



## Durham E-Theses

---

### *The olive in Northern Tripolitania: some aspects of agrarian geography*

Taylor, A. R.

#### How to cite:

---

Taylor, A. R. (1961) *The olive in Northern Tripolitania: some aspects of agrarian geography*, Durham theses, Durham University. Available at Durham E-Theses Online: <http://etheses.dur.ac.uk/9970/>

#### Use policy

---

The full-text may be used and/or reproduced, and given to third parties in any format or medium, without prior permission or charge, for personal research or study, educational, or not-for-profit purposes provided that:

- a full bibliographic reference is made to the original source
- a [link](#) is made to the metadata record in Durham E-Theses
- the full-text is not changed in any way

The full-text must not be sold in any format or medium without the formal permission of the copyright holders.

Please consult the [full Durham E-Theses policy](#) for further details.

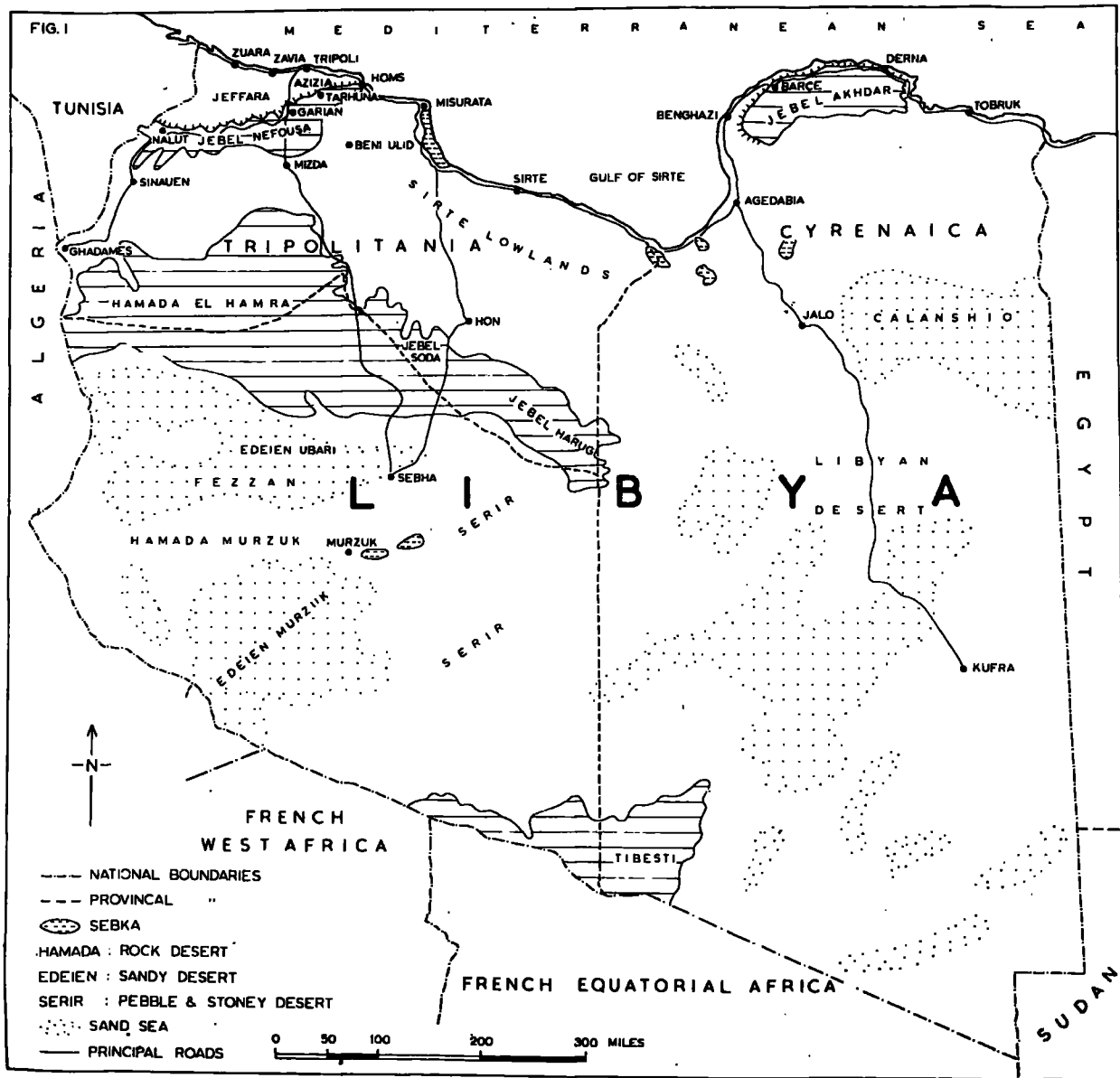


Fig 2a

SIMPLIFIED GEOLOGY

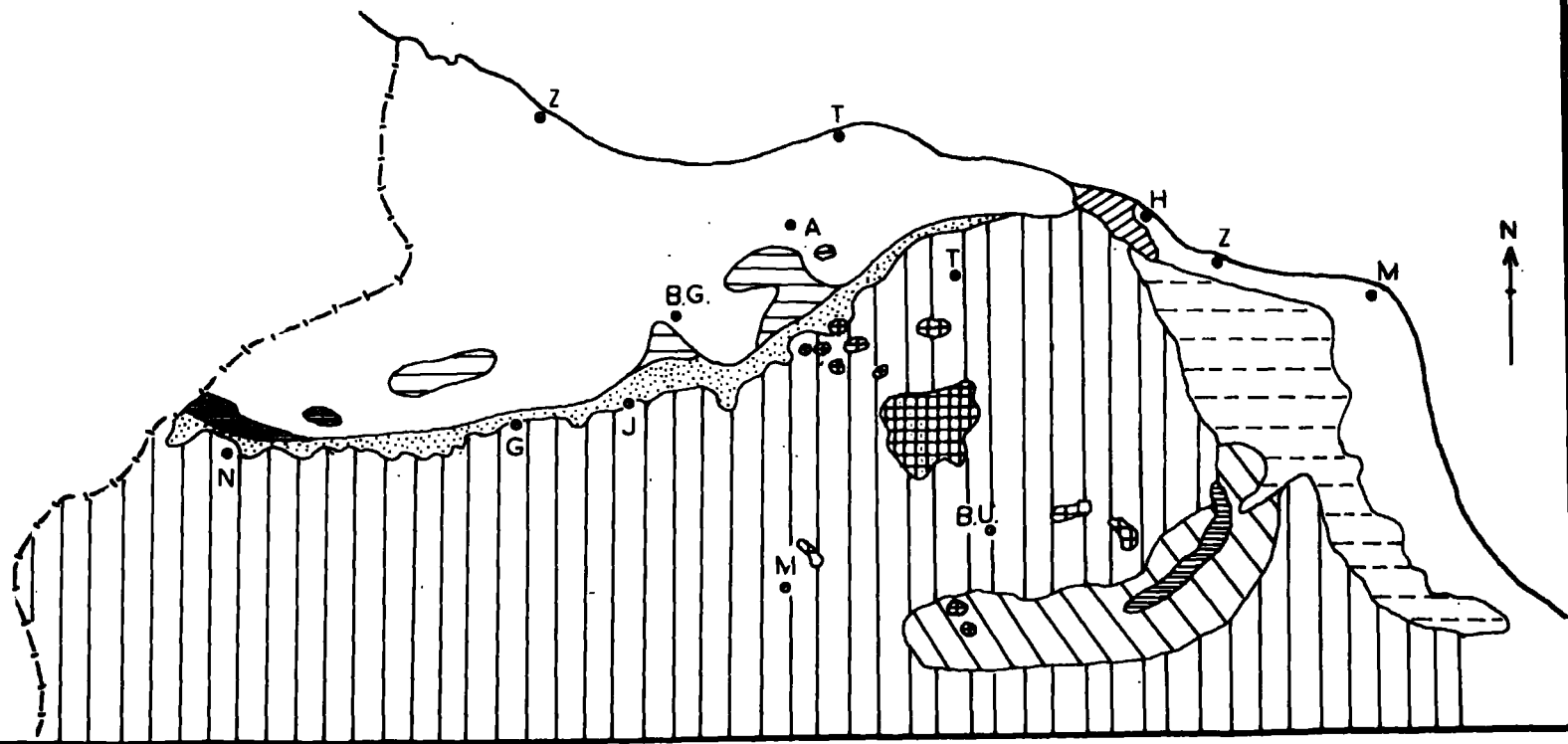
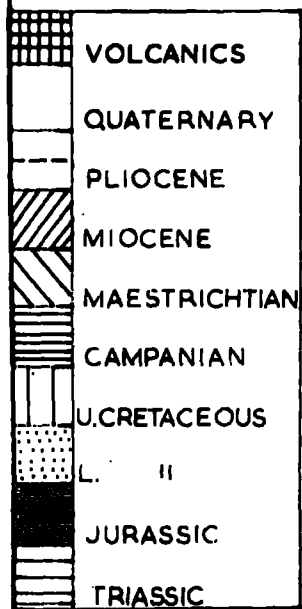


