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BOARD OF ECONOMIC WARFARE
Blockade and Supply Branch
Reoccupation Division

TO SEE
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LEGAL. WDC
CIVIL Supply/ Health
PUBLIC SAFETY Relief Supply
PUBLIC HEALTH
ENEMY PROPERTY

Head of Branch

SARDINIA

OCCUPATION SURVEY

CONFIDENTIAL

Preliminary

June 1943

TO SEE
AT Col FINANCE/ SAUTER

From War Dept. Liaison Office
Board of Economic Warfare

Capt Grimes

Summary

1. Sardinia is about the size of Maryland, 9,200 square miles. It is one of the least inhabited parts of Italy (total population, 1,034,000). The people are distinguishable in appearance, speech and culture from other Italians.

2. The Sardinian economy is predominantly agricultural. In terms of the normal low subsistence level, the island is almost self-sufficient in foodstuffs; the principal shortages are soft wheat, potatoes, sugar and coffee. There are very few surpluses, except for sheep. To help meet food requirements for civilians and occupying forces, local agricultural production needs to be developed.

3. The island has facilities for butchering livestock, milling flour, baking bread and pressing wine and olives; but the largest facilities are concentrated in Cagliari and are probably damaged. Repairs should be made promptly, in order to stabilize the local economy and provide foodstuffs for civilians and occupying forces. Storage facilities may also require repair, and construction of some additional storage and refrigeration capacity for needs of occupying forces may be necessary. The island lacks glass, wood and fiber containers for local produce.

4. Sardinia's coal production has been rapidly developed in recent years; 1942 production was estimated at 1,800,000 metric tons, which provided a considerable surplus over local needs for the Italian mainland. But the coal is mostly low grade bituminous, and has limited usefulness. Because of the acute fuel shortage which the Allies face in the Mediterranean area, Sardinian coal operations should be put in full repair and provision made for maximum production.

5. Sardinia is a principal source of lead and zinc concentrates for the Italian mainland. Local stockpiles can be used in the United Kingdom and United States; some of the manpower and equipment can be transferred to vital coal mining, especially if lead and zinc operations have been impaired by military action.

6. Annual production of antimony ore yields about 1,200 metric tons of metal. Operations should be maintained to help meet supply needs of United States and United Kingdom.

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7. Iron mining could be discontinued, and salt production reduced, as these two operations have little or no importance in the United Nations' wartime economy. The manpower thus released could be used on more urgent repair and construction work.

8. Standard construction materials are scarce. Occupation needs will require maximum operation of cement and lime plants and probably some expansion. Earth construction (adobe) may hold possibilities as means of meeting some construction needs.

9. The railway and electric power facilities are adequate for the normal Sardinian economy, but damage from military operations will undoubtedly make necessary some repairs.

10. The currency and banking institutions of the island are an integral part of the Italian system. Branches of main Italian banks handle commercial banking. Some small cooperatives extend agricultural credit.

Foreword

This report is a brief, preliminary survey of Sardinia, presented in terms of some of the major economic problems which a United Nations force may expect to meet upon occupation of the area. The purpose of the report is to provide the background of basic data against which these problems should be considered. No attempt is made here to define the problems or to recommend detailed operational procedures to meet them. Such definition and such procedures with respect to the more urgent problems are the subject of other reports in preparation.

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I. MAIN FACTS ABOUT THE AREA: LAND AND PEOPLE

1. Topography and Climate

Sardinia is about 165 miles long and about 90 miles wide. It is slightly smaller than the State of Maryland, comprising about 9,200 square miles.

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The eastern half of the island is almost entirely mountainous. The western half (excepting the mountains of the southwest Sulcis region) is generally lower, more arable, and more developed. The most important feature of the western half is the Campidano, a low fertile plain stretching diagonally from Cagliari on the south coast to Oristano on the west. It is about 60 miles long and averages about 10 miles in width.

The coasts are generally steep and rocky; good ports are few. The leading port is Cagliari, which has ready access to the agriculture of the Campidano and to the minerals of the Sulcis.

The interior of the island, consisting largely of mountains and plateaus, is cut by numerous streams. During the winter rains these become torrents, but during most of the year they are small, and in the summer many are entirely dry. The three largest , the Tirso, the Coghinas, and the Flumendosa, have been dammed for hydro-electric and irrigation purposes, but the dams have recently been subjected to bombing. The lake formed in the Tirso valley is the largest artificial lake in Europe, about 17 miles long. It normally stores about 415 million cubic meters of water. Aside from artificial lakes, the water supply depends largely on springs.

Marshes and stagnant waters are common. These breed malarial mosquitoes, and the danger of malaria is considerable, especially from the end of June through November. In recent years some marshy lands have been the subject of reclamation projects. Outstanding are the Mussolinia project in the Campidano near the Gulf of Oristano, the Victor Emanuel project also in the Campidano, and the Fertilia project in the northwest Nurra region.

The climate is typically Mediterranean, with rainy winters (October to March) and dry, hot summers.

2. Population

The people of Sardinia, called Sards, are generally darker and smaller than Italians. While most of them can speak and understand Italian, they commonly use a native dialect which is not generally understood by Italians from the mainland.1/ In recent years some Italians have settled on the reclaimed lands and in the new coal mining town of Carbonia on the west coast.

According to a census taken in 1936, the population of Sardinia is 1,034,000; it is one of the least inhabited parts of Italy. About half the population live in the southwest province of Cagliari; about one-third live in the northwest province of Sassari; and the balance of about one-fifth live in the large and mountainous east central province of Nuoro, least populated province of Italy.

Most densely inhabited areas are the fertile Campidano and the Sulcis-Iglesiente mining region in the southwest and the Sassari-Alghero region in the northwest. Only around the cities of Cagliari and Sassari does the density of population exceed 100 persons per square kilometer.

Although most of the people are engaged in agriculture, over 90 percent live in towns and villages, sometimes many miles from the fields in which they work.

1/. In and around Alghero on the northwest coast, the Sards are of Spanish origin (from the fourteenth century). In addition to Sard and Italian, they speak Catalonian Spanish.

Principal cities and towns, with their approximate populations, are as follows:

Cagliari	120,000
Sassari	55,000
Iglesias, mining town in the southwest	22,000
Alghero, small port southwest of Sassari	16,000
Tempio Pausania, in the northeast cork producing region	16,000
Oristano, near west coast of the Campidano	15,000
Torralba, south of Oristano	12,000
Nuoro, in the east central region	11,000
Olbia (Terranova Pausania), east coast port	10,000
Carbonia, newly developed coal mining town in the southwest	10,000

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II. AGRICULTURE AND FOODSTUFFS

1. General

Except for a few permanent shortages such as sugar and coffee, Sardinia is fairly self-sufficient in foodstuffs, in terms of the subsistence level and limited dietary habits of the population.

The great majority of the people are engaged in farming, livestock raising, and forestry. Agricultural activity, except for livestock raising, is predominantly in the western half. Main cultivated areas are the Campidano in the southwest, the Trexenta in the south central, and the area around Sassari in the northwest. (See appended vegetation map, showing extent and distribution of grasslands, cereals, woods, and tree crops.)

Only about 20 percent of the land is privately owned, and this is in small holdings. About 40 percent is owned by the State, and the remaining 40 percent by the various communes or counties.

2. Livestock

The most important agricultural asset of Sardinia is its livestock, especially sheep. Extensive grasslands and pastures permit the raising of livestock throughout most of the island.

