in part by local councils. After the formation of the Central Council, which will act as the national legislature, the President will have a constitution drafted and hold national elections. Local council elections were completed 1 May 1963.

The government encourages private enterprise, both domestic and foreign, but it has undertaken the most important development projects itself. An agreement concluded with Egypt in 1959 for the division of the Nile waters permitted the Sudanese Government to proceed with major irrigation and hydroelectric projects. Two comprehensive five-year plans for economic development have already been completed, and in September 1962 the government announced the adoption of a ten-year plan which would include 19 individual projects.

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2. Political Opposition to the Military Regime

The politicians of the former parliamentary regime are a continuing source of opposition to the existing government and its policies. The principal reasons for this opposition are the slowness of the regime in bringing about democratization of the government and its reluctance to restore the parliamentary process. The regime, on its part, has attempted to maintain the distinction between the formal political parties, which it opposes, and the religious brotherhoods, whose support it hopes to gain.

The most important Sudanese political parties represent the two largest Moslem brotherhoods in northern Sudan, the Ansar and the Khatmiyah.

A major issue of Sudanese politics has been the question of union with Egypt. At the time Sudan achieved independence, Egypt exerted strong pressure to bring about a union of the two countries in order to gain complete control of the Nile River.

a. The Ansar Brotherhood and the Umma Party

The Ansar brotherhood is essentially a religious grouping, but it is politically important because its members give political as well as spiritual allegiance to the head of the brotherhood. Originally Ansar members were followers of the Mahdi, who led the revolt against Egyptian rule (1881-85). During the greater part of the Condominium the brotherhood was led by Abd al-Rahman al Mahdi (1885-1959) who regarded himself as the heir to his father's "divinely appointed" leadership and the champion of Sudanese independence. His policy was to resist Egyptian attempts to absorb Sudan and to cooperate with Britain until Sudan could stand alone. The present Ansar membership is about 3 million, including most of the population of Kordofan and Darfur Provinces and about 60 percent of Blue Nile Province. It is presently headed by Hadi Mahdi.

In 1945 the Umma Party was formed as the political arm of the Ansar brotherhood. Although the head of the Umma Party, Abdallah Khalil, became Sudan's second Prime Minister in 1956, the party never developed substantial strength outside the Ansar brotherhood. The Umma Party has become the most conservative political group in Sudan, more inclined than any other toward private enterprise and the West, and more strongly opposed than any other to Egyptian efforts to undermine the sovereignty of Sudan.

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b. Khatmiyah Brotherhood, People's Democratic Party, and National Unionist Party

The Khatmiyah religious brotherhood, under the leadership of Ali al-Mirghani, has traditionally turned to Egypt for aid to counter Britain's support of its chief rival, the Ansar. Although the Khatmiyah group is probably as large as the Ansar, its effectiveness has been hindered by the diverse tribal and urban background of its membership. Its political instrument, which suffers from the same handicaps, is the People's Democratic Party.

The first Prime Minister of Sudan, Isma'il Azhari came to power as the spokesman of the urban professional class with the support of the Khatmiyah. His opposition to the Khatmiyah's pro-Egyptian policy, however, led to the downfall of his government, the decline of his National Unionist Party, and the temporary ascendancy of Khalil and the Umma Party.

c. Current Political Activities

The inability of the three political parties to cooperate constructively for the national good and corruption among elected officials led to the military coup of 1958. The buying of votes had become the normal means of passing legislation. This system was used by Egypt to promote its own ends, and consequently the military justified its action as the only way to preserve Sudanese independence.

One of the first decrees issued by the military regime banned all political organizations; the Ansar and Khatmiyah, being religious brotherhoods rather than political parties, were not affected, and they agreed to cooperate with the new regime. After three unsuccessful coup attempts within the army during the first year of the military regime, the Ansar and National Unionist Party leaders addressed letters to President Abboud demanding an early return to parliamentary government. The same two organizations formed an alliance in 1959 as the National Front. In 1960 members of all former political groups addressed a petition to the Supreme Council of the Armed Forces calling for popular elections for a Constituent Assembly. Only the Khatmiyah brotherhood, among the major civilian political forces, did not take part in opposition activities. The Ansar brotherhood, now under the leadership of Hadi Mahdi, assumed the leadership of the opposition. Under this pressure President Abboud's military government announced plans in November 1961 for a gradual return to constitutional government. Continued cooperation of the Ansar with the government will depend on the degree to which the government carries out its proposed constitutional reforms.

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d. The Communist Party

The Sudanese Communist Party (SCP), although numerically weak, has been able to exert considerable influence over other opposition groups. Before the military coup, the SCP was strong in the trade unions and student organizations. After seizing power the military regime banned all trade unions and jailed the principal Communists. The government is maintaining strict surveillance over suspected Communist activities and recently raided the central printing operation of the SCP in Omdurman. In spite of repression the SCP is still active, mostly in the cities and towns. It receives some financial aid from abroad, but this aid has been restricted because of the Soviet Union's desire to gain the good will of the Sudanese government.

The Sudanese Communist Party tactic at present is cooperation with other opposition groups. It has worked with the National Front and has made its printing facilities available for the publication of attacks on the government. The party has managed to seize the initiative in student demonstrations against the government but lost its dominant position in student organizations in recent elections. The Communists have lost influence in the trade unions, which were allowed to form again in 1960. They did not do well in the 1961 elections for officers of the Sudan Railway Workers Union, the key labor union in Sudan, winning only 8 of the 25 seats on the Executive Committee, as compared with 19 in 1958. At a meeting in August 1963, the leaders of 43 unions resolved to expel all Communists from their ranks.

3. Southern Opposition to the Military Regime

Opposition to the present government has also come from the south, where the authoritarian control by northern Sudanese officials led in 1955 to a mutiny of southern troops against their northern officers. The parliamentary government attempted to gain the allegiance of the south with promises of autonomy. The present military government, on the other hand, has decided to bring about the assimilation of the south by means of education, economic development, and administrative integration. Both the parliamentary and the present government have fostered the advance of Islam among the pagan tribes of the south, and measures have been taken to discourage Christian missionary work.

All of these policies, however, have failed to lessen the economic and cultural gap between the north and the south, and reaction against continuing northern domination has resulted in a southern secessionist movement under the direction of several political leaders. These leaders are former members of parliament who from 1953 to 1958 championed southern autonomy within a Sudanese federation. In January 1961 they fled to Uganda and declared their determination to gain foreign support for southern independence. By the end of the year they had been joined

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by nearly all former southern politicians. The secessionist movement is at present directed by the Sudan African National Union (SANU) (formerly the Sudan African Closed Districts National Union) under the leadership of Father Saturnino, Joseph Oduho, and William Deng. In an attempt to appease this group the government announced an amnesty in February 1963 for all those convicted for the 1955 uprising and for all southerners who had fled. It is cultivating closer relations with the countries on its borders to forestall outside support to the dissidents and to prevent illegal border crossings. The visit of the President of Uganda to Sudan in March 1963 was planned by the Sudanese Government to demonstrate to the southerners the futility of asking for assistance from this newly independent country.

In spite of measures taken by the Sudanese Government, the secessionist movement is gaining strength. It has achieved varying degrees of sympathy and local support from the peoples of neighboring countries. The governments of these countries, except possibly Ethiopia, will probably take no more than token measures in support of Khartoum's efforts to suppress the movement. Undetermined numbers of secessionist forces are located within the borders of the Republic of the Congo and the Central African Republic, probably with the tacit consent of the governments of these countries. At the same time large numbers of refugees are in Uganda and Ethiopia, but these are more closely controlled by the security forces of the countries concerned. Reportedly the dissident forces are collecting arms for use in harassing actions, to which they will resort should they be unable to achieve their aims by peaceful means. SANU's precise aims are unknown. At the very least it wants greater autonomy within Sudan, but more likely it wants self-determination and the formation of a new independent African nation.

In response to international criticism of its anti-missionary policy the government issued a statement to the effect that some foreign missionaries had been expelled from Sudan because their educational and medical work had been taken over by native Sudanese. It is generally believed, however, that these expulsions were prompted by what the government authorities in the capital believed to be opposition on the part of the missionaries and persons educated by the missionaries to government policy in the south. The government has stressed repeatedly that it is not opposed to Christianity as such, but it obviously does not want to encourage the expansion of Christianity among the pagan population, whom it regards as potential converts to Islam.

C. Structure of Government

1. Central Government

Sudan is a highly centralized state administered principally from Khartoum. Under the parliamentary government, Sudan was ruled according

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to the Transitional Constitution of 1955. It provided for a parliament consisting of a House of Representatives elected by adult males and a Senate, which was partially elected. The Council of Ministers, or Cabinet, was responsible to parliament, and the judiciary was established as an independent branch of the government. When the military seized power in 1958, it suspended the Transitional Constitution; the civilian administration and the judiciary were subordinated to military administrators appointed at all levels of the government.

Since President Abboud has seldom used the dictatorial powers given to him, the Supreme Council of the Armed Forces has actually functioned as a governing committee. Its membership has changed frequently because of conflicts within the military leadership. The present membership includes hostile factions led by Maj. Gen. Hasan Bashir Nasir and Maj. Gen. Mohammad Talat Farid. Although Farid ranks second to Abboud and has been named Acting President during Abboud's foreign visits, Bashir Nasir wields greater actual power as Deputy Commander in Chief of the Armed Forces. Abboud has exercised rather indecisive leadership of the Supreme Council by acting as mediator between these two factions. Conflicts within the Supreme Council have tended to interfere with the making of national policy.

The Council of Ministers has been retained by the military regime as its primary administrative organ. Every member of the Supreme Council of the Armed Forces holds at least one position in the Council of Ministers, thus assuring military control of the administrative process. None of the civilian members of the Council of Ministers was prominent politically during the parliamentary period, and all are closely controlled by the military members of the Council.

Provincial and local administration is the responsibility of the Ministries of Interior and Local Government. These and other ministries, as well as special government agencies, provide for basic public services and administer major sectors of the economy.

2. Provincial Government

During the period of parliamentary government the governors of the nine provinces were civil servants responsible to the Minister of Interior. The military regime retained the civil governors but also designated a parallel echelon of military governors who were authorized to intervene in the provincial administration and overrule the civil governor. Military channels parallel the civil administration down to the basic units of local government.

In 1960 the Supreme Council of the Armed Forces adopted the Provincial Administration Act to foster local self-government. Provincial Councils were granted substantial authority, particularly in initiating

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public works projects. The councils are presided over by an appointed government representative, who is usually a military officer; the un-appointed members may be locally elected but only from among those nominated by the government representative. The central government retains the right to withhold confirmation of those elected and to veto acts of the Provincial Councils.

3. Local Government

The structure of local government, below the provincial level, varies widely from one region to another. The Sudanese Government has followed the British policy of encouraging a gradual evolution toward a system in which a rural or municipal council elects its own chairman and performs local services, such as health, education, utilities, and agricultural development. According to the Local Government Act of November 1962 no more than half the members of local councils in the less advanced areas are to be appointed by the government, and no more than one-third are to be appointed in other areas. All members of the councils are to serve for 4 years. Elections for 84 local councils were completed on 1 May 1963.

4. Judiciary

The organization of the courts remains as it was under the Transitional Constitution. Tribal courts have original jurisdiction throughout most of the rural areas of Sudan. Decisions taken in the tribal courts can be appealed to government civil courts. The Sharia courts administer the religious law of Islam for Moslems in such matters as marriage, divorce, and inheritance. The civil courts handle other cases according to judicial codes enacted by the British.

In November 1958 the Supreme Council of the Armed Forces assumed authority to appoint the Chief Justice, the Chief Qadi (who supervises the administration of the Sharia law), and the judges of the highest civil and Sharia courts. Since November 1958, sedition and all other offenses against the state as well as offenses relating to public tranquility can be tried by court martial, but few civilians actually have been given a military trial.

5. Civil Service

The Sudanese civil service under the Condominium was efficient, had high morale, and was professionally competent. Its efficiency was seriously impaired with the achievement of independence, when British subjects -- who had held virtually all controlling positions in the civil service -- were forced to resign. More recently, under the military regime, senior civil servants have been dismissed on grounds of disloyalty. Rumors of further dismissals as well as the subordination

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of civil servants to military officers have been demoralizing. Nevertheless, the regime endorses the British concept of good administration and has tried to avoid disruption of administrative functions while imposing stricter control. Professional training of Sudanese officials has been expanded through UN assistance. Many Sudanese have also been sent abroad for training under US and other foreign aid programs.

D. International Relations

1. Sudanese Neutralism

The primary objectives of Sudanese foreign policy are to maintain Sudanese independence, obtain foreign aid required for economic development, and promote foreign markets for Sudanese cotton. Neutralism has been accepted as the basis of Sudanese foreign policy. Sudan maintains diplomatic relations with Bloc countries as well as with the West. The military regime has avoided alliances that might imply Sudanese alignment with either major power bloc or with any of the emerging blocs in Africa. Sudan joined the Arab League in 1956 and sent a contingent of troops under League auspices to Kuwait in the fall of 1961 to prevent the attempted Iraqi takeover. Otherwise it has tried to avoid involvement in conflicts among the Arab states.

To avoid economic dependence on any one country or bloc, the present regime has made an effort to broaden foreign markets and to obtain foreign economic assistance from various sources. Before the coup, Sudan relied primarily on the United Kingdom for assistance in its developmental program. By 1961 the United States was providing a major portion of all foreign assistance. West Germany has recently been playing a more important part in assistance to Sudan.

The government also has accepted some assistance from non-Western sources. Since 1959 Yugoslavia has provided a broad range of assistance including equipment and training for the Sudanese navy and air force. It has also agreed to conduct a survey for the improvement of the port of Suakin, President Abboud's home town. The first Soviet technical assistance program for Sudan was concluded in 1961. Since then trade agreements have been signed with several Bloc countries. Sudan has received promises of financial aid for its new ten-year plan from both East and West.

2. Relations with Egypt

The historical links between Sudan and Egypt, as well as their mutual dependence on the Nile, have made the relationship between these two countries extremely important. Although the threat of Egyptian subversion was one of the major reasons for the military coup, the Abboud regime has been able to maintain cordial relations

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with Egypt. The Nile Waters Agreement of November 1959 won public congratulations from the leaders of the Sudanese political parties as well as from the heads of Ansar and Khatmiyah brotherhoods. Sudan disagreed with Egypt over the Congolese question, however, and refused to allow Egypt to supply the Gizenga regime in the Congo through Sudan.

Sudan is dependent on Egypt in a number of ways. It depends on Egyptian markets for selling livestock and other products. About 52,000 Sudanese are employed in Egypt, and their expulsion by Egypt would bring economic hardship to Sudan. Egyptian influence is felt at all levels of society in northern Sudan, including the army and civil service. Although the military regime has curtailed the spread of Egyptian propaganda, Egyptian teachers in Sudan still exert considerable influence. The extent of this influence was apparent in the student demonstrations that began in Egyptian-run schools in February 1961, which protested the murder of former Congo Premier Patrice Lumumba.

3. Relations With Other African States

Good relations between Sudan and the African states on its borders are especially important to the Sudanese Government because of the southern secessionist movement. The Prime Minister of Uganda, Milton Obote, visited Sudan in March 1963 and agreed to try to prevent illegal border crossings from southern Sudan to Uganda. Southern secessionists also hope to find a refuge in Kenya. In an effort to prevent such refuge Sudan had provided assistance to Jomo Kenyatta, now Prime Minister of Kenya. Sudan has always supported the Central Congolese Government and the efforts of the United Nations against the secessionist Katanga regime. In this way it hopes to help establish a strong Congo that will cooperate with Sudan against Sudanese secessionists.

Sudan has taken part in a nonpartisan way in the various pan-African organizations, and it hopes to have the African Development Bank established in Khartoum. Sudanese policy toward Africa as a whole is, according to the Sudanese Foreign Minister, to support African independence movements, to free the African continent from nuclear weapons and foreign military bases, and to promote African economic and other forms of cooperation. Sudan was a signatory to the charter of the Organization of African Unity drafted in Addis Ababa in May 1963, which established a loosely knit consultative organization. It agreed to take part in the organization's economic and diplomatic boycott of Portugal and South Africa.

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CHRONOLOGY

- 1820 Muhammad Ali, Ottoman governor of Egypt, invades and occupies Sudan.
- 1885 The Mahdi revolts against Egyptian rule.
- 1899-1955 As the Anglo-Egyptian Sudan, the country is administered by British officials.
- 1954 Local self-government is granted with a British Governor-General responsible for foreign affairs.
- 1956 Sudan becomes independent on 1 January and joins the United Nations.
- 1958 A group of army officers under the leadership of Ibrahim Abboud seizes control of the government on 17 November.
- 1959 Sudan signs a treaty with Egypt over the division of the Nile waters.
- 1960 Civilians petition Abboud for restoration of democratic constitutional government.
- 1961 President Abboud announces program for gradual return to civilian constitutional government.
- 1963 Elections to Local Councils are completed on 1 May.

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LEADING PERSONALITIES

Chief of State: President of the Supreme Council of the Armed Forces:	ABBOUD, Ibrahim (Lt. Gen.)
Council of Ministers:	
*Prime Minister; Minister of Defense; Commander in Chief of the Armed Forces:	ABBOUD, Ibrahim (Lt. Gen.)
*Presidential Affairs; Deputy Commander in Chief of the Armed Forces:	NASIR, Hasan Bashir (Maj. Gen.)
*Interior:	URWAH, Muhammad Ahmad (Brigadier)
*Local Government:	al-BAHARI, Ahmad Majdhub (Maj. Gen.)
*Commerce, Industry, and Supply:	al-AMIN al Hajj, Maqbul (Brigadier)
Communications:	HUSAYN, Sulayman
Information and Labor:	UTHMAN, Muhammad Nasir
Public Works:	ARBAB, Ziyadah Uthman
*Agriculture:	FARID, Ahmad Rida (Maj. Gen.)
Irrigation and Hydroelectric Power:	al-MANNA, Makki
Animal Resources:	DENG TENG, Santino
*Education:	FARID, Muhammad Talat (Maj. Gen.)
Finance and Economics:	AHMAD, Abd al-Majid
Foreign Affairs and Mineral Resources:	KHAYR, Ahmad
Health:	ZAKI, Ahmad Ali
Former Prime Ministers:	al-AZHARI, Ismail KHALIL, Abdallah

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Ansar Sect, Head:	al-MAHDI, al-Hadi
Khatmiyah Sect, Head:	al-MIRGHANI, Ali
Communist Party, Secretary General:	al-MAHJUB, Abd al-Khaliq
Sudan African National Union leaders:	Father SATURNINO ODUHO, Joseph DENG, William

* Member of the Supreme Council of the Armed Forces.

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III. Physical Geography

A. Introduction

All of Sudan can be considered a transition zone, nearly a million square miles in extent, between the deserts of northeast Africa and the forests of the tropics. In this transition zone distinctly different physical features merge with each other. Desert, swamp, grassland, forest, coast, mountain, and plain provide a variety of landscapes. Even the stretch of the Nile that traverses the country is far from uniform. From the wooded highlands in the south to the true deserts of the north, Sudan gradually becomes lower, drier, and more barren.

For convenience in using this Handbook, Sudan is divided into five natural regions that are of significance to a person on the ground (see Map 38094 - Terrain and Regions). The Desert Region comprises most of the northern third of the country. The Semidesert Region, which receives more rainfall, forms a relatively wide transitional band between the desert and the Red Sea on the east and between the desert and the wooded regions to the south. Extending across the country from about 11°N to about 14°N is the Thin Woodland Savanna Region, a gently undulating plain some 2,000 to 3,000 feet high. South of this woodland savanna are two other regions -- (1) the northward extensions of the upland forests of northern Congo and eastern Central African Republic, which form the Wooded Upland Region and (2) the huge permanent swamp area that is overflooded by seasonally flooding rivers and expands greatly in size during the season of the heavy White Nile flow. In this Handbook, this swampy area is called the Seasonal Flood Region. The boundaries between these five regions are not clear cut but instead are broad transition belts as much as 50 miles wide that generally are hard to identify from the ground.

B. Desert Region

1. General

The northern third of Sudan is true desert and is one of the driest areas in the world. Technically the average annual rainfall is 4 inches or less, but much of the area may not have any rain for several years at a time. The sun is hot at all seasons, and in summer it is scorching. Even goats can't find a living away from the Nile, and consequently few nomads roam this northern area. Summer nights may be barely comfortable, with temperatures dropping below 80°F by sunrise; and in winter the lowest temperatures may drop as low as the 50's. Most of the time the air is extremely dry, and even on the coolest nights there is no dew. There is much loose sand and fine soil on the surface of the ground, and the air is dusty whenever the wind blows, particularly in late afternoon. Fine gritty dust is carried through tightly shut doors and windows, through clothing, into mouths, and into machinery. Dust is a normal part of desert living.

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The Desert Region is comprised of three subregions that have appreciable differences. East of the Nile is the Nubian Desert. The area west of the Nile is part of the large Libyan Desert, except for the area in the loop of the river between Al Dabbah and Omdurman, which is called the Bayuda Desert.

Drop sites unobservable by native population are readily available, but locating them in terms of natural features alone may be difficult because one wadi bed or one hill resembles another. The sandy portion of a wadi makes for softer landing and easier digging for a cache but may be scoured out by the next flood -- a week or a decade hence. Selection of a landing site should be made from the ground. A clay plain, windswept free of sand, is the most desirable surface, but it may contain small loose stones that are difficult to detect from the air and require removal by hand. Locating such a site would be fairly easy in the parts of the Libyan Desert that are away from the major sand areas and also would be easy in the loop of the Nubian Desert west of Abu Hamad. In the rest of the Nubian Desert and in the Bayuda Desert, which are hillier and are carved by wadies, less flatland is available for landing sites.

2. Nubian Desert

The Nubian Desert is made up of the western slopes of the Red Sea Hills that are below about 4,000 feet and the extensive plains into which they merge on the west. Although the western slopes are gentle, in some places the wadies have carved deeply, making steep banks and small hills. Many small granite masses and a few large ones rise above the plains on both sides of the Abu Hamad -- Wadi Halfa rail line. The highest is Jabel Kuror, which is 4,000 feet in elevation -- some 3,000 feet above the surrounding plain.

The Nubian Desert has no oases, but water is available from the 11,000-gallon storage tank at Railway Station No. 6 halfway between Abu Hamad and Wadi Halfa. There are no permanent wadies. The Atbara River contains water from June to November and has a very heavy flow in August and September. Other watercourses flow only after the rare desert thunderstorms. Wadi Allaqi and Wadi Gabgaba flow northwestward and join the Nile about 100 miles across the Egyptian border. Shallow wells dug at low places in Wadi Gabgaba once supported a caravan route between Abu Hamad and Korosko on the Nile in Egypt. What sparse vegetation there is -- bunchgrass, low desert scrub, and a few thorny acacia -- clings to low or sheltered places where roots can tap underground moisture. Most of the desert surface, however, is made up of sand dunes or drift sand or of clay plains with stones and large rock masses and has no vegetation.

Cross-country movement on foot would be handicapped by the intense heat, by sand areas, and possibly by small hills or steep slopes that would have to be circumnavigated. Wheeled vehicles could traverse selected areas of the plains in the west more easily and for greater distances than they

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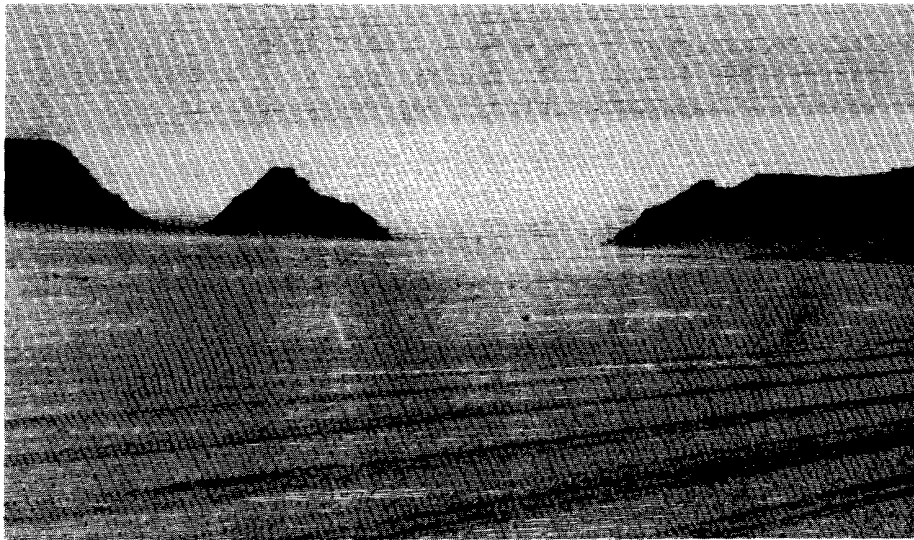


Figure 1. The desert south of Wadi Halfa ($21^{\circ}56'N-31^{\circ}20'E$). Roads here are unnecessary. Note truck tracks.

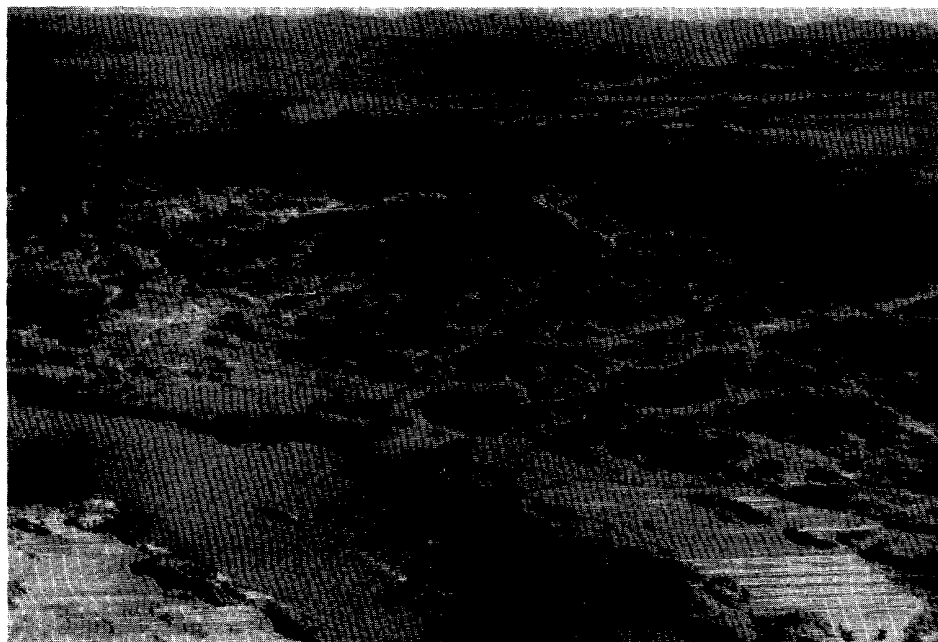


Figure 2. Low hills near the Nile in the vicinity of Dongola ($19^{\circ}10'N-30^{\circ}29'E$).

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could cross the rougher wadi country in the east. In the rough eastern hills, however, concealment from ground observation and cover from small-arms fire are possible in the lee of hills and wadi banks, whereas in the west there is little such protection. For brief periods, small groups might be concealed from air observation in the long shadows of morning or evening or in the sparse wadi vegetation. In the Nubian Desert almost no civilians live more than a few miles from the Nile, but caravans move across the desert from time to time.

3. Libyan Desert

West of the Nile and the Bayuda Desert lies the southeast corner of the vast Libyan Desert. In Sudan it is largely a plain between 1,000 and 2,500 feet in elevation, with occasional small hills and for the most part very gentle slopes. Jebel Uweinat, in the extreme northwest, reaches 6,400 feet. Wadi Howar enters the region from the southwest at about 2,400 feet, and all other known elevations are lower. Some 90 miles west of the Nile at Dongola, Jebel Abyad stands out as a low plateau about 60 miles long, oriented north-south and fading westward into the plain. Low elevations and lack of rainfall have kept most of this area from being carved by wadies. The surface is largely covered with sand flats or dunes, but some parts have hard, rock-strewn plains or small rock outcrops. On the west, Wadi Howar cuts through a large featureless sand plain; and on the northern border near 28°E a wide area of dunes extends into Egypt.

Away from the Nile the Libyan Desert is the most barren and desolate region of Sudan, particularly in the north. Vegetation can exist only in low spots of the few wadi beds and along underground drainage lines where moisture comes fairly near the surface. Even in these locations it consists only of scattered tufts of grass, small plants, and an occasional acacia bush. In the extreme southern part of this subregion (the upper part of Wadi Howar and eastward), there is a greater possibility of rainfall, and in some years there is enough grass to support the sheep and goats of nomadic people from the south for part of the winter season--sometimes as late as February. This area is called the Jizzu. Camels are not suited to the stony ground and they require more food than is available.

Travel on foot or by motor vehicle is hampered chiefly by the large proportion of sand, either flats or dunes, and by the almost total lack of cover and concealment. Water is the major problem. Few wadies are moist enough to provide water when wells are dug. Notable exceptions are Wadi Howar; Wadi el Malik, which forms the southeastern boundary of the subregion; and Wadi el Qa'ab, near the Nile west of Dongola. Water may be available in a few old wells around the foot of Jebel Uweinat. Along the Forty Days Road (Darb el Arab'in), a former caravan route from Darfur to Asyut in Egypt, are four small oases. They do not have a settled population as do the large oases of Egypt; they can support only a few people and an occasional military garrison.

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4. Bayuda Desert

This subregion is bounded on the east by the loop of the Nile between Omdurman and Al Dabbah and on the west by Wadi Malik. Because it lies in the southern part of the Desert Region and is nearly surrounded by a permanent water body, it has a little more grass than most of the region. It is sometimes called a steppe desert, or grassy desert. Wadi Malik, Wadi Muqaddam, Khor Abu Dom, and several other small watercourses run to the Nile from the slightly higher land north and northwest of Omdurman. They flow only after a rain, but many of them contain wells that have been dug and that support flocks or a meager agriculture, particularly in the south and near the Nile. Probably more people live here than in the Nubian or Libyan Deserts because they can take advantage of the thin steppe-desert pastures for a short time and then return to the Nile or to a major wadi. The subregion has considerable rough rock land and is dissected by wadies, and the surface features resemble those of the eastern Nubian Desert. Most of the land lies between 1,000 and 1,600 feet above sea level, and local differences in elevation are not great. West of Wadi Muqaddam the surface is less rough and more sandy. The area would not be particularly difficult to traverse on foot, and river water is relatively nearer than elsewhere in the Desert Region. Motor vehicles must use routes that are selected to avoid the small jebels and deep sand. Most wadi banks are low enough to be negotiated by motor vehicles. Cover and concealment are near minimal.

5. The Nile River

The Nile is reliable; it always contains water. Wherever there is fertile soil between the river and the desert, a green bordering strip of cultivated crops or naturally seeded grasses and trees supports a relatively dense population. The date palm is most common, but there also are several other trees that are useful for food, fuel, or construction materials, and matting. In some places the river flows through a narrow hard-rock trench and is broken by cataracts. Here there are few riverine terraces. In other places the riverbed is wide, and broad flood plains have been developed on one or both sides. Even so, the habitable strip is rarely more than a mile and a half wide.

In southern and eastern Sudan and in the countries beyond, the rains of spring and summer swell the tributaries of the Nile between June and December. During the peak flow of August-September the Nile below Atbara may carry 12 times as much water as it does during the low-water period from March through May.

For more than half its course in the Desert Region the bed of the Nile is large enough to accommodate the yearly flood; but between Sabaloka and Atbara (the Shendi reach) and between Karima and Kerma (the

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Figure 3. Fifth Cataract of the Nile during low water (18°46'N-33°34'E). Even at the water's edge natural vegetation is scant.

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Merowe-Dongola reach), several sections of old riverbed flank the present-day Nile. These basins act as escape valves, receiving the excess flow and later losing most of it through drainage back to the river. In a fairly good year some 80,000 acres of basin are inundated. Variations in the Nile flood from year to year are so great, however, that the figure may be 10,000 or 110,000 acres. Some of these natural basins have been converted into areas of perennial irrigation where diesel pumps are used as well as the old-fashioned ox-powered sajia, or water wheel.

C. Semidesert Region

1. General

On the edge of the true desert is a zone of more reliable rainfall that produces grass enough for animals on migration but not enough for settled agriculture. This zone is used chiefly for nomadic herding. Agriculture is limited to those areas that are near a natural or manmade source of ground water.

Rain falls between June and September, but the amount is unreliable, varying from an average of 4 inches in the north to 16 inches in the south. This produces a vegetation ranging from widely scattered bunchgrass and almost no shrubs or trees in the north to continuous grass cover or grass and thin thorny woodland in the south.

The Red Sea Hills are included in the Semidesert Region. Although the area north of Suakin receives less than 4 inches of rainfall, grazing is possible because the rainfall is concentrated in wadies and the moisture is increased by fog and humid air from the Red Sea. On the immediate coast some rain falls in winter also, but none of the watercourses in the Red Sea Hills are permanent. The Semidesert continues down the western slopes of the Red Sea Hills to an elevation between 4,000 and 3,000 feet. It includes the Blue Nile from the Sennar Dam to Khartoum and the White Nile from near Kosti to the Sixth Cataract (the Sabaloka Gorge, some 60 miles north of Khartoum). From the river westward the Semidesert Region becomes somewhat narrower and extends between the Jizzu of the Libyan Desert and the Jebel Marra. On the southern border of the region, about the latitude of El Fasher and Kosti, there are more trees and permanent settlements. East of the Blue Nile from Sennar to Khor Gash the southern border follows the north edge of sedentary population. The railroad closely skirts this part of the southern boundary of the region.