Fig 2b

GEOLOGICAL SECTION FROM THE GEBEL GARIAN ACROSS THE JEFARA PLAIN

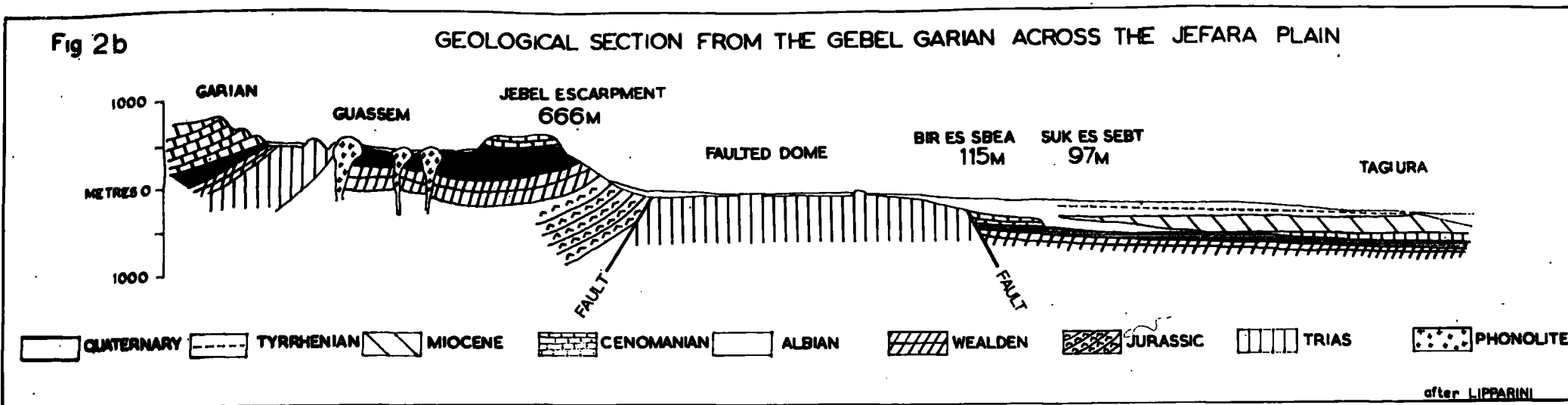
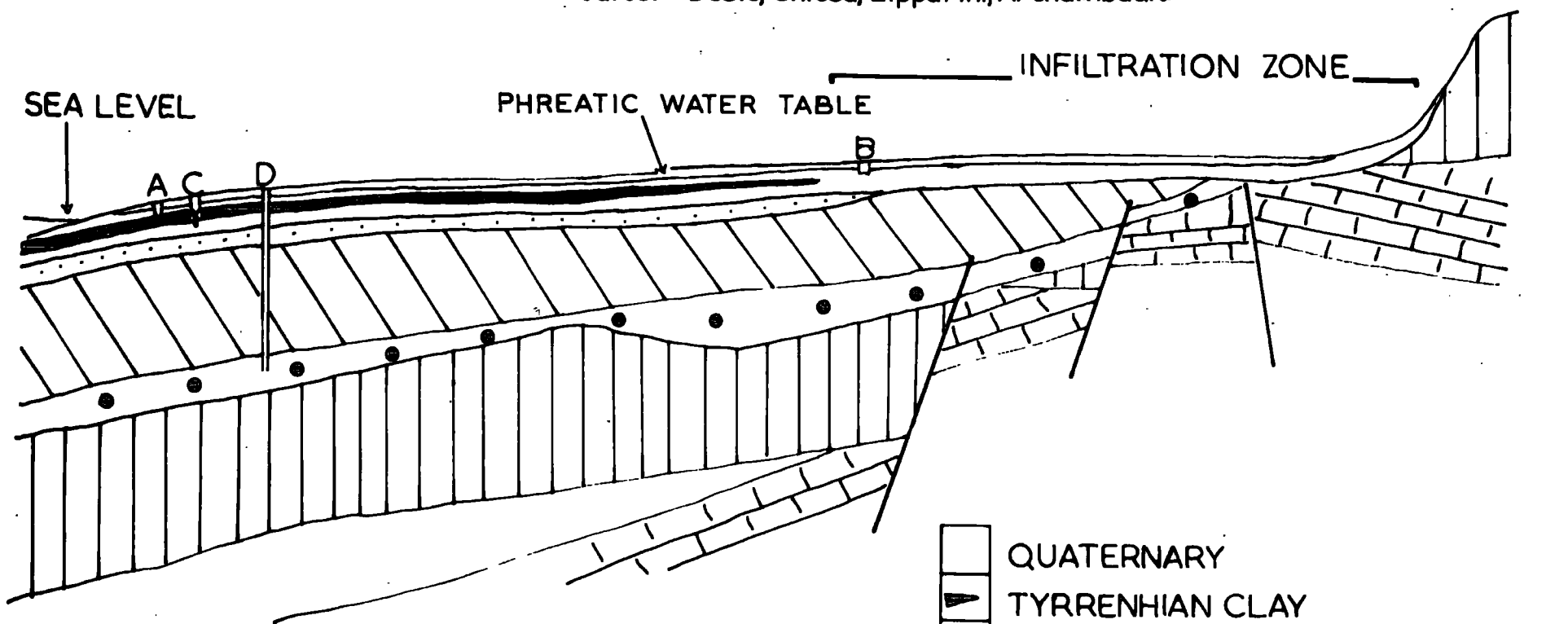


Fig 3

# ACQUIFERS OF THE JEFARA

(after Desio, Chiesa, Lipparini, Archambault)



## TYPES OF WELLS

- A Coastal Phreatic
- B Interior "
- C Sub-Artesian
- D Artesian








	QUATERNARY
	TYRRENHIAN CLAY
	MIOCENE Lst. - TORTONIAN
	" CLAY - HELVETIAN
	" SANDS, GRAVELS - LANGHIAN
	CRETACEOUS
	TRIASSIC