Official Italian estimates give the following figures for livestock in 1940:

	No. of head	
Sheep	2,130,000	(over 20 percent of the entire Italian flock)
Goats	426,000	
Cattle	229,000	
Hogs	147,000	
Horses	43,000	
Mules and donkeys	50,000	

Livestock and meats are ordinarily available in exportable quantities. In 1938, Sardinia exported about 9,000 heads of livestock and some 3,200 metric tons of meat. The lamb, mutton and pork are considered of good quality, but the beef is apparently second-grade, as the

cattle are small and usually slaughtered late, after being used as draught animals.

Dairying has not been extensively developed. Milk is generally handled by small dairies, except in Cagliari and Sassari.2/ Yet cheese (mostly pecorino, made of sheep's milk) is a major product; in 1938 some 60,000 metric tons were produced, and large quantities exported.

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About 2,000 metric tons of raw wool are annually shipped to the mainland, but much of the local wool (sometimes mixed with goat hair) is used in domestic spinning and weaving; in recent years the Sards have been encouraged to produce a heavy black fabric called orbace, used for winter uniforms of Fascist party members. Untreated sheep and goat skins are normally exported; some skins, however, are treated in local tanneries in Cagliard, Sassari, Bosa and Iglesias. Their production is small, however, and they would have to be expanded, or new tanneries established, if Sardinia's leather needs were to be met locally.

There is very little production of poultry and eggs.

3. Cereals and Grains

Bread, spaghetti and macaroni are the staples of the Sardinian diet; and wheat (mostly hard) is the main crop. More than 240,000 hectares are devoted to wheat growing. Barley, oats and corn, used mostly for fodder, are grown in much smaller quantities. These cereals and grains are found throughout most of the western half of the island and in some few scattered parts of the eastern half. Most intensive cereal production is in the Campidano, Arborea and Trexenta in the southwest and south central regions. Harvests occur in the latter half of June and in July.

Production of cereals and grains for the years 1937-40, inclusive, was approximately as follows:

2/ Because of the danger of Malta fever, the goat milk is not generally safe to drink.

(metric tons)

Crop	1937	1938	1939	1940
Wheat	262,800	296,500	218,000	175,200
Barley	34,700	29,300	32,100	23,300
Oats	24,100	19,700	19,500	18,200
Corn	6,700	5,700	6,300	7,500

The island ordinarily requires and consumes practically all of its cereal and grain crops. However, some barley and oats are exported; in 1938 such exports aggregated about 33,000 metric tons.

While Sardinia satisfies its own hard wheat requirements, it normally depends on some imports of soft wheat flour for bread. In 1938 such imports amounted to about 33,000 metric tons. During the months following the summer harvests, there should be no shortage of any cereals or grains, and a temporary surplus.

4. Wine

Vineyards are found widely through the western half and southern parts of the island and in a few scattered places inland along the eastern coast, particularly in the Ogliastra. Principal production is in the Campidano, around the Gulfs of Cagliari and Oristano, around Sassari and around Bosa. The grape harvest occurs in September and October.

About 34,000 hectares are devoted to vineyards, and production in 1938-40 was approximately as follows:

Product	1938	1939	1940
Wine grapes	119,900 metric tons	87,600 metric tons	80,800 metric tons
Wine	674,000 hectolitres	539,000 hectolitres	483,000 hectolitres

Almost all produce of the vineyards is consumed locally; about 90 percent of the grapes are used for wine, but some are eaten fresh or as dried raisins.

5. Olives and Olive Oil

Olives and olive oil are important in the Sardinian diet, and olive trees are cultivated widely, generally in the same areas where vineyards are found. The harvest is from October through January. About 45,000 hectares

are devoted to this crop, and production in the years 1938-40 was approximately as follows:

(metric tons)

	1938	1939	1940
Olives	43,100	32,700	47,500
Olive oil	7,100	3,100	5,900

This entire production is normally consumed locally.

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6. Vegetables

Sardinian vegetable production is meager, except for potatoes, artichokes, tomatoes, and dried legumes. Figures for production of principal vegetables in 1938 were approximately as follows:

Crop	Metric tons
Potatoes	29,100
Artichokes	18,700
Tomatoes	15,300
Cauliflower	4,600
Cabbages	2,700
Peas	2,100
Onions and garlic	880
Dried legumes	43,000

Harvests are generally from 30 to 60 days earlier than on the continent.

A large part of the artichoke crop is normally exported to the mainland. The potato crop is insufficient for ordinary local needs and some 8,000 to 10,000 tons are normally imported, but other vegetable importations are negligible.

7. Fruits and Nuts

Citrus fruits (mostly oranges) are grown in adequate quantities to provide for local needs. Harvests occur in the late fall and winter. Production figures in 1937-40 were approximately as follows:

	Approximate production in metric tons			
	1937	1938	1939	1940
Citrus fruits	7,300	7,000	7,500	7,000

Other fruits are also found in adequate quantities for local needs, with occasionally a small surplus of 500-800 metric tons. In 1938 production was approximately as follows:

Fruit	Metric tons
Watermelons and cantaloupes	10,700
Pears	6,400
Peaches	2,000
Apples	1,300
Figs	300
Others	300

Almonds and other nuts are a regular crop, but again most of the production is used locally, with a small surplus (mostly almonds) of 600-1,000 metric tons. In 1938, production figures were approximately as follows:

Nuts	Metric tons
Almonds	12,200
Chestnuts	5,800
Others	1,300

8. Fish

In normal times, fishing is an important activity, particularly around the western ports of Carloforte (on the little island of San Pietro off the southwest coast) and Alghero in the northwest. Greatest catch is tuna; lobsters and sardines are also brought in. In 1938 the island exported about 2,200 metric tons of fish and lobsters. However, military and naval operations have undoubtedly interfered greatly with fishing; and as the tuna season is in May and June, no sizable catch can be counted on this year.

Fishing may be less disturbed in the numerous small lakes and brackish ponds near the coasts, where mullets, sole, eels and shellfish are common.

9. Forest Products

Only about 5 percent of Sardinia's total area is wooded. Principal woodlands are in the east central Barbagia region and in the northeast. Chief woods are cork oak, wild olive, and chestnut.

The cork is ordinarily shipped to the mainland; in 1938 exports amounted to about 10,000 metric tons. In the same year the exports of firewood (and charcoal) amounted to about 17,800 metric tons.

The island depends on imports for mining timber and construction lumber. 1489

10. Major Problems of Agricultural Production

Shortages and need for increased production. So far as the civilian population is concerned, there appear to be adequate local resources of meat, fodder, hard wheat, wine, olives and olive oil, green vegetables, tomatoes, fruits and nuts. Principal shortages of food, together with approximate 1938 import figures are as follows:

Shortages	Approximate 1938 imports in metric tons
Soft wheat flour for bread	33,000
Potatoes	7,000
Sugar	3,500
Coffee	600

If fishing is seriously curtailed by military and naval operations, there may also be a shortage of fish and other seafoods.

Concerning food needs of occupying forces, there appear to be local supplies of lamb, mutton, pork and perhaps a little beef, some cereals, and small quantities of tomatoes and green vegetables, fruits and nuts.

To meet food requirements for civilians and to develop supplies for occupying forces at the same time, action must be taken to improve and expand local agricultural production.

Need for planning and enlarging use of land. An over-all crop planning program should be developed as soon as possible, in order to obtain maximum use of agricultural lands. Details of such a program adjustable to whatever special conditions are found on the spot, will be dealt with in a separate report. There will be need to encourage the production of such crops as soft wheat, potatoes and green vegetables, as well as poultry, eggs and dairy products.