Except for the Red Sea Hills and western Darfur Province, the Semidesert Region is the chief camel-raising area of Sudan. Camels can travel long distances between watering places and therefore can fit into the local pattern of migration between areas of seasonal grazing.

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During the summer, many depressions, khors, and wadies along the edges of the desert contain pools of water for days or weeks after a rain, and in less favored wadies the underground water is near the surface. At this time grazing is good and the more sedentary natives also do a little farming. In winter the surface water and shallow wells dry up, animals must turn to browsing on bushes, and it may be a long time between drinks for both people and animals. More or less permanent wells have been dug at the base of some of the hills, as in the Meidob Hills, where there is also a crater with interior springs and a small salt lake. Ten miles west of Bara a series of natural clay-lined depressions between sand dunes extends northward for about 40 miles. In these depressions water is reached at 10 feet or less, and wells support a local commercial agriculture. A similar but deeper line of underground watercourses immediately north of Bara provides the town with water.

Drop sites and landing sites that are free of scrub and small trees can be more easily selected in the northern (drier) part of the region than the southern, except in the Red Sea Hills where more of the land is sloping and cut up than elsewhere. The most extensive areas of flat land are between the Atbara River and the White Nile.

No considerable portion of the region is consistently uninhabited, and there are certain to be people near sources of water most of the time. Conversely, to forecast the probable avoidance of an area by a nomadic group requires a knowledge of current local rainfall conditions. Minimum concealment for small numbers is available near scrub and small trees growing along watercourses, especially in the southern part of the region. West of the White Nile, travel on foot or by wheeled vehicle would be hampered more by the relatively small but frequent sand areas than by slopes or vegetation, which can be skirted. In the Gezira and the Butana there are few obstructions to movement, other than the three major watercourses. The use of vehicles in the Red Sea Hills is impractical and movement on foot over roundabout routes is somewhat rough.

2. Red Sea Hills and Coast

The Red Sea Hills rise to over 7,000 feet in the north and over 9,000 feet at the Eritrean (Ethiopian) border, averaging perhaps 5,000 feet in elevation. Slopes are angular and jagged, and the crest of the hills is only 30 to 40 miles inland, thus producing an eastern face that is considerably shorter and steeper than the western. All of the hill country has been carved by wadies, but south of the Baraka Delta the highland is broader and the surface is particularly rugged. In summer the Khor Baraka flows from the Eritrean Highlands northward across this rough terrain to the Baraka Delta on the Red Sea. The Khor Gash and the Atbara River flow northwestward from the highlands

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onto the plains north of Kassala. From the western slopes inland from Port Sudan, Wadi Amur leads westward to the Nile. Water flows in the Wadi Odib and the Wadi Amur only after a heavy rain. The coastal plain east of the mountains varies in width from about 10 miles in the north to 35 miles at the Baraka Delta. Port Sudan (population 50,000) and four small villages are the principal population clusters on the coast. Fishing, salt processing, agriculture, and herding in winter are carried on outside the villages. Nearly all the coastline is fringed with coral reefs, some of them covered with shifting sandbanks 1 to 6 feet below the surface. An outer reef extends from a quarter of a mile to several miles offshore. Native boats use established loading places opposite breaks in the reefs. There are several beaches more than 900 feet long. The most suitable one for landings is near Dunqunab and Trinkitat. Generally, the beaches are composed of firm sand with varying amounts of coral, rock, and mud. They experience little surf or tide. Inland on the coastal plain, small rocky hills and shallow khors provide minimal concealment in an area that can be easily observed from the hills.

3. The Butana

The Butana is a flat to gently undulating plain averaging some 1,500 to 2,000 feet in elevation located entirely within the Semidesert Region between the Blue Nile and the Atbara River. Its western half is fairly sandy, and in the center and east are small isolated hard-rock hills. The grazing, however, is generally very good. Only the Blue Nile carries water all year. The Rahad and Dinder Rivers, tributaries of the Blue Nile, are similar to the Atbara. Because of rains on the Ethiopian highlands, all three come to life in summer, flood in August and September, and cease to flow on the surface in winter. Tribes living on the periphery of the Butana therefore are able to be partly nomadic and partly settled, whereas those in central Butana are entirely nomadic.

4. Areas of Irrigated Agriculture

Between the Blue Nile and the White Nile north of Sennar is a flat plain called the Gezira. It is famous because nearly a third of it, close to 2 million acres, has been irrigated by gravity systems from the Blue Nile and made to grow cotton -- Sudan's chief source of income -- under the direction of the government's Gezira Board. Elsewhere in the Gezira, agriculture is carried on by pumping water from the rivers and by building low ridges in the shape of a V or U, a foot or two high, to hold and concentrate the rainwater. Large numbers of sheep and goats are raised here, particularly in the west away from the gravity irrigation scheme, as well as on both sides of the Gezira, because of the nearness to water and markets. The two other

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extensive areas of irrigated agriculture in Sudan, other than the strips along the Nile, also are located in the Semidesert Region. For 70 miles north of Kassala, on both sides of the railroad, a series of canals and wiers controls the Gash River flood. Near the coast the Baraka River floodwaters irrigate a smaller delta around Tokar. As in the Gezira, cotton growing is the chief activity in both areas, but the floods vary so much in amount and duration that the crop is unreliable. However, the grazing is usually very good nearby.

5. West of the White Nile

West of the Nile, the land generally is some 2,000 to 3,000 feet above sea level. A few hills are higher, notably those 100 miles west of Khartoum and those in western Darfur, where elevations reach 4,000 to 7,000 feet north and northwest of El Fasher. Except for these hills, most of this part of the region is a gently to moderately undulating plain. Wadies lace most of the plain, but they contain water for only a few hours at a time and not necessarily every year. No major drainage system has developed and many of the wadies just peter out in the sands. The largest are Wadi Malik, leading northward at about 29°E, and Wadi Howar on the northwest edge of the region. Between the White Nile and El Fasher the southern part of the region has fewer wadies because the rains sink into the sands without forming rivulets. Some of the wadi banks may be steep, but they are not high.

D. Thin Woodland Savanna Region

1. General

This region is essentially a gently undulating plain about 2,000 to 3,000 feet high that is broken by two major hill areas and occasional small rock outcrops. In the east and southeast the surface material is largely clay, whereas in the center and west it contains more sand, but there are few areas of soft dune sand. Temperatures are similar to those in the desert with "winter" highs in the 90's and no frost on the plains. In spring and summer the highest temperatures are well over 100°F, except during the July-September period when the rains are heaviest. Precipitation ranges from about 16 inches in the north to more than 30 inches in the south -- enough to make the tree growth more important than the grasses and to provide a water supply that generally is fairly reliable. Only the White Nile and the Blue Nile have water flowing all year, but the many wadies of the woodland savanna have flowing or standing water for a longer period of the year than wadies in drier regions to the north. It follows that this region has a relatively high density of rural population and that the majority of the people are not nomadic but live in permanent settlements. The northern boundary of the

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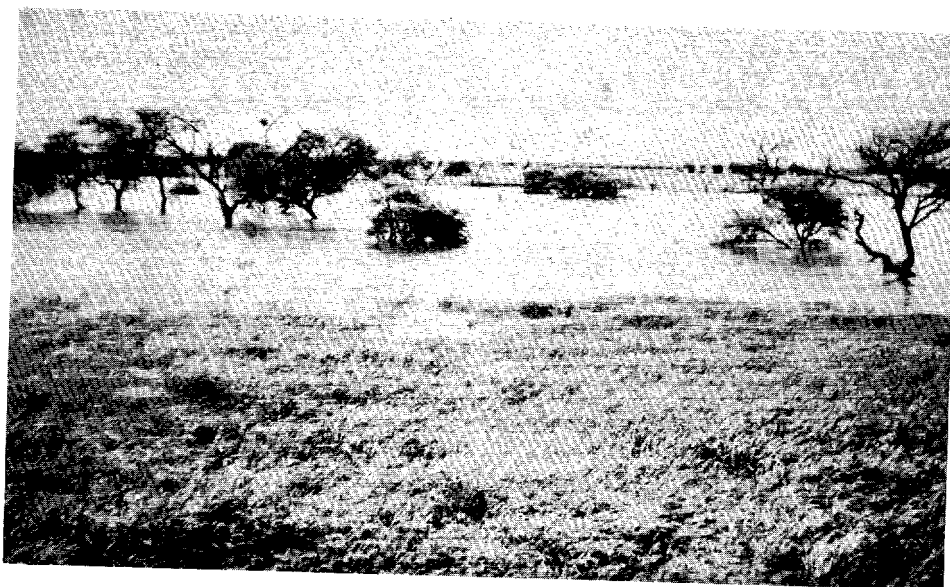


Figure 4. Flooded land along the Blue Nile south of Kosti during the rainy season.

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Thin Woodland Savanna runs just north of the line of permanent settlements that extends roughly east-west across Sudan, and the southern boundary borders the Seasonal Flood Region and, in the far west, the Wooded Upland Region.

Walking through this area would be relatively easy except for traversing Jebel Marra and the Nuba Hills which would be difficult but not impossible. However, a small party would be easily observed by the native population and would find concealment only in small clusters of trees in the southern part of the region or along watercourses. Through observation on the ground, suitable areas for landing sites can be found in many places, but they may require the removal of a few bushes or small trees. Satisfactory drop sites are available almost anywhere outside the two mountain areas.

2. The Clay Plains

The eastern third of the Thin Woodland Savanna -- the part east of the Nuba Hills -- is a gently undulating plain made up of fine clay and silt. These are fertile soil materials and people settle wherever there is enough water for growing crops. Most of the settled population lives along the White Nile, Blue Nile, Dinder, Rahad, and Atbara Rivers; few people live in the areas between the rivers. From Gedaref, Singa, and Kosti southwards the government is building many hafirs (small manmade reservoirs) to improve the water supply, and two small mechanized crop production schemes have been started just west of the Gedaref Ridge, about 2,000 feet in elevation. Kosti, at an elevation of 1,300 feet, is the lowest point on the clay plains.

Some parts of these plains are not suitable for permanent settlement. Many areas along the Dinder and Rahad Rivers where the clay soil holds the overflow water are poorly drained and retain stagnant water. These areas are infested with insects even in the dry season. Few people live near them. The west bank of the White Nile has a very gentle slope, and therefore floods extend for a considerable distance westward. Few villages are located here because of this fluctuation of water level. Such country is best suited to nomads.

Enough rain falls in this region to permit those who lead a nomadic life to move along established routes. These people do not require constant advice from outposts on grass conditions elsewhere. They migrate eastward and westward from both the White Nile and the Blue Nile, northward from the Dinder-Rahad area out of the region into the Butana, and southward from the Sennar-Rabak area out of the region to the Machar Marshes. They are not constantly on the move but instead spend weeks or months in a general area and then return to their starting point in a one-year cycle. Those going southward

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return in a hurry when the spring rains bring clouds of flies that bite men and animals.

3. The Hills

Western Darfur Province presents two rather different landscapes. South and west of the Geneina-El Fasher-Nyala track is the volcanic mass called Jebel Marra -- a 90-mile ridge aligned north-south and about 5,000 feet in elevation. The plain around it averages about 3,000 feet. At the southern end is a volcanic cone that reaches 10,000 feet in elevation and contains two small lakes. Considerable rain is brought by the prevailing southwest wind of summer, perhaps as much as 40 inches per year in the mountains, and all sides of the Jebel are riddled with wadies. In winter there is neither rain nor flowing water in the wadies, but a substantial water supply remains in the pools and wells.

Jebel Marra is populated by both settlers and nomads. Villages are located on well-drained, stony sites half a mile from the wadi bed, and usually on a southern exposure for protection from the cool northeast winds and possible frost of winter. The best farmlands are the nearby silty terraces and flood plains, but individual terraced farms may be found as high as 9,000 feet. Villagers keep few domestic animals other than donkeys for transportation and a small breed of cattle. Nomads find the grasses good for grazing, especially for cattle and sheep. Sycamores and tall acacia trees grow along the watercourses.

The El Fasher-Geneina track crosses Jebel Marra at a low spot near the northern end. Beyond the northern end is a confused or badlands type of terrain that includes small isolated volcanic cones. It is part of the Semidesert Region. Here the water supplies are inadequate and the grasses thin. It is the least attractive section of western Darfur.

The Thin Woodland Savanna Region includes another group of hills, the Nuba Hills, centered about a hundred miles west of the White Nile at Renk. The surrounding plain rises gradually from 1,300 feet at the Nile to about 2,000 feet on the eastern and southern sides of the hills, but on the west and northwest sides the general level is over 2,000 feet. The Nuba Hills are formed by dozens of hard granite hill masses, most of them shaped like a dome or sugarloaf with bare top and steep sides and surrounded by an irregular apron of small boulders. These granite masses may be the size of a small village or may cover several square miles. Some are so old and worn down that the top is covered with soil which supports the usual grass and scattered trees of the countryside. As on Jebel Marra the rainfall is heavier and more reliable than on the plain, and

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water is available in pools and wells during the dry season. In addition, water can be obtained from the many hafirs that have been provided by the government.

The inhabitants of the Nuba Hills are mainly farmers, tilling the silty red loam at the base of a hill or near a wadi bed -- always near a source of water. Sheep, goats, pigs, and donkeys are commonly raised by settled families. Nomadism is relatively unimportant here.

4. The Qoz

The Arabic term goz or gawz is used for the type of terrain that comprises the "big middle" of the Thin Woodland Savanna Region. It consists of large expanses of rolling sandy ground, including dunes. Some sand is soft and drifting, but most of it has been sufficiently consolidated on the surface so that men and animals can walk on it; but vehicles break through and find it hard going. The usual vegetation of grass, scrub, and low scattered trees grow in this sandy area as they do in the rest of the region but the soil holds water so poorly that hafirs can be effective only in selected areas of high clay content, chiefly in the south, and more reliance is placed on deep bore wells. The Qoz extends from the White Nile westward, north of the Nuba Hills, and includes El Fasher and Nyala, but not westernmost Darfur. West of 29°E the southern boundary of the Qoz coincides with the boundary of the Thin Woodland Savanna Region. On the southern margins of the Qoz the sand thins out and clay soils become predominant.

Both nomadism and sedentary agriculture are important in the Qoz. In the north, tribes that are wholly nomadic spend the rainy season in the Semidesert Region and retreat to the better savanna grasses to carry through the last of the dry season. On the southern margins of the Qoz the Baqqara cattle-herding tribes move southward in the dry season to the low moist clay plains near Bahr el Arab and retreat northward (with the advancing rain and flies) to spend the rainy season in the Qoz.

Settlements are located throughout the Qoz but are concentrated in the center, in the Umm Ruwaba-En Nahub area. Not only the presence of a reliable water supply but also the Nyala railroad, the roads to El Fasher, and the belt of wild gum arabic trees (hashab or acacia) have contributed to this concentration. Water resources are extensively exploited to support the present population. El Obeid formerly had a plentiful supply of local ground water, but now it must be supplemented by water pumped from sources several miles away. El Fasher has been able to save runoff water in storage dams. The yearly flash floods of Khor Abu Habl are utilized in an irrigation scheme of 5,000 acres. Villages are rarely located more than half a day's travel away from the emergency water supply.

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E. Wooded Upland Region

1. General

The Wooded Upland Region in southern Sudan is a distinctly different part of the country. Not only is it higher, wetter, and covered with medium-thick forest, but it also is in "the South," a backward area inhabited almost entirely by Negroes. The region includes three-fourths of Bahr al Ghazal and Equatoria Provinces, which together with Upper Nile Province make up the non-Arab half of Sudan. This southern area looks and feels like part of forested "Black Africa," but nevertheless it is run by the Arab government in Khartoum.

2. West of the White Nile

Most of the Wooded Upland Region lies west of the White Nile and is fairly uniform. The international boundaries with Republic of the Congo and Central African Republic lie on the Congo-Nile divide, which is here about 2,500 to 3,500 feet high. The boundary between Sudan and Uganda runs from the eastern end of the divide to the White Nile at Nimule. In the vicinity of the divide and on both sides of it the land is slightly rolling and slopes gently downward to the southwest and northeast. The many watercourses on the Sudan side of the border run northward or northeastward, flowing most of the year but being reduced to a trickle or to surface pools or to percolating through the soil near the surface from December through February in the east or from November through March in the northeast. A variety of fish become concentrated in pools during the dry season. In some cases they are so thick they need not be caught but can be literally "pushed" out of the water with branches.

The long northeastern boundary of the region (west of the Nile) runs approximately along the average high-water mark of the Seasonal Flood Region, between 1,300 and 1,400 feet in elevation, but this part of the country is so nearly flat that differences of only a few inches in the height of the annual flood can move the actual boundary many miles. Of course there are also many small swampy areas on the main part of the upland, even in the dry season; but large, permanent swamps are not characteristic of this region. The vegetation line along the regional boundary is somewhat irregular. Land that is flooded by the rivers but dry and firm in the dry season is covered with 1-foot to 3-foot tall grass fine for grazing cattle. This land is called "toich". Other areas away from the rivers may be lightly flooded because the rain runs off so slowly. On slightly higher ground to the south and west, where flooding is light, the trees take over. West of 26°E the boundary between the Wooded Upland Region to the south and the Thin Woodland Savanna Region to the north is very hazy.

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Figure 5. Typical regrowth (after clearing) about 20 feet high, 50 miles northwest of Yei at the end of the dry season (March). No object can be seen or identified through 200 feet of this vegetation.



Figure 6. Dense vegetation at the Congo border on the road between Yei and Aba, Republic of the Congo.

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The "feel" of this upland region is one of forest. The men carry bows or spears and like to hunt the forest animals. When they till the red leached "ironstone" soil the trees must be girdled and removed by burning or cutting. In a few years the soil is depleted, a new site is cultivated, and the old one reverts to nature. Each year the tallest vegetation on the old site is all the same height, whether it is 3 feet or 30 feet, in contrast to the virgin woods which contains trees of all heights. You can see these "flat-top" regrowth areas along the roads or from higher ground. They are good places to hide because the people who cultivated them have moved on, and the undergrowth is so thick no native would hack his way through it from choice. They are infested, however, with nettles and insects. After several years the regrowth is more like the natural forest in which at least three levels are distinguishable:

- (1.) The tallest trees, over 60 feet tall and near the end of their life span, are widely spaced and stand out above the next lower level.
- (2.) Trees in vigorous growth, 40 to 50 feet tall, cover most of the area.
- (3.) A variety of undergrowth -- grass, bushes, and saplings -- is mostly below 10 feet tall.

This mature forest is a little easier to walk through than the young regrowth, particularly in the dry season (December-March), because the undergrowth is not so dense. It also provides a broken canopy of protection from distant ground observation or air observation. No considerable part of the upland is free of native families or small villages. Wheeled vehicles stay on the roads at all seasons. The dry season is the most comfortable and healthful. Although the highest temperatures then are over 100°F, the humidity is low and there are fewer insects and less undergrowth than during the wet season. Many grass fires are started by natives in openings in the forest at this time, and they may produce an identifiable pattern for a drop site relatively free of trees.

3. East of the White Nile

East of the White Nile the landscape is varied in many respects. The lowest areas are about 1,500 feet in elevation. Some may be swampy only in the wet season but others are swampy all year, as is the Lotagipi swamp, in the extreme southeast corner of the region near the Kenya border. Half a dozen isolated highland masses rise like stacks above the 3,000-foot plain to elevations between 6,000 and 10,000 feet and finger out northward towards the swamps beyond Torit and Kapoeta. Between them other isolated small gray hard-rock domes

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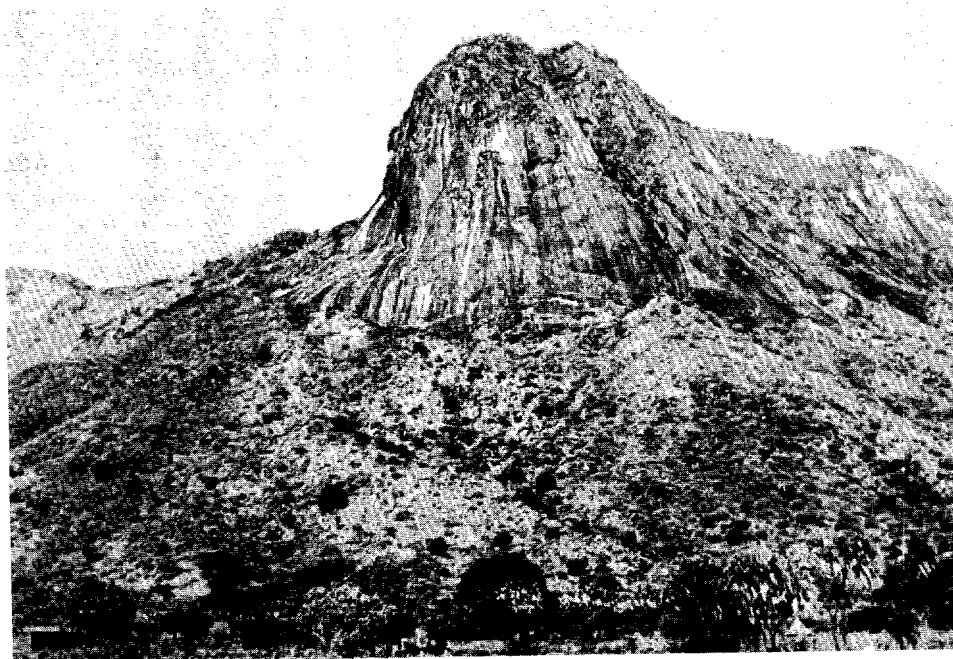


Figure 7. Volcanic hills 40 miles west of Kapoeta (4°47'N-33°35'E) near the end of the dry season. Note huts and buildings at foot of hill -- an ideal place to dig for water.

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stand up 100 feet or so from the plain. The ruggedness, scenic beauty, and cooler climate of the highlands have permitted a very modest resort business, which is run by Sudan Railways. Before Sudan became independent, Nogishot (6,500 feet) was the home of the British District Commissioner and his assistant, and their guests enjoyed fine hunting. On the lowlands the longer dry season (November-March) and precipitation of about 25 inches a year produce only a thin woodland; whereas the hills, which have up to 70 inches of precipitation spread over most of the year, are forested. Some of the hills have a "layer" of bamboo that grows between elevations of 3,000 and 5,000 feet.

Wheeled vehicles can leave the road only in selected parts of the plains where they can travel through grass about 3 feet tall or duck between acacia trees on stony clay. The forested hills provide good concealment and a potential water and food supply. They have a sparse native population -- certainly fewer people per square mile than on the upland west of the White Nile.

Drop sites can be designated at will on the plains east of the White Nile, perhaps in relation to one of the low rock domes. Emergency landing areas free of trees and rocks are difficult to find. Small grassy stretches may contain anthills a foot or less in height.

F. Seasonal Flood Region

This is the odd-ball region of Sudan. It is flat as a pancake and has a lot of standing water all year.

From Bor, at an elevation of 1,380 feet, to Malakal the gradient is less than 6 inches per mile. When the summer rains fall and the flow of rivers from the east, west, and south into the area is increased, the water has no place to go. Rivers flood beyond the permanent lakes and swamps onto the flood plains, which remain under water 4 to 6 months a year. Between the rivers large areas are covered with standing rainwater that cannot drain off. In this kind of country, elevations of just a few feet are very important as they drain fairly well after a rain and become islands to which cattle and people can retreat in summer. One of the largest in the region is a sandy ridge about 7 feet high that extends for 160 miles north of Bor. The only really high land in the Seasonal Flood Region is the very small Boma Plateau in the south along the Ethiopian border where some 2,500 square miles of land are between 3,000 and 4,000 feet above sea level.

Rainfall is fairly uniform over the entire region and is fairly reliable, some 30 to 40 inches falling between April and October. The

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Figure 8. Palm trees and grass 50 miles north of Malakal in the transition belt between the Seasonal Flood Region and the thin Woodland Savanna Region.



Figure 9. Looking southward over the marshland of Upper Nile Province from Ler (08°18'N-30°08'E).

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Boma Plateau, being higher, receives more. To a person in western clothes it is hot all year and in addition the rainy season is very humid. Low humidities during the dry season make the days more bearable and the nights fairly comfortable.

The vegetation is predominantly grass of various kinds, and it is easy for the natives to raise cattle and to clear the land by burning. Most of the dry season smoke is visible somewhere on the horizon and indicates either uncontrolled burning or, at night, the smudge fires that are needed by both man and animal as protection against insects. Fires and poor drainage make it hard for trees to grow over most of the area, but wood was once plentiful enough to fuel the Nile steamers. At least a few scattered acacias can usually be seen on stretches of higher ground back from the rivers, and palms on these stretches indicate that the higher ground probably is also sandy and well drained. Much of the White Nile is flanked by ribbons -- yards or miles wide -- of the famous papyrus. This round reed with a wavy tassel at the top grows in the water and rises 8 to 12 feet above it.

Movement on foot over dry ground is relatively easy, but there is little concealment other than low grass. Avoidance of the local population requires plans that mesh with their way of life. Most of the inhabitants own cattle and stay with them continuously. Their normal migration is away from their permanent villages on higher ground onto the flood plain for the dry season, then back to higher ground in summer. Probably no large areas of liveable land are uninhabited at any time. During the flood season, dry land is at a premium, and even during the dry season a few people remain in the permanent villages to harvest crops. Concealment should be possible for several weeks in the grass, papyrus, or scrub of the flooded plain while the native population is on higher ground. However, a slim native canoe, which requires expert handling, is necessary to slice through the vegetation, and even then mobility is greatly restricted. Similar concealment in summer in the permanent papyrus swamps near the White Nile probably is impossible because the natives are too near at hand. They take their cattle to the surrounding flood plain, and they also seek open swamp water or the rivers themselves to partake of the concentrated supply of fish. In flood season the security forces of Upper Nile Province customarily travel by boat rather than by land. The boats range in size from outboards to Nile steamers. A man standing on the wheelhouse roof of a steamer and equipped with binoculars has a surprisingly commanding view of the countryside for many miles around.

Good landing sites are not readily available. Although flat grassy areas are plentiful, the full-grown grass may be too tall to permit landing or takeoff. The choice is between acceptance of an

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area recently burned over by natives or the burning of a selected site. In either case the local population will know about both the burning and the landing. Good drop sites are abundant but not easily approachable by wheeled vehicles. Much more firm ground is available for both landings and drops between January and April than at other times. Commercial aircraft flying the Malakal-Wau-Juba route have been overflying the area for several years, and therefore any aircraft at normal airline altitude should cause no comment. Aircraft flying at a low level could attract considerable attention.

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GLOSSARY

Hafir - An artificially excavated surface reservoir.

Hashab - The acacia tree (Acacia senegal), also the gum arabic which it yields.

Jebel - A hill.

Khor - A short-lived stream or watercourse; also a backwater of the Nile or a narrow inlet of the sea.

Qoz or Qawz - A sandy area. Large expanses of rolling sandy ground with stubby vegetation ranging from thick to sparse.

Saqla - An ox-drawn water wheel.

Teich - The flood plain of the Nile, which affords good grazing in winter after the flood subsides.

Wadi - A large river with a sandy bed which flows intermittently in the rainy season.

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Sudan is almost as large as the United States east of the Mississippi, but in 1963 it had an estimated population of only 12,600,000. The distribution of people throughout the country is uneven -- 14 percent of the land area contains more than half the population. The greatest concentration is found along the Nile River and its branches, where some areas reach a density of 250 persons per square mile. In contrast, not a person is to be found in many square miles of desert landscape in the northwest. Population statistics for Sudan are poor by Western standards and at best should be considered estimates subject to revision. The population of the nine provinces according to the census of 1955-56 is given below:

<u>Province</u>	<u>Persons Per Square Mile</u>	<u>Males</u>	<u>Females</u>	<u>Total</u>
Bahr el Ghazal	12	505,094	485,928	991,022
Blue Nile	38	1,065,586	1,004,060	2,069,646
Darfur	7	632,166	696,599	1,328,765
Equatoria	12	442,997	460,506	903,503
Kassala	7	502,947	438,092	941,039
Khartoum	62	272,824	232,099	504,923
Kordofan	12	887,571	874,397	1,761,968
Northern	5	422,297	450,762	873,059
Upper Nile	10	454,644	433,967	888,611
Total	11	5,186,126	5,076,410	10,262,536

Approximately 92 percent of the people live in rural areas; 14 percent are nomads. Except for the banks of the Nile and the hills and plains bordering the Red Sea, vast expanses of the Desert Region have very few people. In the zone between the Desert Region and the northern boundary of the Seasonal Flood Region, where rainfall is sufficient to permit grazing and some cultivation without irrigation, there are scattered nomads and some village settlements. Within this area is the Gezira -- an irrigated cotton belt in the peninsula formed by the White and Blue Niles. This is the most populous region of Sudan. The three southern provinces receive the most rainfall and contain a third of the population of Sudan.

Sudan, like most underdeveloped areas, is a "young" country. An estimated 50 percent of the population is under 15 years of age. Disregarding fitness standards, some 18 percent of the population are males of military age. A high birth rate is characteristic of Sudan. Although the death rate is high, particularly for infants, the annual increase in population is an estimated 2.8 percent. The birth, death, and infant mortality rates of the southern provinces are higher than corresponding rates in the north.

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B. Cultural Contrasts

It is impossible to think of the Sudanese as a "people" in the same sense that one would think of the French as a people. The population is diverse, including Arabs and Negroes; townsmen, nomads, and villagers; and Moslems, Christians, and pagans. Many urban Sudanese have outgrown the beliefs of their ancestors, but rural people retain many traditional practices. To most rural people, the welfare of the family, the village, and the tribe is placed above national problems. Many of these people feel no sense of belonging to a nation.

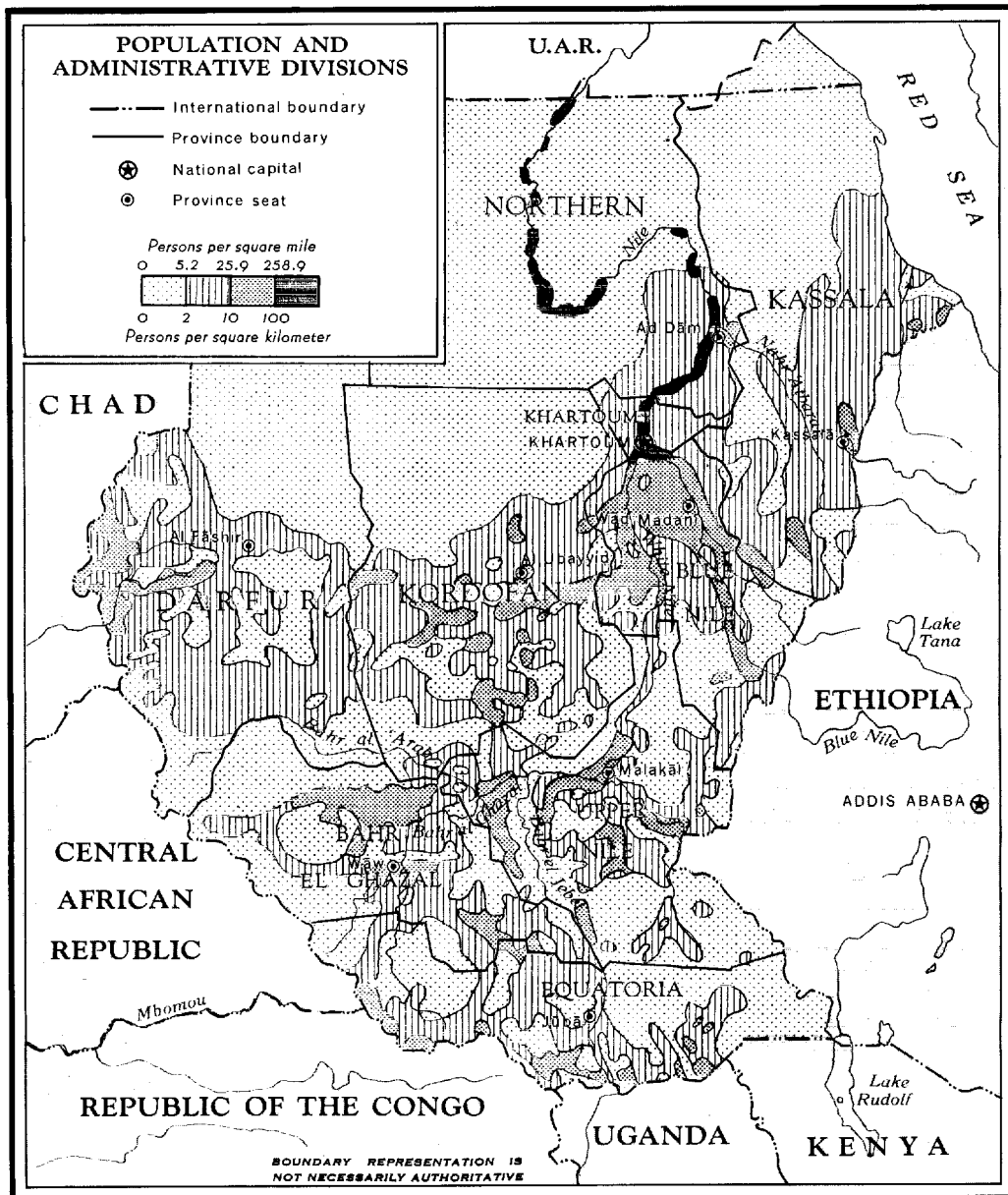
Knowledge of local customs should increase the chances of a hospitable reception, particularly among the rural people. The stranger must guard against unwittingly offending local people. Most Moslems are very particular concerning any contact their women have with men outside the family. Some of the southern tribes have a high degree of morality, but among others extramarital relations are ignored as long as pregnancy does not result. Local customs may come as a surprise to the foreigner and could easily be misinterpreted. For example, among the Acholi and the Dinka, to spit upon a person as a greeting is considered especially respectful.