FIG 4a

SELECTED PROFILES ACROSS THE JEFARA & JEBEL

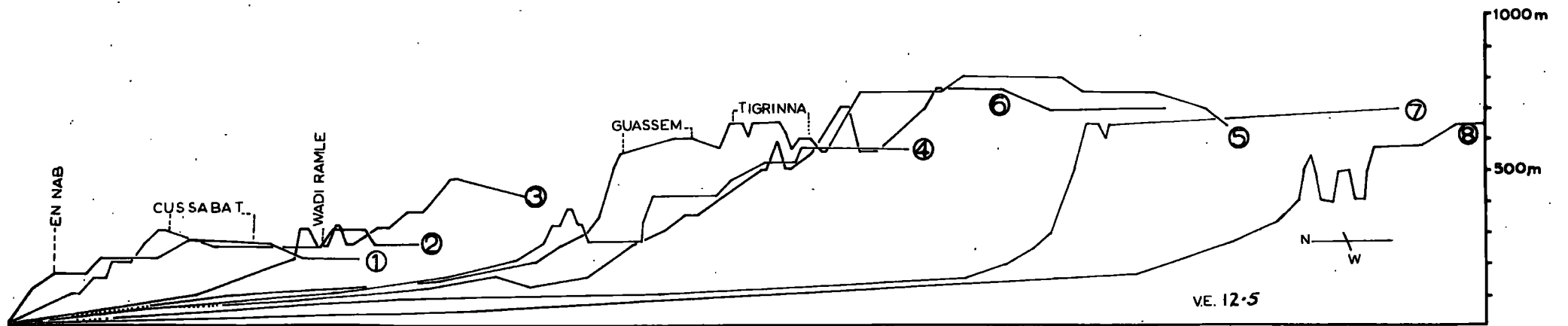


FIG 4b

SELECTED E-W PROFILES ACROSS THE JEBEL

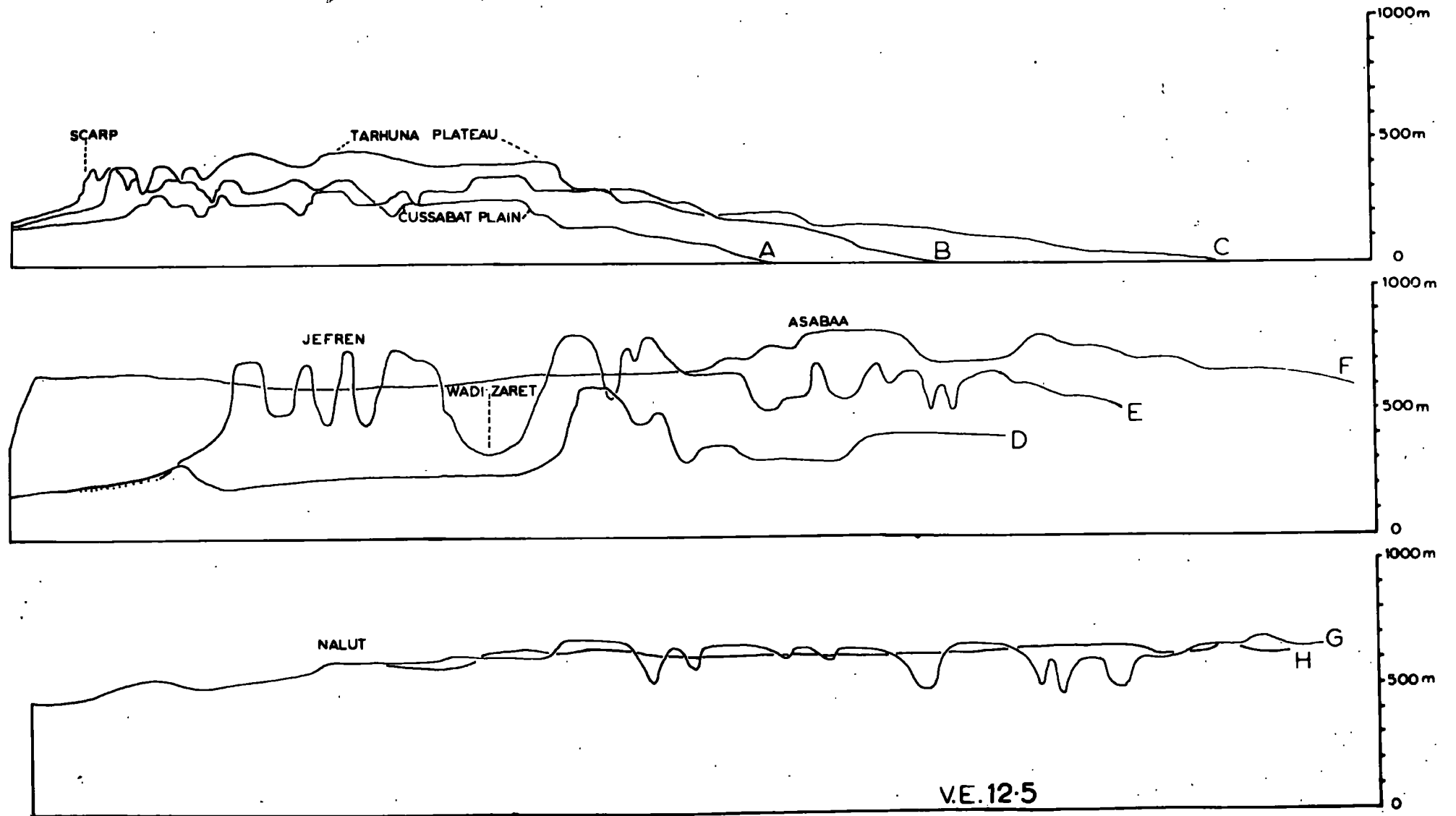
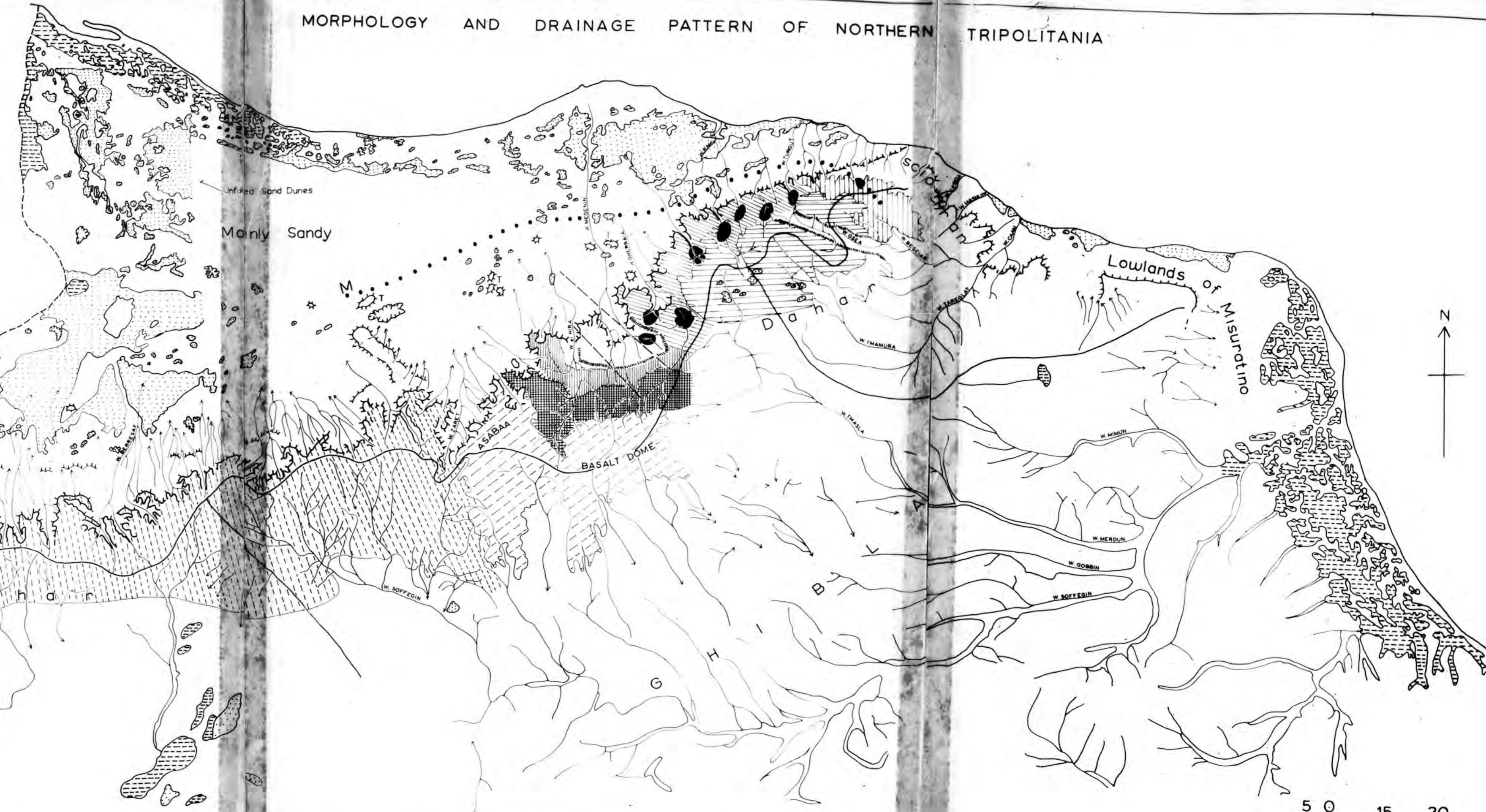


Fig 5

MORPHOLOGY AND DRAINAGE PATTERN OF NORTHERN TRIPOLITANIA

- fault depressions
- middle basins
- 200-300ms surface
- 250-350ms    ||
- 350-500ms    ||
- 500-600ms    ||
- 600-750ms    || (Tigrina)
- 600-750ms    || (Nefousa)
- 750-900ms    ||
- .. southern limit of Miocene
- Jebel scarp
- small scarps and cuestas
- major watersheds
- wadis
- depressions
- dunes
- sebkhas
- triassic outcrops
- faults