In recent years the Italians have prepared and undertaken some plans for agricultural development on the island, including reclamation and irrigation projects. Such plans and projects are being examined, and to the extent that they include practical short-term proposals-as, for example, the drilling of wells and installation of pumps-recommendations will be made concerning them. If military operations have damaged irrigation facilities, attention must, of course, be given to their repair.

Need for farm equipment. One of the major limiting factors in the island's agricultural development is the lack of modern farm equipment. Except in a few areas, notably where land has been reclaimed and is now controlled by interests on the mainland, modern methods and equipment are extremely scarce. The Sards, however, have shown considerable interest in such few mechanical improvements as have been introduced; and, when given an opportunity, they have generally been quick to learn the use of new methods and equipment. With some technical guidance and the introduction of some farm machinery (together with the necessary fuels and lubricants) additional production will be feasible in a relatively short time.

Need for fertilizer. Sardinia has normally depended for phosphates on imports from Tunisia. In 1938, the island imported about 20,000 metric tons of phosphate rock, which was treated with sulphuric acid (locally manufactured) to produce superphosphates at plants in Cagliari. With reference to the supplies of phosphate rock available in North Africa, the question of allocating certain amounts to Sardinia is being examined. Normal imports of chemical fertilizers may also have to be resumed, unless it appears feasible to establish facilities for local production.3/ In 1938, about 5,500 metric tons of chemical fertilizers were imported.

3/ A nitrates plant at Oschiri, in north central Sardinia, operates from time to time, when surplus electric power is available. In some years it has produced nitrate fertilizers in quantities containing about 3,000 metric tons of nitrogen.

III. FOOD PROCESSING AND STORAGE

1. Slaughter Houses

Most of the meat butchering in Sardinia appears to be done on the farms; the rest by commercial or public butchers, of which there are approximately 55 or 60 on the island. The largest slaughter house is in Cagliari; in 1936 it butchered about 1,850 metric tons of meat. Most of the other slaughter houses butchered about 50 metric tons or less.

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2. Flour Mills and Bakeries

Hundreds of small flour mills are located throughout the island; few of them produce more than 100 metric tons a year. There appears to be only one large mill--at Cagliari--which ordinarily produces over 40 percent of Sardinia's total output. In 1936 it produced about 40,000 metric tons out of the total Sardinian flour production in that year of about 100,000 metric tons.

There are 15 or 20 plants in various towns manufacturing spaghetti, macaroni, etc. In 1936, their total production amounted to about 11,000 metric tons. The largest plants are in Nuoro and Cagliari.

There are about 1,200 bakeries, most of them producing less than 500 metric tons of bread a year. However, there are two large bakeries in Cagliari which in 1936 produced a total of about 2,000 metric tons of bread.

3. Wine Pressing

There are about 100 wine pressing establishments in Sardinia, the great majority located in the southwest province of Cagliari. Most of them produce less than 5,000 hectoliters a year, and only two (both in or near Cagliari) produce more than 20,000 hectoliters.

4. Olive Pressing

There are over 200 olive pressing establishments, over half of which are located in the northwest province of Sassari. The four largest plants (three in or near Sassari and one in Nuoro) each produced about 1,000 metric tons in 1936.

5. Fruit and Vegetable Processing

There appear to be no fruit or vegetable canneries on the island, excepting some small plants which manufacture and can tomato paste or puree. In 1936, they produced a total of about 800 metric tons of paste. The principal plants are in or near Cagliari and Sassari.

6. Major Problems of Food Processing and Storing

Need for repair and construction of processing and storage plants. While the food processing facilities of Sardinia are mostly small-scale plants scattered throughout the island, the few large plants, such as the big flour mill, the big bakeries, the big abbatoir, and the big wine plants, are concentrated in or near Cagliari. This port has been the object of such heavy military operations that damage to these important plants may be considerable. Early attention to the repair of such plants will be important, both in stabilizing the local economy and in providing food supplies for civilians and occupying forces.

Storage and warehouse facilities, the biggest of which are located in the large towns and cities, may also require repair. The presence of occupying forces will probably require the construction of some additional storage facilities and probably some refrigeration plants, which the island now lacks.

Need for containers. Sardinia lacks containers. While some ceramic jars are made locally, the island normally imports bottles, barrels, bags, and other forms of containers needed for local produce. Provision will have to be made to supply these needs.

IV. MINERALS

1. Coal

The most important wartime mineral production of Sardinia is coal.

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Principal coal mines are near Bacu Abis in the Gonnesa-Carbonia area in the southwest Sulcis region of the island. The seams are numerous but thin; they vary in thickness from about 1½ to 3½ feet. Operations are by shafts and underground workings. Production has been increased rapidly in recent years (it has been estimated that over 10,000 workers are now employed in the industry) and in 1942 the output of these mines was estimated at about 1,800,000 metric tons. Untapped reserves are estimated at about 300,000,000 metric tons. The quality of this coal, however, is poor; it is a low grade bituminous and has a high content of ash (about 15-20 percent) and sulphur (about 10-15 percent).

The coal is washed at Serbariu, where a new large plant has a capacity of about 8,000 metric tons. Part of the coal is coked at a plant at Palmas Suergiu. Another coke works near Sant' Antioco was built to treat 100,000 metric tons annually, to yield 72,000 metric tons of semi-coke, 7,500 metric tons of tar and 5,000,000 cubic meters of gas. The mines and plants are connected by rail with Porto Ponte Romano (the new port of Sant' Antioco) and with Cagliari.

In addition to soft coal, a small amount of low grade anthracite, estimated at about 50,000 metric tons a year, is mined near Seui in south central Sardinia. It is used almost entirely for local lead smelting.

The great bulk of Sardinian coal is of such poor quality that its utility is limited; but it is used by the Italian Navy, by some railroads and power plants, by some other industries and for domestic heating.

Need to repair mines and plants. In most parts of the Mediterranean area there is an acute fuel shortage. As the Allies extend their occupation in this area, their need for coal will become increasingly urgent. Military operations have undoubtedly interfered with coal production and washing in Sardinia. Repairs to the mines themselves, if they are flooded or otherwise damaged, and to the plants, as well as to transport and power facilities, will required early attention.

Need to increase coal production. Measures should be taken not only to resume all coal operations but also to increase

production and washing as much as possible, in order to help meet the critical shortage which faces the Allies in North Africa, on the nearby islands, and in the southern parts of the continent.4/ Prompt consideration should be given to the introduction of such methods, machinery and personnel as may be found necessary to achieve this objective. A separate report is in preparation concerning problems of Sardinian coal production.

2. Lead and Zinc

Sardinia is Italy's chief source of lead and zinc. The principal mines are within a radius of about 26 miles of Iglesias in the southwest part of the island, around Montevecchio, Malacalzetta, Monteponi and Iglesias itself. Small quantities are also obtained from a few scattered mines around Muravera in the southeast Sarrabus region and from the Argentiera mine in the northwest Nurra region.

The ore is crushed and washed locally to produce concentrates. In this form Sardinia's total annual production is estimated at about 80,000 metric tons of lead concentrates (averaging 60 percent lead content) and about 160,000 tons of zinc concentrates (averaging about 45 percent zinc content).

Of the lead concentrates, about 55,000 to 60,000 metric tons are smelted on the island in smelters located principally at San Gavino Monreale (about 13 miles east of Montvecchio) and near Iglesias. These smelting plants are believed to produce respectively about 28,000 and 10,000 metric tons of refined lead a year, or a total of about 38,000 metric tons.

Of the zinc concentrates, some are treated in an electrolytic zinc refinery located at Monteponi, which is believed to produce about 8,000 metric tons of refined zinc a year.