Some natives, when met on the road, will drop what they are carrying and sit down with both hands held out. The implication is that "you have nothing to fear from me." Under appropriate conditions a pocket knife, nail file, or spool of wire may be used effectively as an indication of friendship. In some circumstances the application of simple health remedies, such as aspirin, could produce a spirit of good will and cooperation. Sudan is an "emerging" nation and many Sudanese have become somewhat accustomed to Westerners. Even in the south small Greek merchants are known to natives in the bush. Sudanese money is a valued commodity even to the tribesman who cannot read the Arabic numbers on the bills.

In the south witch doctors do a thriving business in charms and drugs believed to counteract the effects of witchcraft and the "evil eye" -- the belief that certain persons can wittingly or unwittingly kill or injure with a glance. Strangers, particularly, may be suspected of having the "evil eye" and must be especially careful in offering compliments. Compliments expressed by an "evil eye" bearer are said to bring disaster to the person or animal to which they are directed. The "evil eye" is an important force in the lives of seemingly sophisticated Sudanese. An image, piece of wood or other object made to resemble the victim, or some object closely associated with the victim such as pieces of hair, nail parings or clothing, is burned or buried as a means of carrying out black magic.

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A white man has particular advantages and liabilities in dealing with the natives. White skin and western dress will serve as objects of curiosity for many people who have had limited contacts with Europeans. In the south the white man may receive the same favorable treatment accorded Christian missionaries and visiting British civil servants under the colonial administration. On the other hand, the southerner has a long history of hatred for his Arab neighbor to the north and in some areas the white man may be looked upon with distrust, particularly if he is mistaken for an Arab.

C. Ethnic Groupings

There are two major ethnic types in Sudan. North of 12°N live the "Arabs" who are mostly Moslem; south of 12°N are the Negroes who are either pagan or Christian. While the Arab has become mixed with Negro blood, the Negro is more nearly a true racial type. Islam has been the cultural standard and a unifying force among most people in the north for many years. Most of the country's leadership comes from the north. The government is attempting to decrease the cultural contrasts and sectional interests by spreading Islam and the Arabic language throughout the nation.

There are three principal ethnic groups in the north: the Beja, living between the Nile and the Red Sea; the Nubians, occupying the narrow valley of the Nile immediately south of Egypt; and those who call themselves "Arabs" in the central part of the country (see Map 38096 -- Sudan: Tribes). In the south there are also three major groups. Linguistically they may be considered Nilotes, Nilo-Hamites, and Sudanic tribes. The "Arabs" of the north look down upon the predominantly pagan Negroid people of the south and, although the days of slavery have long passed, the south is still considered a source of cheap labor. The tribal structure by province, population figures for tribal groups, and languages spoken in Sudan are tabulated below:

Tribal Structure by Province (1955-56 Census)

<u>Province</u>	<u>Main Tribes</u>	<u>Percent of Total Population of Province</u>
Bahr el Ghazal	Central Southerners (mainly Nilotic)	93
Blue Nile	Arabs	74
Darfur	Westerners (mainly Fur, Zaghawa, Daju, Tungur)	63
Equatoria	Eastern Southerners (mainly Nilo-Hamitic)	56
Kassala	Beja	54
Khartoum	Arabs	61
Kordofan	Arabs	56
Northern	Arabs	66
Upper Nile	Central Southerners (mainly Nilotic)	94

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Tribes and Tribal Groups (1955-56 Census)

<u>Group</u>	<u>Number</u>	<u>Percent of Sudanese Population</u>
Arab	3,989,000	39
Nuba	573,000	6
Beja	646,000	6
Nubian	330,000	3
Central Southerners (mainly Nilotic)	2,026,000	20
Eastern Southerners (mainly Nilo-Hamitic)	549,000	5
Western Southerners (mainly Sudanic)	482,000	5
Westerners (mainly Fur, Zaghawa, Daju, Tungur)	1,315,000	13
Miscellaneous	353,000	3

Languages

<u>Language Spoken</u>	<u>Number of Persons</u>	<u>Percent of Total</u>
Arabic	5,276,000	51
Non-Arabic (spoken in northern and central Sudan)	1,244,000	12
Nilotic	1,843,000	18
Nilo-Hamitic	501,000	5
Sudanic	483,000	5
Darfurian	546,000	5
Other African	359,000	4
European	8,000	--
Other Languages (mainly Asian)	3,000	--

1. The Arabs

When using the term "Arab" in Sudan, further definition becomes necessary. Sometimes the word is used on the basis of race, speech, or way of life and sometimes in connection with the Moslem religion. Not all who claim to be Arabs would be accepted as such by others. Some who at times claim to be Arabs, at other times will speak disparagingly of Arabs.

The majority of the Arab population lives in the belt of permanent settlements between Kassala and El Fasher or as nomads in the same general area and to the north and south of it. Most Arabs who came to Sudan came from Arabia by land up the Nile Valley, although some came

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Figure 10. Arab women in Omdurman ($15^{\circ}38'N-32^{\circ}30'E$). The Islamic code dictates that women's bodies be covered to this extent.



Figure 11. Arab ditch tenders near Sennar ($13^{\circ}33'N-33^{\circ}38'E$). The ditch tenders control irrigation gates in the Gezira irrigation area.

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directly across the Red Sea. They have spread as far west as Kordofan Province. Many have intermarried freely with the Negroes and converted a number to the Moslem faith establishing a link of spiritual brotherhood.

The Arabs who entered Sudan are divided geneologically into two groups, the Ja'aliyin and the Guhayna, corresponding roughly to settled and nomadic tribes. The Ja'aliyin also include many tribes that are predominantly Nubian. Medium brown in color, the Ja'aliyin have fairly narrow noses, but slightly broadened lips and curly black hair because of the Negro blood.

Most Guhayna Arabs still follow the nomadic way of life. Typical of these are the camel-owning Kababish of northern Kordofan, the Shukriya of southern Kassala who keep both camels and cattle, and the great cattle-owning Baqqara tribes of southern Kordofan and Darfur. Some of the sedentary tribes living in the Gezira belong to the Guhayna group such as the Mesellimiya, Halawin, and Ruf'aa.

Personal relationships between Arabs are governed by precise etiquette. The handshake is the universal greeting, and it may be repeated several times during the course of a meeting. Conversation is leisurely and is always begun by inquiring into the man's health and general welfare. One does not ask about a man's family except in the most general terms, and asking about his wives or any other women in the household should be avoided absolutely. Concepts of time are inexact, and appointments are more likely to be for "the evening" rather than for "7 o'clock."

The left hand is considered unclean, and one does not use it to make a greeting or to present something to another. When eating with Arabs, it is very important never to remove food from the cooking pot or to touch another's food with the left hand. It is considered a sign of disrespect to show the sole of the foot.

Clothing is not only an indication of wealth, it is directly related to notions of morality. Nakedness is associated with the primitive Negro and is regarded as a sign of ignorance of Koranic law and morality.

Seventy-three percent of the Sudanese are Moslems of the Sunna Sect, including nearly all Sudanese in northern provinces. In keeping with the many differences between the north and south, the Moslem religion of the north contrasts with the religious practices of the three southern provinces of Bahr el Ghazal, Upper Nile, and Equatoria, where most of the inhabitants are pagan. The degree of adherence to the practices of Islam varies greatly from Moslem to Moslem. On the one hand there is the rather casual acceptance of Islam on the part of a very small sophisticated upper class; on the other hand there is the extremism of the religious sheikhs and leaders. The most common practice is typified by the lower class majority in their simple acceptance of the five basic requirements of Islam: faith, prayer, fasting, almsgiving, and pilgrimage.

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Almost all Moslems in Sudan observe the fast of Ramadan -- the ninth month of the Moslem calendar. Strictest in this respect are the tribesmen and nomads. During this month all devout Moslems fast from daybreak (reckoned as the moment a black thread may be distinguished from a white one) until the last ray of light has disappeared. The fast means abstinence from all food, drink, tobacco, and indulgence in worldly pleasures; exceptions are made for the sick, the weak, soldiers on duty and travelers. The end of the fast at dusk is frequently signaled by the firing of a cannon.

The chief Moslem festivals have received official recognition as public holidays. New clothes are worn during these festivals, and visits to relatives and friends are common. Cemeteries and tombs of the saints are also visited. On the Prophet's birthday special processions are organized and in Omdurman the religious brotherhoods compete in elaborate displays.

Partly because of Islamic law and to demonstrate the purity and nobility of his lineage, the Arab has constructed a genealogy that often extends back to the Prophet. In Sudan the Arab carefully omits any reference to Negroes in his family tree. Since it is likely that there are Negroes in the family tree, it is wise never to question an Arab's genealogy unless you have every intention of making him your enemy.

Rural Arabs may be classified as "villagers" or "nomads". The villager entrusts his loyalty to the patron or "Sheikh," a man of influence and wealth who serves as administrator and protector. The villager is usually a farmer or possibly a small merchant. He values money and places a high premium upon conservative Arab respectability. Historically, the villager has feared the nomad who frequently attacked and plundered the smaller villages.

For the nomad the welfare of his animals comes first; animals provide milk, meat, hides, and fuel. In addition, animals represent his savings and wealth. Nomads have little use for money except to pay occasional taxes and to make certain purchases in the market. Should he earn any excess by hiring out his animals as transport, he is likely to invest immediately in a cow or camel. Direct trade in livestock has only limited appeal to the nomad. It has been said that asking an Arab the price of a sheep is like asking an American how much he wants for a dollar bill.

Since livestock represents an investment, nomads are reluctant to eat them. However, in entertaining guests tradition calls for an extravagant provision of meat, usually far more than is necessary. The guest in turn is expected to proclaim often his unworthiness of such excellent fare and to state that he has had "too much" (often in fact, before he has had too much). The Arab is deeply involved personally in his ability to honor his guests according to tradition. Traditionally, once an individual has eaten an Arab's food and while he remains his guest, his host is bound to protect him from all enemies.

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Figure 12. Nubian girl of mixed Negro and Arab blood. Members of this group have more Negro blood than any other northern group, but because of the admixture of Arab blood they have a light color often called "reddish."

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The family life of Moslems is guided by the Sharia, part of the law of Islam, and by other holy writing and interpretations. These precepts favor the authority of the father in family life.

2. The Nubians

The Nubians occupy the narrow valley of the Nile immediately south of the Egyptian border. This is a true desert, and the only source of water is the Nile itself. The Nubians numbered 330,032, according to the 1955-56 census -- 3 percent of the total Sudan population.

They are primarily representative of the Brown Race, modified somewhat by Egyptian, Negro, and Arab elements, which have given the Nubians a rich brown color like that of milk chocolate. A lighter skin would indicate a recent admixture of Turkish or Egyptian blood, whereas a darker colored skin could be traced to a slave ancestry.

The Nubians, like the settled Arabs, are villagers and Moslems. Their social values are not always those of the Arabs, although they are eager for acceptance in the Arab world. They seek religious and secular education and have acquired a disproportionate influence in the government. Many of the Nubians are merchants and were formerly slave traders, earning for the Arabs the ill will of the Negro tribes to the south.

Although the Arabic language is spoken by some, most speak a language called Nubian. This is divided into two groups: one spoken by the Sukkot and Mahas around Wadi Halfa and the other by the Danagla of Dongola district farther south.

The Danagla, physically the most Negroid of northern Sudanese, claim Arab ancestry and in many cases speak only Arabic outside the home. Many leave their northern homes and take jobs as cooks, waiters, and domestic servants in the towns of Sudan and Egypt. The Bedeiriya upstream of the Danagla are likewise almost wholly Nubian although they claim an Arab origin.

The Shaiqiya, living from Korti upstream to the Fourth Cataract, are a well-built people of the same color as the Danagla; their appearance is more Arablike than that of the Danagla. Many of the Shaiqiya have found jobs as policemen or soldiers -- including President Abboud. Most are settled in permanent villages, but some still live on the fringe of the desert.

Upstream of the Fourth Cataract the population consists of the Manasir, Rubatab, and Mirafab tribes, who are a mixture of Nubian and Arab stock. Because of the poverty of their land the Rubatab live a seminomadic existence, grazing their animals on the thin desert scrub in the loop of the Nile and wherever fodder can be found along its banks.

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Figure 13. Typical Beja of the Red Sea Hills.
These men are members of the Hadendowa tribe.

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Southward from the point where the Atbara River joins the Nile is the Ja'aliyin tribe. Although they claim to be pure Arabs, they are largely Nubians. There are a few seminomadic sections of the tribe whose flocks and herds graze the steppe away from the river and cultivate the wadi beds. Members of the Ja'aliyin tribe also live in the Gezira.

There are 31,000 tribesmen in the northwestern part of the Nuba Hills near Dilling who are also considered Nubians. They are sometimes grouped with the Nuba tribes, whom they resemble culturally, but they are properly known as Hill Nubians.

3. The Beja

The Beja, who live between the Nile and the Red Sea, may have occupied their present territory for as long as 6,000 years. They resemble early Egyptians in appearance and are nominally Moslems but often use the term "Arab" as an insult. They adhere only superficially to Arab-Moslem morality. For example, no shame attaches to bastards or their mothers in Beja society. Leisure and freedom from labor are idealized and, although frequently on the verge of starvation, these people are loath to work.

The southern Beja tribe, the Beni Amer, most closely resemble the early Egyptians. Their territory is located on both sides of the Sudan-Ethiopian border. Members of the three northern tribes -- Amara, Bisharin, and Hadendowa -- have broader heads and are taller than the Beni Amer. In all cases there has been a slight darkening of the skin because of the admixture of Negro blood.

The Halenga of Kassala district and the Qabail Ukhra, a collection of small tribal groups inhabiting the southern part of the coastal plain of the Red Sea, are included among the Beja.

An old Hamitic language called "Tu Bedawie" has been the language of the Beja, but as it is not a written language the use of Arabic has increased.

4. The Nuba

Some of the members of the Brown Race who were not assimilated into the Arab tribes were driven by the Arabs into the Nuba Hills of southern Kordofan Province. The Arabs use the term Nuba to refer to all the inhabitants of the Nuba Hills. These members of the Brown Race mixed with the Negroes and soon became indistinguishable from them. In general they are tall, big-boned, and muscular with predominantly Negroid features. None of their many languages appear to be related to any known language elsewhere. The various hill communities show a remarkable diversity of custom, and only limited tribal groupings are acknowledged. There are no common traditions or major unifying factors.

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Figure 14. A chief of the Dinka tribe.



Figure 15. Nuer tribesmen along the Nile south of Malakal in typical dugout canoes.

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In an effort to absorb the Nuba into the mass of the northern population, the government is introducing the Arabic language and Islam. There are now about 450,000 Nuba in Kordofan, excluding the Hill Nubians and Daju peoples who live in the same area and are frequently grouped with them.

5. The Darfur Tribes

Numerous Negroid tribes occupy Darfur Province; by far the major group is the Fur, who number about 170,000. Negroid in appearance, the Fur live a sedentary farming life on volcanic Jebel Marra and much of the lowland around it.

The Zaghawa tribe live north of the Fur and are a people of mixed Negroid and Brown Race origin. They are a seminomadic people, lithe, stalwart, active, and very black-skinned.

In east central Darfur are the Meidob people who are seminomadic animal herders. To the west are several tribes who live along the border of Chad and Central African Republic; these are the Masalit, the Gimr, and the Tama. Several Negroid groups such as the Daju, Beigo, Birkid, and Fellata live in southern Darfur.

As throughout the rest of the country, the Arabic language and Moslem religion are spreading among the people of Darfur Province. The Fur pretend, as do the Nubians, to Arab ancestry. They are villagers and industrious farmers. More warlike than the Arab villager, raiding the lowlands was until recently a favorite pastime. Fur women have a high degree of personal independence. There is a shortage of young men, and the dances which form a prominent feature of Fur social life are notably occasions for promiscuity. Girls are not secluded, wear little clothing, and take great trouble to prepare elaborate hairdoes.

6. The Nilotes

The Nilotic people, so called because of their close association with the Nile and its headwaters, are thought to have come originally from the vicinity of Lake Rudolph in modern Kenya. Intermarriage and warfare have so affected the Nilotes that it is not always possible to determine precisely which people are Nilotes and which are not. Generally accepted as Nilotes are the following groups: Dinka, Nuer, Shilluk, Anuak, Burun, Bor Balanda, Jur, and Acholi, of whom the last live on both sides of the Sudan-Uganda border.

Although this grouping of Nilotes is primarily linguistic, general physical characteristics are common to the great majority. They have Negroid features modified somewhat by admixture with peoples of the Brown Race from Ethiopia and are extremely tall with a wiry, long-legged

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Figure 16. Shilluk tribesman with typical Shilluk "bead" scarification. Conical houses called "tukels" can be seen in the background. The Shilluk economy is mainly agricultural.

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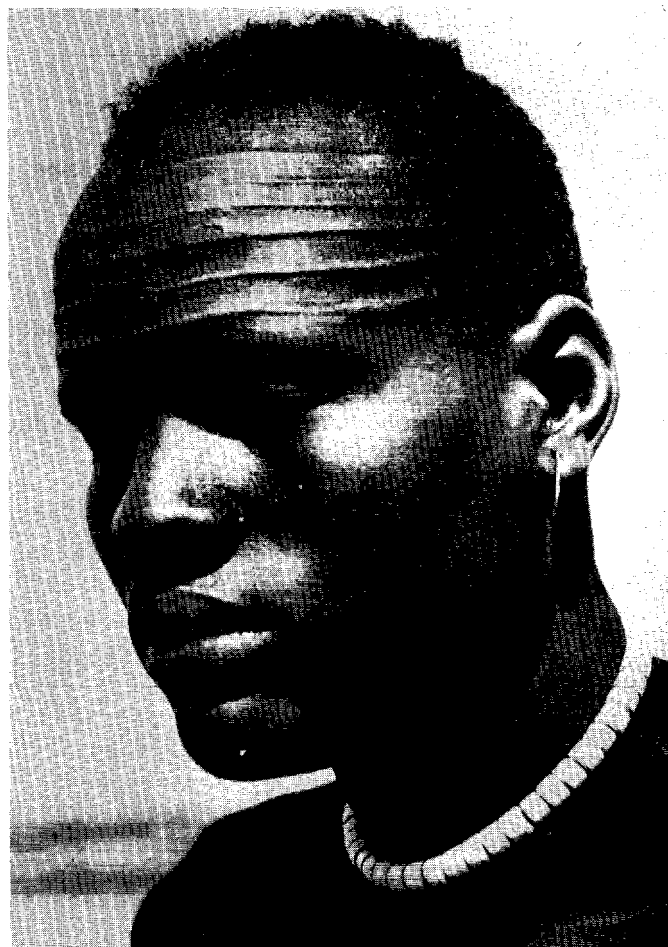


Figure 17. Nuer tribesman. The results of scarification can be seen in the bands around his forehead.

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build. Their hair is frizzy and their skin is dark brown to black. Generally their heads are longer than most Negroes' heads and their facial characteristics range from long straight noses and thin lips to broad noses and thick lips. Sometimes many ornaments are worn; they rarely wear clothes.

The Nilotes are predominantly cattle keepers. Even those who are mainly farmers share a preoccupation with cattle which far exceeds the devotion of the Arab to his herds. Cattle are not merely a means of subsistence but are intimately related to the entire system of social and spiritual values.

The Dinka and Nuer are among the tallest people in the world, the men averaging 70 inches; many individuals measure 78 inches and more. The Dinka are the largest Nilotic group, numbering over 1,000,000. The Nuer are a homogeneous group with no major differences in dialects or culture variations. They are warlike, the most independent, and the most intolerant of foreigners.

Preoccupation with the morality of their own way of life has strengthened the general indifference of the Nilotes, particularly those with the most cattle, to alien cultures. The Nilotes are noted for their self-sufficient pride and their disinclination to defer to anyone. They are intensely loyal to their family and tribe and to their ideals of justice and fairness. They are chivalrous toward women.

7. The Nilo-Hamites

The Nilo-Hamites in Sudan are the northernmost members of this group. The most southern group extends as far south as central Tanganyika, and other Nilo-Hamites live in Uganda, Kenya, and Ethiopia. Again, this is a linguistic grouping. There is no predominant physical type. Individuals vary in color from dark brown to black. The skin color of one group, the Bari, is so dark as to be described as blue-black. They are generally fairly tall and have long heads.

The western group, located near the Nile south of Bor, include the Bari, Mandari, Nyangbara, Fajelu, Kakwa, Kuku, Nyepu, Lokoya, Luluba, Latuka, and Lango.

All of these people attach great importance to rainmaking and believe in rain stones. Except among the village-dwelling Latuka, scattered groups of huts or even individual huts constitute the usual type of settlement. There is no strong tribal organization or permanent chief.

Most of the western Nilo-Hamites in Sudan occupy a territory infested with the tsetse fly, which transmits African sleeping sickness, and they are therefore unable to keep cattle. Some tribes, such as the Bari and Mandari, live on the east bank of the Nile outside the tsetse country and are thus able to keep some cattle.

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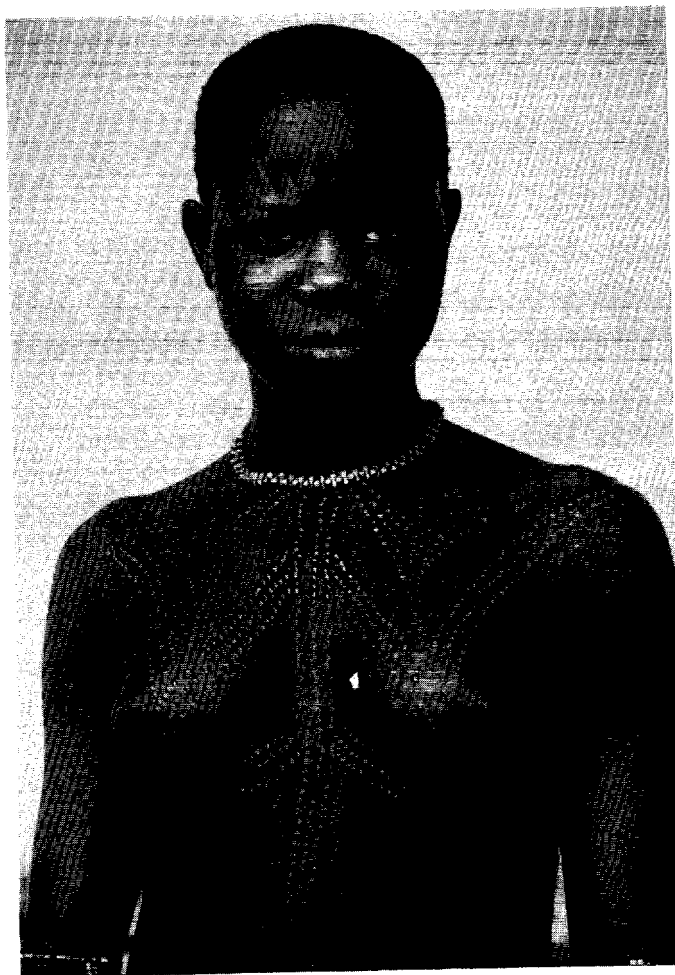


Figure 18. Girl of the Madi tribe of Equatoria Province. The beaded scars were once probably tribal marks but now are regarded as ornamental.

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The eastern groups of the Nilo-Hamites in Sudan are made up of the Toposa, Donyiro, Jiye, and Turkana. The Donyiro and Turkana tribesmen are administered by the government of Kenya because of the difficulty of reaching their territory from Sudanese administrative centers.

8. The Sudanic Tribes

There are four main groups of the Sudanic-speaking tribes of southwestern Sudan: the Azande, the Ndogo-Sere group, the Moru-Madi, and the Bongo-Baka.

The Azande are actually a group of tribes rather than a single people. They are a dull chocolate brown in color, usually short, have round heads and broad noses, and are markedly stockier than the Nilotes or Nilo-Hamites. The Azande and Azande-influenced peoples of the southwest are relatively materialistic. Their economy is agricultural and their society competitive. Cattle and other animals are so scarce in most of the area that the people are meat-starved and will eat any meat they can find.

Little is known about the remaining three groups. The Ndogo-Sere probably came from the south long ago. The Moru-Madi group is divided linguistically into three subgroups, none of which can understand the others. There is no central authority within the tribes, and the largest group that comes under a single chief is rarely more than a handful of villages. The Bongo-Baka group also has little unity and is very scattered; there is no cohesion between neighboring villages.

D. Migration

In all five regions of Sudan there are groups of people who move from one place to another. The moves differ in distance, direction, duration, time of year, motive, and percent of the village or tribe who participate. Except for those who are traveling in search of employment, the groups return to, or near to, their starting point within a year.

Few if any nomads occupy the Libyan Desert in northwest Sudan because there is not enough water to support life. In the rest of the Desert Region and in the Semidesert Region, the unreliable rainfall makes it difficult for nomads to follow a prescribed migration pattern. Instead, they generally move north and south with the rains but change direction as scouts report on the condition of distant pastures. Nomads are not necessarily in motion every day or every week. If pastures permit, they stay in one area a month or two and make short moves within this area every few days.

Toward the end of the dry season there are fewer and fewer ungrazed pastures to turn to and many nomadic groups have to remain near established sources of water. In the Thin Woodland Savanna Region nomadism

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Figure 19. Zande witch doctor. The Azande believe strongly in witchcraft and attribute all illnesses and calamities to it.

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is less important than settled agriculture. Those groups that do live by pasturing animals can follow more regular migration patterns because the rainfall is more reliable. They can also remain in one grazing area longer than people do farther north and may have permanent villages to which they return for a few months each year. Some of the group remain in the village at all times to tend crops and to maintain the integrity of the homelands. On the border of the Wooded Upland the predominance of trees almost eliminates nomadic herding.

Within the Seasonal Flood Region and on its borders in Sudan the migration cycle is quite regular and dependable. It follows the rhythm of the Nile River system, which floods widely in summer and retreats to the riverbeds and permanent swamps for varying periods between January and June. Most of the natives in this region with their animals, chiefly cattle, move onto the flood plain as waters recede and new grasses sprout and then retreat uphill to their permanent villages ahead of the flood. The vertical rise may be only 10 feet, but the trek may be several dozen miles and extend over a period of weeks.

Groups of people numbering several hundred may move many miles from their homes on the Wooded Upland for brief periods, but these are hardly migrations. They move in large groups for the purpose of hunting, a favorite occupation, or to fight another tribe; the fight is usually a war game, and few people are wounded.

E. Health and Medical Care

Sudan has one of the highest death rates in the world. About 94 out of 1,000 babies born die during their first year. The life expectancy of the Sudanese is only 28 years. Primitive and unsanitary living conditions, malnutrition, and the general scarcity of medical facilities throughout the country contribute to Sudan's high death rate.

Only the educated and wealthy classes of the town understand the value of, and can afford, a balanced diet. Because of the shortage of transportation facilities, especially in the south, most of the people have to rely on what they produce or gather. In certain periods of the year or in time of catastrophe serious famine occurs.

Unsanitary conditions are a cause of poor health and disease. Rivers, canals, stagnant pools, and wells, used for washing of foods, bathing, laundering, as well as for drinking water, are polluted with human and animal wastes. The inspection of food is very lax, and controls have been attempted only in the larger towns. Even in these towns there are few facilities for pasteurization of milk.

Diseases prevalent throughout the Sudan include dysentery, malaria, syphilis, trachoma, and tuberculosis. Other serious diseases occur in

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particular areas: bilharziasis along the Nile and its tributaries in the north and also in irrigated areas, hookworm and leprosy in the southern provinces, and sleeping sickness along the southern borders of Equatoria and Bahr el Ghazal Provinces.

Health facilities are generally inadequate and substandard although major outbreaks of contagious diseases can now be controlled. In 1960 there was only one physician per 32,000 people (370 physicians in all) and only one hospital bed per 1,248 people (9,434 beds).

The Ministry of Health uses radio programs, agricultural shows, and tribal gatherings as well as its own network of dispensaries to present simple educational programs on disease prevention, mother and child care, and nutrition. Instruction is also given to hospitalized patients in how to avoid recurrences of sickness. Nevertheless, facilities and health education are not expanding at a pace sufficient for the increasing needs.

F. Diet

Very few Sudanese have the means to obtain nutritious foods, and only the educated seek a balanced diet. Deficiencies in staple foods cause several diseases. Because of religious beliefs, even those who can afford to eat nutritious foods do not always do so.

The shortage of transport facilities, especially in the south, results in little exchange of foodstuffs. Each tribe or group exists primarily on what the group itself can produce. This usually consists of only one or two staple foods. After catastrophies such as locust invasion, semi-starvation exists. Food shortages also occur at the end of the dry season when grain is scarce and cattle, camels, and goats give little milk. In emergencies some tribes dig up the wild yam and wash off its poisonous substances; the Dinka rely heavily on wild berries.

There is a great difference between the diets of the settled cultivators on the one hand and the nomads and seminomads on the other. Settled cultivators, although better fed than the nomads, do not have as well balanced a diet. Most people -- although they may keep a few goats, sheep, or work cattle -- do not get enough animal food products. Peoples of the Wooded Upland Region are unable to raise cattle because of the tsetse fly; their main food is cassava supplemented by peanuts and forest fruits. They also fish, hunt wild game, and catch rodents, termites, and insects.

The cattle-keeping Nilotes' diet is higher than the settled cultivators' in animal protein, and they cultivate whole-meal millet as their staple food. Similarly the food of the pastoral people of the north is derived mainly from their animals and is supplemented by grain. Some of the nomadic tribes eat meat and milk products regularly, whereas the poorer tribes must sell their milk and they eat meat only on ceremonial occasions.

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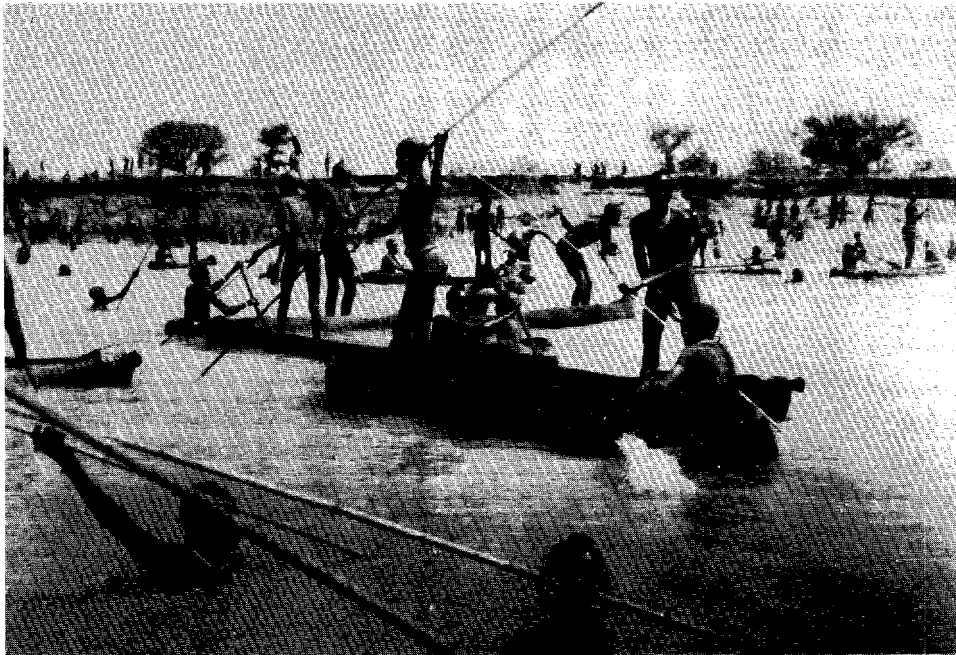


Figure 20. Dinka fishermen on the Lol River.

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Outside the three southern provinces fresh fruit and vegetables almost disappear from the rural diet. Many people along the Nile supplement their diets with fish. Some farmers living near markets, as in the irrigated areas and the grain belt, are able to supplement their basic diets through cash purchases.

G. Dress

While working, the Arab usually wears only baggy trousers and the long overshirt reaching to his knees. However, when leisure allows, even when the climate is hot, the respectable Arab is heavily clothed. Clothing is an indication of wealth, but it also is to the Arab a sign of morality. The Arab looks down upon the naked Negro as ignorant, especially of good morals.

Respectable Moslem women are for the most part expected to be veiled and wrapped in concealing garments. This does not hold true, however, among sophisticated, educated, urban Moslem families. In very poor families in villages and nomadic camps, where a woman may help in farm work, she is rarely veiled and may go about bare to the waist.