5 0 15 30  
Kilometres



# LOCATION OF PROFILES

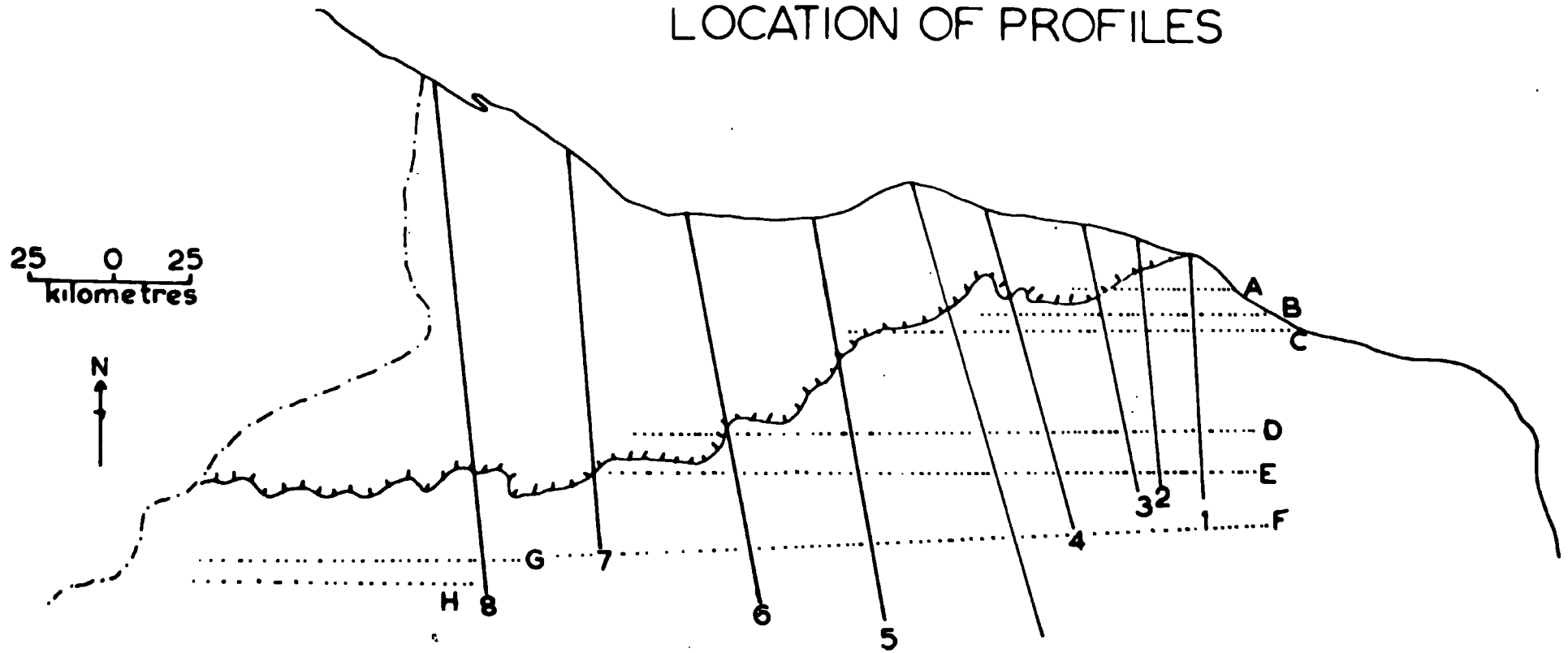


FIG 6

WADI PROFILES

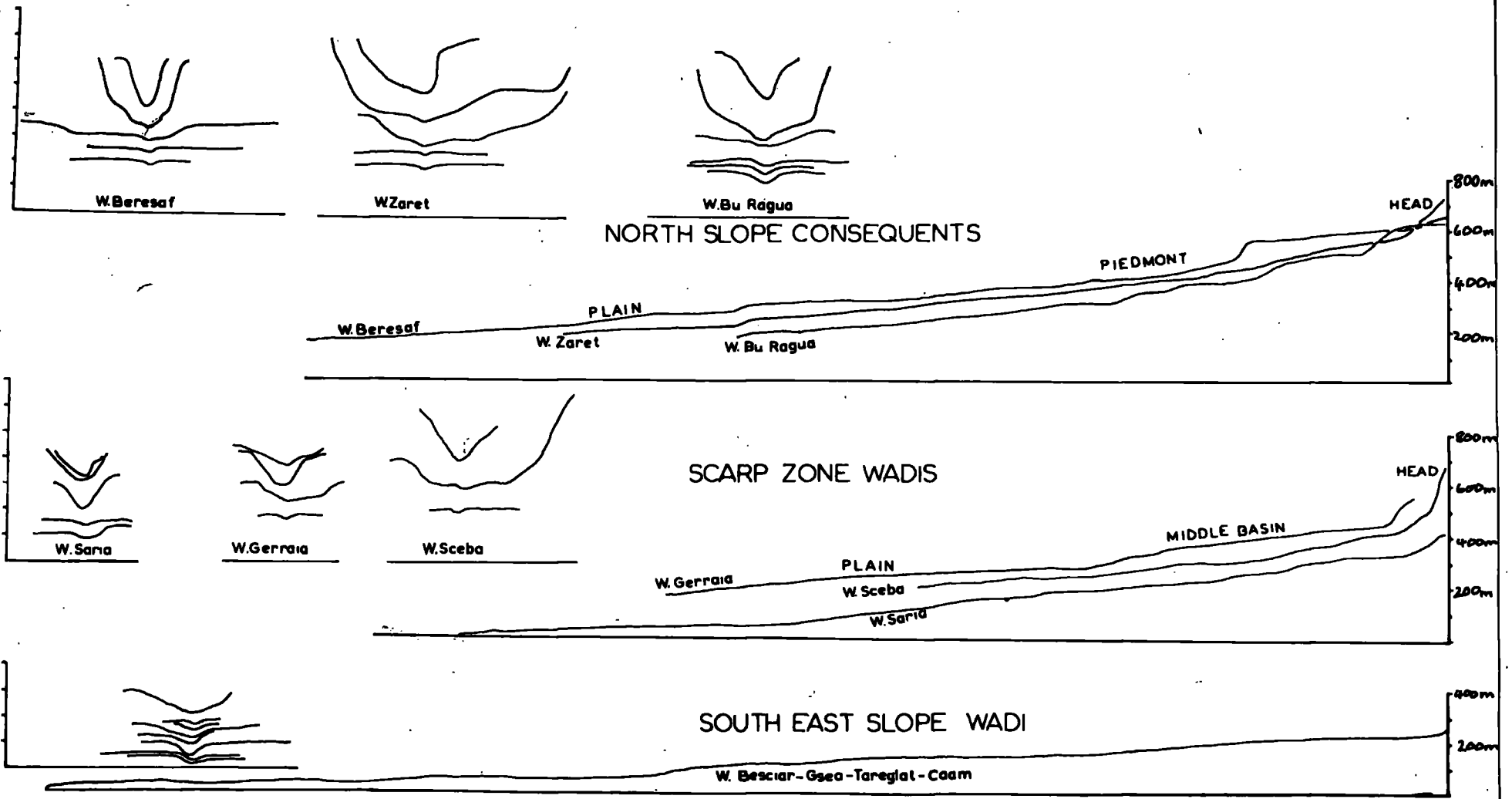







Fig 7

# CLIMATIC REGIONS after Fantoli

0 50 100  
kilometres

-  Maritime
-  Steppe
-  High Plain
-  Semi Desert
-  Desert

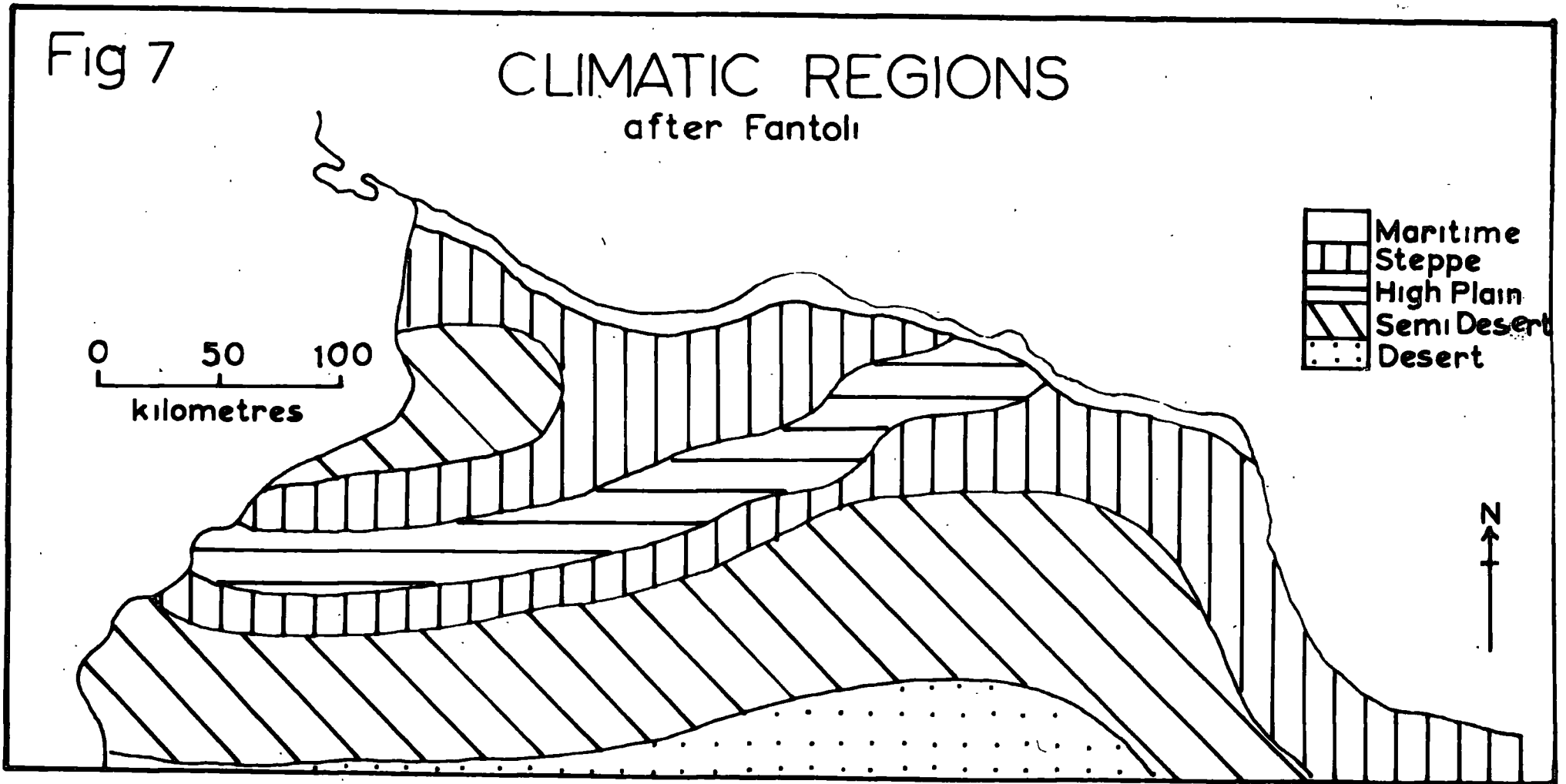


FIG 8

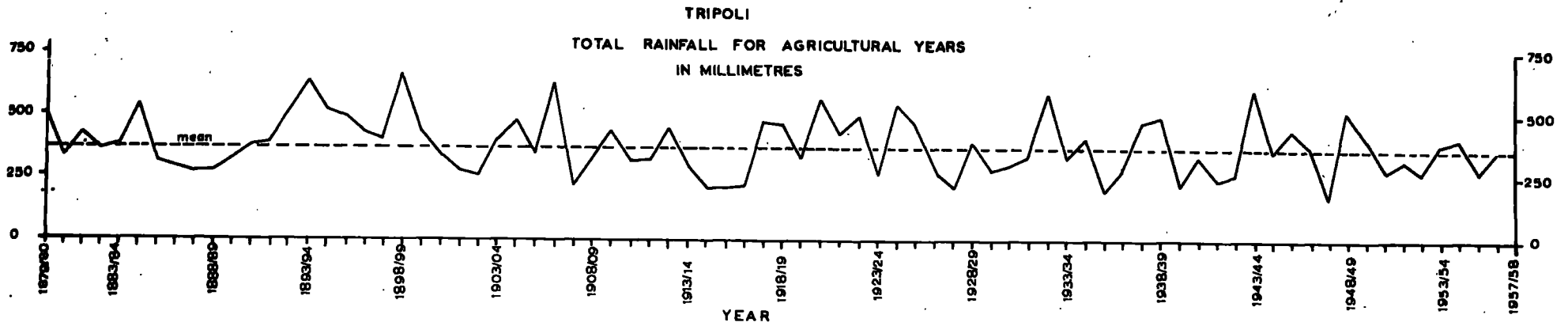


FIG 9

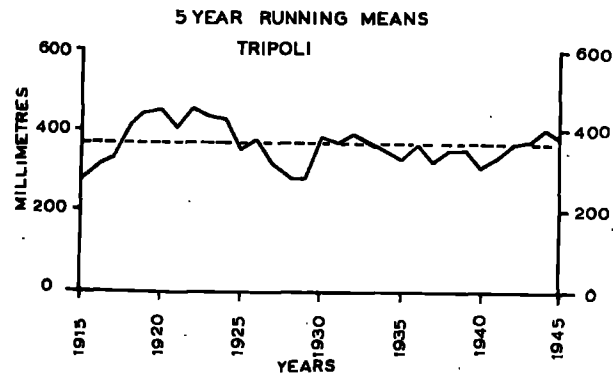


FIG 11

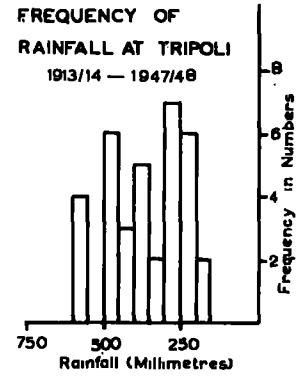


FIG 10

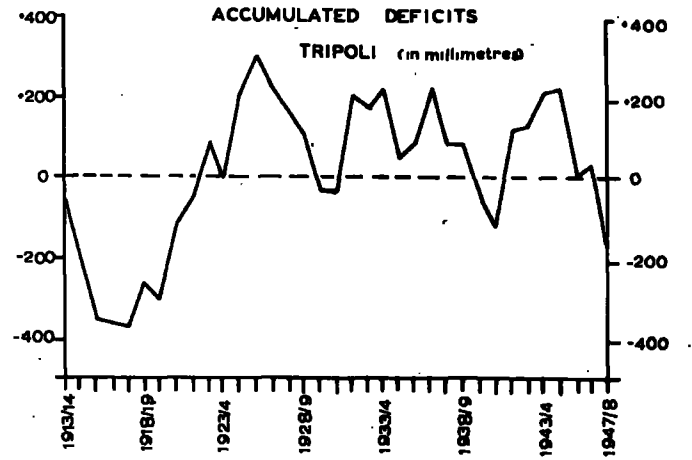


Fig 12

MEAN ANNUAL RAINFALL IN NORTHERN TRIPOLITANIA  
( IN MILLIMETRES )