Use of stockpiles. If stockpiles of lead and zinc concentrates and refined metals are found in Sardinia, they can be used in the United States and United Kingdom in place of, or in addition to, such metals now shipped over longer sea routes. Although the United States and United Kingdom are the world's major lead and zinc producers, both countries now import some additional quantities of these metals, the largest United States imports being lead and zinc from South America and lead from Australia, while the largest United Kingdom import is zinc from Canada and Australia.

4/ Military activity has slowed the usual flow of Sardinian coal to the Italian mainland, and some stockpiles may be found on the island.

Desirability of transferring some manpower and equipment to coal mining. If the Sardinian lead and zinc mines, washeries or smelters, etc., are seriously damaged, there may be considerable unemployment and dislocation of this aspect of the island's economy. In this event, and probably in any event, some of the manpower and equipment in the lead and zinc mines could be transferred temporarily or indefinitely to the work of increasing vital coal production, rather than attempting to restore or continue full scale production of lead and zinc.

3. Antimony

Antimony ore is found in a few small mines near Villasalto in southeastern Sardinia. Production (metal content) in 1938 was 307 tons, in 1939 was 370 tons, and is now estimated at about 1,200 tons. Smelting capacity near the mines is believed sufficient to treat about half of the production.

Need to maintain operations. If the antimony mines or smelting facilities in Sardinia are damaged, they should be put back in operation in order to help meet needs of the United Nations for antimony. The United States depends on imports for more than half of its wartime antimony requirements. The United Kingdom also needs this metal.

4. Iron

About 200,000 metric tons of low grade iron ore (metal content 30-40 percent) are mined in the northwest Nurra region.

Desirability of transferring manpower to more urgent work. The Sardinian iron production would be of no importance in the United Nations' supply situation, and consideration should be given to the desirability of closing the iron mines and transferring the miners to work on roads and other military needs in the area.

5. Salt

Salt is obtained in Sardinia through the evaporation of sea water. The largest evaporating facilities are around Cagliari. Exports in 1938 amounted to about 350,000 metric tons.

Desirability of transferring some manpower to more urgent work. Consideration should be given to the desirability of transferring some of the manpower in the salt industry to the work of repair and reconstruction around Cagliari.

6. Miscellaneous

Small quantities of other minerals and metals are found in Sardinia: copper at Fontana Raminosa in central Sardinia and at Cala Bona near Alghero; manganese on the little island of San Pietro off the southwest coast; and negligible quantities of tin and silver.

V. CONSTRUCTION MATERIALS

Standard construction materials are scarce on Sardinia. Building lumber is imported. Granite and slate, however, are found widely throughout the island in substantial quantities, particularly in the central and eastern parts. (See map on geology.)

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There are several cement and lime plants, notably those at Cagliari and Olbia; and some bricks are manufactured, principally at Oristano and Iglesias. The largest cement plant at Cagliari produced about 80,000 metric tons of cement in 1938; other production figures are not available. Construction needs incident to occupation will require maximum operation of all cement plants, and probably some expansion.

The use of dried mud bricks or adobes is common in the Campidano, especially in and around Oristano.

VI. RAILROADS AND ELECTRIC UTILITIES

1. Railroads

There are two railway systems in Sardinia, a standard gauge system and a narrow gauge system (3 feet 1 3/8 inches). No part is electrified; they are operated largely, if not entirely, on local coal.

The standard gauge system, operated by a division of the Italian State Railways, with headquarters in Cagliari, comprises about 250 miles of line. The main line runs the length of the island from Cagliari to the northwest port of Olbia; branch lines extend to Iglesias, Sassari and Porto Torres.

The narrow gauge system, operated by three different companies with headquarters respectively at Cagliari, Iglesias and Sassari, comprises about 700 miles of lines. The narrow gauge lines connect with the standard gauge at Cagliari, Sanluri, San Gavino Monreale, Macomer, Chilivani, Monti, Olbia; at Sassari; and at Iglesias and Siliqua. The railways, especially in the mountainous regions, are marked by steep grades, sharp turns and wide detours.

2. Electric Utilities

Power production and distribution in Sardinia is controlled by the Societa Elettrica Sarda.

Electricity is generated chiefly by four plants, of which two are hydro-electric and two are steam. These feed a high voltage grid connecting Cagliari, Sassari, Sant'Antioco and the principal mining districts.

The four main generating plants are as follows:

Location	Type	Installed Capacity
Santa Chiara d'Ula, on the Tirso River	Hydro	30,000 KW
Coghinas, about 9 miles southwest of Tempio Pausania on the Coghinas River	Hydro	27,000 KW
Santa Caterina, in the southwestern corner of the island, opposite Sant'Antioco	Steam	20,000 KW
Cagliari	Steam	26,000 KW

A new, large hydro-electric plant on the Flumendosa River is believed to have been recently completed. No information concerning its capacity is available.

Important substations are located at Busachi, a few miles down the river from the Santa Chiara d'Ula plant, and at Guspini, about 16 miles northeast of Iglesias. 148

VII. CURRENCY AND BANKING

Sardinia's currency and banking institutions are an integral part of the Italian system. The currency in circulation is the Italian lira, and consists of bank notes issued by the Bank of Italy and state notes and coins issued by the Italian Treasury. All notes and coins are printed or minted in Rome.

Far-reaching and strict control over all banking operations is exercised by a special Inspectorate or control agency (Ispettorato per la Difesa del Risparmio e l'Esercizio del Credito) which operates chiefly through the branch organizations and personnel of the central bank and sole bank of issue, the Bank of Italy (Banca d'Italia). In Sardinia this bank maintains one branch in the capital of each province, at Cagliari, Sassari, and at Nuoro.

Commercial banking facilities on the island are provided largely by branch offices of the main Italian banks. The Credito Italiano maintains branches at Cagliari, Sassari, Nuoro, Iglesias, Bosa, and Oristano; the Banco di Napoli at Sassari, Nuoro, and Oristano; the Banca Commerciale Italiana at Cagliari and Sassari, Nuoro, and Oristano; the Banca Commerciale Italiana at Cagliari and Sassari; the Banca Nazionale del Lavoro at Cagliari; and the Banco di Roma at Cagliari.

There are no important local banking institutions. To fill local agricultural credit requirements, some cooperatives have been established. The only one of any size is the Banca Popolare Cooperativa Anonima di Sassari (capital one million lire) which operates in the province of Sassari. The Instituto di Credito Agrario per la Sardegna, an agricultural lending agency in Sassari, is also authorized to receive deposits, because of the scarcity of other banking facilities.

Savings are also collected by the Government Post Office, which in turn conveys these funds to the Deposit and Loan Bureau in Rome, an agency of the Italian Treasury.

For details on currency, banking and exchange control in Italy (including Sardinia) and for recommendations in this field, see BEW Report No. RR-53, CURRENCY AND BANKING PROBLEMS OF OCCUPATION IN ITALY.