Because of the intense heat, in the southern bush country and the swamps of the upper Nile, clothes are generally not worn by the Negro population. Even in towns such as Wau, Malakal, and Juba some of the men and women on the streets may be almost naked. The standard Dinka insect repellent is a complete suit of mud and nothing else. The Nilotes and the Nuba wear the least amount of clothing; the people of the southwest wear at least a pair of shorts, and a married woman is expected to wear at least a bunch of leaves or a leather apron as a symbol of her status.

In areas of cash economy some Negroes wear cotton clothes. A brightly colored wraparound tied above the breasts or over one shoulder is worn by many women. A man who makes his living in town as a postal clerk or policeman may discard most of his clothes when he returns home on leave. European shirts and shorts (sometimes the shirts only) are popular, and European hats are especially favored by headmen and chiefs. Some Southern leaders elected to Parliament in 1958 bought their first western suits for their appearance in Khartoum.

H. Housing

Housing materials vary by region of the country. North of 12°N in the region of little rainfall, most rural houses are built of unfired mud-brick. A mixture of dung and clay is applied to the outside walls, and inside walls may have a thin coat of whitewash. The structures are usually one story tall with flat roofs of matting supported by palm logs and plastered over with clay to make a reasonably weathertight finish.

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Figure 21. Village along the railroad in the desert south of Abu Hamed. The houses are made of sun-dried mud bricks.



Figure 22. Cluster of huts around a central courtyard in the Nuba Hills.

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Figure 23. Jur family and hut 40 miles east of Tonj during dry season.



Figure 24. Dinka family in front of elevated hut in the transition belt between the Wooded Upland and Seasonal Flood Regions 40 miles east of Tonj.

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The floors are of earth and the windows are small and unglazed. The dwelling is usually partitioned to form separate quarters for the women. Most houses are surrounded by mud walls to protect the owners' property and to insure the seclusion of his women. These houses are cool during the winter months and stiflingly hot during the summer.

In central and southern Sudan the normal building materials are poles, grass, and millet stalks, and the huts are round with conical thatched roofs. The walls that enclose the compounds in central Sudan are usually built of millet stalks. In the southern provinces the homes vary considerably. The Nilotes and Nilo-Hamites live in villages of huts and cattle shelters; a chief's home is likely to have a wall around it.

Housing in the poorest areas, such as Darfung and most of the south, is likely to be crudely constructed, often in simple beehive shape. While the Nuer build their huts on the ground, certain of the western Dinka build structures on wooden platforms raised several feet from the ground. The Azande build their huts in the dense brush at some distance from one another.

I. Education

In keeping with Khartoum's attempt to unify the country, educational facilities in Sudan, including mission schools in the south, are being brought under direct government supervision. There are, however, some 60 schools with an enrollment of about 10,000 students still being operated by Egyptians. It was estimated in 1955 that between 3 and 5 percent of the population were literate. The government claims that currently 24 percent of all children of school age are attending public or private primary schools. Most of these primary schools are in the northern part of the country, with the greatest concentration in Khartoum Province.

Most secondary schools are also in northern Sudan. There are 10 secondary schools in the north in contrast to two in the south. After graduation from a secondary school a student may enter the University of Khartoum or one of seven Intermediate-Technical Schools. Some 800 Sudanese students are enrolled in the Khartoum branch of the University of Cairo.

Study at university level outside the country has been steadily increasing, especially in Soviet Bloc universities. Of 295 Bloc scholarships extended since 1956, 77 were given in the academic year 1962-63. The number of scholarship students in non-Bloc countries is roughly 600 at the present time. Most of these are in Great Britain, the United States, or the American University at Beirut. In addition, the United States has contributed funds for technical education and for the construction of technical schools in Sudan.

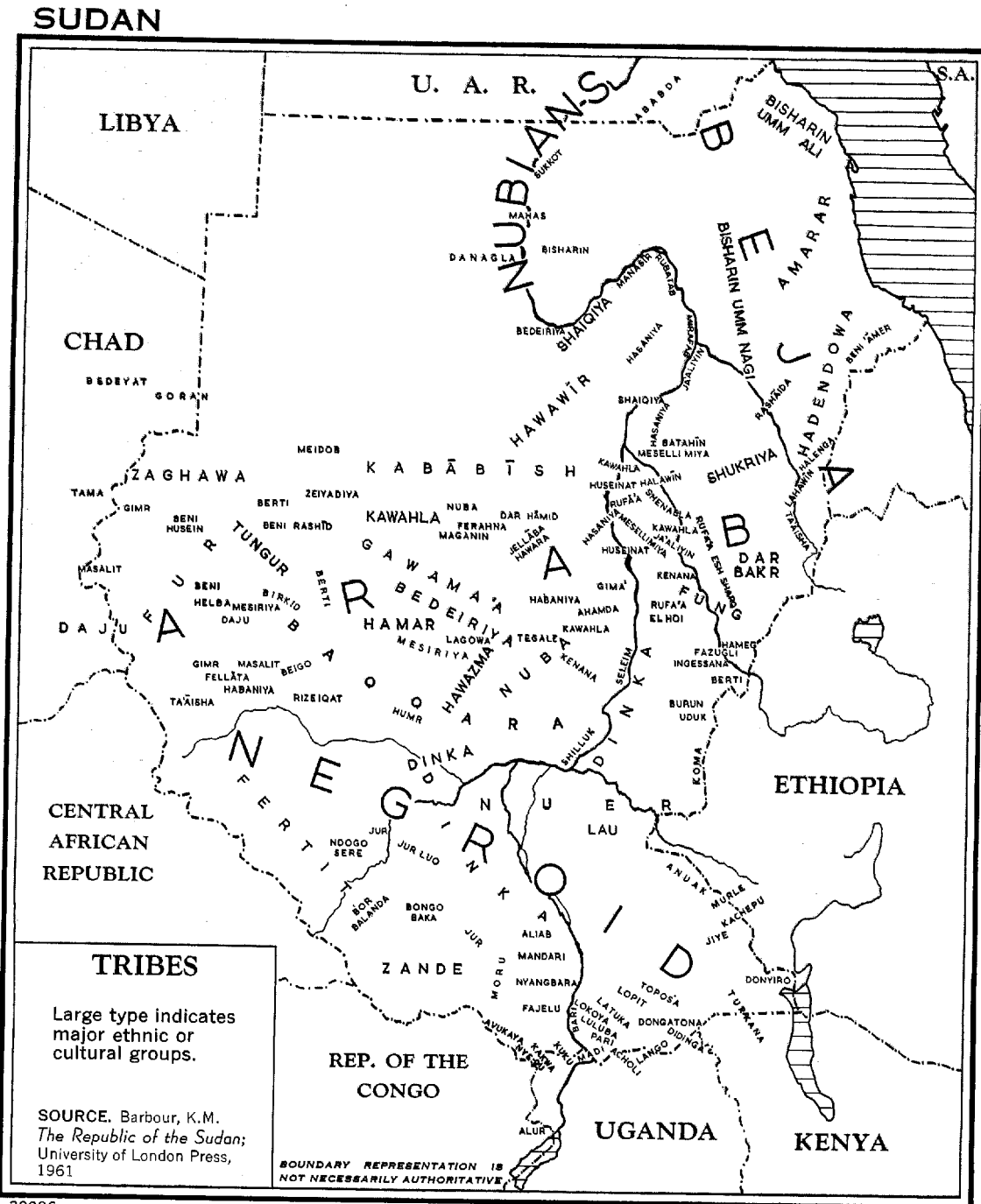
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Sudan, with 967,500 square miles, is the largest country in Africa. Flowing north, the Nile river system provides water transport as well as vital irrigation. Commercial, governmental, transport, and military activities center on the Khartoum urban complex.

Cotton is the major cash crop and principal source of foreign exchange in Sudan, where 92 percent of the population is directly dependent on the land. Most cotton is grown by government-controlled irrigation schemes, but other crops and livestock are privately owned. Sudan is short of fuel, power, and mineral resources and has no heavy industry.

The economic characteristics of the country vary greatly between the Arab Moslem north and the Negro pagan and Christian south. The money economy is confined primarily to the areas around Khartoum, Port Sudan, and the Gezira and has little influence on most of the people in the south, where hunting, fishing, and subsistence agriculture are the prevailing occupations. The central and northern steppes and deserts support an extensive nomadic and pastoral economy.

The origin of the total domestic output of the country demonstrates the overriding importance of agriculture:

	Contribution to Total Domestic Output 1960-61 (percent)
Agriculture, livestock, forestry, fishing	57
Transport, distribution, banking	15
Mining, manufacturing, public utilities	2
Building and construction	7
Crafts, services, rental income	11
Administration, social services, miscellaneous	8
	<u>100</u>

In spite of increasing agricultural production and a recent growth in light industry, the national income is still very low. A large percentage of the population lives at a subsistence level, and per capita income does not exceed \$80 a year, which places Sudan in the lower range of the low-income countries. The economy, however, is generally sound; export earnings meet vital needs and regularly return a surplus to the national budget, which finances a large part of development projects. Inflationary pressures have been controlled fairly well, foreign exchange reserves are adequate,

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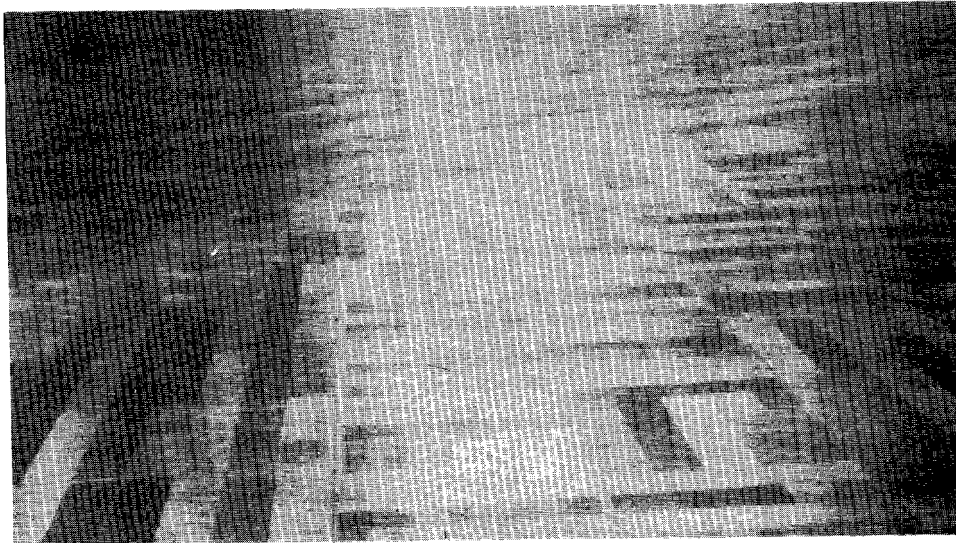


Figure 25. Aerial view of northern part of the Gezira Scheme.

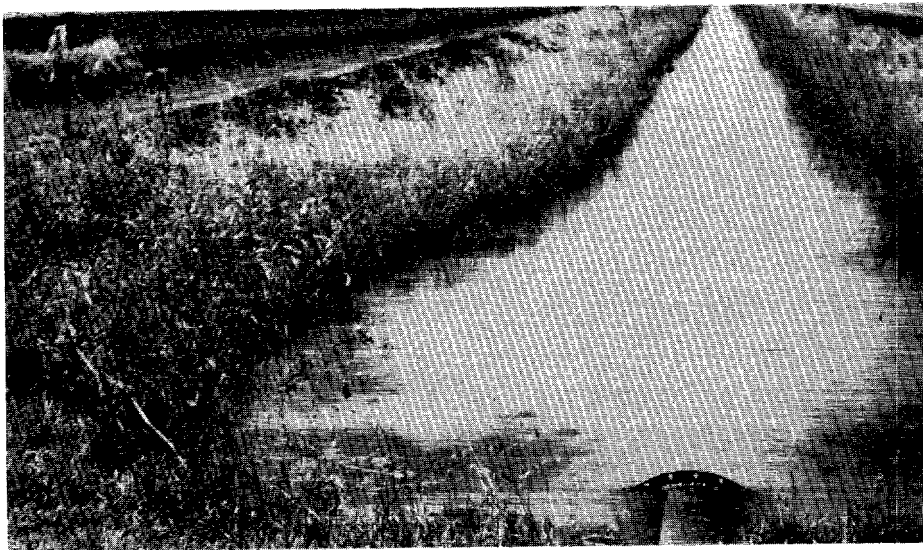


Figure 26. Small canal in the Gezira.

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and trade and investment levels are rising. Government policy is generally conducive to growth, and the outlook for continued Sudanese economic expansion is promising.

B. Natural Resources

The primary economic resources of Sudan are the Nile River and its tributaries, the White Nile and the Blue Nile, along with gum acacia woodlands and some areas of potentially arable land. Exploitable mineral resources are limited. An iron ore deposit along the Red Sea coast about 70 miles north of Port Sudan is expected to produce 500,000 tons annually after nearby port facilities have been improved. Gold, manganese, salt, mica, limestone, and gypsum are mined on a small scale.

Domestic energy resources are extremely limited. The country has no commercial coal or oil deposits; wood, animal dung, and charcoal are the predominant fuels. (See Section D for discussion of hydroelectric potential of Sudan.)

C. Agriculture

The Sudanese economy is based almost entirely upon agriculture. About 92 percent of the population depends on the land for a living, and between 90 and 95 percent of export sales is made up of agricultural products. Most of the population is not involved in the money economy. Subsistence farming is the rule in all but a small area in the northern half of the country, where the government is the chief promoter of large-scale modern commercial farms dependent on irrigation from the Nile and its tributaries. These irrigated lands, devoted chiefly to growing long-staple cotton, constitute 16 percent of the cultivated area and produce 40 percent of the value of agricultural output and about 65 percent of the total value of exports. The government is devoting major efforts to the difficult task of converting a subsistence economy to one producing a variety of cash crops, but it faces major handicaps in the form of superstition, lack of education, and poor communications and transportation.

The Gezira Irrigation Scheme, the largest and most important of the major government-managed agricultural projects, has transformed the area between the Blue Nile and the White Nile south of Khartoum into good arable land, suitable for cotton, grain, and fodder. The total area, including the recently completed Managuil extension, is over 1.8 million acres. Completion of the \$89 million Roseires Dam on the Blue Nile will permit the inauguration of another extension of the Gezira -- the Kenana Scheme -- which will eventually bring an additional 1.25 million acres into cultivation.

The Gash Delta Scheme of about 75,000 acres is on the Khor Gash.

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The Tokar Delta Scheme of 400,000 acres is near the Red Sea along the Khor Baraka.

The Guneid Scheme is the largest pump project in Africa, irrigating over 30,000 acres of land on the east bank of the Blue Nile opposite the Gezira. It includes a government-constructed sugar refinery with a planned capacity of 60,000 tons per year.

The Nuba Hills Scheme in Kordofan Province encompasses about 200,000 acres of rain-grown cotton, largely of the short-staple varieties.

The Zande Scheme in the southwest corner of Equatoria Province is an experimental project designed to promote the welfare of the primitive Azande tribesmen of the area. In addition to cotton the products from this project include coffee, tobacco, sorghum, peanuts, and sesame seed.

A 1959 agreement with Egypt confirms 4 billion cubic meters of Nile water as the current share for Sudan. When the High Dam at Aswan, Egypt, is completed, another 14.5 billion cubic meters will be added to the Sudanese total. Because the Aswan reservoir will flood the Wadi Halfa area of Sudan, Egypt has made compensatory payments of about \$43 million to be used in relocating the 50,000 to 60,000 residents of Wadi Halfa on land along the Atbara River southeast of Kassala, where the Khasm el Girba Dam that is being built under an Italian credit will provide water to irrigate some 500,000 acres.

Land that is capable of producing crops is estimated to be 5 or 6 times the 17 million acres now under cultivation. The present population is insufficient to cultivate available land effectively. The recent emphasis on mechanization offers great potential for the development of agricultural surpluses for export. In spite of the current underutilization of land, Sudan produces almost all its own food. Sorghum, millet, corn, wheat, beans, and onions are the major food crops. Cotton and cottonseed provide over 70 percent of the country's export earnings, with gum arabic, sesame seed, and peanuts trailing in importance as cash crops.

Animal husbandry is important. There are estimated to be 6 million sheep, 5 million goats, 5.5 million cattle, and 2 million camels in the country. About half a million hides and skins are exported annually, as well as approximately 60,000 camels, 30,000 cattle, and 80,000 sheep.

There is no entrenched landlord class, and fair divisions of profits have been set in the government-run schemes and have been adopted generally.

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D. Industry and Electric Power

The Sudanese manufacturing industry is in its infancy -- the 1960-61 contribution to total domestic output was only 2 percent -- but it is growing steadily. The contribution of manufacturing to total domestic output increased from \$6.3 million in 1955-56 to \$14.9 million in 1960-61. The heaviest industrial concentration is in the triangle that is formed by Khartoum, Khartoum North, and Omdurman, and emphasis is largely on processing local materials, especially agricultural products. Local and foreign investments in industry are encouraged by the government through various incentives, and equitable compensation in the event of nationalization is guaranteed.

A cement factory at Atbara produces a small exportable surplus which will be augmented by a second factory at Rabak in 1965. A large textile mill was opened in 1962; a Japanese mill is presently under construction, and others are planned. A government-owned sugar factory opened in 1962 with a potential annual output of 60,000 tons; when a second sugar factory has been completed at Khasm el Girba, all Sudan's sugar requirements will be covered. A government-owned cardboard factory at Aroma began production in 1962 using local cotton stalks as raw material, and a second is planned; a pharmaceutical plant is operating, as well as two refrigerator-assembling facilities, two granaries, and several food-processing plants. Other large plants include a brewery and a leather tannery in Khartoum and a cigarette factory at Wad Medani.

The British-owned oil refinery near Port Sudan will be completed in 1964. It will have a capacity of 20,000 barrels a day, which will cover all fuel needs. Two papermills are under construction, and additional new manufacturing operations that are in the planning stage include fertilizer plants at Port Sudan and Roseires, an insecticide plant at Wad Medani, and factories to manufacture matches, asbestos cement sheets and pipes, building materials, tires, soap, pharmaceuticals, and knitwear.

Electric power generating capacity has expanded rapidly since Sudan's independence, but power remains available to only a small portion of the populace. Completion of the Sennar hydroelectric project late in 1962 raised the capacity to 70,000 kilowatts. At the beginning of 1962, there were about 50,000 electric power subscribers in a total population of approximately 12.2 million, and about half of these customers are along the Khartoum-Sennar line.

Sudanese Government studies indicate that the Nile could produce up to 2 million kilowatts of power, but building the necessary dams and generating equipment will be expensive and difficult. In the meantime, most power in Sudan will continue to be generated by diesel and steam generators for which fuel must be imported.

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Plants with installed capacities of at least 1,000 kilowatts are tabulated below:

<u>Location</u>	<u>Type</u>	<u>Installed Capacity</u> (kilowatts)
Burri (Khartoum area)	Diesel	10,500
	Steam	30,000
Wad Medani	Diesel	2,240
Port Sudan	Diesel	3,195
South Town (Port Sudan)	Diesel	1,830
Sudan American Textile Industry (Khartoum) a/	Diesel	7,400
Atbara	Diesel	4,680
Sennar	Hydroelectric	15,000

a. Privately owned; all other plants listed are owned by the Sudanese Government.

Overhead power transmission lines run from the Burri power system (Khartoum) to Sennar and from Sennar to Kosti.

E. Forestry and Fisheries

Forests cover 36 percent of Sudan's land area and constitute one of its major economic resources. Acacia trees in the northern and eastern areas annually provide 45,000 to 50,000 tons of gum arabic, which is 80 to 90 percent of the world's supply. Gum arabic is the second largest export crop (after cotton) and the largest dollar earner. Nearly all of the 226 million acres of forest land is owned by the government.

Although fish abound in the Nile and the Red Sea, fishing is not commercially important. Lack of preserving facilities hinders significant shipment to interior areas or abroad, although a small quantity of sun-dried, salted Nile fish is exported to the Republic of the Congo (Leopoldville) and to Egypt. At present, fish is an important food source only for the tribes living near the upper Nile drainage system.

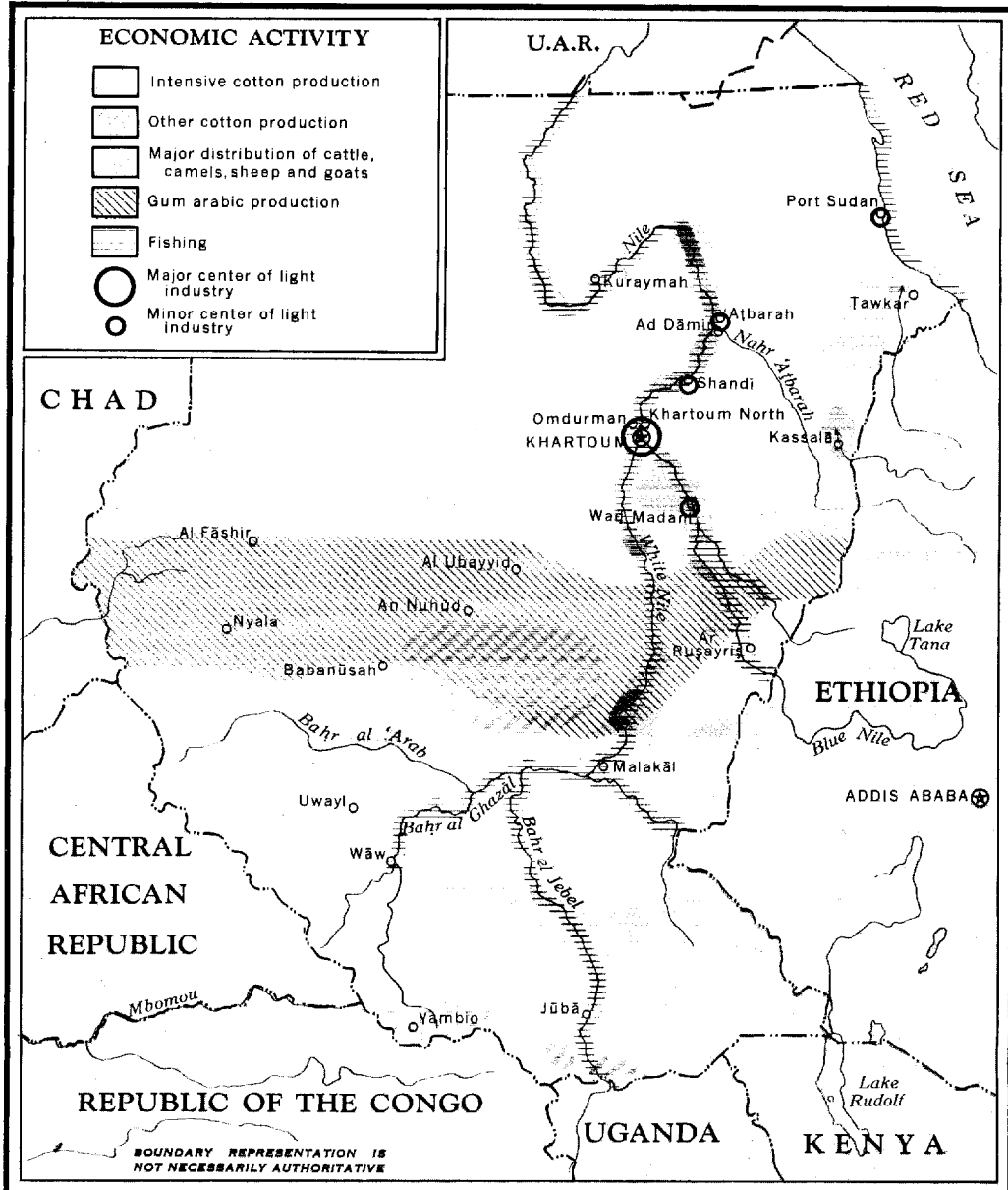
F. Employment and Labor

Out of Sudan's employable population of 8.2 million (1955-56 census), less than half are economically active. Nearly all of the workers are in agriculture -- farming, livestock, and forestry. Most are subsistence farmers and herders who have little interest in additional employment and are not normally available to meet the labor demands of commerce and industry.

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Before 1960 Sudan relied heavily on migrant labor from West Africa to relieve the severe labor shortage. During 1960 and 1961, however, the government began recruitment of laborers from the south and agricultural workers from the western provinces. This program has been relatively successful in the case of the southerners, but the movement of western workers to the cultivated areas has not been satisfactory.

The small but sudden growth of industry is placing a severe strain on the limited supply of skilled and semiskilled labor. Of the 500,000 persons engaged in nonagricultural employment, less than 10 percent are normally enrolled in trade unions, not enough to be a major economic or political force. The rapid growth from 5 to 112 registered unions in the period 1949-58 was halted by the military coup of November 1958. The suspension invoked at that time was lifted in 1960, but the revival of the unions has been hampered by strict conditions limiting their power and effectiveness.

The 20,000-member Sudan Railway Workers Union (SRWU) is the only large union in the country. The ability of the SRWU to cripple the sole means of fuel and commodity distribution is offset by lack of leadership and strike funds, as well as the demonstrated willingness of the government to use any available means to crush railway or port strikes.

All other unions are small, and the law prohibits industry-wide unions, national federations, and association with foreign labor organizations. In the short run, therefore, the growth of strong, influential unionism is unlikely.

The Communists, who gained control of several unions during the first decade of union growth, suffered a major setback in 1955, losing leadership of the SRWU. Communist involvement in a 1962 strike cost them more loss of influence, and their current participation in the labor movement is at a low level. Nevertheless, Communist infiltration remains a threat of which the government is aware.

Sudan has no comprehensive social security system. A share of the annual profits of government-managed agricultural schemes is set aside for social welfare programs. Sick pay and pension arrangements are limited almost exclusively to civil service employees. Islamic law provides legal enforcement of traditional family responsibility and tends to insulate the government from pressures for welfare services.

G. Foreign Trade

Because the economy is predominantly agricultural, exports are almost entirely raw and semiprocessed materials. Imports are manufactured items. The biggest single export is long-staple cotton, which usually accounts for about half the total; following in order of 1962 value are peanuts, sesame, cottonseed, gum arabic, and sorghum.

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The normal trade pattern is illustrated by the following figures on the percent distribution of 1961 trade with major partners:

	<u>Exports</u>	<u>Imports</u>
United Kingdom	19	27
India	10	10
Italy	9	5
West Germany	10	10
France	4	--
Egypt	5	7

Sudan normally follows a liberal trade policy, but import restrictions have been imposed on occasion -- in 1958, for example, when cotton exports were unusually low. Current restrictions apply only to competitors of locally manufactured or cultivated commodities.

In 4 years of the period 1953-62, Sudan had an export surplus and in 6 years a deficit. Although gold and foreign exchange holdings have fluctuated somewhat, holdings at the end of 1962 were \$168.8 million, only \$800,000 less than the 1954 balance. Payments from Egypt under the Nile Waters Agreement, agricultural commodity and military support grants from the US Government, and numerous foreign credits have offset the foreign trade imbalance, and Sudan had over \$100 million of undrawn foreign credits available as of the end of 1962.

H. Foreign Loans and Aid Programs

Since achieving independence Sudan has received numerous long-term loans and credits from foreign sources. The major loans, which total over \$250 million, are given below:

World Bank

\$39.0 million	Transport development
\$15.5 million	Managuil extension
\$39.5 million	Roseires Dam and other projects

US Development Loan Fund

\$10.0 million	Textile mill
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US AID

\$30.6 million	Development assistance
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UK

\$11.2 million	Export credits
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\$18.4 million	Roseires Dam
\$18.0 million	Guneid sugar mill

Italy

\$11.5 million	Khasm el Girba Dam
----------------	--------------------

Kuwait Development Fund

\$20.1 million	Railway modernization
----------------	-----------------------

Yugoslavia

\$14.4 million	Paper plant
----------------	-------------

USSR

\$22.2 million	Industrial development, including granaries and food-processing plants
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The USSR line of credit, extended in 1961, marks the beginning of Soviet assistance. The government is aware of the dangers of Bloc aid and apparently has channeled USSR assistance into nonsensitive areas as a deliberate policy. As of the end of 1962, there were estimated to be 50 Soviet Bloc economic technicians in Sudan. The United States had about 65 AID technicians in Sudan at that time.

I. Economic Growth, the Budget, and Development Plans

The total domestic output of Sudan grew from \$816 million in 1955-56 to \$1,015 million by 1960-61. The 3 percent annual growth in the traditional (subsistence economy) sector has exceeded the population growth (2.8 percent) only slightly; the modern sector has had an average growth of about 6.5 percent. The resulting per capita increase has been about 2.5 percent.

Economic development in Sudan has been hampered by a lack of domestic capital and an overwhelming dependence on the export of long-staple cotton, which accounts for 50 to 60 percent of total export earnings.

The development budget is financed by foreign loans and central budget surpluses -- the latter projected at over \$25 million for 1962-63. The Ten Year Development Plan announced in September 1962 aims at an annual expenditure of \$147 million in the period 1962-72 and a total capital inflow of \$491 million from abroad. Of the \$1.5 billion expenditure

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in the 10-year period, \$818.5 million will be directed through the development budgets, \$149 million will be spent on repairs and replacements, and the remaining \$502 million will be invested privately.

J. Money and Banking

The monetary unit is the Sudanese pound (£S) divided into 100 piasters tarif (PT) and 1,000 millièmes (m/ms). The official exchange rate is \$2.872 to the Sudanese pound. The following denominations of currency are in circulation:

<u>Paper Bank Notes</u>	<u>Value in US Dollars</u>
£S 10	\$28.72
£S 5	14.36
£S 1	2.87
PT 50	1.44
PT 25	.72
 <u>Coins</u>	
PT 10 (copper-nickel)	.28
PT 5 (copper-nickel)	.14
PT 2 (copper-nickel)	.06
m/ms 10 (bronze)	.03
m/ms 5 (bronze)	.015
m/ms 2 (bronze)	.006
m/ms 1 (bronze)	.003

The only banks operating in Sudan were foreign-owned -- chiefly British -- until the May 1959 opening of the government-owned Sudan Agricultural Bank. The Bank of Sudan, with an authorized capital of £S 1.5 million, began operations as the country's central bank in February 1960 and has the sole right to issue currency. The government-owned Sudan Industrial Bank was inaugurated in November 1961.

The only private bank wholly owned by Sudanese is the Sudan Commercial Bank, which opened in November 1960; in addition, 34 branches of foreign banks were operating as of April 1961.

Sudan is in effect a member of the sterling area; the government establishes an official fixed exchange for sterling and determines the rates for other currencies on the basis of the London market. Present regulations provide for bilateral trade with Egypt and the Sino-Soviet Bloc; all other countries are considered as convertible areas with payments and receipts permitted in any convertible currency.

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~~S E C R E T~~K. Prime Economic Targets

The two obvious economic targets are the Gezira irrigation complex and the electric power supply of the Khartoum area.

The triangular area between the White and Blue Niles north of Sennar is the heart of Sudan's money economy. This area includes almost all of the government irrigation schemes -- projects which provide 40 percent of the nation's agricultural output and 75 percent of its export earnings. Elimination of the Sennar Dam and the nearly finished Roseires Dam would virtually destroy the irrigated lands and wipe out the money economy of Sudan.

Destruction of the Sennar Dam would also cut the only east-west railroad and the major east-west road, as well as eliminating the hydroelectric power station that provides 35 percent of the power requirements of the city complex that includes Khartoum, Khartoum North, and Omdurman. The Burri thermal power station provides the rest of the power supply for this area. Destruction of Burri and Sennar power installations would bring industrial activity to a sudden and virtually complete halt.

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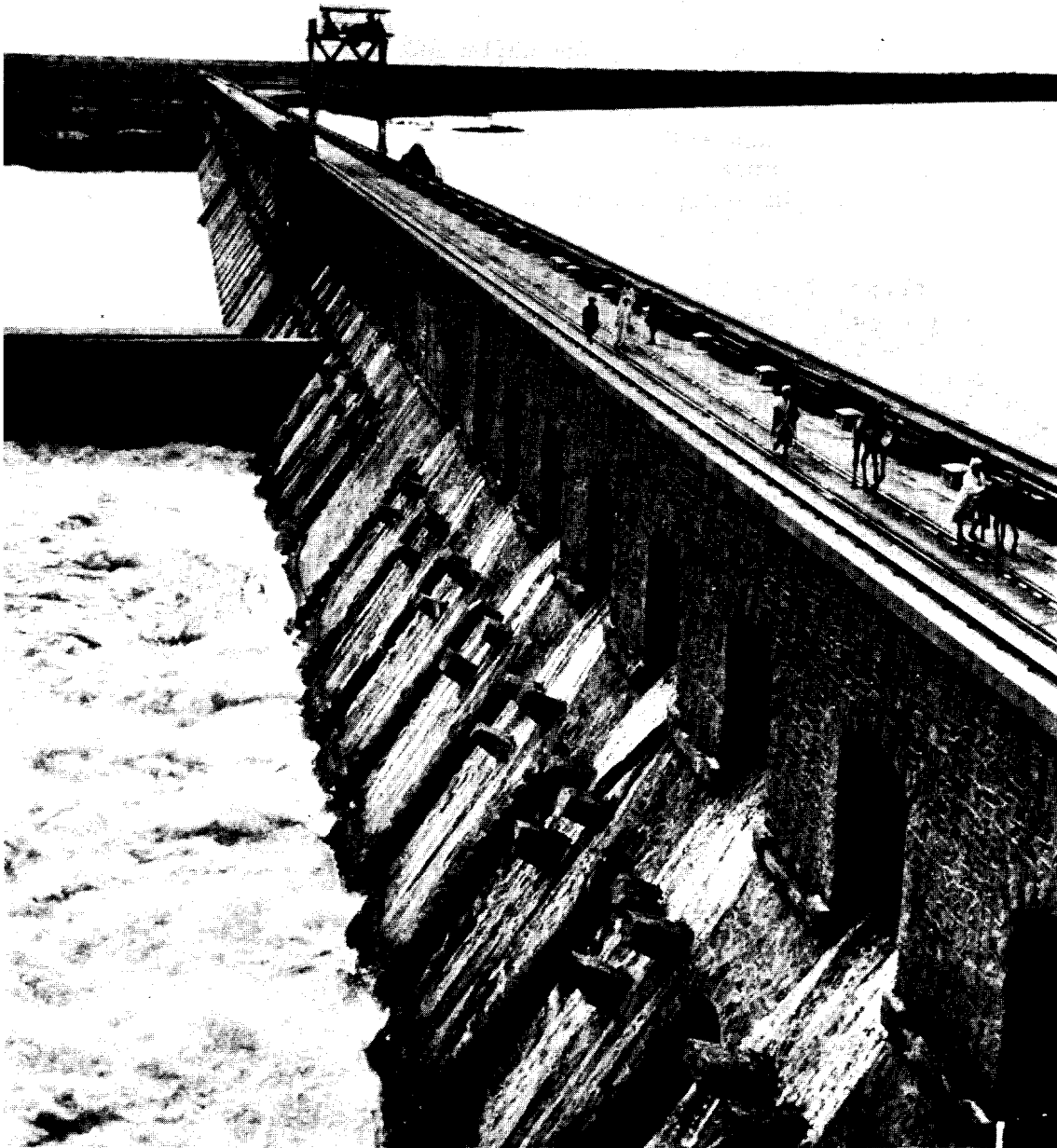


Figure 27. The Sennar Dam.