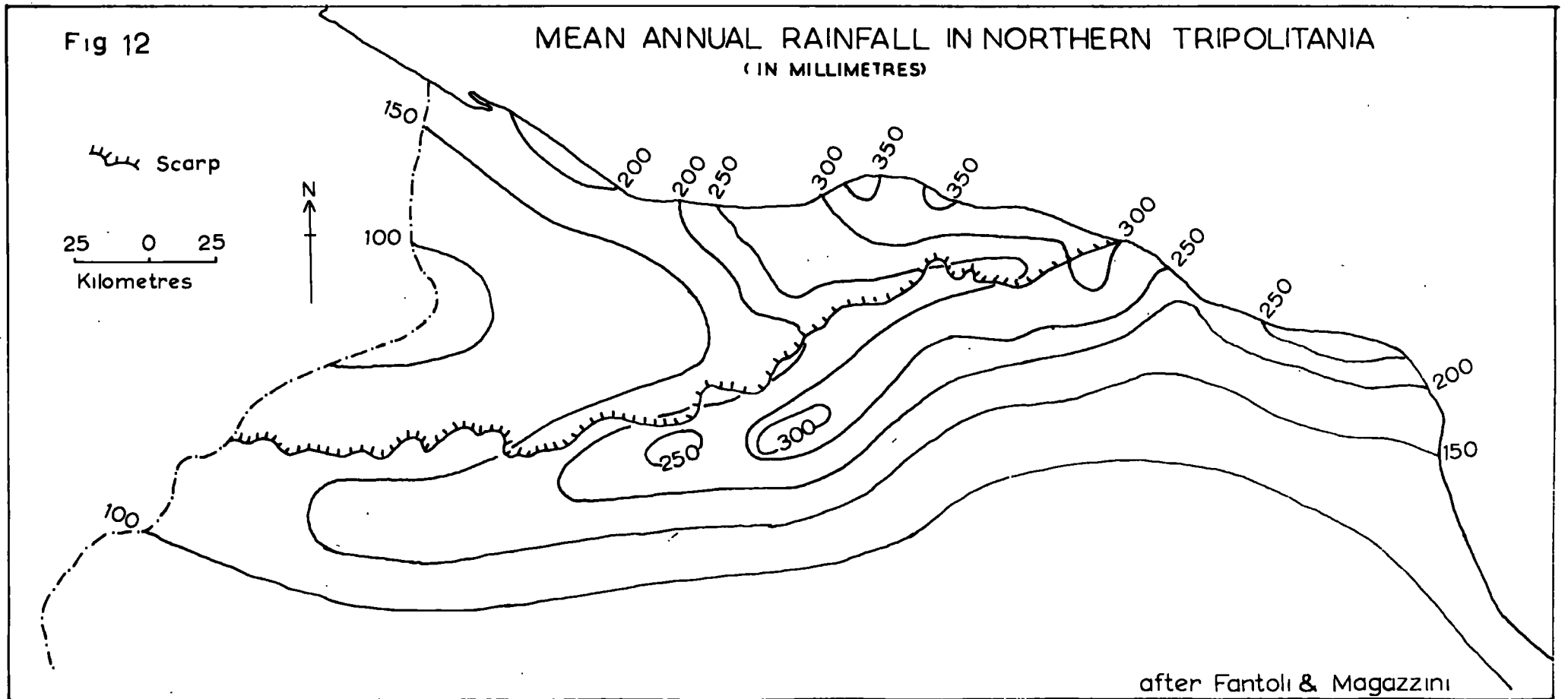


FIG 13

RELATIVE VARIABILITY OF ANNUAL RAINFALL

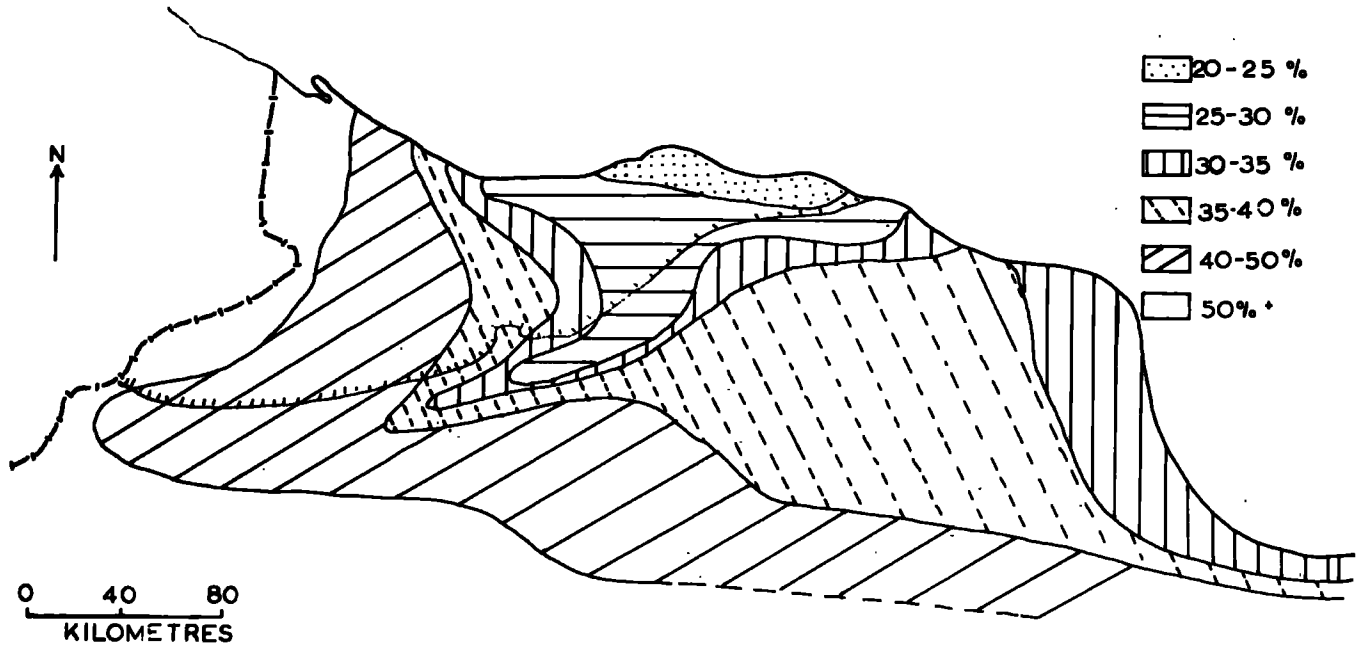


FIG 15

PROBABILITY OF RAINFALL OVER 200mm's per annum

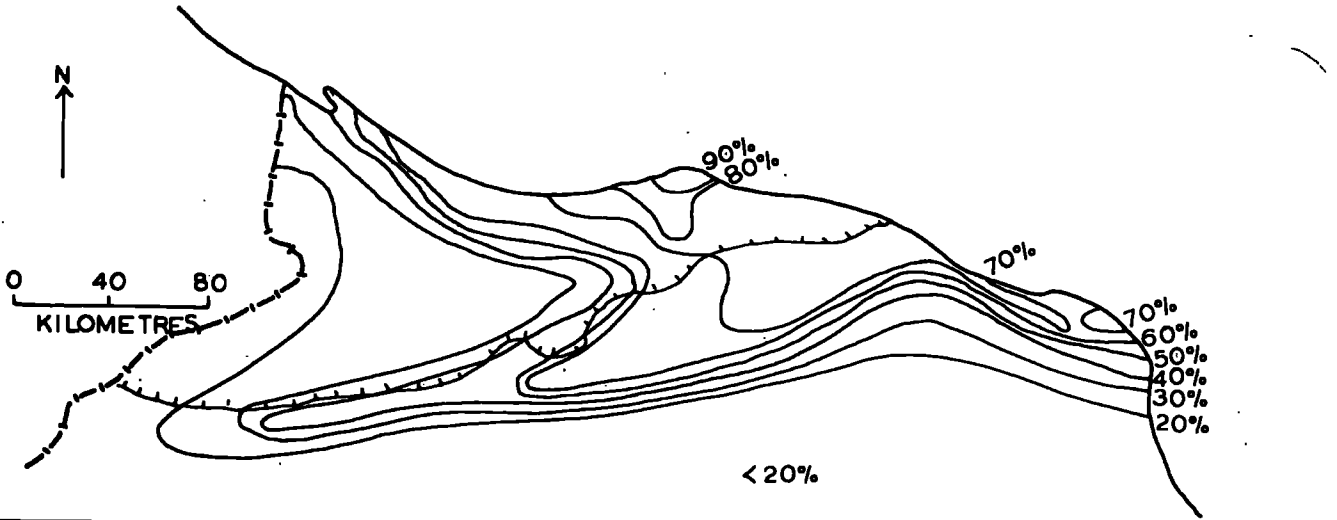


Fig 14

### MOVEMENT OF THE 200mm's ISOHYET IN HIGH AND LOW RAINFALL YEARS

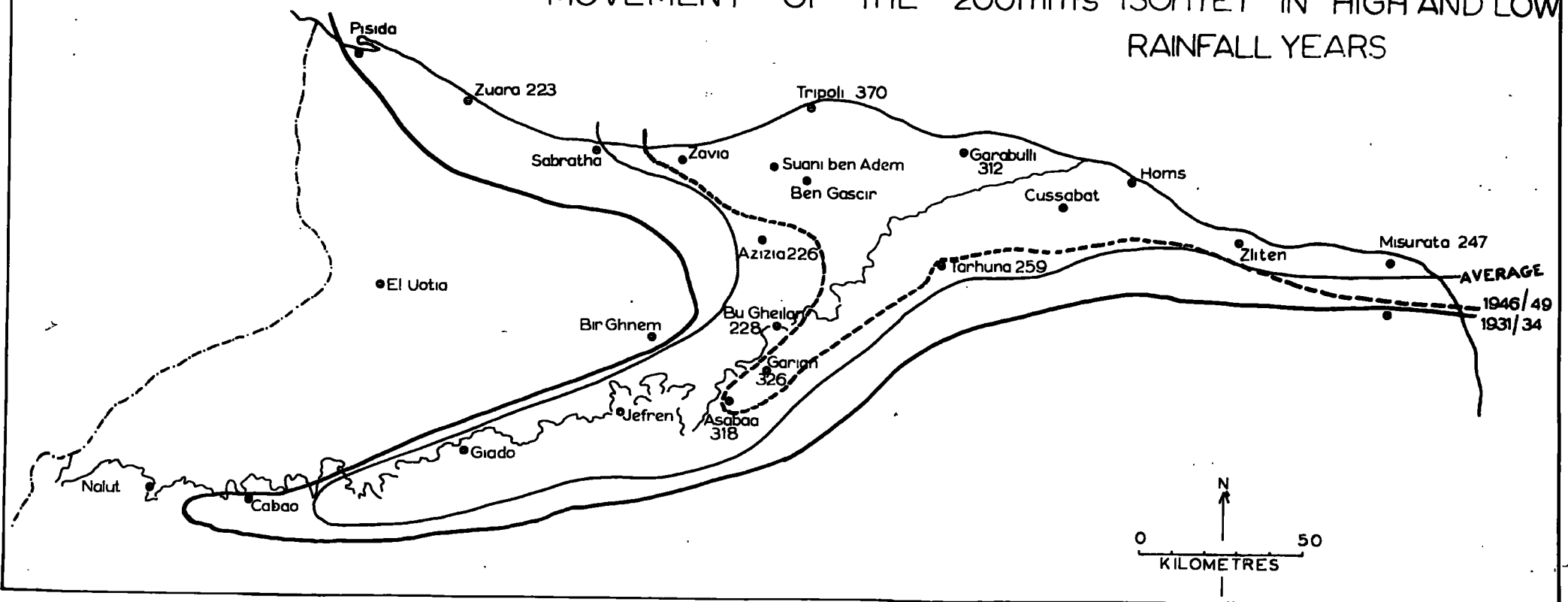
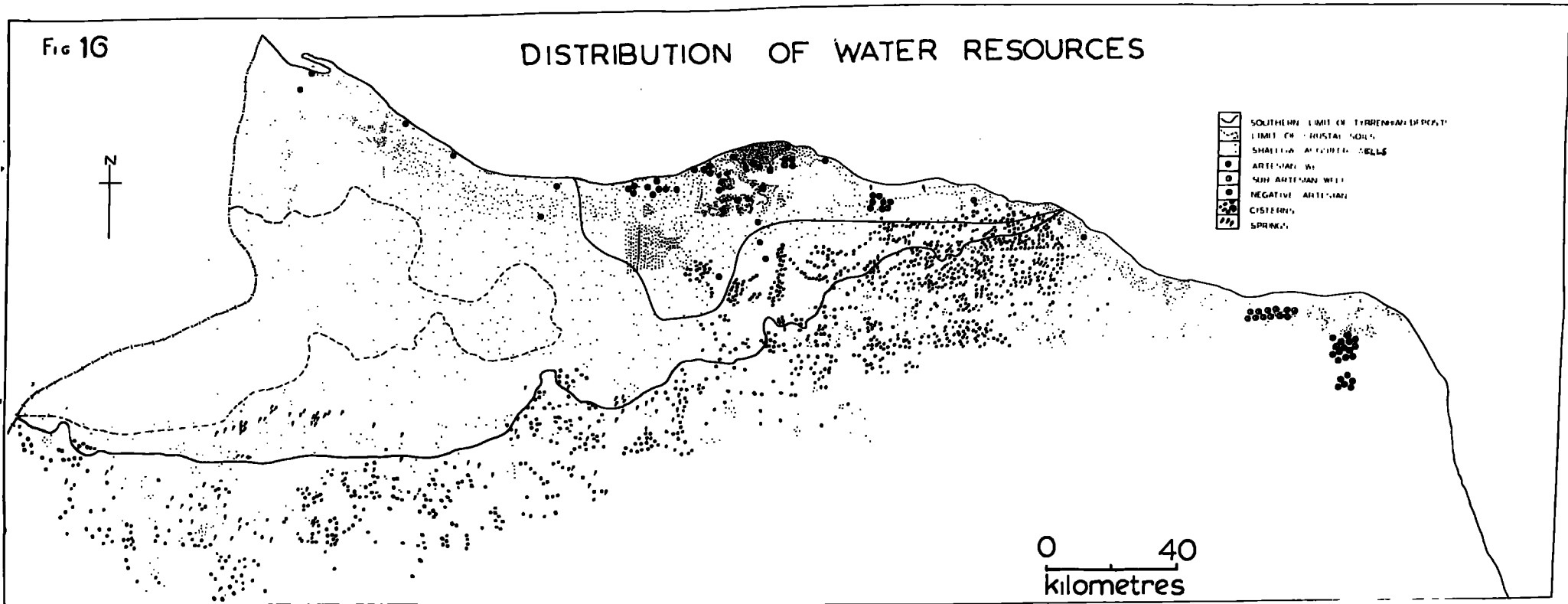


Fig 16

# DISTRIBUTION OF WATER RESOURCES



- SOUTHERN LIMIT OF TYRRENIAN DEPOSITS
- LIMIT OF CRUSTAL SOILS
- SHALLOW ARTESIAN WELLS
- ARTESIAN WELLS
- SUB-ARTESIAN WELLS
- NEGATIVE ARTESIAN WELLS
- CISTERNS
- SPRINGS

0 40  
kilometres


















Fig 17

### FARM TYPES and LAND USE

adapted from BMA, Land Use in Tripolitania

-  Italian Demographic (wholly or partially transferred to the State)
-  Saniya
-  Demographic Saniya
-  Dispersed "
-  Italian Demographic
-  Hawaza
-  Dry Gardens
-  Afforested land
-  Shifting Cereal Cultivation
-  Grazing with Cereals in wadis
-  Grazing & Semi-nomadism
-  Unused land
-  Escarpment