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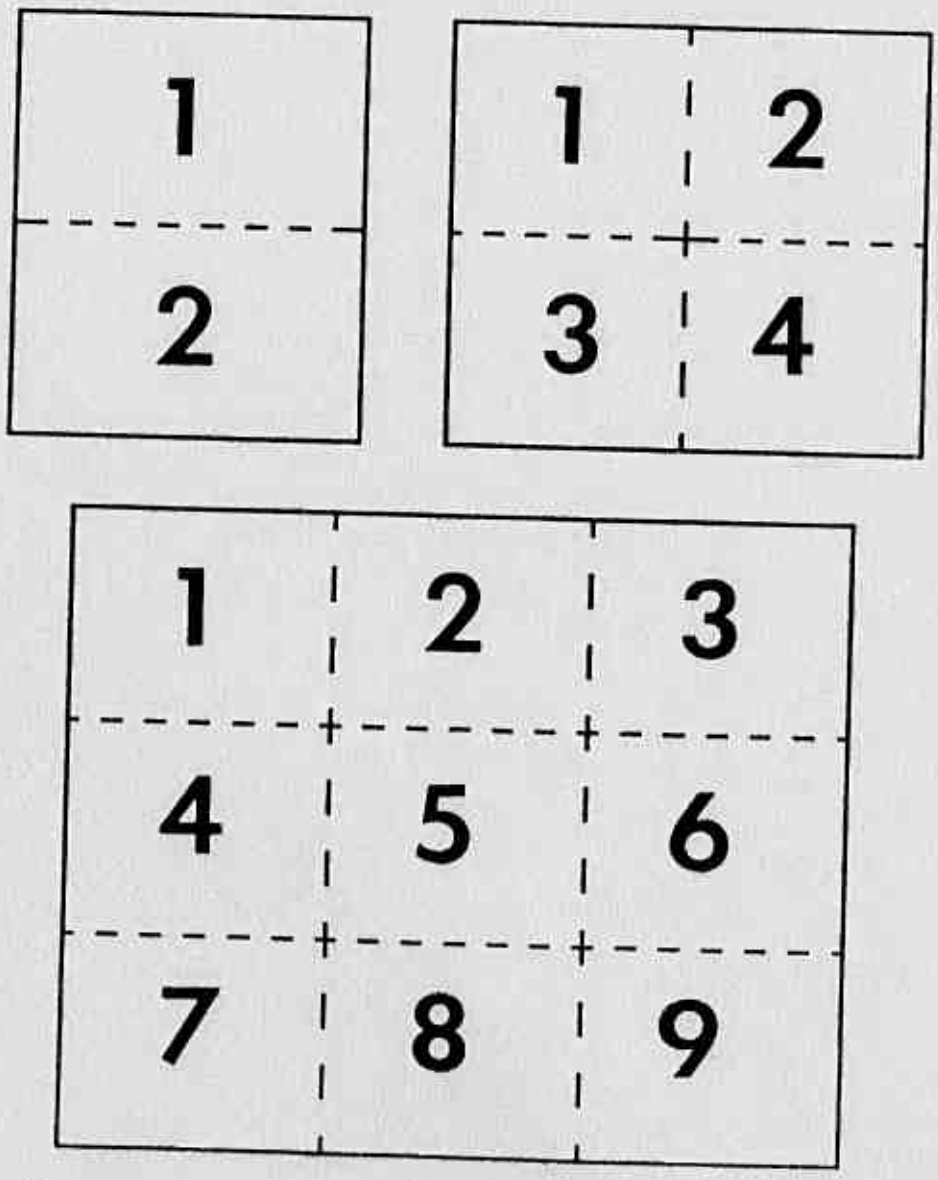
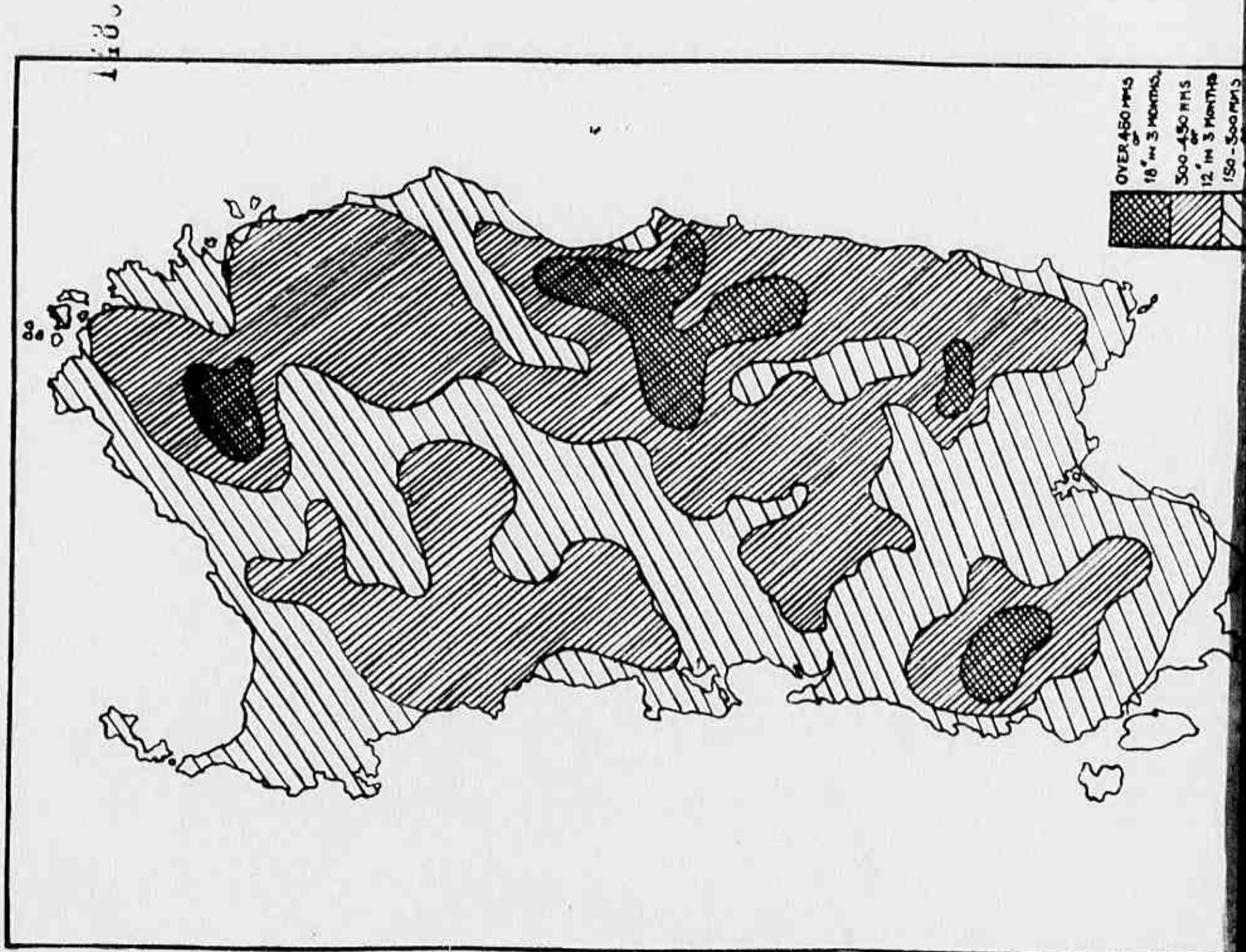
SEE DIAGRAMS BELOW.