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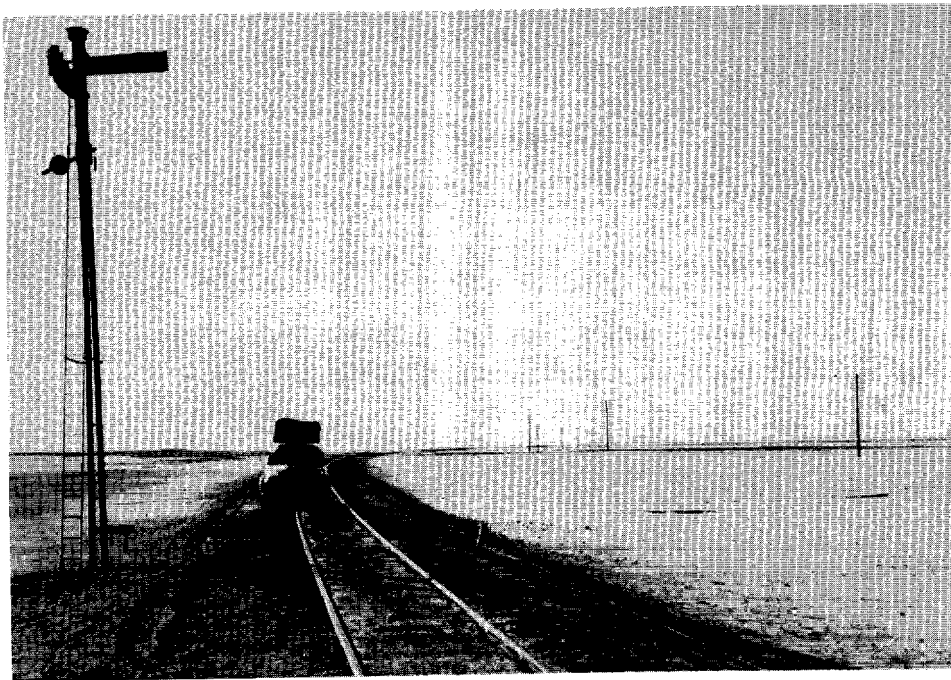


Figure 28. Typical stretch of road and railroad across the Nubian Desert between Abu Hamed ($19^{\circ}32'N-33^{\circ}19'E$) and Wadi Halfa ($21^{\circ}56'N-31^{\circ}20'E$). Poles carry telephone and telegraph wires.

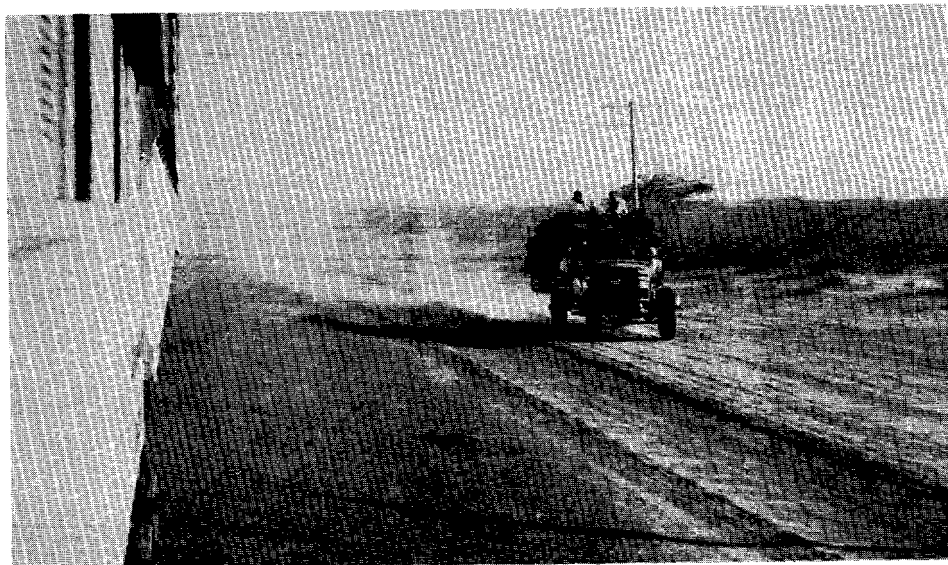


Figure 29. Road and railroad between Khartoum ($15^{\circ}36'N-32^{\circ}32'E$) and Atbara ($17^{\circ}42'N-33^{\circ}59'E$). Pullman car is at left. Scrub vegetation.

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VI. Transportation and Telecommunications

A. Roads and Tracks

1. Trafficability and Seasonality

Roads in Sudan are extremely poor by most standards. Highways are nonexistent, surfaced roads are few, and the road network is characterized by unpaved tracks which are impassable for much of the year. It is almost impossible to motor from one end of the country to the other. Adverse weather conditions, difficult terrain, and primitive economic development are factors that have contributed to the widespread neglect and deficiency of the roads.

There are 16,000 miles of roads unevenly distributed throughout the country. They are densest in southern and central Sudan. The absence of satisfactory connections between southern and central Sudan and between the interior and Port Sudan is a serious problem.

Sudan has less than 1,000 miles of improved roads, excluding city streets. Most of these roads are lightly covered with local gravel and are little different from the natural terrain. Even in and around the cities there are only a few miles of improved roads; some of these have bituminous surfacing. Natural surface roads are generally sand in the north and clay in the south. Road widths depend upon the terrain, season, and volume of traffic and vary from 8 feet to unlimited widths in some desert areas.

Because the traveler's main concern is whether or not roads are passable, roads are best described in terms of their seasonal trafficability. Roads designated "all weather" (see Map 38095 - Roads) are often impassable for a few hours or longer following a heavy rain, and "dry season" motor roads vary from truck tracks to cleared, ditched, two-lane roads.

The majority of roads in Sudan are limited to dry-weather travel. Many roads, particularly those in the seasonal flood region, are flooded during the wet season; they may be a sea of mud during heavy rains, and may be washed out in places. In such instances, no one considers traveling until after the rains have stopped. Vegetation grows so rapidly that many roads revert to bush during the months of disuse. Consequently, new clearing of land, as well as ditching and grading, is necessary and road sites often change from year to year.

There are numerous bridges, fords, dry watercourses, and ferry crossings. Approximately 100 permanent highway or highway-railroad bridges 20 feet or more exist. Most are located in the south, along with many small wooden bridges and culverts. Bridges are usually one

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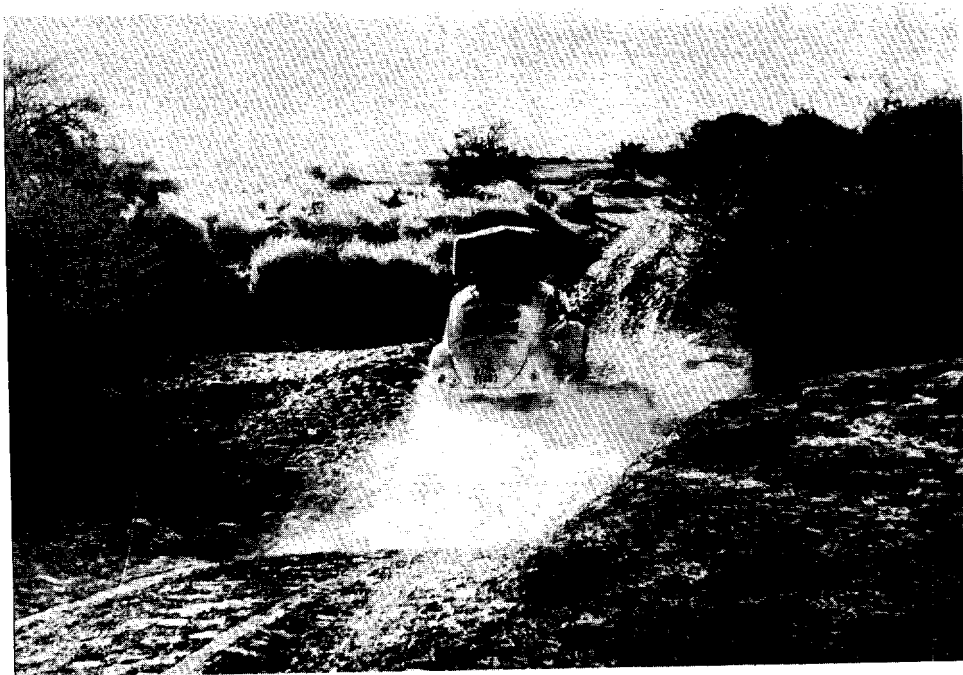


Figure 30. Road between Berber (18°01'N-33°59'E) and Shendi (16°42'N-33°26'E). The car is crossing a dry streambed which is probably flooded during the infrequent rains.



Figure 31. Dry-weather road about 60 miles north of Malakal (9°31'N-31°39'E). Notice the cracks and ruts in the natural clay soil.

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Figure 32. Typical ferry carrying truck across Sobat River approximately 15 miles south of Malakal ($9^{\circ}31'N-31^{\circ}39'E$). Picture taken toward the end of the dry season (April) when the river is very low.

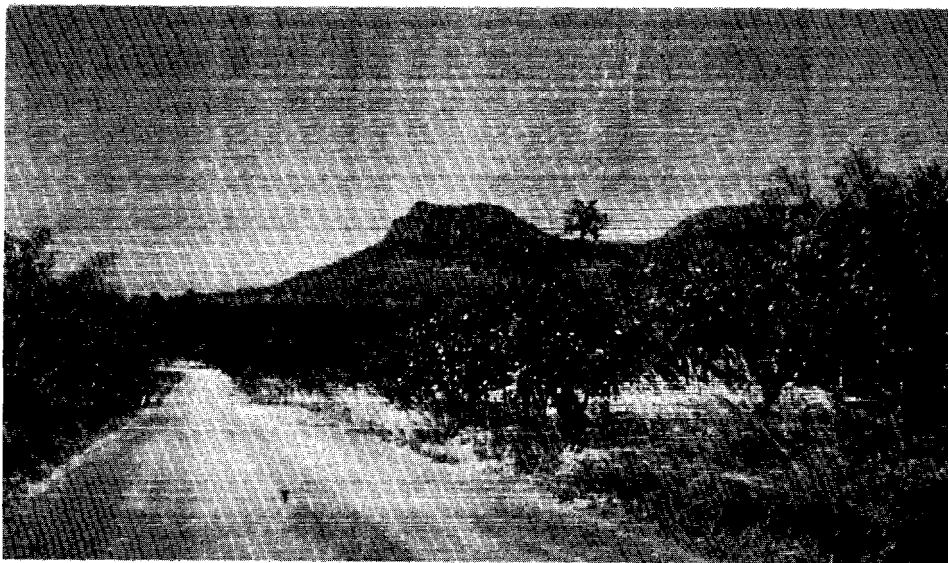


Figure 33. All-weather road on Southwestern Plateau between Juba ($4^{\circ}51'N-31^{\circ}37'E$) and Mundri ($5^{\circ}23'N-30^{\circ}22'E$). Note ditch, which needs to be redug, and thick vegetation up to the road.

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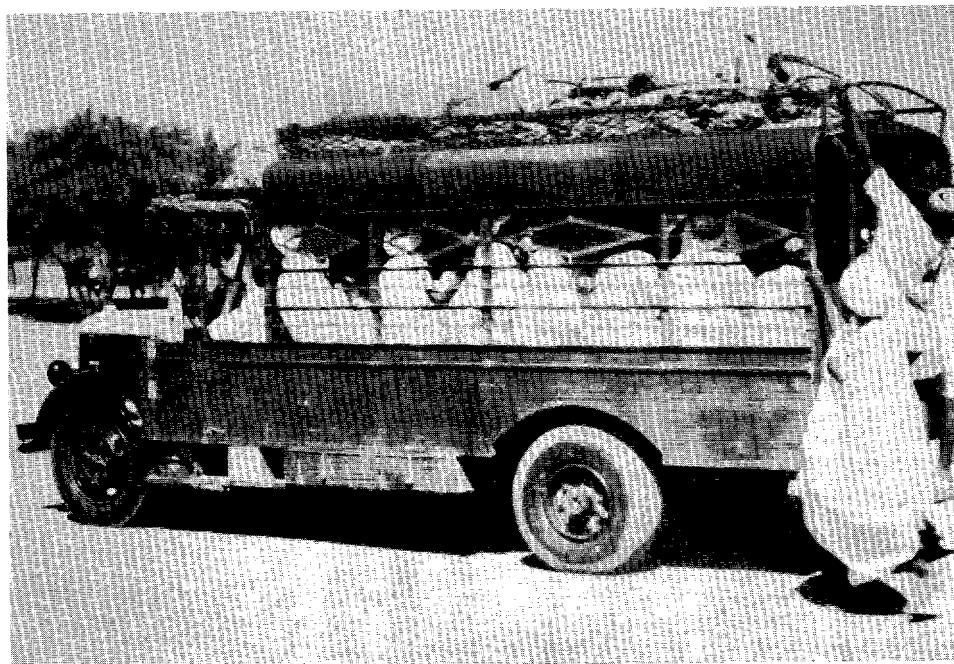


Figure 34. Typical bus equipped with sand tires, near Sennar (13°33'N-33°38'E). Buses are often even more heavily loaded than this.

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lane, of unlimited vertical clearance, and have axleload capacities of 3 to 5 tons.

The larger bridges are usually well maintained. During the rainy season, the wooden bridge capacities are often much reduced, and some are washed away. Ferries usually consist of hand-operated barges of low carrying capacity (1.5 to 6 tons); the majority are limited to one vehicle at a time.

In regions where vegetation is not abundant, a single truck traveling cross-country creates a "road" which other vehicles may or may not follow. Off-road travel in some areas is virtually equivalent to on-road travel, particularly in the Desert Region. The track along the railroad from Atbara to Abu Hamed and Wadi Halfa is the principal road connection with Egypt. A few caravan trails comprise the only routes in the western part of the Desert Region. Difficult terrain and poor roads are found in the Red Sea Hills near the coast. After the infrequent rains, drainage courses are flooded and impassable.

In the Semi-Desert and thin Woodland Sawanna Regions the country is generally flat and roads are normally cleared tracks of varying widths with shallow ditches. A network of all-weather tracks serves the marketing towns in the Qoz west of the White Nile. It extends in a belt from Khartoum southwest to El Obeid and En Nahud, and west from there to El Fasher and Nyala. Roads here are in poorest condition during the rainy season.

Southward to the Wooded Upland Region, and east of the Nile from Khartoum to Juba, is an extensive area of especially poor roads. Roads in this area are natural surface, and the dark heavy soil, which becomes a sticky morass after rains, limits travel to the dry season, generally from November to April. From Malakal to Juba permanent swamps allow movement only between about December and March.

In the extreme south all-weather routes extend from Juba westward and eastward toward the hills near the border, but in neither direction do they connect with other parts of Sudan. These roads were made by clearing and smoothing a two-lane swath through the natural terrain and are reditched annually. Alternate and supplementary roads are single lane and during the wet season may be impassable or flooded.

2. Vehicles

As of January 1960 there were approximately 17,000 passenger cars, 12,000 trucks, 600 busses, 1,000 tractors, 1,000 motorcycles, and 30 petroleum tankers in Sudan. Almost all the passenger cars are in towns, largely because it is impractical to travel outside urban areas in other than trucks equipped with extra water and gasoline tanks. The most common truck used is a two-wheel drive type of about 2 tons capacity.

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Figure 35. A trail extending southwestward across the Congo border from the road between Nzara (4°40'N-28°14'E) and Source Yubo (5°23'N-27°15'E), 30 miles south of Source Yubo. This is typical of well-used forest trails in the south.

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3. Probable Trail Patterns

In the Desert Region, where water is scarce, tracks almost invariably converge on a waterhole. Where there are no waterholes large numbers of tracks may be seen in a criss-cross or irregular pattern. Their presence does not necessarily mean that they have been used recently, for in these areas a trail may not be obliterated for years. Many streambeds are dry in winter and can be used for foot -- and often vehicular -- travel, but the route may be circuitous; it may lead to the Nile or it may lead nowhere.

In the south, where dense vegetation occurs up to the road, a foot-path perpendicular to the road may be seen every few miles heading off through the forest to a native village a half mile or more away. Many of these villages are connected by paths that roughly parallel the road. Other paths out of villages usually lead to a source of water.

4. Cross-Border Movement

The international boundary of Sudan is for the most part undemarcated. Most of the border is unguarded, and penetration on foot at most places can be accomplished almost at will. While vehicular movement across the border is not easy, it is possible in many places; numerous tracks and trails cross each boundary.

The Egyptian and Libyan borders (776 and 238 miles long, respectively), except in the Red Sea Hills, have terrain offering the least difficulty to cross-border passage. Heat, aridity, and sand are the main deterrents. There are no roads except along the Nile.

Much of the 1,460-mile Ethiopian border can be crossed on foot or by vehicle with little difficulty in the dry season. However, the mountains of the extreme north and south and of that portion of the border extending 200 miles south of the Blue Nile make motor travel impractical. Several minor tracks and trails cross this boundary. There is evidence of some cotton smuggling into Eritrea, probably by camel.

Conditions along much of the relatively short Kenya border (140 miles) do not favor off-road travel, although a few plains in this area can be crossed in the dry season. The terrain varies from rocky highland to permanent swamp. The entire border is crossed by a few tracks and trails.

The 275-mile Uganda boundary is a heavily forested highland alternating with low hills and plains. One major road and a few dry-season local tracks cross it.

The boundary with the Republic of the Congo follows the divide between the watersheds of the Nile and Congo Rivers for 390 miles. Dense

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Figure 36. Congo border post on the road southwest of Yei (04°05'N-30°40'E) looking toward the Republic of the Congo. There is no Sudanese border post between here and Yei.

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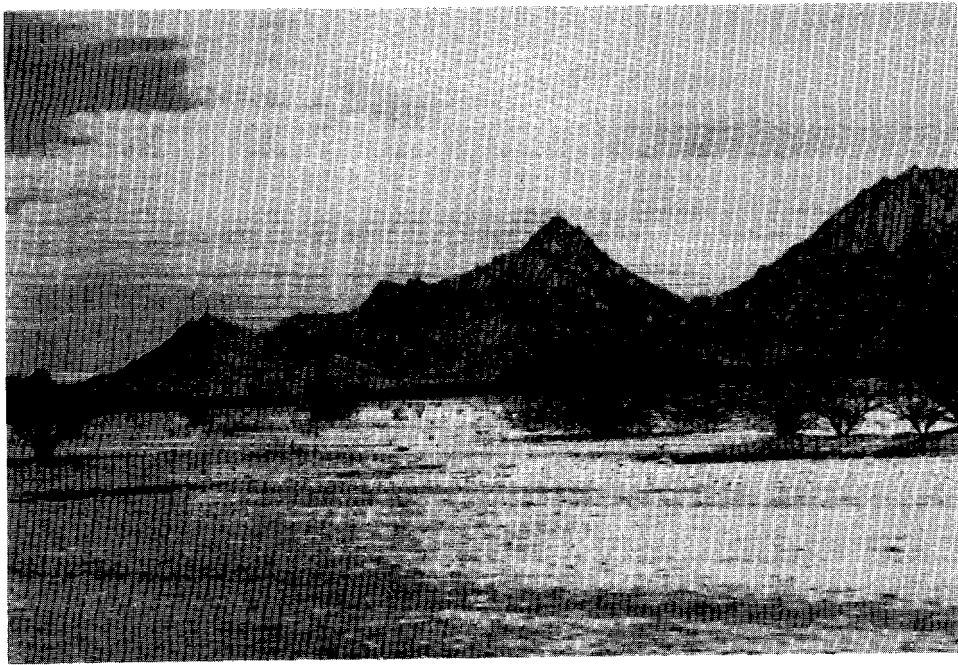


Figure 37. Road and countryside between Kassala ($15^{\circ}28'N-36^{\circ}24'E$) and Eritrean border. The road, in foreground, is barely distinguishable from the natural surface.

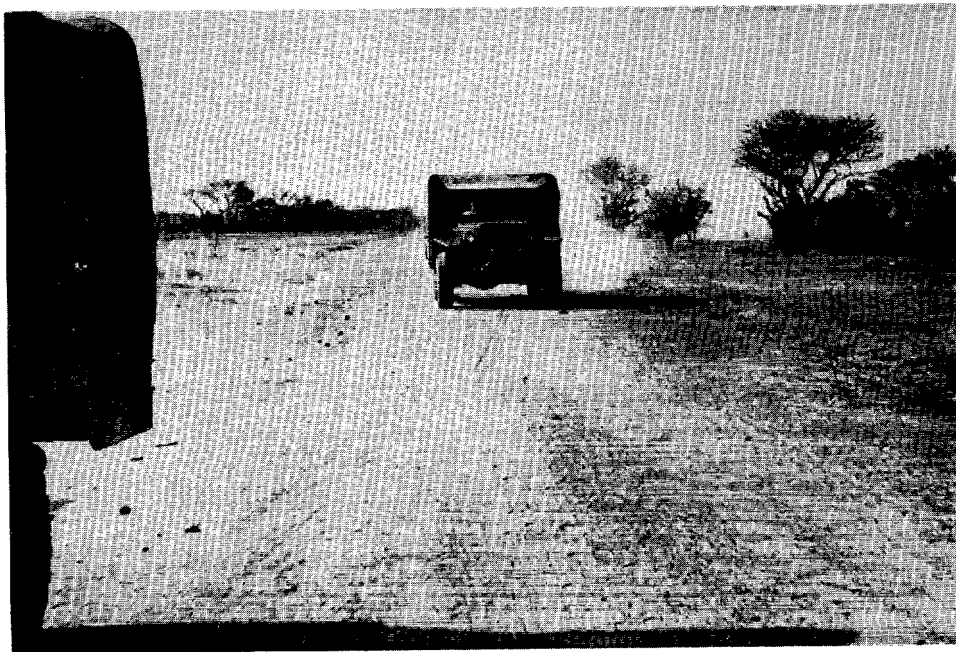


Figure 38. Road and countryside between Kosti ($13^{\circ}10'N-32^{\circ}40'E$) and Renk ($11^{\circ}45'N-32^{\circ}48'E$). Note the similarity of the road to the natural terrain.

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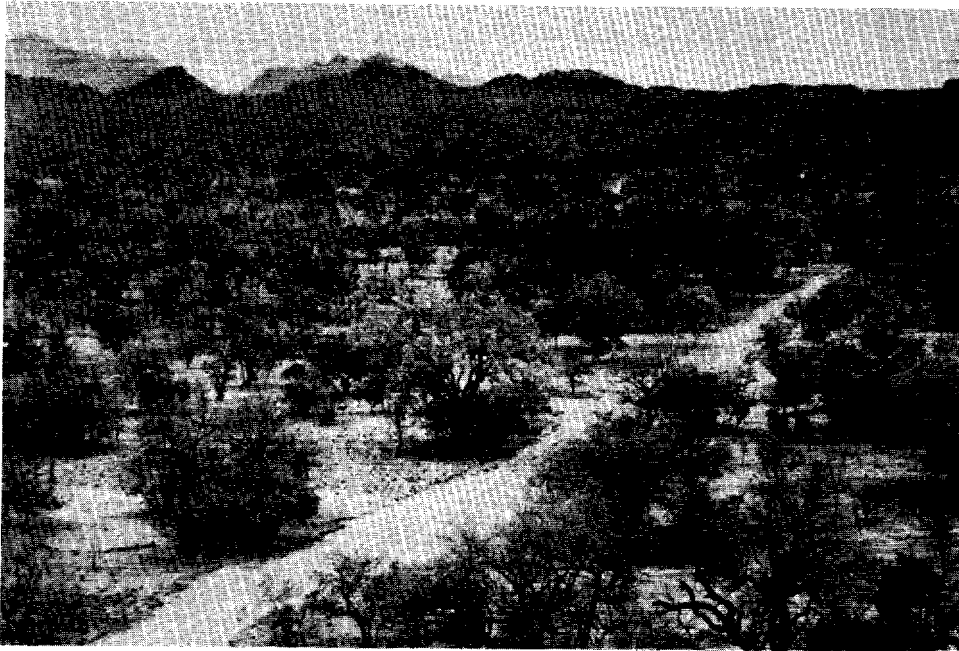


Figure 39. Dry-weather road and countryside from hill 30 miles west of Kapoeta ($4^{\circ}47'N-33^{\circ}35'E$), looking eastward. Offroad movement would be possible here for limited distances.

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forest and much rainfall make off-road movement in this area impractical. The only good route crossing the border is an all-weather road from Yei.

Most of the 725-mile Central African Republic border lies across the densely forested southwestern plateau, where movement off the road is impossible. However, the northern 100 miles of this border extend through the sandy Qoz region, where travel is possible but difficult.

Cross-border, off-road movement is fair along the southern half of the 845-mile Chad boundary, except for the mountainous region around El Geneina, where the going is more difficult. There is some smuggling of cattle and goods back and forth over the border in this area. Movement is good at all times across the straight northern part of the boundary. The terrain is flat, open desert.

5. Off-Road and Cross-Country Wheeled Movement

High temperatures, lack of water, and haboobs (dust storms) are the major deterrents to wheeled movement throughout the entire northern half of the nation. In most parts of the gently rolling desert plains west of the Nile the going is excellent. Cultivated areas and hills bordering the Nile are minor obstacles, as are the soft sand of the Bayuda Desert and the isolated rocky jebels of the Red Sea foothills. From Wadi Halfa to Atbara east of the river (and, on the Karema reach north of the river), there is a wide belt of desert passable at all times. The belt continues from Atbara southward to Khartoum and eastward nearly to the Eritrean border.

Off-road travel becomes considerably more difficult in the Red Sea Hills and is impractical at all times in the eastern and southern parts of this area. Travel is generally easy along the coastal plain. In the Baraka delta, near the Ethiopian border, cultivation is an obstacle. Western Darfur presents generally rough going, and Jebel Marra is impassable. The Nuba Hills of Kordofan are also impassable. The thin crust of the wide Qoz area breaks easily and the sand beneath it becomes churned up by wheels, making cross-country movement difficult. Travel is somewhat better after rainfall.

The immense clay plain of the Gezira, the thin Woodland Savanna east of the Nuba Hills, and the Seasonal Flood Region, is impractical for off-road movement during the wet season. The rest of the year it is fair for travel. More difficult to traverse are the river and flood-plain banks, which are often densely wooded. The rivers are difficult or impossible to ford. In the Gezira, widespread cultivation prevents off-road vehicular travel. The permanent swamps of the Seasonal Flood Region are year-round barriers, but limited cross-country movement is possible on their southern margins.

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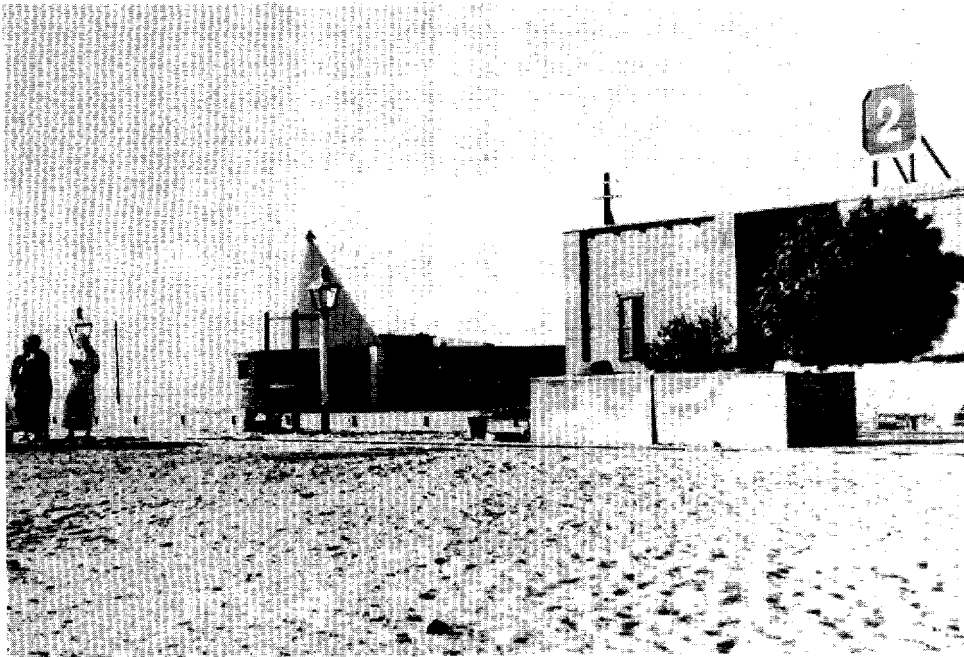


Figure 40. Railroad Station No. 2 about 35 miles southeast of Wadi Halfa ($21^{\circ}56'N-31^{\circ}20'E$) on the line to Abu Hamed ($19^{\circ}32'N-33^{\circ}19'E$). The "road" parallels or straddles the railroad.

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B. Railroads

The most important means of transportation in Sudan is by rail. The 2,852-mile network is concentrated in the northeast portion of the country, with an extension to the south and west (see Map 38097 - Administration and Railroads).

The most important railroad line is between Port Sudan and Khartoum. It brings petroleum products and manufactured articles to distribution points and carries cotton and other crops to the port. Heavy congestion occurs on this line at harvest time. Sandstorms and washouts at times cause movement to cease altogether. Two of Sudan's five principal railroad bridges and approximately 60 others are on the Khartoum-Port Sudan line.

The second most important route is from Atbara to Wadi Halfa and Faras (Egypt). There are approximately 15 small bridges on this line. No railroad exists for 208 miles north of Faras; steamer services provide the link with the Egyptian railroad system.

The recent extensions to Nyala and Wau provide the only reliable year-round means of communication (other than by air) between these areas and Khartoum.

The rail system is single-track, 3'6" gauge. Curves and gradients are few, and there are no ferries or tunnels. Of the 150 railroad bridges, 44 are known to be over 105 feet long.

The government-owned Sudan Railways controls most of the country's transportation system. It operates the entire railroad system, the steamer services of the Nile, and the port facilities of Wadi Halfa and Port Sudan. Movement of freight is the major function of Sudan Railways.

In early 1962, Sudan Railways had 131 main-line and 49 switching steam locomotives, 40 main-line and 11 switching diesel locomotives, 4,948 freight cars, and 458 passenger cars. Over half the freight cars were boxcars, and most had four axles. Plans call for increasing the number of main-line diesel engines to 67 and for acquisition of new freight cars.

Sudan Railways has its own telegraph system. The manual-block system is used in traffic control, and switches and signals are operated by hand.