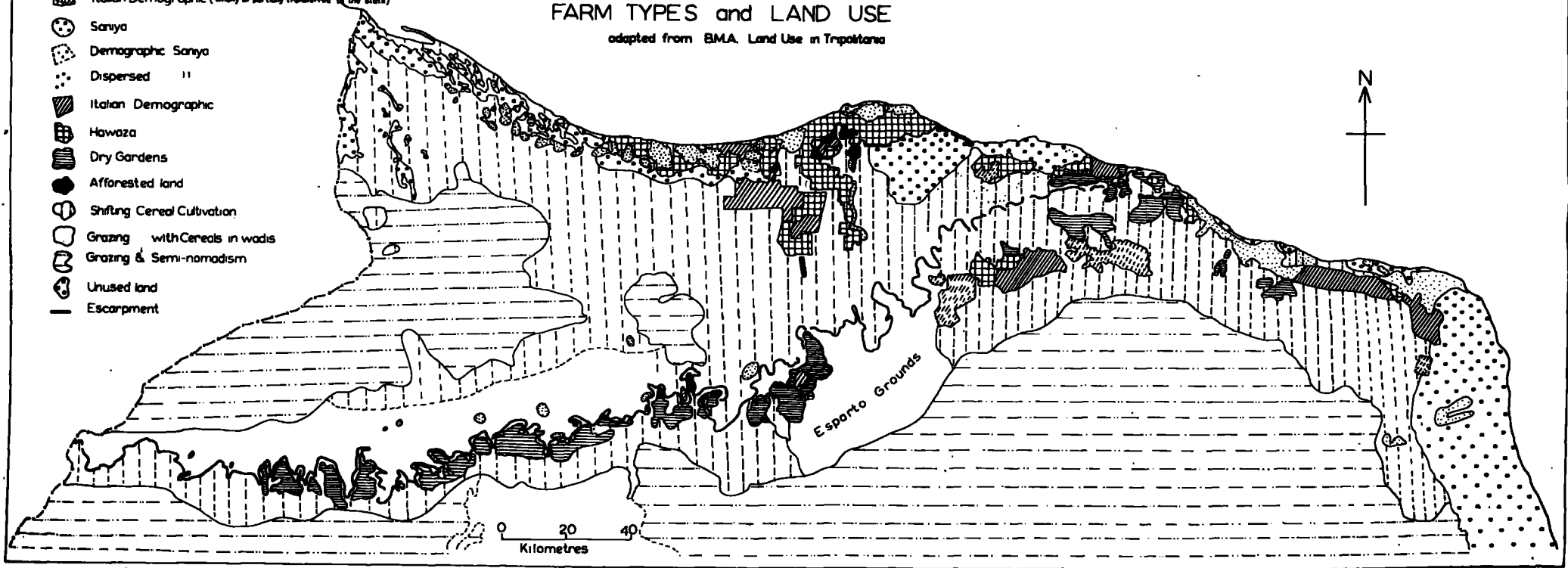


fig 18a

### Distribution of Olive Trees

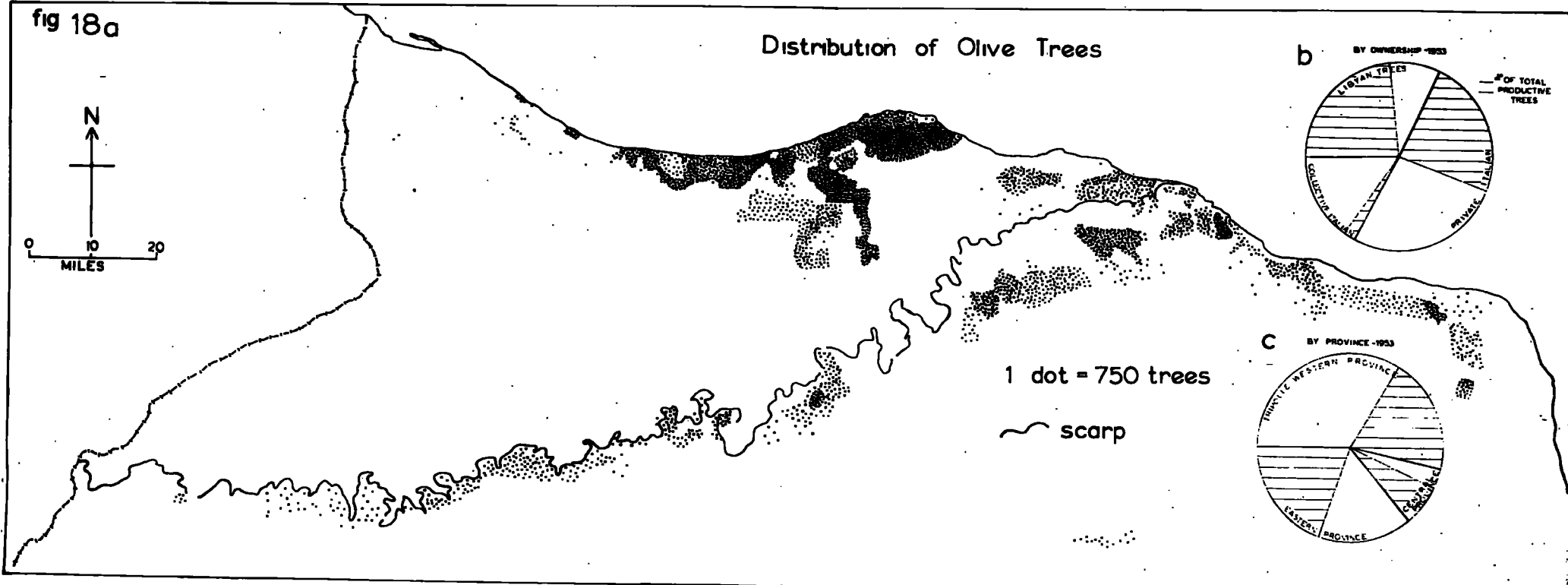


Fig 19

DISTRIBUTION OF TREE CROPS - 1952 - BY DISTRICTS

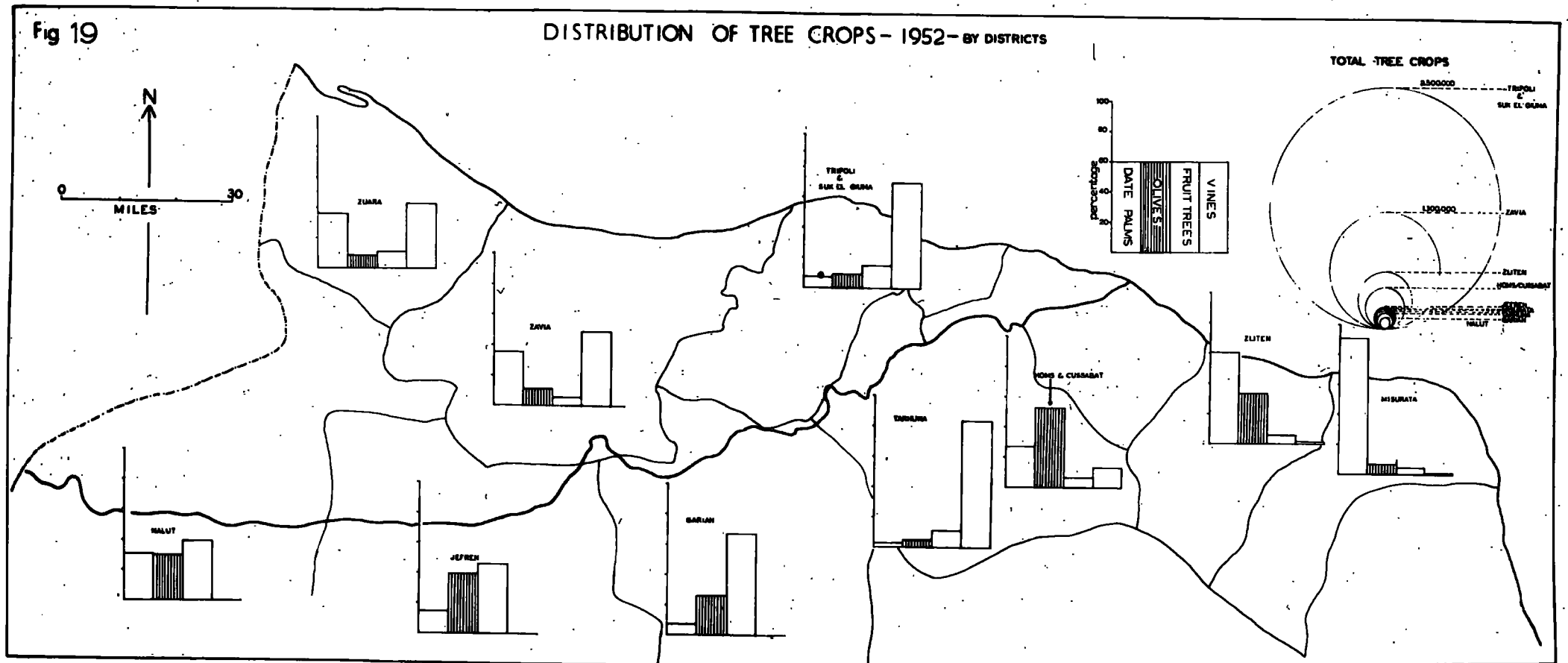






Fig 20

# CROP EXPECTATION OF DRYLAND OLIVES

-  GOOD CROP 300mmrs+
-  FAIR || 250-300||
-  POOR || 150-250 ||
-  NO CROP <150 mmrs