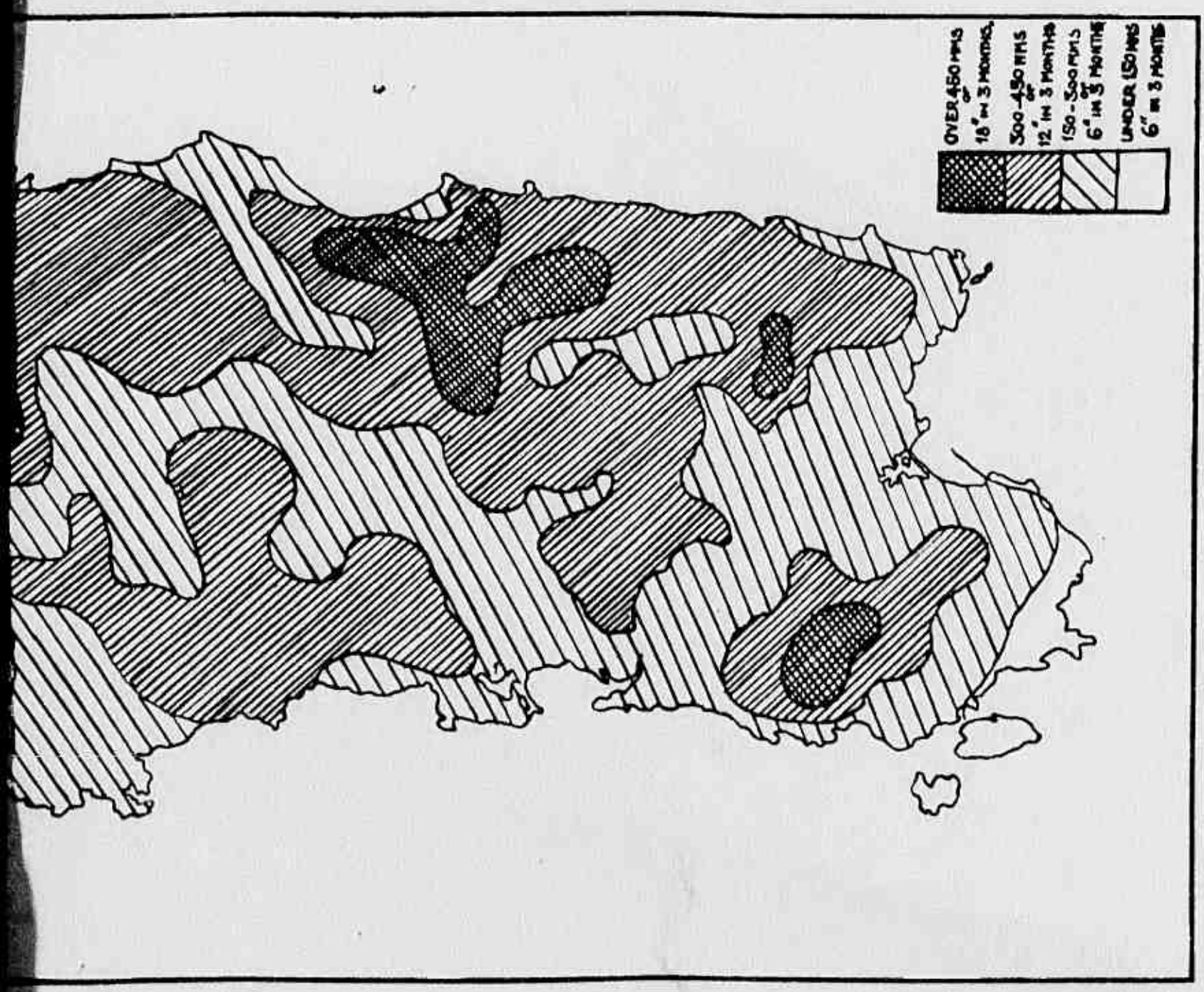


FIG. 10. Mean rainfall in winter (Dec., Jan., Feb.)

SARDINIA

MONTHLY RAINFALL (inches)

Station	Lat.N.	Long.E.	Altitude (feet)		J.	F.	M.	A.	M.	J.	J.	A.	S.	O.	N.	D.	Year
Sassari	40°43'	08°33'	735	(a)	2.2	2.1	2.2	2.2	1.6	0.5	0.2	0.2	1.8	2.5	3.6	3.9	23.0
				(b)	2	0.5	1	1	1	0.3	0.3	0	0.7	3	4	4	18
Ozieri	40°34'	08°59'	1,280	(a)	2.6	2.7	2.3	2.3	2.0	1.1	0.9	0.5	2.3	2.6	3.3	3.6	26.4
				(b)	3	0.7	2	3	2	0.5	2	0	2	3	3	3	24
Orosei	40°21'	09°40'	62	(a)	2.4	1.9	1.8	1.1	0.9	0.2	0.2	0.1	0.9	2.7	2.9	4.6	19.7
				(b)	2	0.7	2	1	1	0	0.5	0.3	0.7	3	2	2	15
Desulo	40°04'	09°14'	3,018	(a)	5.9	7.6	6.5	5.9	3.7	1.0	0.6	0.2	2.0	3.9	6.1	8.0	51.4
				(b)	6	5	6	4	4	0.7	0.5	0.3	0.7	3	7	7	42
Nurri	39°43'	09°13'	1,831	(a)	4.2	3.9	4.1	3.8	2.2	0.8	0.7	0.1	2.0	3.3	3.8	4.6	33.5
				(b)	3	2	3	3	3	0.5	1	0	2	3	5	5	31
Cagliari	39°19'	09°06'	239	(a)	2.0	1.7	1.9	1.5	1.2	0.7	0.1	0.2	1.4	2.5	2.8	2.2	18.2
				(b)	1	1	2	2	2	0	0.5	0	1	3	1	2	15
Carloforte	39°08	08°19'	59	(a)	1.9	1.9	1.8	1.5	1.4	0.8	0.2	0.3	1.5	3.0	3.0	2.5	19.8
				(b)	0.5	0	0.7	1	1	0	0.3	0	1	1	4	1	11

(a) Average monthly rainfall in inches
(b) Days with 0.4 inches (10mm.) or more of rainfall