The main yard and repair shop is at Atbara. Other repair shops are at Khartoum, Karema, Kosti, Wadi Halfa, Derudeb, Port Sudan, Gebeit, Abu Hamed, Wad Medani, Kassala, Er Rahad, Sennar, El Obeid, Haiya, and

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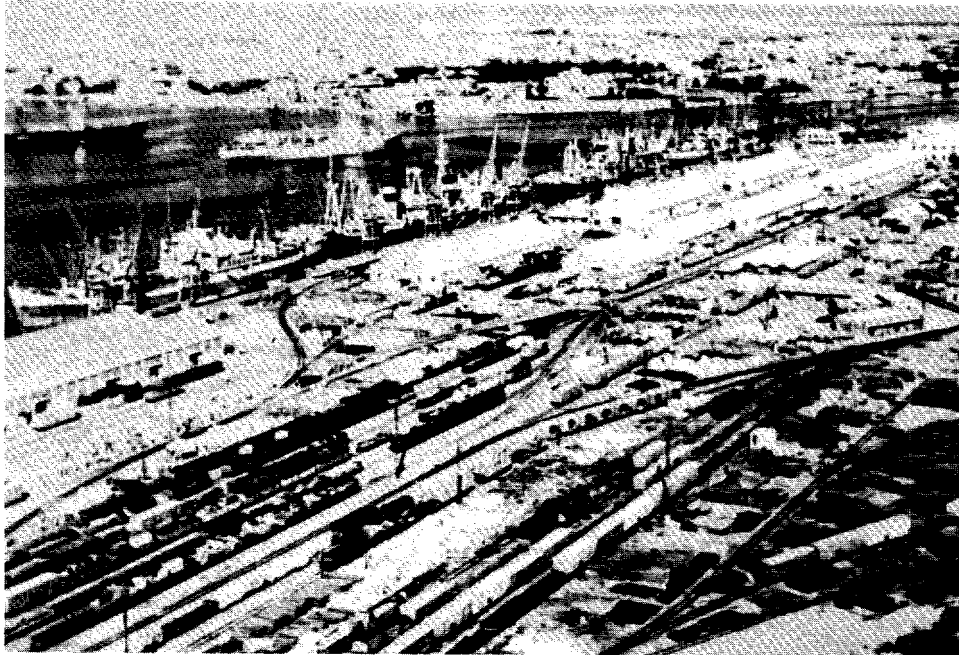


Figure 41. Port Sudan harbor (19°37'N-37°14'E), looking west at the main quay. Note cranes, warehouses, outdoor storage space, and complex of rail sidings.

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Gedaref. The first six repair shops listed have facilities for light locomotive repairs and have wheel-drop pits or heavy lift cranes. The railroad is operated efficiently, but the railroad line to the coast has already reached a traffic saturation point. During the March-to-July peak season, the railroad must carry cotton and other products to Port Sudan as quickly as possible, since storage facilities are lacking elsewhere.

The railroad is the lifeline of the nation's economy. Imports and exports move almost exclusively by rail. A severe breakdown of the railroad system would be disastrous to the economy of Sudan.

C. Water Transportation

1. Merchant Marine

The Sudan is almost entirely dependent upon 69 shipping lines of other nations for its ocean-going commerce. There are two Sudanese shipping companies, Sudan Navigation Co., Ltd., and Sudan Shipping Lines, Ltd., but in 1963 they had only four ships between them. Two of these are over 30 years old, and have deadweight tonnage capacity (DWT) of 4,900 tons each. The others, recently acquired from Yugoslavia, are slightly smaller, 4,800 DWT. Four more cargo ships are to be obtained from Yugoslavia in the future.

Fewer than 300 people are available for service in the Merchant Marine. However, an agreement with Yugoslavia provides for the training of 50 men annually.

2. Ports

Natural harbors are few along the 525-mile coast line because of the extensive coastal and barrier reefs. Port Sudan is the most important port. Other salt-water ports are Suakin and Trinkitat. Wadi Halfa, on the Nile River near the Egyptian border, is the second most important port.

Port Sudan has a good natural harbor and handles 90 percent of all Sudanese shipping. It is the only port engaged in ocean-going commerce and is known as one of the most efficient in the Middle East. The total harbor area of Port Sudan is about 0.6 square miles, and depths in the basin range from 36 to 102 feet.

Port Sudan has alongside accommodations for 12 ocean-going and 12 coastal cargo ships and 1 ocean-going and 1 coastal tanker. Total wharfage is 8,000 feet, and wharfside depths range from 7 to 36 feet. The largest ship that can be accommodated would occupy a berth 640 feet long and could draw no more than 33 feet. Two new berths, totaling

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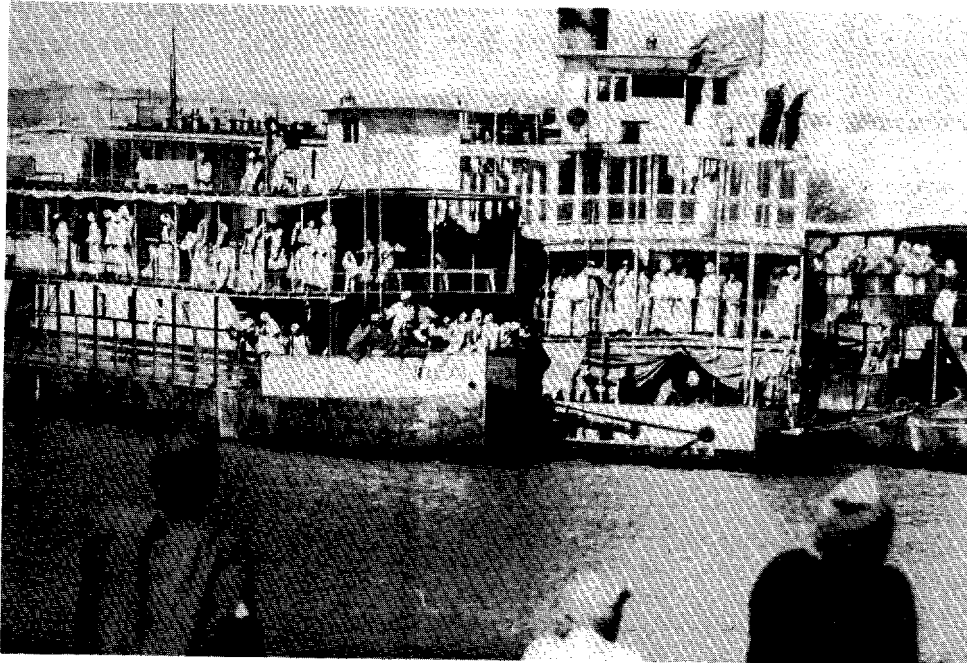


Figure 42. Passenger boats coming into Wadi Halfa (21°56'N-31°20'E) from Aswan, Egypt. Passengers on the steamboat (center) travel first class, whereas those on the attached side boats travel steerage.

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approximately 1,200 feet, are under construction as extensions of the main quays. Extensive anchorage is available for all classes of vessels 7½ miles south of the port at North Towartit Reef.

Covered storage space consists of 12 transit sheds and 63 warehouses totaling 3,334,000 square feet. There are 14,382 cubic feet of cold storage space, 537,000 barrels of POL space, and approximately 46 acres of open storage space. The port has 29 cranes.

Sudan's one repair facility for ocean-going vessels, a small government-owned shipyard, is located at Port Sudan. It is able to make top-side repairs on most merchant ships, and can perform electrical, hull, and machinery maintenance and repair on small ships and harbor craft.

Port Sudan is strategically located. It is the first important port south of the Suez Canal. If the canal were closed, the port's importance would be significantly heightened because of its railroad line to Atbara and rail-river connections with northern Egypt. The only other ports of any significance are Suakin and Trinkitat. There is a surfaced road between Suakin and Port Sudan. The meager facilities of these ports have deteriorated through neglect, and they are important only locally or seasonally. Suakin is used primarily as a transit point for pilgrims bound for Mecca. Trinkitat is primarily an outlet for the cotton crop shipped from Tokar, approximately 18 miles inland.

Under the recent agreement between Sudan and Yugoslavia, Yugoslavia will grant a loan for the improvement of Sudanese shipping and harbor facilities and Suakin will be relocated approximately 6 or 7 miles north of its present site. There a new port will be constructed (1964-67). It will ultimately be three times as large as Port Sudan.

3. Inland Waterways

The Nile system totals approximately 3,300 miles of navigable waterway and is an essential part of the transportation system. Somewhat less than 50 percent of this is navigable year-round; the rest is generally open for about 6 months of the year. By June the Blue Nile is on the rise, and in August or September it reaches its maximum with a discharge 40 times as great as the April minimum. The White Nile, on the other hand, has no great extremes, the low water discharge being 40 percent of the maximum flood discharge.

The White Nile, with its tributaries the Bahr el Ghazal, Bahr el Jebel, and Bahr el Zeraf, is passable for 1,088 miles between Juba and Khartoum. The River Sobat, its branches, and the River Jur are navigable from July to October or November.

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The Blue Nile between Roseires and Khartoum (387 miles) is navigable only from July to December. Sennar Dam, about halfway between the cities, has no locks, thus precluding through navigation, although transshipment is possible. Two tributaries of the Blue Nile, the Rivers Dinder and Rahad, are also generally navigable from July to December.

North of Khartoum, on the Main Nile, cataracts are hindrances. Year-round travel is feasible only in isolated reaches: from Shendi to Atbara (approximately 90 miles) and from Karema to Dongola (178 miles). The section between Wadi Halfa and El Shallal, Egypt (210 miles) connects the railroad systems of the two nations. Two short reaches of the Main Nile, Khartoum to Shendi (111 miles) and Dongola to Kerma (approximately 30 miles), and the River Atbara (between Khasm el Girba and Atbara) are navigable only during the flood season.

There are two international connections in addition to the Wadi Halfa-El Shallal route. One is with Gambela, Ethiopia, on a seasonal route from Kosti; the other is with Uganda from Nimule. A road connects Juba with Nimule, as rapids prevent navigation there. From Nimule south, river travel is possible to Lake Albert.

The river craft used by Sudan Railways are mostly barges and flat-bottomed steamers of 3 feet or less draft. These are often lashed together in units of three, six, or nine, with one boat supplying the power for all. There are an estimated 258 vessels in service, with total carrying capacity of 15,637 tons.

The principal river ports are Wadi Halfa, Karema, Khartoum, Kosti, and Juba. Wadi Halfa and Khartoum are capable of making major ship repairs, while the others have minor repair facilities. Khartoum is the largest and best equipped and can construct, as well as maintain, all types of river craft. A large volume of exports, primarily livestock and agricultural products, pass through Wadi Halfa in transit to Egypt.

D. Air Service

Civil aviation is administered by the Department of Civil Aviation under the Ministry of Communications. The sole domestic airline is Sudan Airways (Sudanair), owned by the government but operated as a profit-making commercial company.

Sudanair has its base at Khartoum, and that city is the hub of all the country's air traffic. Regular domestic services exist between Khartoum and 18 other points: Atbara, El Fasher, Geneina, El Obeid, Juba, Kassala, Khasm el Girba, Kosti, Malakal, Nyala, Port Sudan, Wadi Halfa, Wad Medani, En Nahud, Dongola, Merowe, Roseires, and Wau. Sudanair has international flights to 11 cities. An

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agreement has been reached between Sudan and the Soviet Union whereby each nation has landing and on-flight privileges at the capital of the other. A similar agreement has been negotiated with Czechoslovakia, but it has not been ratified.

A total of 14 planes comprise the fleet of Sudanair: a new Vickers Viscount 831, two de Havilland Comet 4Cs, three Fokker F-27s, five Douglas DC-3s, and three de Havilland Doves. The F-27s and two of the DC-3s are used for domestic and nearby international flights. Three DC-3s are devoted to chartering. The Comets make regular flights from Khartoum to London and Beirut. The Viscount is to be used in services to the Middle East. Two of the Doves perform short-range domestic flights, and the other is assigned to the Minister of Communications for use in aerial photography.

Sudanair has about 600 employees, over one-third being unskilled Sudanese workers. Of the 36 pilots, only 11 are Sudanese, and they are qualified only as copilots of the Dove and DC-3 aircraft. No flight training schools exist, and all Sudanese pilots must be trained abroad.

Sudanair can perform only routine maintenance of its equipment in Khartoum; as a result, all major repair work must be done abroad. British Overseas Airways Corporation has a small facility at the capital to service its own planes stopping there and to provide en-route maintenance for foreign carriers.

A total of 38 airfields, administered by the Department of Civil Aviation, are open to civil aviation. The 18 used by Sudanair are nearly all from 1,000 to 2,000 feet above sea level. The highest is El Geneina (2,640 feet), and Port Sudan (10 feet) is the lowest. Only Khartoum Airport can land the Comets; it will not accommodate larger jets that are fully loaded. The DC-3, Fokker, and Viscount planes can land at all the fields on the regular Sudanair route. Most of the remaining airfields have natural-surface runways (see Map 37921 - Airfields and Seaplane Stations).

E. Telecommunications

Public telecommunications operate under the authority of the Department of Posts and Telegraphs in the Ministry of Communications. The various facilities are administered by several government departments, along with a few government-licensed private concerns. Most equipment is of British manufacture.

The Sudan internal trunk system consists of a fairly comprehensive network of overhead open-wire telephone lines along the Blue, White, and Main Niles, as well as several extensions paralleling the railroad. Such towns as Malakal, Juba, Roseires, Karema, Port Sudan, El Fasher,

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Wadi Halfa, and several in Kordofan and Darfur Provinces are served by lines radiating from Khartoum, the hub of all telecommunications activity. These lines are equipped with 1-channel, 3-channel, or 12-channel carrier systems.

Point-to-point radio facilities supplement the wire network and provide communication with outlying regions. The towns of Malakal, Juba, Wau, El Fasher, and El Obeid are linked by radio with Khartoum. Service is extended from these towns to other areas. A single radio relay station atop Jebel Marra connects seven towns in western Darfur Province.

As of January 1962 there were 26,548 telephones in Sudan, over half of which were in the Khartoum area. In 1960, three automatic exchanges were located in the Khartoum area and one each in Atbara, El Obeid, Port Sudan, Shendi, and Wad Medani. There are about 125 manual exchanges in smaller towns. A few party lines provide the rudiments of service to rural areas.

The basic telegraph network is carried on the same poles as the telephone lines, although there are a few poles with telegraph only. The telegraph facilities of Sudan Railways are available for public use. The network is not as extensive as the telephone system, owing primarily to the small number of qualified operators turned out by the Department of Posts and Telegraphs training school. Teleprinter equipment handles telegraph traffic on all major routes, with manual Morse used elsewhere.

There are approximately 50 fixed point-to-point radio stations in Sudan. Internal commercial radio services are centered at Khartoum and Juba. Broadcasting is confined to two AM stations in the Omdurman area, which are administered by the Sudan Broadcasting Service. There are a total of four transmitters, the largest of 50-kilowatt output. In 1961 Sudan had about 135,000 radiobroadcast receivers, most of them equipped with shortwave. No FM or television facilities exist in the country, although a television station is planned for Khartoum.

International telecommunications connections are mostly with Egypt, in the form of landline and submarine cable, the latter from Port Sudan. Other cables run to Jidda and Aden, and there are two open-wire connections with Ethiopia. International radio facilities are located at Khartoum, Port Sudan, Juba, and Nagishot.

The government has recently installed two underground cables between Khartoum and Sennar, each able to provide 60 telephone channels; an additional cable has been laid between Babanousa and Wau. Some expansion of radiobroadcast service was in progress in 1962 under a US aid program.

Even where telecommunications have been established in Sudan, the inefficiency of the system makes contact difficult or impossible. The

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government cannot keep up with the increasing demand for use of the facilities and only limited expansion would be possible in an emergency.

F. Targets

Destruction of only a small number of facilities in Sudan would effectively disrupt the nation's transportation and communications and would bring the economy to a standstill. Emergency expansion of any transportation facility is limited, and alternates are nonexistent in most cases.

The most vulnerable target, as well as the most important, is the railroad. Destruction of one of the several railroad bridges between Port Sudan and Haiya would bring to a halt nearly all of Sudan's import-export traffic, because of the lack of adequate substitute means of transportation.

Below is a list showing potential railroad and highway targets away from heavily populated areas:

<u>Name</u>	<u>Location</u>	<u>Remarks</u>
Erba railroad bridge South	Over Khor Adit, between Port Sudan and Haiya, 19°00'N-36°50'E	315 x 17 feet, three steel spans on masonry piers and abutments. On the most important railroad in the country.
Einha railroad bridge	Over Khor Arab, between Haiya and Atbara, 18°20'N-36°14'E	109 x 17 feet, one steel span on masonry piers and abutments.
Gananita railroad bridge	Over Abu Sudeir, between Abu and Hamed and Atbara, 18°23'N-33°47'E	Information lacking on length and construction. On second most important railroad in the country.
Khasm el Girba railroad and highway bridge	Over Atbara River between Kassala and Sennar, 15°03'N-35°57'E	1050 x 22 feet, seven steel spans of through truss construction.
Aweil highway bridge	Over Pongo River between Aweil and Wau, 08°27'N-27°32'E	180 feet long, four steel spans.

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Mvolo highway bridge	Over Yei River approx. 53 miles southeast of Mvolo, $05^{\circ}40'N-30^{\circ}18'E$ (approx.)	Approx. 264 feet long, eight steel truss spans.
Nimule highway bridge	Over Aswa River approx. 18 miles northwest of Nimule, $03^{\circ}43'N-31^{\circ}59'E$ (approx.)	Approx. 400 feet long, four steel truss spans, with masonry piers and abutments.

Destruction or blockage of the lock at Jebel Aulia Dam ($15^{\circ}14'20"N-32^{\circ}29'10"E$) would effectively halt river travel between Kosti and Khartoum, on the White Nile, and destruction of Sennar Dam ($13^{\circ}35'N-33^{\circ}34'E$) at Sennar would disrupt travel on the Blue Nile.

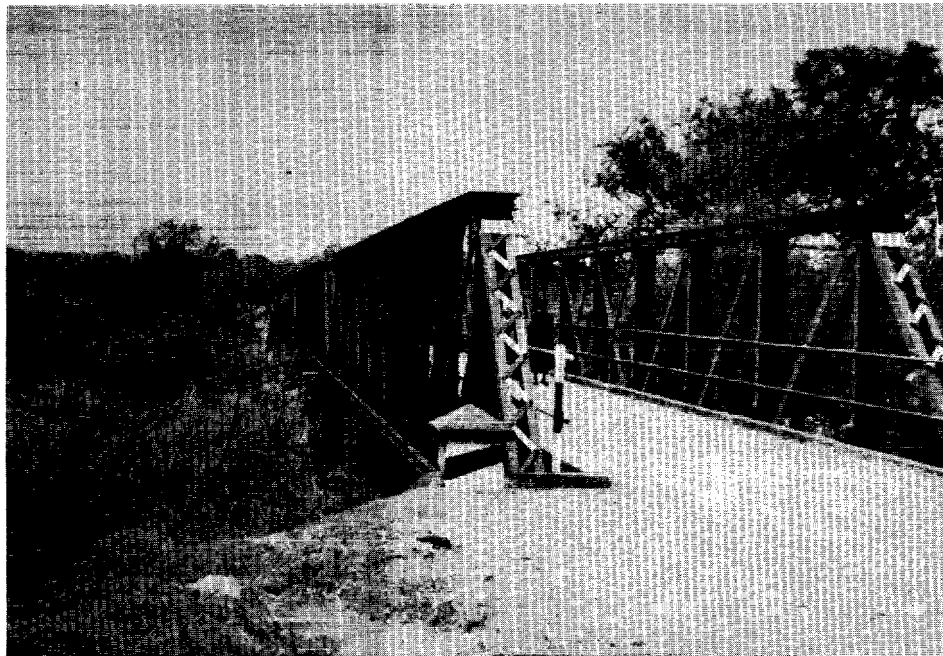


Figure 43. Four-span bridge on the all-weather road between Juba ($4^{\circ}51'N-31^{\circ}37'E$) and Nimule ($3^{\circ}36'N-32^{\circ}03'E$), over the Aswa River approximately 18 miles northwest of Nimule.

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Figure 44. Jebel Aulia Dam and Lock
($15^{\circ}14'N-32^{\circ}29'E$) on the White Nile
about 21 miles south of Khartoum
($15^{\circ}36'N-32^{\circ}32'E$).

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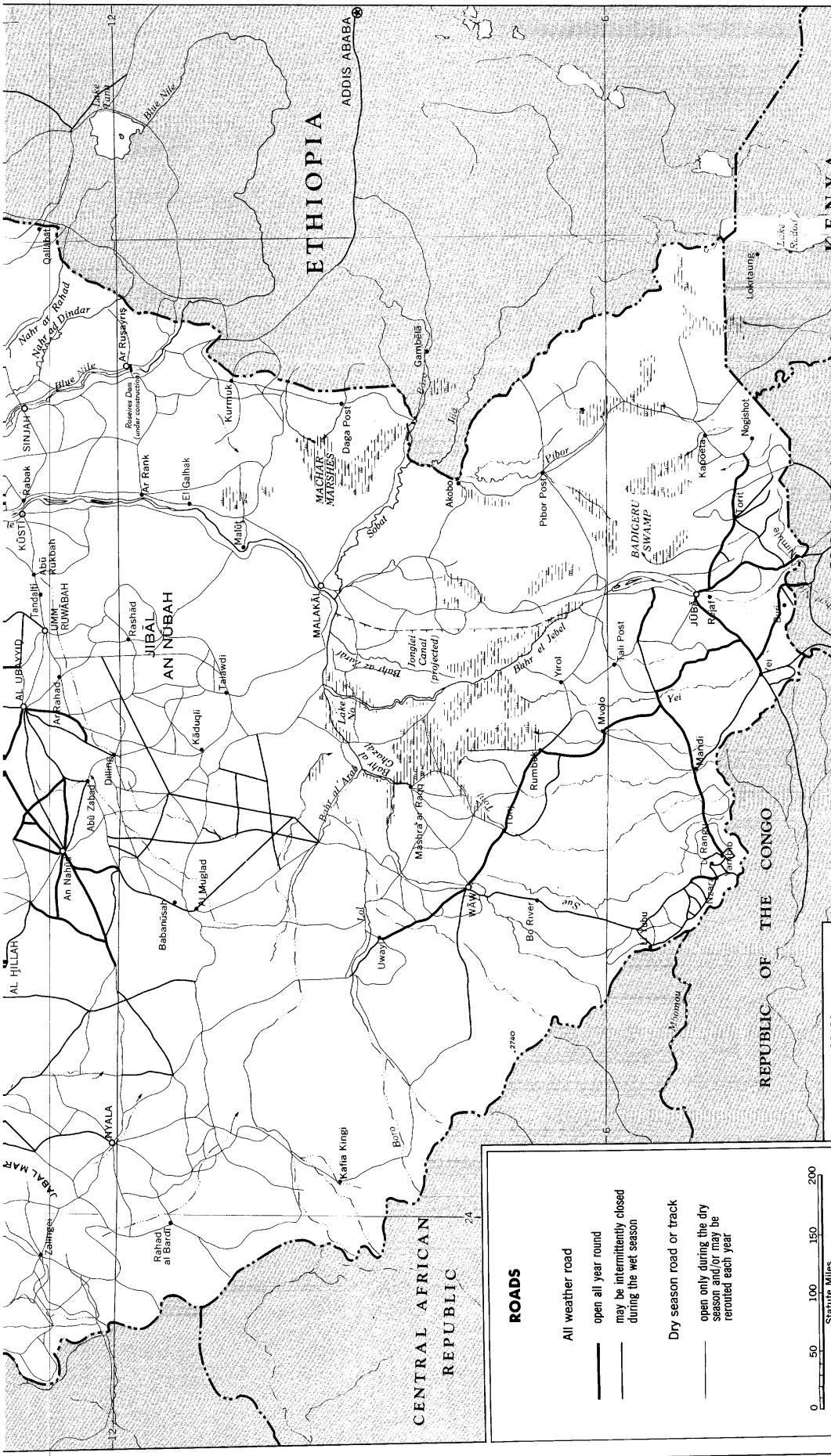
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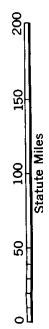
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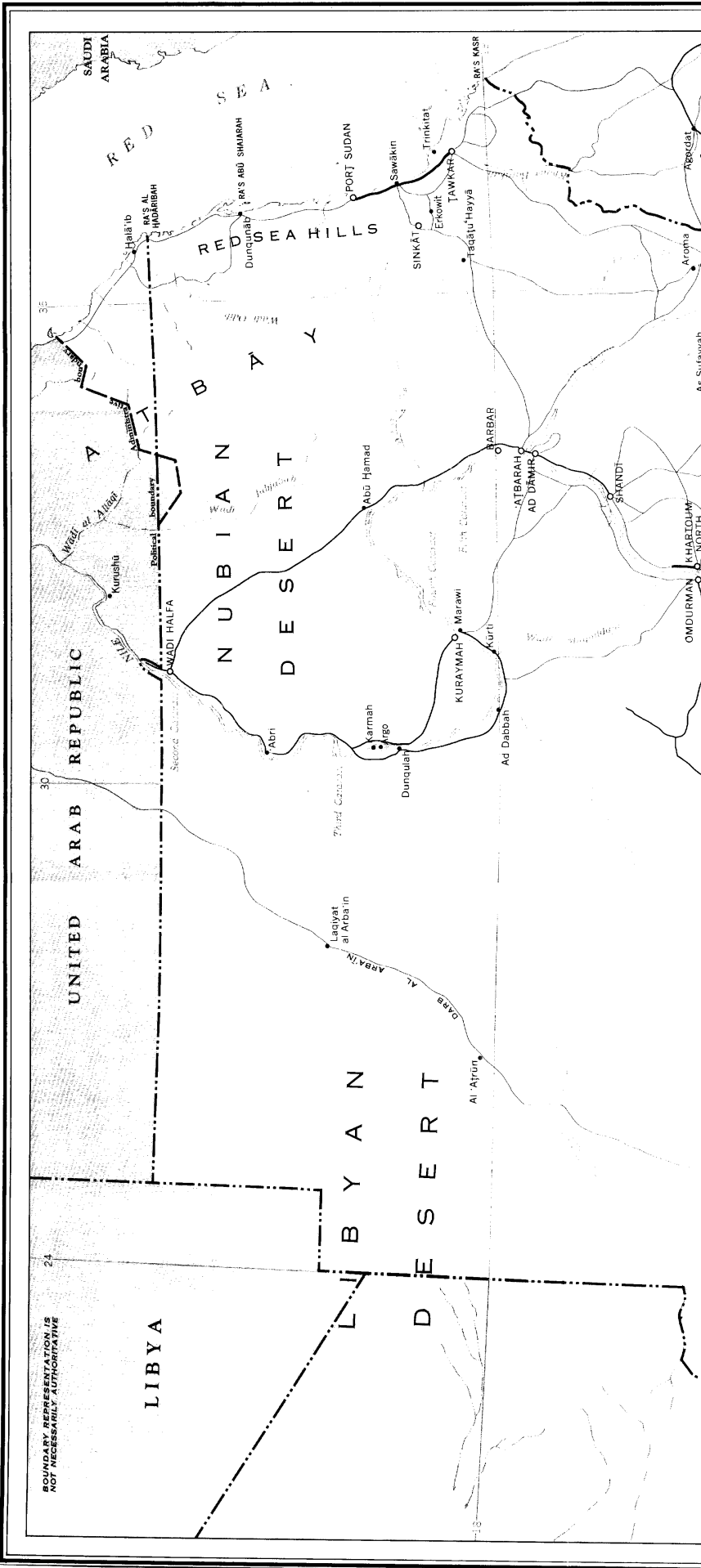


ROADS

- All weather road
- open all year round
- may be intermittently closed during the wet season
- Dry season road or track
- open only during the dry season and/or may be rerouted each year



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VII. Military and Internal Security Forces

A. Introduction

The Sudanese armed forces, totaling about 17,000 men, consist of an army and small air and naval forces. A police force of 10,000 men assists the military organization in maintaining internal security. The military budget was about 15 percent of the national budget for the fiscal year ending June 1963.

The armed forces have no offensive capability and only a limited capacity for defense. The primary mission of the armed forces is to maintain internal security, which they are believed to be capable of doing.

In addition to being President of the Supreme Council of the Armed Forces, Lt. Gen. Ibrahim Abboud is Minister of Defense and Commander in Chief of the Armed Forces. Since he is primarily occupied with his presidential duties, the Deputy Commander in Chief of the Armed Forces, Maj. Gen. Hasan Bashir Nasir, has assumed many of Abboud's military responsibilities.

B. Army

As of March 1963 the army was organized into 12 infantry battalions, one armored infantry battalion, one field artillery regiment, one anti-aircraft artillery regiment, one armored regiment, one engineer battalion, a parachute company, and technical support troops. It is divided territorially into five area commands (see Map 37922 - Order of Battle). The area commander commands all troops in his territory and is responsible to the Deputy Commander in Chief of the Armed Forces. Headquarters are located in El Obeid for the Central Command, Gedaref for the Eastern Command, El Fasher for the Western Command, Shendi for the Northern Command, and Juba for the Southern Command. The Khartoum Garrison is a separate command. Its commander also reports to the Deputy Commander in Chief of the Armed Forces.

Each area command except the Southern Command has three infantry battalions. The Southern Command has no infantry troops of its own but draws one battalion from each of the other four commands. Of the battalions remaining in the parent command, one is kept at full strength. Formerly, troops on duty in the Southern Command were locally recruited, but in 1955 the southern troops mutinied and units from the north put down the rebellion. When order was restored the southern units were disbanded. Battalions from the other commands now stationed there are rotated during the first 2 months of every odd calendar year.

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Figure 45. Sudanese troops training, 1958.



Figure 46. Sudanese paratroopers in aircraft, 1963.

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Each of the nine provinces has a military governor (army) who is directly responsible to the Supreme Council. In a national emergency, all troops in his area would be available to him. The Commandant of Police in each province is responsible to the Military Governor so that, in a national emergency, the police would take their orders directly from the military instead of from police headquarters in Khartoum.

The army is equipped with old materiel, most of which is of British origin. Five Soviet BTR-152 armored personnel carriers are the only known pieces of Sino-Soviet military equipment in the hands of the Sudanese. Artillery consists of British 25-pounder field artillery pieces, 40-mm antiaircraft guns, and 105-mm howitzers. Small arms, including some 7.62-mm US-designed AR-10 rifles, are in adequate supply. The Sudanese have recently received 120-mm mortars and other equipment from West Germany.

A small-arms equipment plant south of Khartoum is capable of fulfilling Sudanese requirements for small-arms ammunition. For all other types of ammunition the country depends on imports. The Ordnance Corps workshops in Khartoum are able to maintain and repair all weapons now in the arms inventory.

The army has an assortment of light tanks, scout cars, armored cars, and personnel carriers of US and UK origin. Maintenance is poor and is handicapped by inadequately trained repairmen.

The Department of Stores and Equipment, an agency of the Ministry of Public Works, procures and distributes supplies for all branches of the government, including the armed forces. The military is dissatisfied with this arrangement and would prefer to form its own logistic organization. An exception to this policy is the one-time procurement of major military items such as vehicles, naval vessels, and aircraft, which are obtained from foreign governments by direct authorization of the Supreme Council. Major logistic weaknesses are poor maintenance, shortage of spare parts, and lack of standardization of equipment.

Within the army itself, logistic support is provided by five technical services: engineers, service (transportation), signal, ordnance, and medical. Heads of the technical services are generally responsible for the supply of materiel associated with the comparable service in the US Army; the only known exception is the assignment of POL supply to the Ordnance Corps.

There were an estimated 2,500,000 males of military age (15-49) as of 1 January 1963. About half of them are considered to be physically fit for military duty. There is no conscription because the number of volunteers exceeds requirements. To enlist, a man must be able to read and write, but many soldiers are almost illiterate.

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The army has no organized reserve nor any known plan for mobilization. Two sources of manpower could be tapped during a national emergency -- (1) an estimated 11,000 men who served in World War II and (2) the boys in secondary schools who receive instruction in close-order drill and rifle marksmanship. The age of the World War II veterans and the limited training given school boys make the value of these sources questionable.

Morale is generally high and is bolstered by the comparatively good pay and social prestige identified with military service. Military service offers a higher standard of living for enlisted men than does civilian life, but the armed forces have difficulty retaining trained specialists, who are in demand in civilian industries. The senior officers are generally satisfied with existing circumstances. An excess of senior officers is developing, however, and this may diminish prospects for promotion and cause dissatisfaction among the younger officers. Duty in the southern areas is unpopular with northern troops because of widely differing backgrounds and mutual hostility between northern and southern Sudanese.

Battalions recruit their own personnel, who are given a 6-month training course corresponding to advanced individual training in the US Army. There is little unit training. The Sudanese Military College at Omdurman is the source of regular officers. Approximately 250 students are now taking the 3-year course. Sudan has no staff college, but selected officers are sent to the service schools of the United Kingdom, United States, Pakistan, and West Germany.

The army is the main support of the present regime, but some sources of discontent within it could possibly lead to a revolt. One is the lack of firm political direction by the present governmental leadership. Another is the recent exposure of corruption in high places. Some officers have been dismissed because of pro-Egyptian activities. The present regime, however, already has survived three attempts at a military coup by the army. The first two, which occurred in March and May 1959, were provoked by personal rivalries. The third was led by junior officers who wanted the army to take a more direct part in the government. Because of the stern measures taken against the leaders, no coups have been attempted since November 1959.

The army as a whole has had no recent combat experience. In 1940 the army engaged in successful hit-and-run warfare against the Italians on the eastern border, and many of the senior officers of today served with the British in the North African Campaign (Tobruk) of World War II. A company-sized unit served with the Arab League in Kuwait, and two rifle companies served with the UN forces in the Congo in 1960-61.

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The Sudanese Army has been influenced by several European nations as well as Egypt and the United States. The United States has trained a few Sudanese officers, and West Germany has trained 40 officers and enlisted men in order to staff the ammunition factory. During its long administration of Sudan, the United Kingdom trained and equipped the Sudanese Army and built most of the present military installations. Military organization, military terms, training and discipline, equipment, and uniforms all strongly reflect British influence.

The main strength of the Sudanese Army is the discipline, courage, loyalty and hardiness of the individual soldier. The main weaknesses are the lack of modern arms and equipment, poor logistics, lack of field unit training, and the low educational level of enlisted personnel.

C. Navy

The Sudanese Navy is a force of about 300 officers and men. Its mission is to patrol the Red Sea coast against smuggling and infiltration, to guard territorial fishing waters, and to assist in maintaining internal security. Combat capabilities are nonexistent. The fleet consists of four Yugoslav-built "Trogir" class patrol boats. Virtually all personnel are assigned aboard the patrol boats, which are currently employed as training ships and operate outside the Port Sudan harbor area and southward to Suakin.

The navy, with headquarters at Port Sudan, is responsible to Armed Forces Headquarters at Khartoum. No formal navy staff organization exists. Shore installations at Port Sudan consist only of barracks, messhalls, and four mooring buoys for the patrol boats. The navy depends on the facilities of a small government-owned shipyard at Port Sudan for ship maintenance and repair services. Sudan has no shipbuilding industry and depends on Yugoslavia for spare parts for the patrol boats.

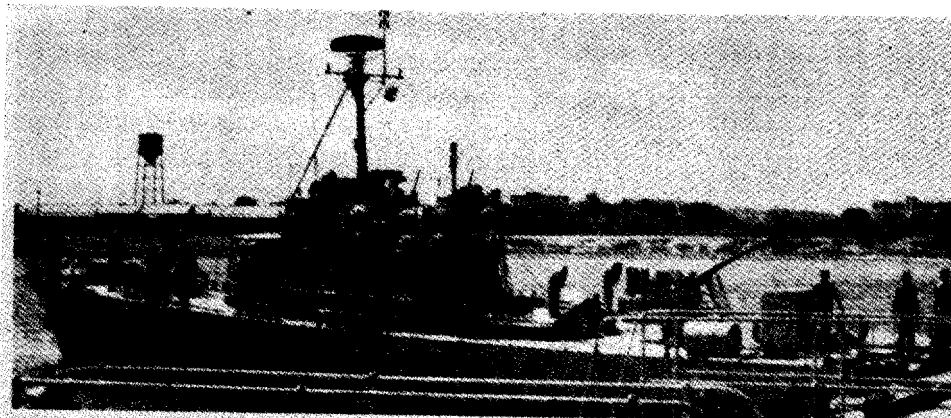
Foreign naval influence comes mostly from Yugoslavia, although some officers have received training in Egypt, Ethiopia, and the United Kingdom. A small Yugoslav naval mission is stationed at Port Sudan. Most of the officer training and all naval equipment have been provided by Yugoslavia. The Sudanese naval uniforms are patterned after those of the Yugoslav Navy.

D. Air Force

The Sudanese Air Force (SAF) consists of approximately 100 officers and men and 16 aircraft based at Khartoum Airfield. Its mission is to help maintain internal security, but the SAF is small, poorly equipped, and inexperienced. The SAF does have some capability for reconnaissance,

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PB 1

1962. Sudan Navy. Official



PB 2, PB 3, PB 4

1962. Sudan Navy. Official

GIHAD	HORRIYA	ISTIGLAL	SHAAB
Displacement:	100 tons		
Dimensions:	115 x 16 1/2 x 5 1/2 feet		
Guns:	1—10 mm. AA. 1—20 mm. AA. 2—7.6 mm. AA. M.G.		
Machinery:	Mercedes Benz diesels 2 shafts. B.H.P. : 1,800	20 kts.	
Radius:	1,400 miles		
Complement:	20 officers and men.		

Notes: Built by Mosor Shipyard, Trogir, Yugoslavia. Of steel construction. First craft acquired by the newly established Sudanese Navy. Length also reported as 90 feet.

Figure 47. The Sudanese fleet.

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punitive ground strafing, and leaflet-dropping missions; and it could develop a modest capability for close support with small bombs and rockets.

Air operations of a wider scope would be limited by lack of technically skilled personnel. Under combat conditions, the functions of command, maintenance, and communications probably would deteriorate rapidly unless the SAF was given foreign assistance. The scarcity of airfields, the lack of adequate logistic support, and the short range of Sudanese aircraft limit countrywide operations. The SAF would be ineffectual against an armed attack by either Egypt or Ethiopia, the only neighboring countries that possess air forces with significant capabilities. The meager military transport capability of Sudan could be augmented during a national emergency by aircraft of the Sudan Airways, the country's civilian airline. The military potential of the Sudan Airways is limited, however, because few of its pilots are Sudanese nationals.

The SAF has 16 aircraft: 4 Jet Provost trainers; 5 piston-engine Provost trainers; 2 light, twin-engine Pembroke transports; and 5 Egyptian Gomhoria trainers. Thirty-five of the approximately 100 military personnel are pilots, and the SAF also employs about 50 civilians, nearly half of whom are British.

In Sudan there are 39 operational airfields with runways 2,000 feet long or longer, but most of them are seldom used. In addition, approximately 47 airstrips either have been abandoned or are less than 2,000 feet long (see Map 37921 - Airfields and Seaplane Stations). For military operations, Wadi Seidna South Airfield (currently inactive) has the greatest potential. This airfield could support limited operations by jet fighters and jet light bombers. The civil airports at Khartoum, Wadi Halfa, and Malakal could be used by B-57 type jet light bombers and jet fighters. Port Sudan, Kassala New, El Fasher, and Juba Airfields are strategically located near the borders of the country and could support medium military air transports and early-model jet fighters. Most of the remaining airfields could support only light transport or reconnaissance operations.

The Sudanese Air Force is entirely dependent on foreign sources for aircraft, spare parts, armament, electronic equipment, and aviation petroleum products. The air logistic system is poor, only the main civil airfields have maintenance facilities, surface transportation is unreliable, and methods of distribution are inefficient. Aviation fuel is in particularly short supply, but in a national emergency it could be augmented by the reserves of private airlines. Petroleum reserves are almost nonexistent except at the major airfields.

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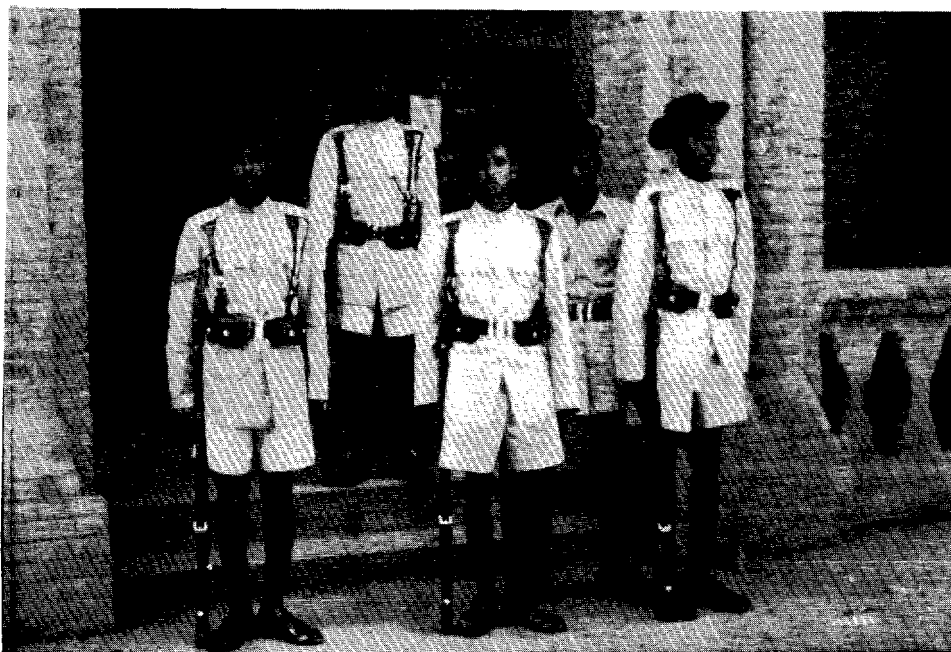


Figure 48. Civil Police, Wad Medani, 1961.

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All air force personnel are stationed at the Khartoum Army Garrison, adjacent to Khartoum Airfield. A plan to move them to Wadi Seidna South Airfield, 12 miles north of Khartoum, is complicated by the need to rehabilitate this World War II installation. Most basic flight training is conducted in the United Kingdom. Training in maintenance is provided by British civilian technicians employed by the SAF.

Foreign influence in the SAF is primarily British, but Egypt, Ethiopia, and Yugoslavia have provided some training.

E. Internal Security Force

The 10,000-man Sudan Police Force is responsible for law enforcement and internal security. Since the tribal chiefs retain authority in the rural areas, most of the police are assigned to the cities and towns. The police are under the command of the Commissioner of Police, who in turn is responsible to the Minister of Interior, but in a national emergency the police would take orders directly from the military. The police force is subdivided into nine commands, one for each of the nine provinces. The headquarters unit, which is located at Khartoum, includes a Criminal Investigation Division and a Special (political) Branch. Small CID units are stationed in each of the other provinces, and a unit of two or three men of the Special Branch is in Equatoria Province.

The police force is responsible for controlling riots, and for protecting government officials, public buildings, communication facilities, and airports. The Sudan Railway Police and the police who are responsible for border security are separate units. The police are considered to have adequate arms, but they lack the transport and communications facilities that would be required to handle any large-scale disorder or sophisticated efforts at subversion. If either situation developed the police would receive support from army units which are situated so as to provide a ready reserve for support to the police in emergencies.

The primary responsibilities of the CID and the Special Branch are to counter subversion whether initiated internally or externally, to direct security procedures for protection of high-level officials, and to prevent sabotage and smuggling.

Largely because of British training, the police have a reputation for efficiency and nonpartisan devotion to duty. They are considered to be completely loyal to the government. A new Police College with modern facilities was opened in Khartoum in 1959, and police officers have been sent to the United Kingdom, Egypt, and West Germany for advanced technical training. Motorized police reserve companies in the principal towns are specially trained for riot control. On the few recent occasions when police have been called upon to disperse mass demonstrations in urban areas, they have performed effectively.

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An Identity Card Act was decreed in 1962 by President Abboud. The Act stipulates that all Sudanese citizens over the age of 16, except those having suitable alternate means of identity (members of the Armed Forces and Police Force, holders of valid Sudanese passports, and students), shall possess identity cards. The Minister of Interior has been given the responsibility for implementing the Act. To date no identity cards have been issued.

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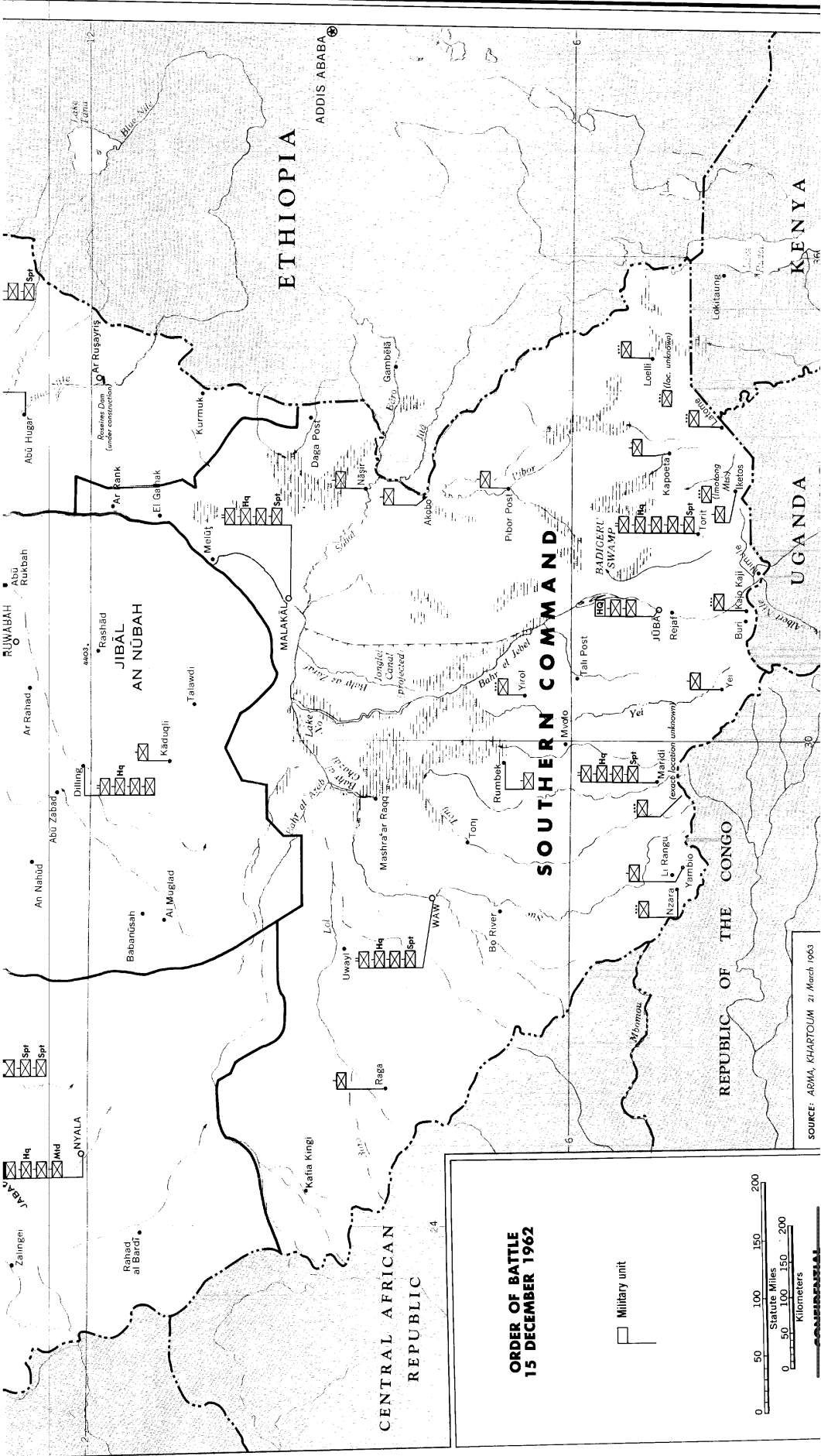
1. CIA. NIS 54, Sudan, sec 18; May 62. S/NO FOREIGN DISSEM.
2. Army, ACSI. Order of Battle Summary, Foreign Ground Forces, Jul 61. S.
3. Ibid., Army Intelligence Digest, 15 Feb 63. S.
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**ORDER OF BATTLE
15 DECEMBER 1962**

□ Military unit

0 50 100 150 200
Statute Miles

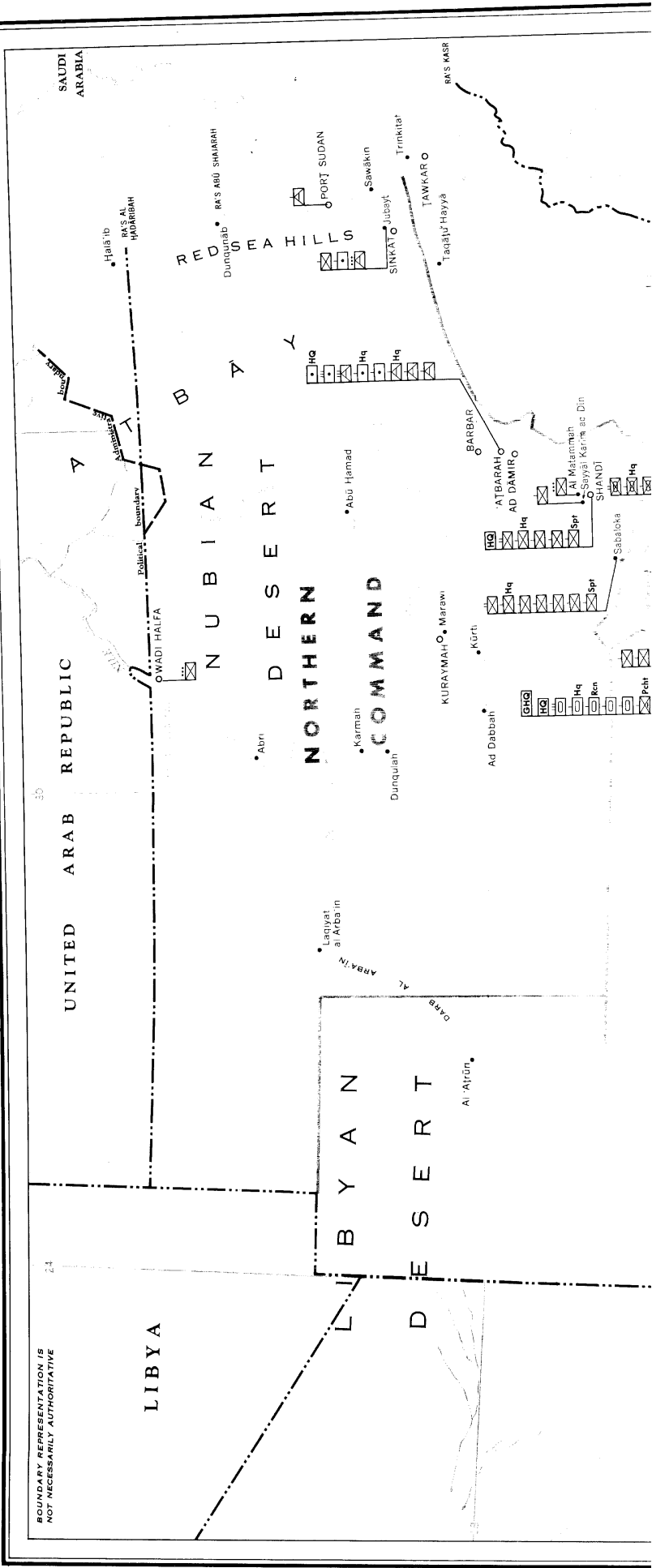
0 50 100 150 200
Kilometers

SOURCE: ARMA, KHARTOUM 21 March 1963

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VIII. Survival Factors

A. Physical

In considering the problems of a man on foot in Sudan, it is convenient to divide the country into three areas: The dry area north of 10° N (the three northernmost regions), the Wooded Upland Region, and the Seasonal Flood Region. Some portions of these areas are relatively densely populated, and some are seemingly devoid of people. Few areas can be considered unpopulated. Local people may turn up when least expected, even in the desert, miles from any track or habitation.

1. Water

By far the greatest single survival problem is to find enough water to sustain life. The whole country is very hot in the daytime all year, and an active person will need several quarts of water per day. In the dry area there is rarely a surplus for the native population, and this is found only in permanent streams or for brief periods after a rain. Sources of water are well frequented by the natives. Particularly towards the end of the dry season both people and animals stay close to the remaining sources of water, and the best places to dig supplementary wells are well known to the natives. If the evader should be lucky enough to find an isolated low spot and digs his own shallow well, he should expect company at any time, particularly if the dry season is prolonged. These marginal sites in the dry area are less likely to be frequented by people in search of water during the season of rains.

Water presents almost no problem in the Wooded Upland Region during the long rainy season, and the dry season is so short that many unfrequented marginal sites are available, especially small swamps and dry stream beds. The Seasonal Flood Region as a whole has an abundance of water even in the dry season, but distances between rivers or swampy areas may be great. The possibility of digging a shallow well through the silt and muck should be investigated before a long overland hike is attempted.

All water must be considered contaminated and should be boiled and chemically treated before drinking. If it becomes necessary to drink unboiled, untreated water, the least contamination will probably be found in a flowing stream unless its banks are densely populated upstream. For years Westerners have drunk the untreated water of the Baro and Sobat Rivers, in which a few natives and animals bathe, and have experienced no ill effects. Water from deep hand-dug permanent wells or from shallow wells dug in a dry stream bed may show equally light contamination. Water in surface pools is least desirable.

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2. Food

Little information is available on living off the land. North of the latitude of Khartoum the desert provides only small animals and very sparse vegetation, but some higher and less dry areas in the desert may be better supplied. For instance, wild sheep, standing nearly 3 feet high, are known to live around the Sabaloka Gorge and in the Meidob Hills and western Red Sea Hills. These sheep do not frequent watering places but get their liquid largely from grass. The area from Khartoum south to the northern borders of the Seasonal Flood and Wooded Upland Regions contains fleet-footed plains animals who must drink every day or two. In this area of semidesert and savanna nearly half the cattle of Sudan and most of the sheep, goats, and camels are raised under varying degrees of watchfulness by their owners.

Food is relatively more plentiful in the two southern regions at all seasons and is easier to acquire in the dry season. When waters are low travel is easier, especially on the floodplain, and at this time both domestic and wild animals return to lowland grazing grounds. The Wooded Upland Region has a concentrated supply of fish in the low rivers and pools, which may be caught by partitioning off a small area with branches and probing in the water with a sharp stick. Around the larger isolated bodies of water and along flowing rivers there is usually a dense bird population -- also interested in the fish. Mango, cassava, palm, and banana grow wild in the Wooded Upland Region. There are many wild animals in this region, and, in extreme cases, they may be the greatest threat to survival. South of 10°N, from Ethiopia west to the Central African Republic, the hunting is excellent; buffalo, waterbuck, reedbuck, antelope, gazelle, warthog, monkey, and many smaller animals abound. "Big cats" are also stalking this game, sometimes on the banks of the Nile. Leopards grow large in the Meidob Hills and Nuba Hills and to the south. Herds of several dozen elephants roam the forest edge or the borders of the Nile swamps.

There is little chance of stealing cultivated crops. They are usually planted near a village or isolated hut and are carefully guarded. In the north, where village dogs are found, any approach to a village garden could stir up a noisy reception. Villagers who plant crops and then move away for a few months in search of better pastures usually leave behind a group to defend the crops.

3. Natural Dangers

An adequate defense is necessary against the heat, which ranges from 110°F and extremely dry to 95°F and very humid. Flies are persistent even in the desert. In humid areas such as the Wooded Upland Region and along the Nile, the swarms of insects that torture men and animals are most numerous at night. Adequate clothing is a Westerner's best

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defense. The native protection is a coating of mud on the body and a smoke-filled shed in which to sleep. This pins down the native population in humid areas at night, when most travel must be done if concealment is desired.

Cobras and vipers are found throughout Sudan, and their bite may be fatal. Scorpions are also found. Their bite, however, is seldom fatal although there may be severe pain along the whole length of an arm or leg for a few hours.

Swamps and rivers may contain crocodiles that sometimes attack a man in the water.

Crossing a river either by swimming or in a boat may be difficult because of the speed of the current. At Juba in April the Nile is very low, yet it flows nearly 10 miles per hour and appears to "boil."

B. Medical

The adverse climate of Sudan, coupled with limited medical resources and very low sanitation and health standards among the people, gives rise to a large variety of infectious diseases. The extension of medical services into remote regions of the country, however, is bringing such diseases as malaria, yellow fever, blood fluke diseases, cholera, smallpox, sleeping sickness, yaws, and syphilis under better control. The effective operation of small forces in isolated areas of Sudan depends to a large degree upon their ability to prevent these infections or, once contracted, to deal effectively with them until evacuation can be achieved.

The principal diseases encountered and other pertinent data are tabulated at the end of this chapter.

The following points will be of use in operations in Sudan:

- (1) The tsetse fly, which spreads trypanosomiasis (African sleeping sickness), is attracted by moving objects, particularly black, brown, or khaki colors. It is repelled by white. The fly will follow its prey some 300 yards from densely wooded stream banks, which makes camping in such areas highly dangerous.
- (2) Scorpions are plentiful. The bite is painful and may cause severe reaction but usually is not fatal to adults.
- (3) Poisonous snakes include the cobra, black mamba, and adder. All are deadly.

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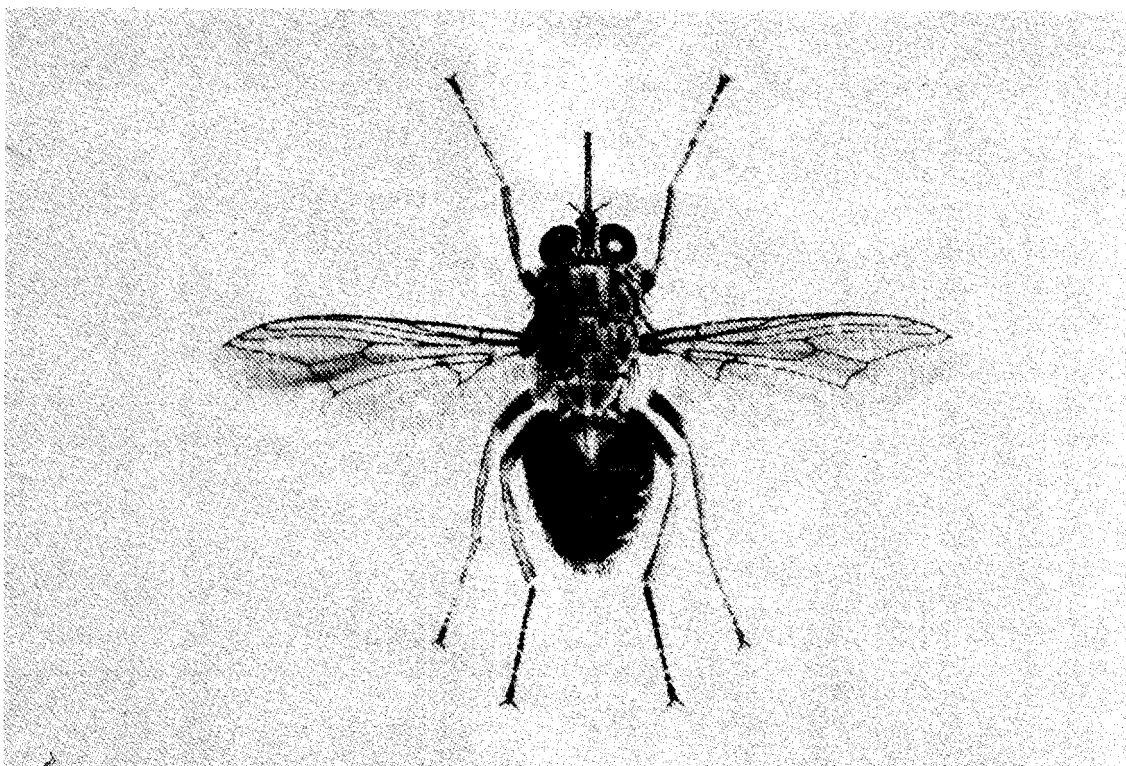


Figure 49. Tsetse fly. The tsetse fly is strong, bristly, and generally larger than the housefly (1/4 to 2/3ds of an inch long). At rest the wings are held flat over the back.

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(4) Jackals and hyenas transmit rabies. The "big cat" danger is obvious. Crocodiles are particularly bad along the Nile, making travel in very light river craft dangerous.

(5) In order to avoid schistosomiasis, or bilharziasis, do not swim in lakes, rivers, or canals.

(6) Filter and boil all water for 20 minutes. Chemical treatment of water is a secondary method. Cook all food thoroughly. Eat foods while they are still hot. Clean and scald all fresh fruits and vegetables, or after cleaning soak in chemical water treatment solution.

Immunizations against the following diseases should be given before departure for Sudan: smallpox, typhoid-paratyphoid, typhus, tetanus, yellow fever, cholera, plague, poliomyelitis. Propamidine, 5 milligrams per kilogram of body weight administered intramuscularly, has provided 3 to 6 months' protection against trypanosomiasis.

Clothing and living areas should be treated as follows:

(1) Impregnate clothing. Use 45 parts benzyl benzoate, 45 parts dibutyl phthalate, and 10 parts detergent emulsifier, or spray the clothing with residual chlorophenothane (DDT).

(2) Dust shoes and socks with DDT 10 percent in inert powder.

(3) Apply insect repellent to exposed skin. Use dimethyl phthalate.

(4) Use DDT aerosol bombs in enclosed spaces (subject to logistic considerations).

(5) Spray ground area with DDT, Dieldrin, or Lindane (subject to logistic considerations), and then sleep off the ground.

Polyvalent antsnakebite serum is available from the South African Institute for Medical Research, Johannesburg. Other recommended medical supplies are included in the table at the end of this chapter. Individual first-aid kits should contain the following: 4-inch x 4-inch battle dressing, adhesive strip dressing, chlortetracycline (Aureomycin) tablets, chloroquine diphosphate tablets, bismuth and paregoric, chap stick, antibiotic ophthalmic ointment, aspirin, water purification tablets, anti-histamine prolonged action tablets, and salt tablets.

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Diseases of Military Importance in Sudan

<u>Disease</u>	<u>Distribution</u>	<u>Carriers</u>	<u>Prevention</u>	<u>Treatment</u>
Typhus ^{a/}	Sporadic	Ticks	DDT powder in clothing	Chloromycetin (6505-160-0495)
Epidemic relapsing fever	Equatoria Province	Ticks	DDT powder in clothing	Chlortetracycline (Aureomycin) (6505-159-6575)
Q fever	North of 120N	Ticks	DDT powder and benzyl benzoate in clothing	Chlortetracycline (Aureomycin) (6505-159-6575) or Chloromycetin (6505-160-0495)
Boutonneuse fever	Widespread	Ticks	DDT powder and benzyl benzoate in clothing	Chlortetracycline (Aureomycin) (6505-159-6575)
Dengue fever ^{a/}	Widespread	Mosquitoes	Mosquito repellent	Bed rest
Malaria, particularly <i>P. falciparum</i> (most serious variety of malaria) ^{a/}	Widespread	Mosquitoes	Mosquito repellent and chloroquine and primaquine phosphates (6505-753-5043)	Chloroquine diphosphate (6505-113-9310)
Filariasis ^{a/}	Widespread, particularly in south	Mosquitoes	Mosquito repellent	Hextrazan (open purchase)
Yellow fever ^{a/}	Widespread	Mosquitoes	Mosquito repellent and inoculation	Essentially none
Trypanosomiasis (African sleeping sickness) ^{a/}	Widespread in south	Tsetse flies	Fly repellent, suramin injection (open purchase), and wearing of white clothing	Essentially none, but propamidine and suramin (open purchase) may have limited use

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(Continued)

<u>Disease</u>	<u>Distribution</u>	<u>Carriers</u>	<u>Prevention</u>	<u>Treatment</u>
Onchocerciasis (skin tumors)	Equatoria Province and along rivers	Flies	Fly repellent	Suramin or hetrazan (open purchase)
Sandfly fever <u>a/</u>	Widespread	Flies	Fly repellent	Essentially none; clears up after a few days' disability
Filariasis <u>a/</u>	Widespread	Flies	Fly repellent	Hetrazan (open purchase)
Kala azar or visceral leishmaniasis <u>a/</u>	Darfur Province, Nuba Hills, and northern Khartoum	Flies	Fly repellent	Neostibosan (open purchase)
Persistent filariasis	Southern Sudan	Gnats	Insect repellent	Hetrazan (open purchase)
Schistosomiasis or bilharziasis (blood fluke diseases)	Widespread	Snails	Avoidance of snail-infested waters or wear- ing of protective clothing	Tartar emetic (open purchase)
Classical typhus	Widespread	Lice	Inoculation	Chlortetracycline (Aureomycin) (6505-159-6575) or Chloromycetin (6505-160-0495)
Epidemic relapsing fever <u>a/</u>	widespread	Lice	DDT powder in clothing	Chloromycetin (6505-160-0495)
Scrub typhus <u>a/</u>	Widespread	Mites	DDT powder in clothing	Chloromycetin (6505-160-0495)
Murine typhus	Widespread	Fleas	Inoculation	Chloromycetin (6505-160-0495)
Rat and dog tapeworm	Widespread	Fleas	Insect repellent	Quinacrine (Atabrine) (open purchase)

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(Continued)

<u>Disease</u>	<u>Distribution</u>	<u>Carriers</u>	<u>Prevention</u>	<u>Treatment</u>
Hookworm <u>a/</u> and roundworm <u>a/</u>	Widespread in south	Unclean water or food	Wearing of shoes and using of clean water and food	Tetrachlorethylene (6505-153-8752) or piperazine (6505-598-8561)
Tapeworm <u>a/</u>	Parts of Equatoria Province and the north in general	Unclean water or food	Cleanliness and well-cooked food	Quinacrine (Atabrine) (open purchase)
Typhoid and paratyphoid fevers <u>a/</u>	Widespread	Unclean water or food	Inoculation	--
Bacillary dysentery	Widespread; very prevalent	Unclean water or food	Clean water and food; sulfa- guanidine (open purchase) if exposed	Chlortetracycline (Aureomycin) (6505-159-6575) or sulfadiazine (6505-146-2200)
Amebic dysentery	Widespread	Unclean water or food	Clean water and food	Diodoquin (6505-116-8590)
Meningitis <u>a/</u>	Widespread	Infected humans	Prophylactic doses of penicillin (6505-237-8480 and 6505-664-7117) or sulfonamides during epidemics	Penicillin or sulfadiazine (6505-146-2200)