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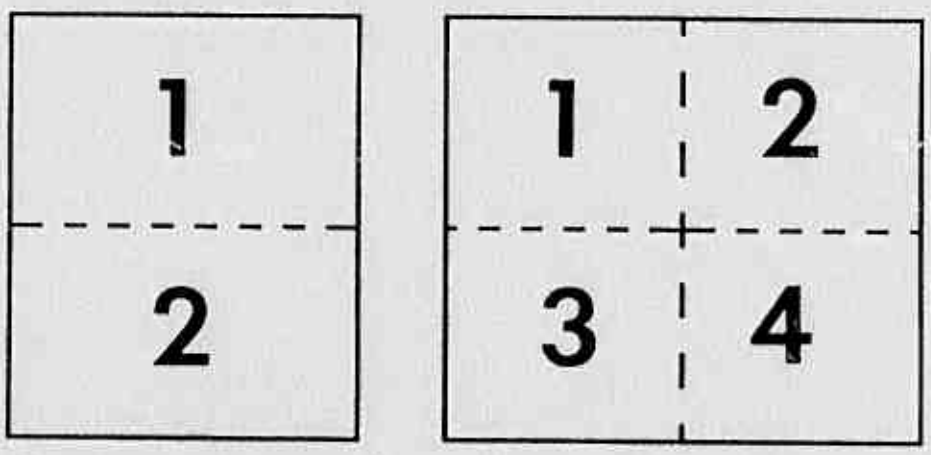
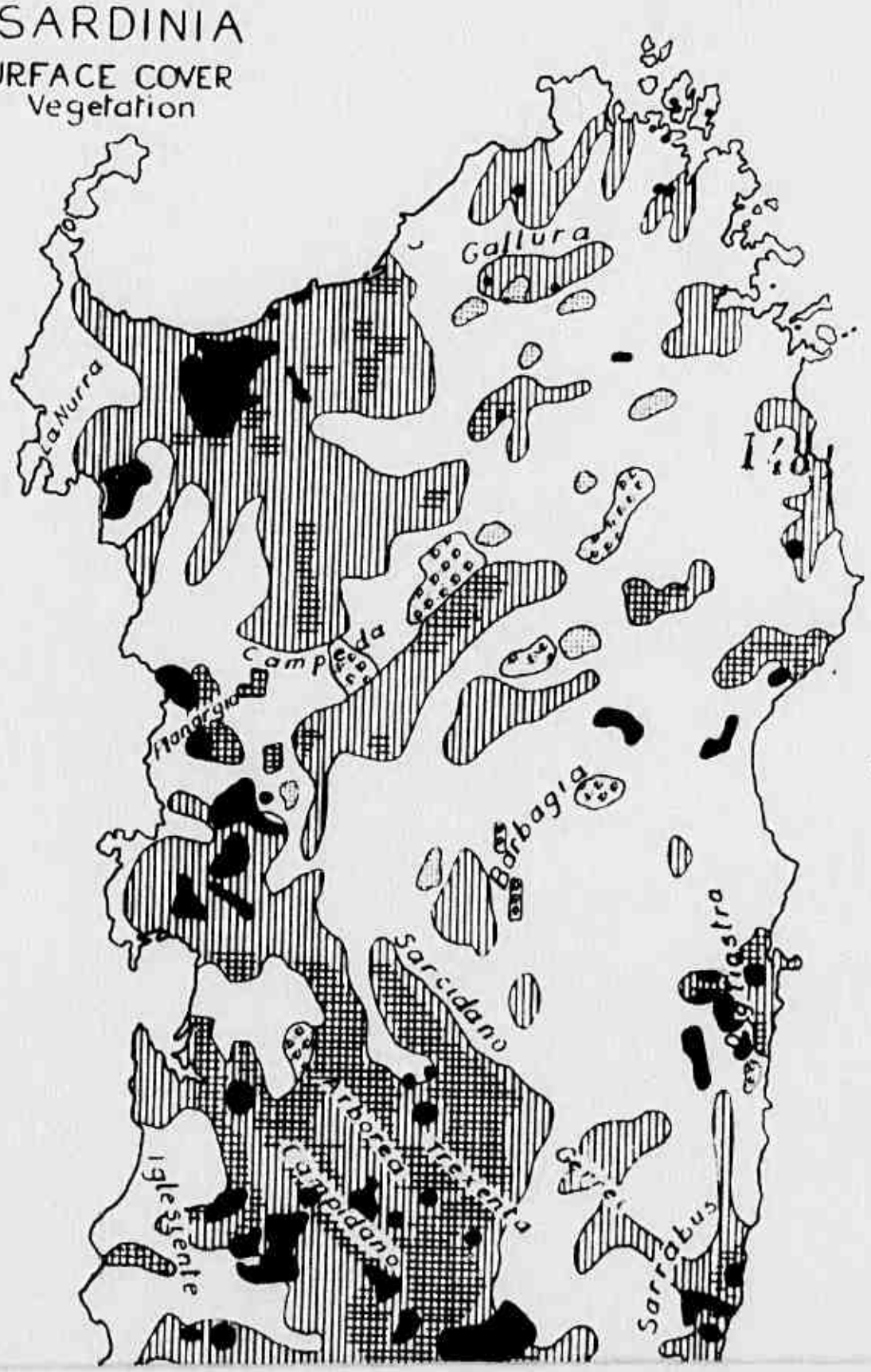
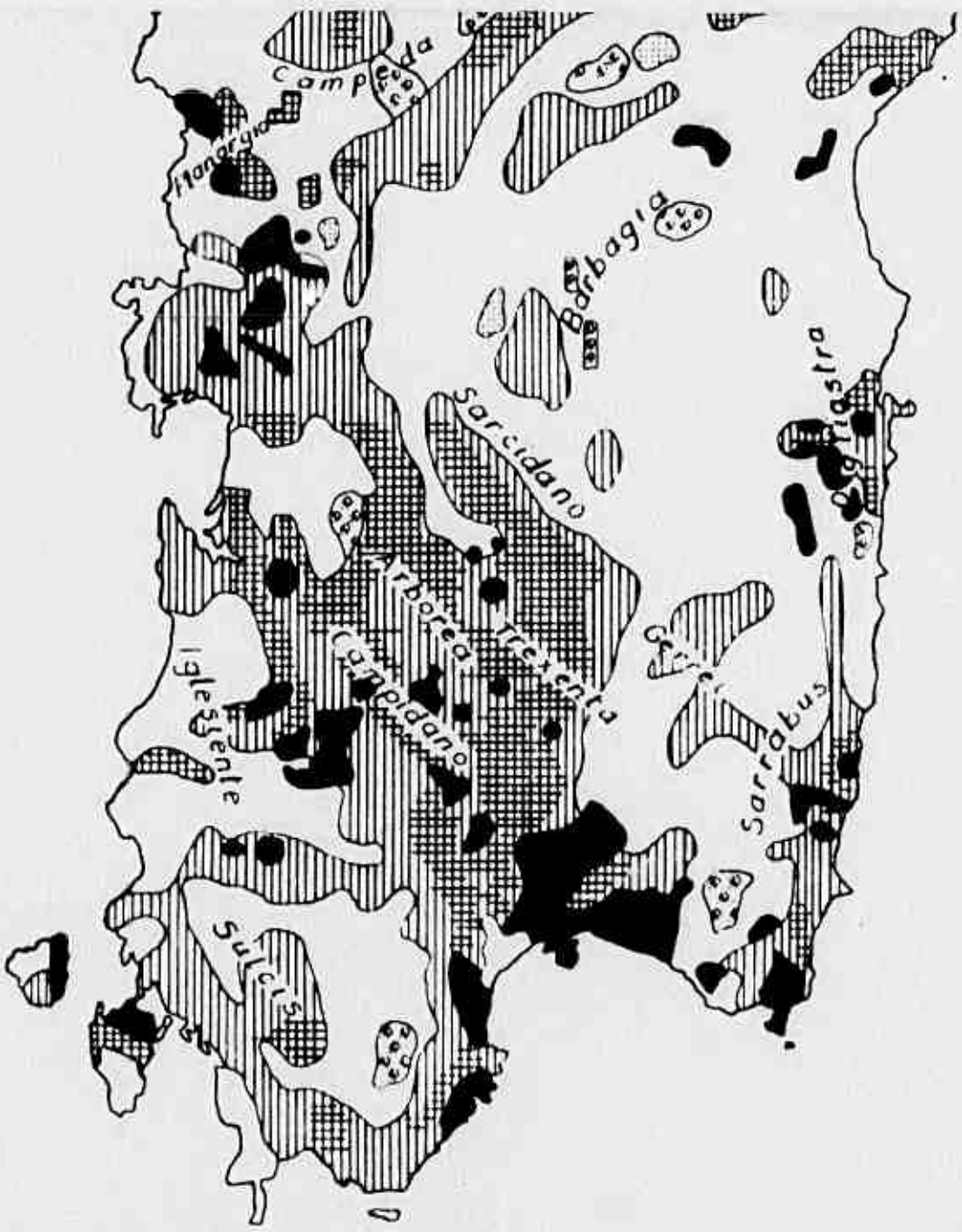


SARDINIA

SURFACE COVER

Vegetation





REFERENCE

Grassland and rough mountain pasture.

Cork oak.

Woods (Chestnut, etc.)