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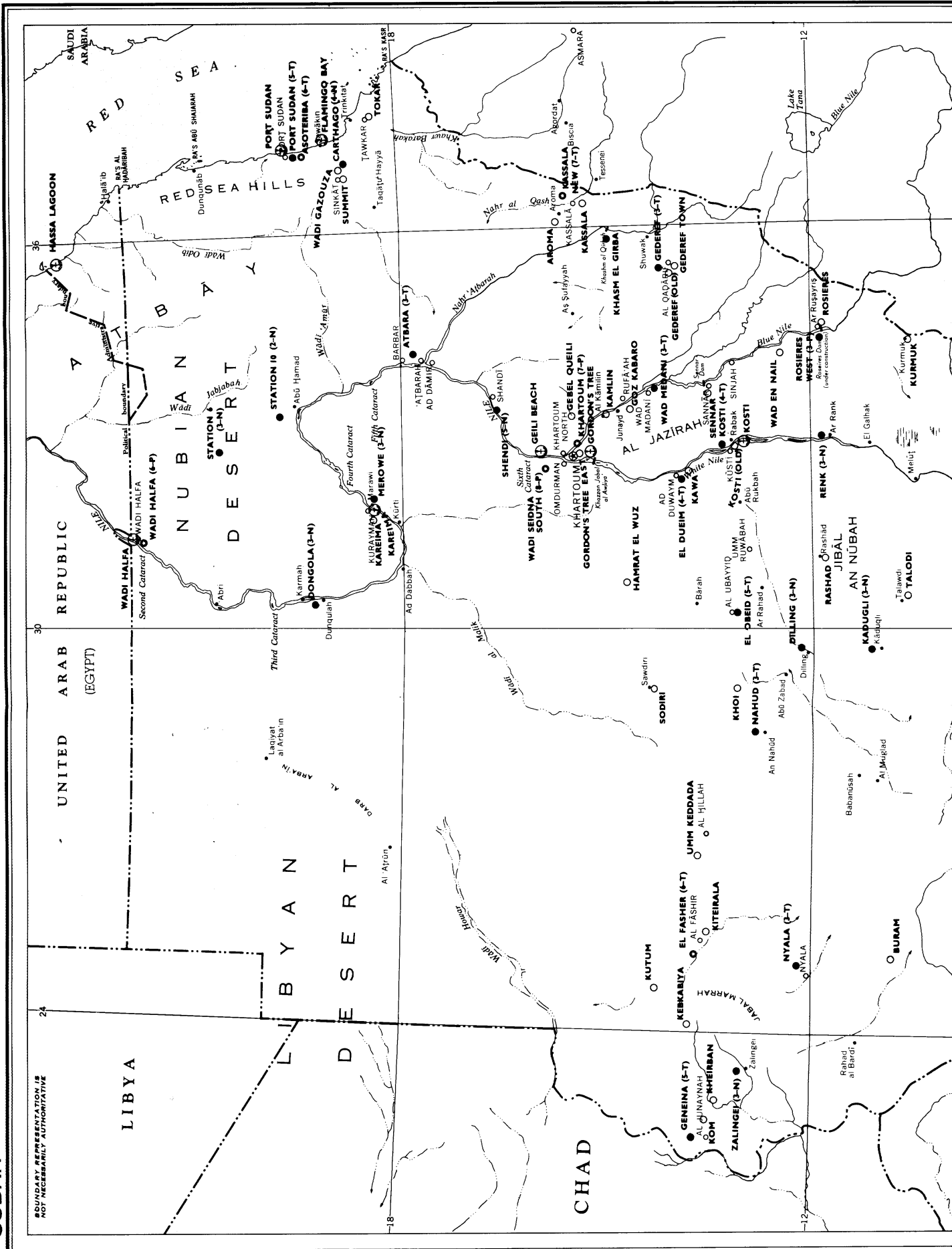
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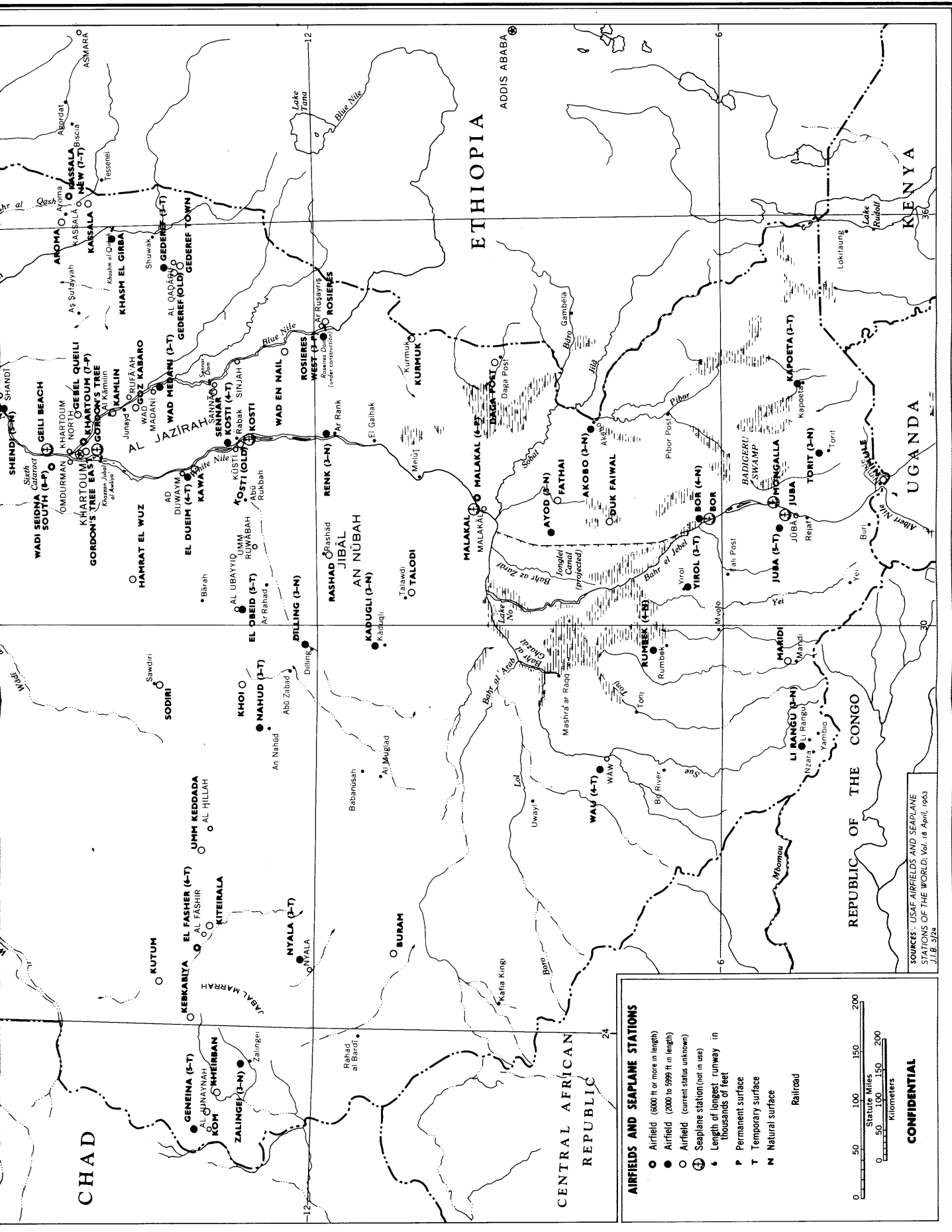
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Diseases of Military Importance in Sudan
(Continued)

<u>Disease</u>	<u>Distribution</u>	<u>Carriers</u>	<u>Prevention</u>	<u>Treatment</u>
Yaws	Widespread	Infected humans	General cleanliness and penicillin (6505-237-8480 and 6505-664-7117)	Penicillin
Syphilis	Widespread	Infected humans	General cleanliness and penicillin (6505-237-8480 and 6505-664-7117)	Penicillin
Rabies	Widespread	Jackals and hyenas	Inoculation	Preventative only

a. Of particular importance to US military forces.





AIRFIELDS AND SEAPLANE STATIONS

- Airfield (6000 ft or more in length)
- Airfield (2000 to 5999 ft in length)
- Airfield (current status unknown)
- ⊕ Seaplane station (not in use)
- ⊕ Length of longest runway in thousands of feet
- P Permanent surface
- T Temporary surface
- N Natural surface

Railroad

0 50 100 150 200
Statute Miles

0 50 100 150 200
Kilometers

SOURCES: USAF AIRFIELDS AND SEAPLANE STATIONS OF THE WORLD, Vol. 18 April, 1963 JLB/SZ

1:500,000 Scale
GPO: 1963 O-500-000

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APPENDIX A

PLACE NAME SPELLINGS (WITH COORDINATES)Part I

<u>Popular Spelling</u>	<u>Board on Geographic Names Spelling</u>	<u>Coordinates</u>
Abu Hamed	Abū Hamad	19°32'N 33°19'E
Al Dabbah	Ad Dābbah	18°03'N 30°57'E
Atbara River	Nahr 'Atbarah	17°40'N 33°56'E
Atbara	'Atbarah	17°42'N 33°59'E
Aweil	Uwayl	8°46'N 27°24'E
Babanousa	Babanūsah	11°20'N 27°48'E
Bahr el Arab	Bahr al 'Arab	9°02'N 29°28'E
Bahr el Ghazal	Bahr al Ghazāl	7°46'N 27°40'E
Bahr el Zeraf	Bahr az Zeraf	14°42'N 31°14'E
Bara	Bārah	13°42'N 30°22'E
Bayuda Desert	Ṣahrā Bayyūdah	18°00'N 33°00'E
Butana, The	Al Buṭanah	15°00'N 35°00'E
Derudeb	Derudeib	17°32'N 36°06'E
Dongola	Dunqulah	19°10'N 30°29'E
Dunqunab	Dunqunāb	21°06'N 37°05'E
El Fasher	Al Fāshir	13°38'N 25°21'E
El Obeid	Al Ubayyid	13°11'N 30°13'E
En Nahud	An Nuhūd	12°42'N 28°26'E
Gallobat	Qallābat	12°58'N 36°09'E
Gash River	Nahr al Qāsh	16°48'N 35°51'E
Gedaref	Al Qadārif	14°02'N 35°24'E
Geneina	Al Junaynah	13°27'N 22°27'E
Gezira	Al Jazīrah	14°25'N 33°00'E
Guneid	Junayd	14°48'N 33°19'E
Haiya	Taqāṭu' Hayyā	18°20'N 36°22'E
Jebel Abyad	Jabal Abyad	20°08'N 30°40'E
Jebel Aulia	Jabal al Awliyā	15°14'N 32°30'E
Jebel Aulia Dam	Khazzan Jabal al Awliyā	15°14'N 32°29'E
Jebel Kuror	Jabal Kuror	20°31'N 31°32'E
Jebel Marra	Jabal Marrah	13°10'N 24°22'E
Jebel Uweinat	Jabal al 'Uwaynāt	21°54'N 24°58'E
Jibal an Nubah	Jibāl an Nūbah	12°00'N 30°45'E
Juba	Jūbā	4°51'N 31°37'E
Karema (Karima)	Kuraymah	18°33'N 31°51'E
Kerma	Karmah	19°38'N 30°25'E
Khashm el Girba	Khashm al Qirbah	14°58'N 35°55'E

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APPENDIX A

Part I (Continued)

<u>Popular Spelling</u>	<u>Board on Geographic Names Spelling</u>	<u>Coordinates</u>
Khor Abu Dom	Wādī Abū Dawm	22°07'N 34°15'E
Khor Abu Habl	Khawr Abū Habl	12°49'N 31°15'E
Khor Baraka	Khawr Barakah	18°13'N 37°35'E
Khor Gash	Nahr al Qāsh	16°48'N 35°51'E
Korosko (Egypt)	Kuruskū (Egypt)	22°36'N 32°20'E
Korti	Kūrṭi	18°07'N 31°33'E
Kosti	Kūstī	13°10'N 32°40'E
Malakal	Malakāl	9°31'N 31°39'E
Meidob Hills	Jabal Maydūb	15°14'N 26°30'E
Merowe	Marawi	18°29'N 31°49'E
Nagishot	Nagichot	4°07'N 33°04'E
Nuba Hills	Jibāl an Nūbah	12°00'N 30°45'E
Rahad River	Nahr ar Rahad	14°28'N 33°31'E
Renk	Ar Rank	11°45'N 32°48'E
Roseires	Ar Rusayris	11°51'N 34°23'E
Sabaloka Gorge	Khāniq̄ as Šablūkah	16°18'N 32°40'E
Sennar	Sannār	13°33'N 33°38'E
Shendi	Shandi	16°42'N 33°26'E
Singa	Sinjah	13°09'N 33°56'E
Source Yubo	Lī Yubu	5°23'N 27°15'E
Suakin	Sawākin	19°07'N 37°20'E
Tokar	Tawkar	18°26'N 37°44'E
Umm Ruwaba	Umm Ruwābah	12°54'N 31°13'E
Wadi Allaqi	Wādī al 'Allāqī	23°07'N 32°47'E
Wadi Amur	Wādī 'Amūr	18°56'N 33°34'E
Wadi Gabgaba	Wādī Jabjabah	22°37'N 33°17'E
Wadi Howar	Wādī Howar	17°30'N 27°08'E
Wadi Malik	Wādī al Malik	18°02'N 30°58'E
Wadi Muqaddam	Wādī Muqaddam	18°04'N 31°30'E
Wad Medani	Wad Medanī	14°24'N 33°32'E
Wau	Wāw	7°42'N 28°00'E

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APPENDIX A

PLACE NAME SPELLINGS

Part II

<u>Board on Geographic Names Spelling</u>	<u>Popular Spelling</u>
Abū Ḥamad	Abu Hamed
Ad Dabbah	Al Dabbah
Al Buṭānah	Butana, The
Al Fāshir	El Fasher
Al Jazīrah	Gezira
Al Junaynah	Geneina
Al Qaḍārif	Gedaref
Al Ubayyīḍ	El Obeid
An Nuhūd	En Nahud
Ar Rank	Renk
Ar Ruṣayriṣ	Roseires
'Aṭbarah	Atbara
Babanūsah	Babanousa
Bahr al 'Arab	Bahr el Arab
Baḥr al Ghazāl	Bahr el Ghazal
Baḥr az Zeraf	Bahr el Zeraf
Bārah	Bara
Derudeib	Derudeb
Dunqulah	Dongola
Dunqunāb	Dunqunab
Jabal Abyaḍ	Jebel Abyad
Jabal al Awliyā	Jebel Aulia
Jabal al 'Uwaynāt	Jebel Uweinat
Jabal Kuror	Jebel Kuror
Jabal Marrah	Jebel Marra
Jabal Maydūb	Meidob Hills
Jibāl an Nūbah	Jibal an Nubah, Nuba Hills
Jūbā	Juba
Junayd	Guneid
Khāniq as Sablūkah	Sabaloka Gorge
Karmah	Kerma
Khashm al Qirbah	Khashm el Girba

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APPENDIX A

Part II (Continued)

<u>Board on Geographic Names Spelling</u>	<u>Popular Spelling</u>
Khawr Abū Ḥabl	Khor Abu Habl
Khawr Barakah	Khor Baraka
Khazzan Jabal al Awliyā	Jebel Aulia Dam
Kuraymah	Karima (Karema)
Kūrṭi	Korti
Kuruskū (Egypt)	Korosko
Kūstī	Kosti
Li Yubu	Source Yubo
Malakāl	Malakal
Marawi	Merowe
Nagichot	Nagishot
Nahr al Qāsh	Khor Gash or Gash River
Nahr 'Aṭbarah	Atbara River
Nahr ar Rahad	Rahad River
Qallābat	Gallobat
Ṣaḥrā' Bayyūḍah	Bayuda Desert
Sannār	Sennar
Sawākin	Suakin
Shandi	Shendi
Sinjah	Singa
Taqāṭu' Hayyā	Haiya
Ṭawkar	Tokar
Umm Ruwābah	Umm Ruawaba
Uwayl	Aweil
Wad Medani	Wad Medani
Wādī Abū Dawm	Khor Abu Dom
Wādī al 'Allāqī	Wadi Allaqi
Wādī al Malik	Wadi Malik
Wādī 'Amur	Wadi Amur
Wādī Howar	Wadi Howar
Wādī Jabjabah	Wadi Gabgaba
Wādī Muqaddam	Wadi Muqaddam
Wāw	Wau

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APPENDIX B

RECOMMENDED MAPS

Topographic maps of Sudan are poor to fair in quality. The largest scale topographic map coverage for all of Sudan is provided by the 1:250,000 series compiled by the Sudan Survey Department. Sheets of this series date from 1930 to 1949, and all later topographic maps have been based on them. The series listed below are all in English and available in quantity at the Army Map Service (AMS).

1. East Africa; 1:250,000; 1930-49. Sudan Survey Department, Khartoum. Entire country covered by 183 sheets. Distributed as Series Y501.
2. East Africa; 1:250,000; 1958-61. U.S. Army Map Service. Area north of 19°N covered by 26 sheets. Distributed as Series Y502.
3. East Africa; 1:250,000; 1960-61. Lands and Survey Department, Uganda. Area south of 4°N covered by three sheets. Covers entire Sudan-Uganda border. Distributed as Series Y503.
4. East Africa; 1:500,000; 1942-49. [British] Directorate of Military Survey. Areas east of 30°N and south of 20°N covered by 31 sheets. Distributed as Series Y401.
5. World; 1:500,000; 1960-61. [British] War Office and Air Ministry. Area north of 20°N covered by seven sheets. Distributed as Series 1404.
6. International Map of the World; 1:1,000,000; 1936-61. Army Map Service. Entire country covered by 17 sheets. Distributed as Series 1301.

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Aeronautical chart coverage of Sudan is complete at 1:1,000,000. The bases were compiled by the US Air Force Aeronautical Chart and Information Center from the 1:250,000 topographic series of the Sudan Surveys Department, British and US nautical charts, and various aerial photographs.

1. World Aeronautical Charts (WAC); 1:1,000,000; base information 1951-61, air information 1953-61. Charts 688-691, 786-788, 810-812, and 909 recommended for Sudan south of 16°N.
2. USAF Operational Navigation Charts (ONC); 1:1,000,000; base information 1960, air information 1961-62. Charts J-5 and J-6 recommended for Sudan north of 16°N.

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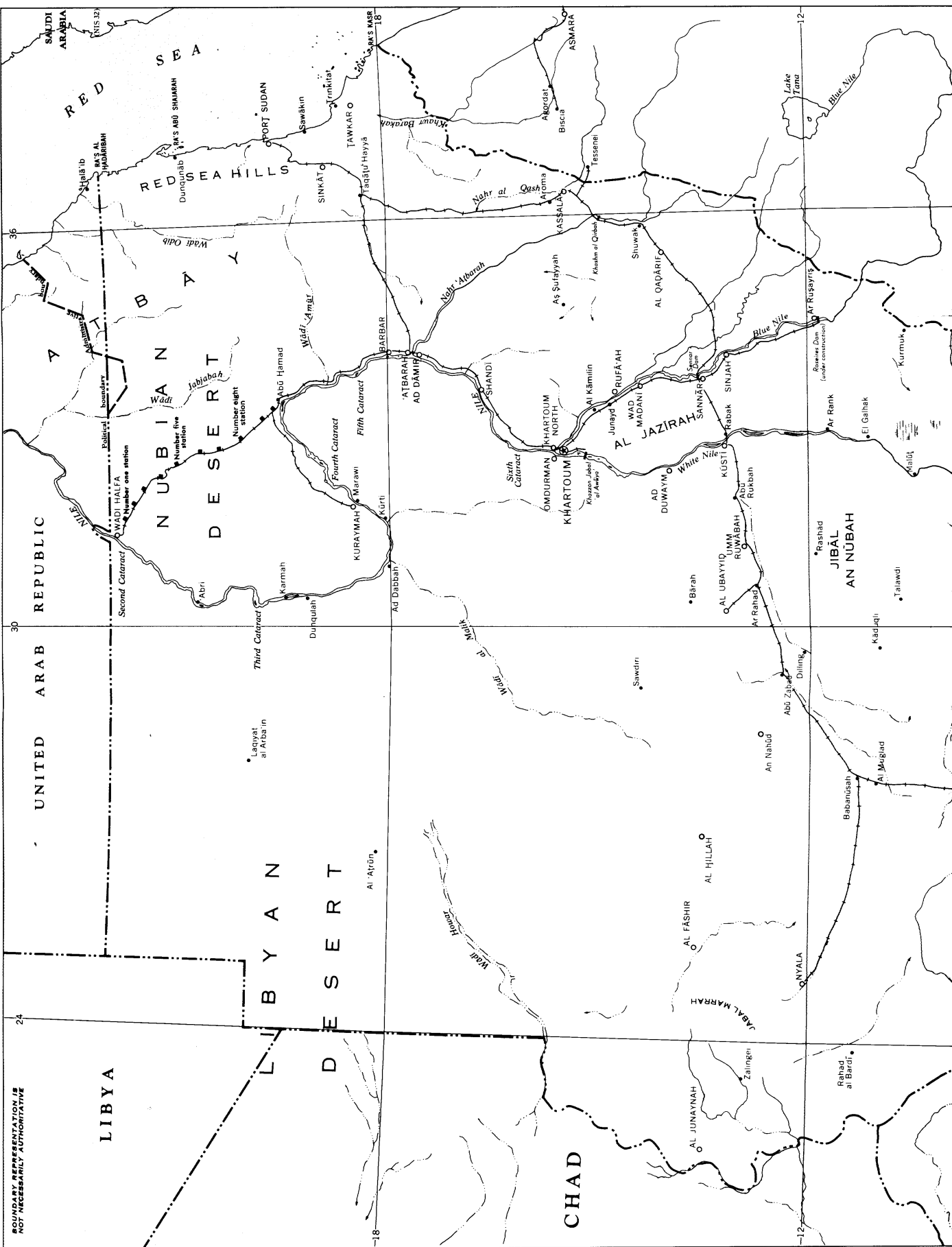
APPENDIX C

RECOMMENDED FILMS

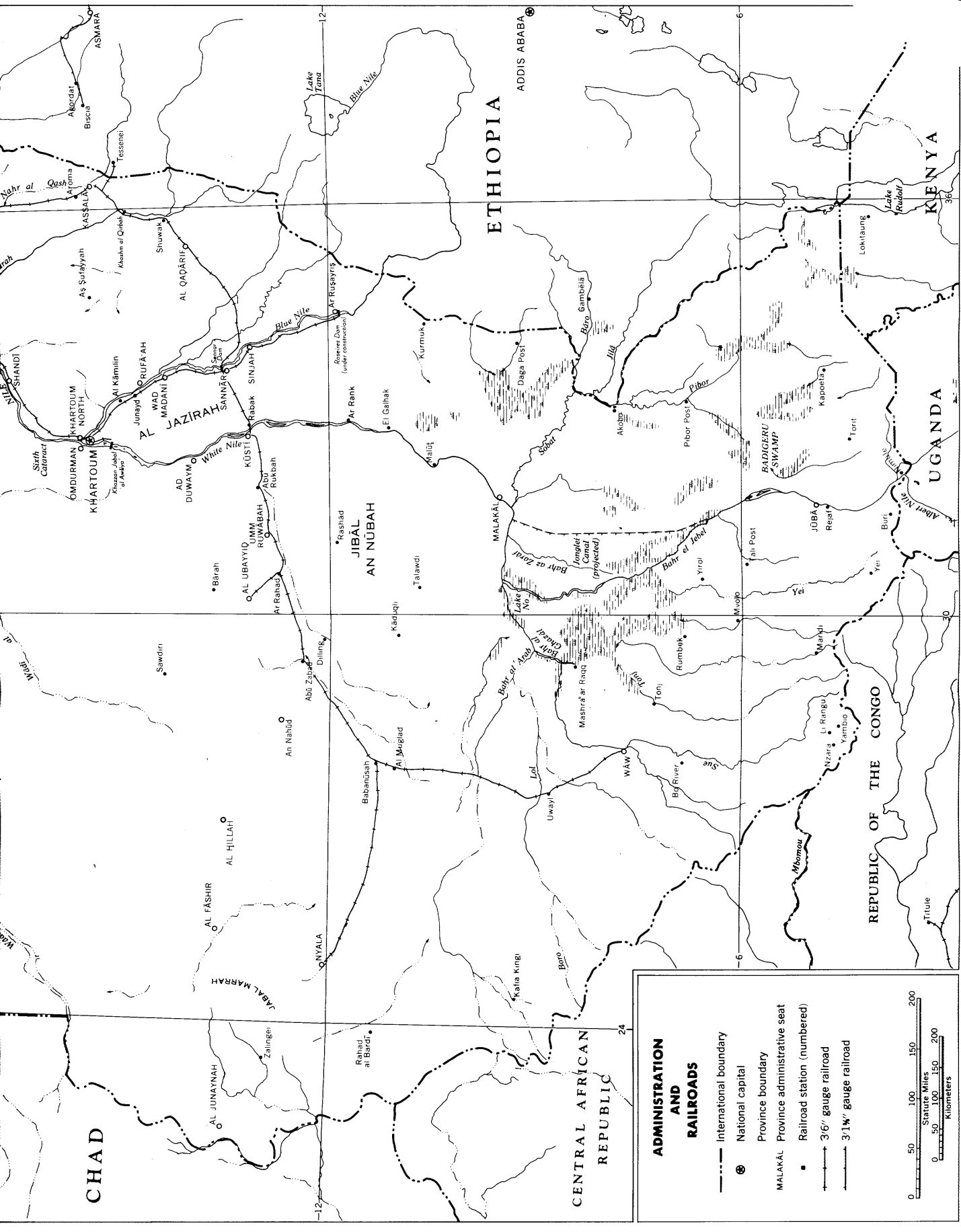
1. Report from Africa (See It Now series), pt II. Edward R. Murrow, CBS-TV, 1956, 16 millimeter, sound, black and white, 10 minutes (Sudan section only). CIA film J6651.
2. Banks of the Nile (Bold Journey series). Julian Lesser, TV, 1957, 16 millimeter, sound, black and white, 31 minutes. CIA film L6882.
3. Sudan Area Study. CBS-TV, 1959, 16 millimeter, sound, black and white, 30 minutes. CIA film M6890.
4. Latuke -- Tribal Life in Sudan. Edgar M. Queeney, Jarville Studios, 1951, 16 millimeter, sound, color, 47 minutes. CIA film J6172.
5. Views from Egypt to Akobi. Amateur travelogue, 1951, 16 millimeter, silent, color, 50 minutes. CIA film G6992.

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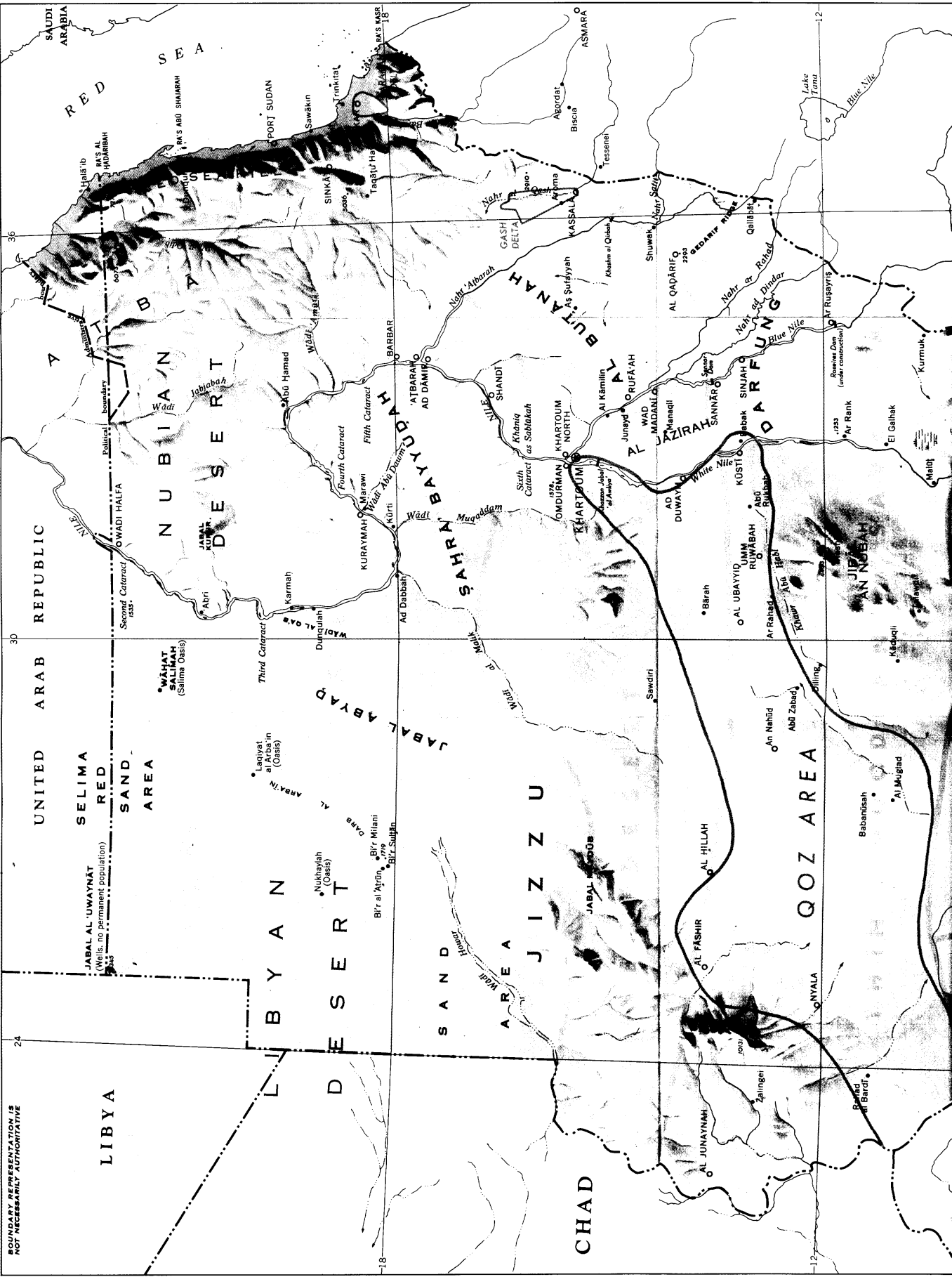
SUDAN



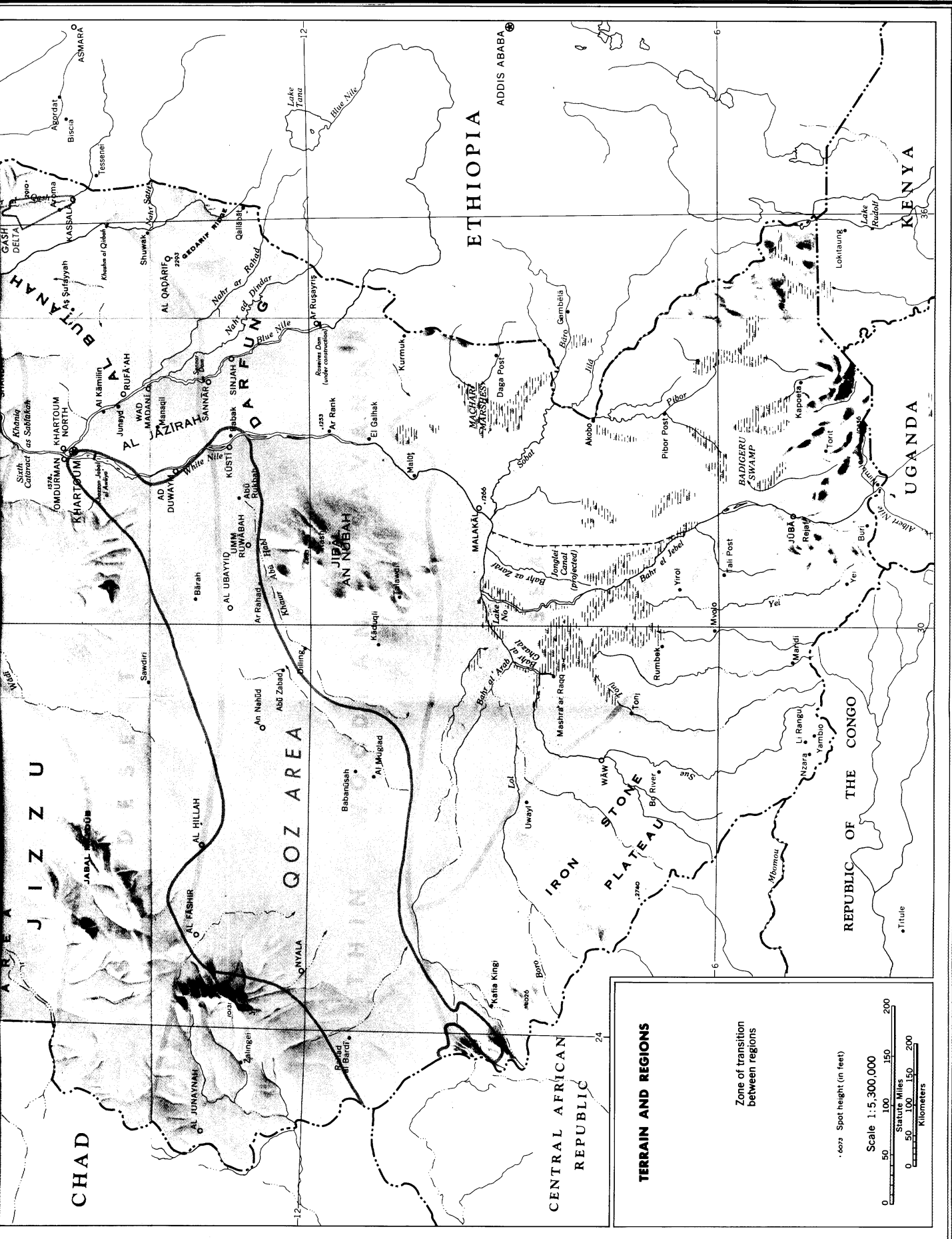
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