Cereal Crops (More important areas)

Almonds, Olives, Vines and citrous fruit

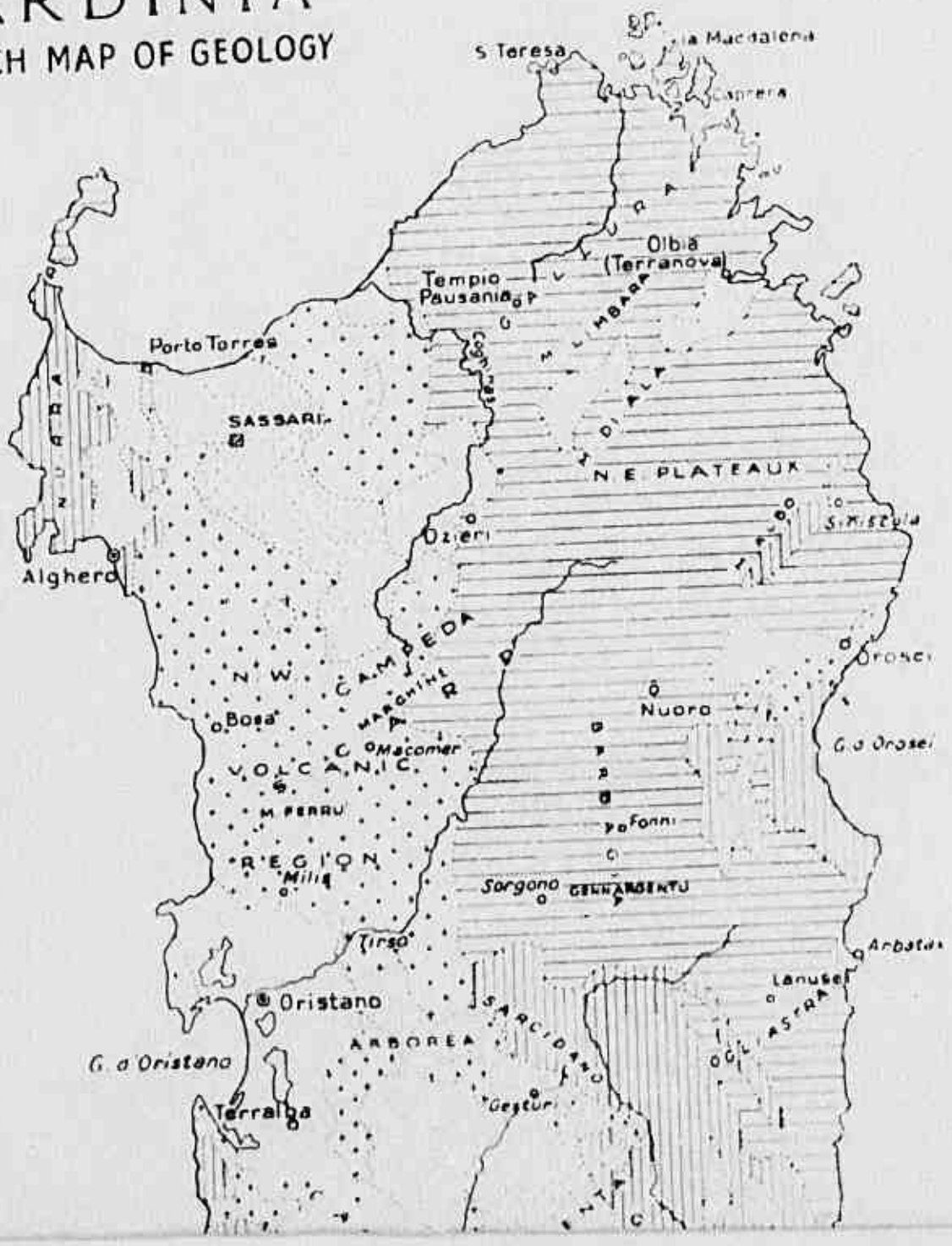
Scale

40 30 20 10 0 10 20 Miles

FIG. 6

SARDINIA

SKETCH MAP OF GEOLOGY



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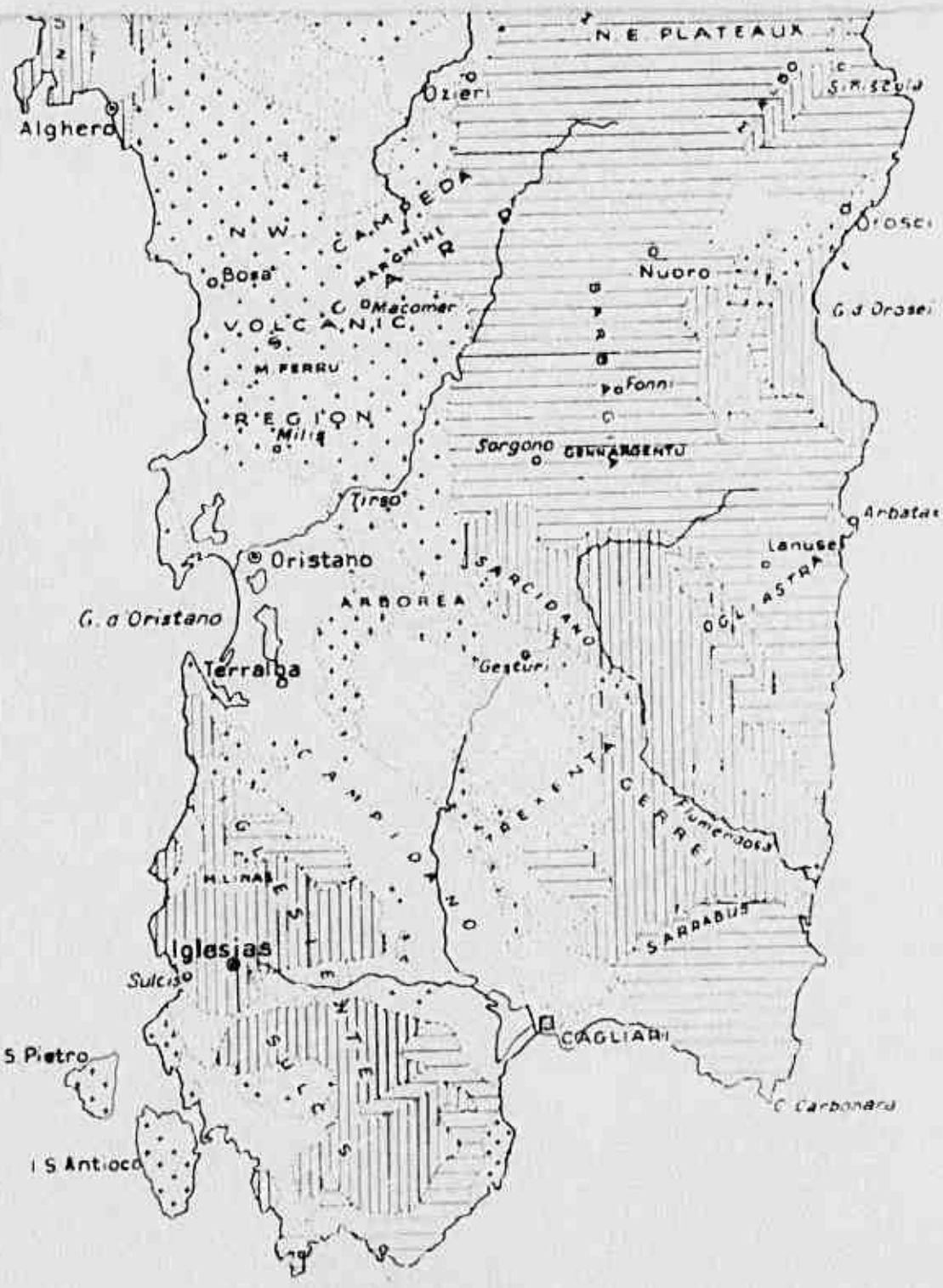

Reference:

Granites, slates, etc { Limestone and sandstone etc.

Fig. 1