 SCARP

25 0 25  
KILOMETRES

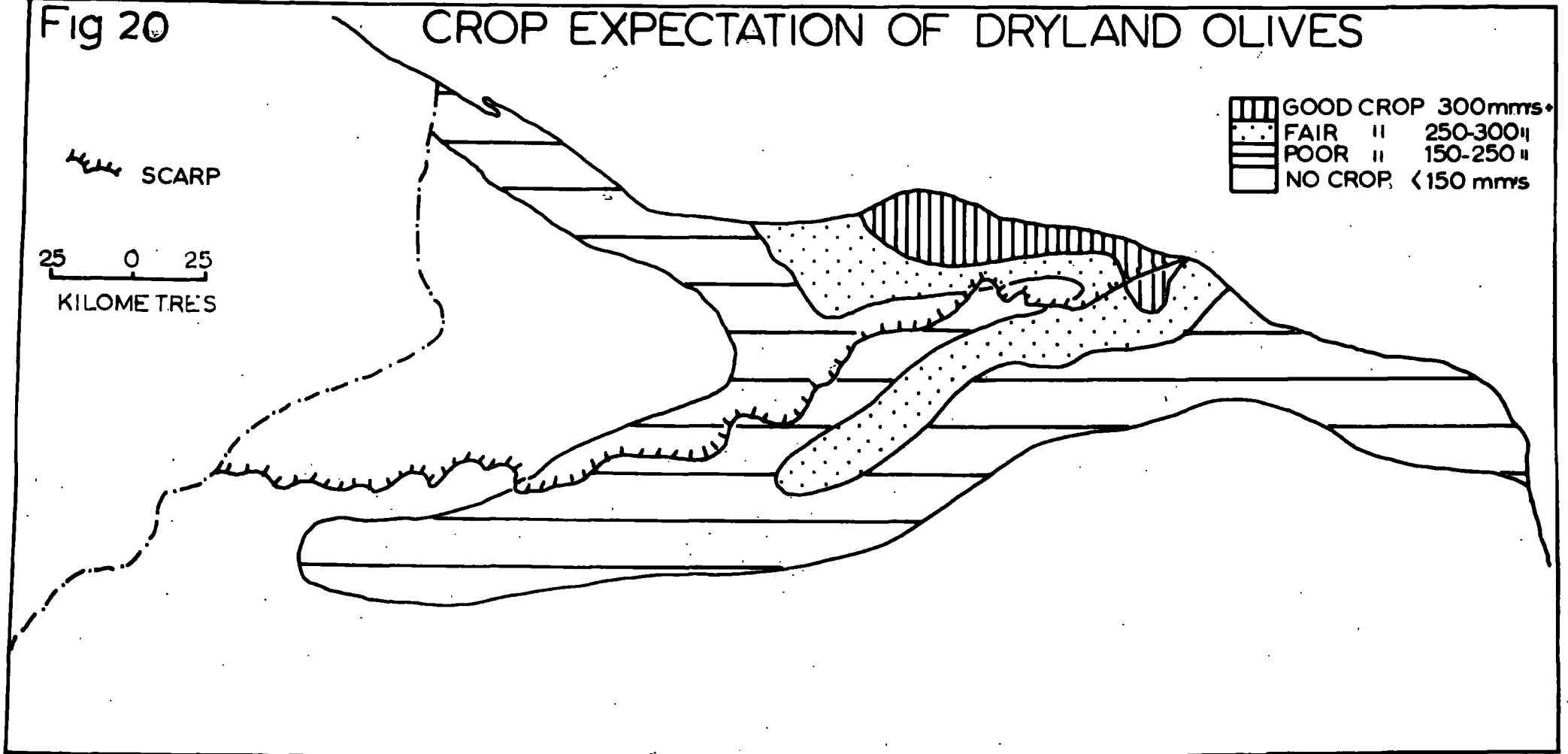
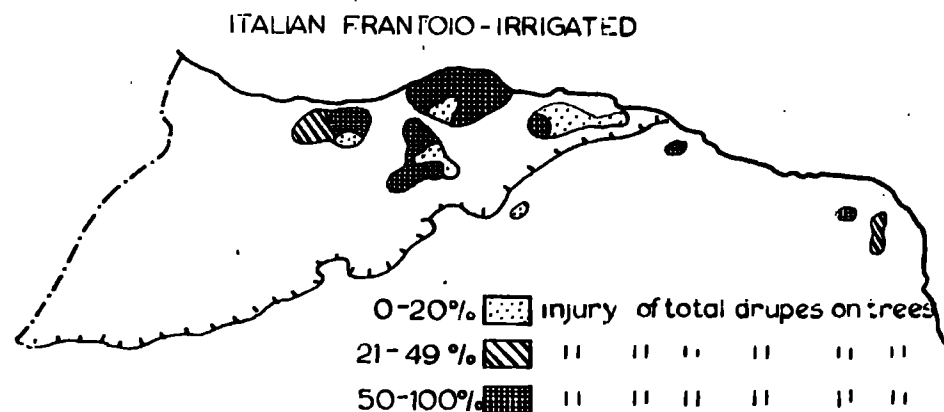
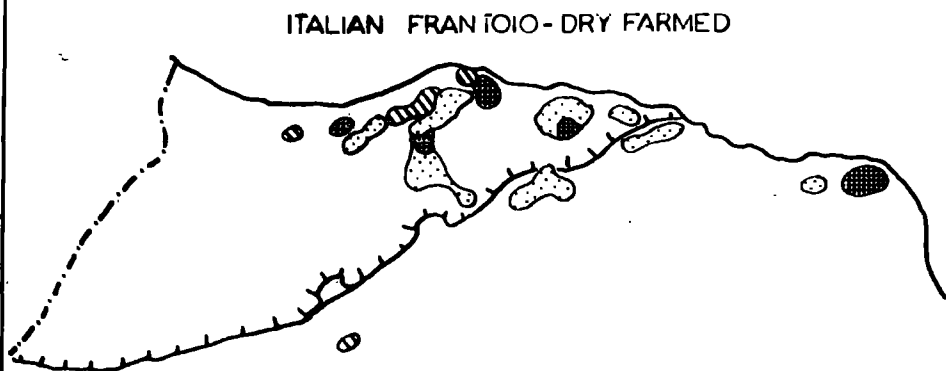
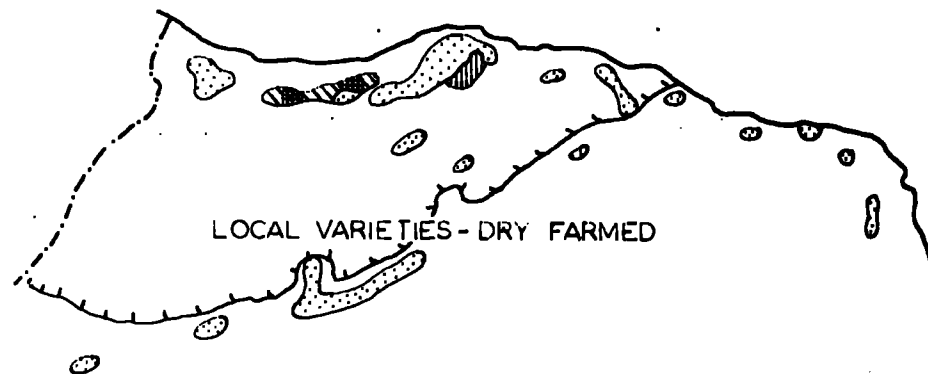
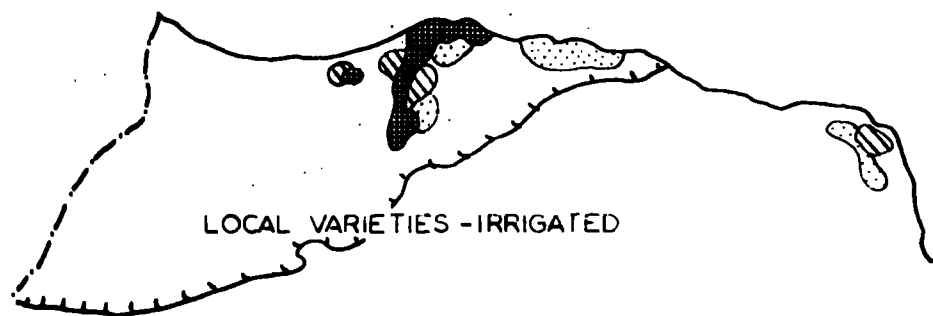


Fig 21

DISTRIBUTION OF DACUS OLEAE ATTACK ON OLIVES IN 1953



0 80  
KILOMETRES

0-20% [stippled] injury of total drupes on trees  
21-49% [diagonal hatching] " " " " " " "  
50-100% [solid black] " " " " " " "

Fig 22

# OLIVE CULTIVATION REGIONS

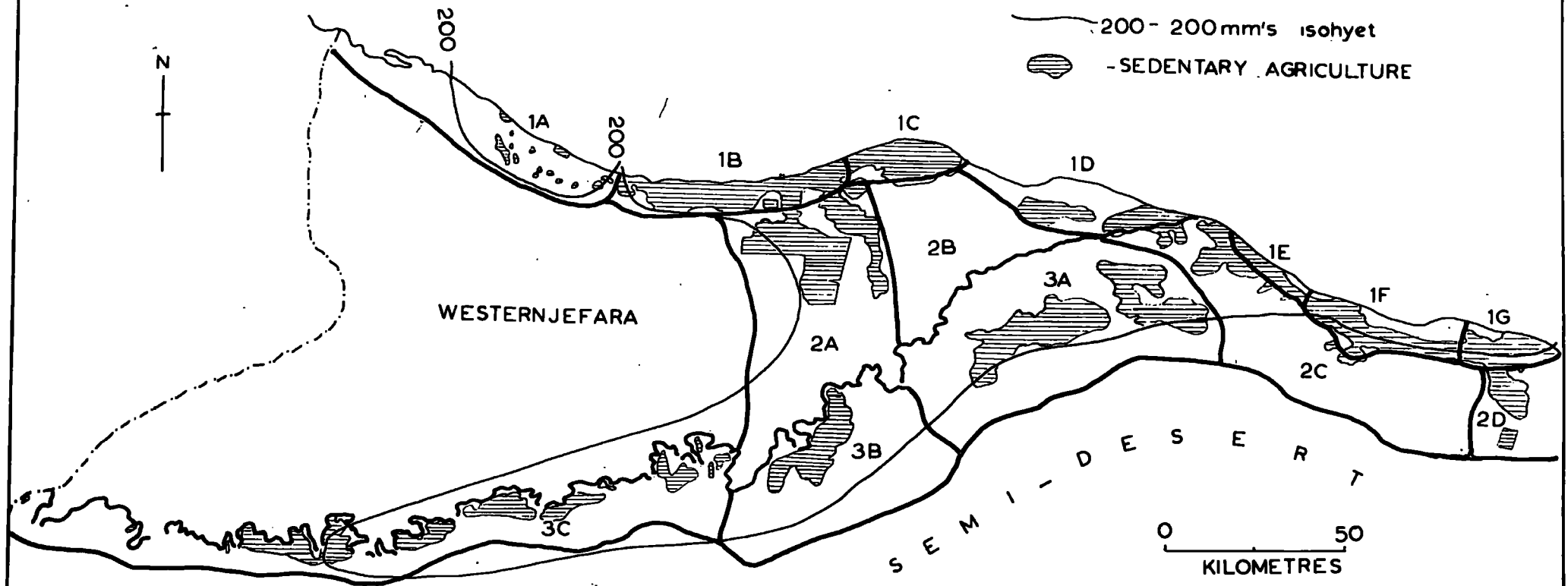
COASTAL PLAIN - 1.A.B.C.D.E.F.G

INTERIOR PLAIN - 2.A.B.C.D

JEBEL - 3.A.B.C.

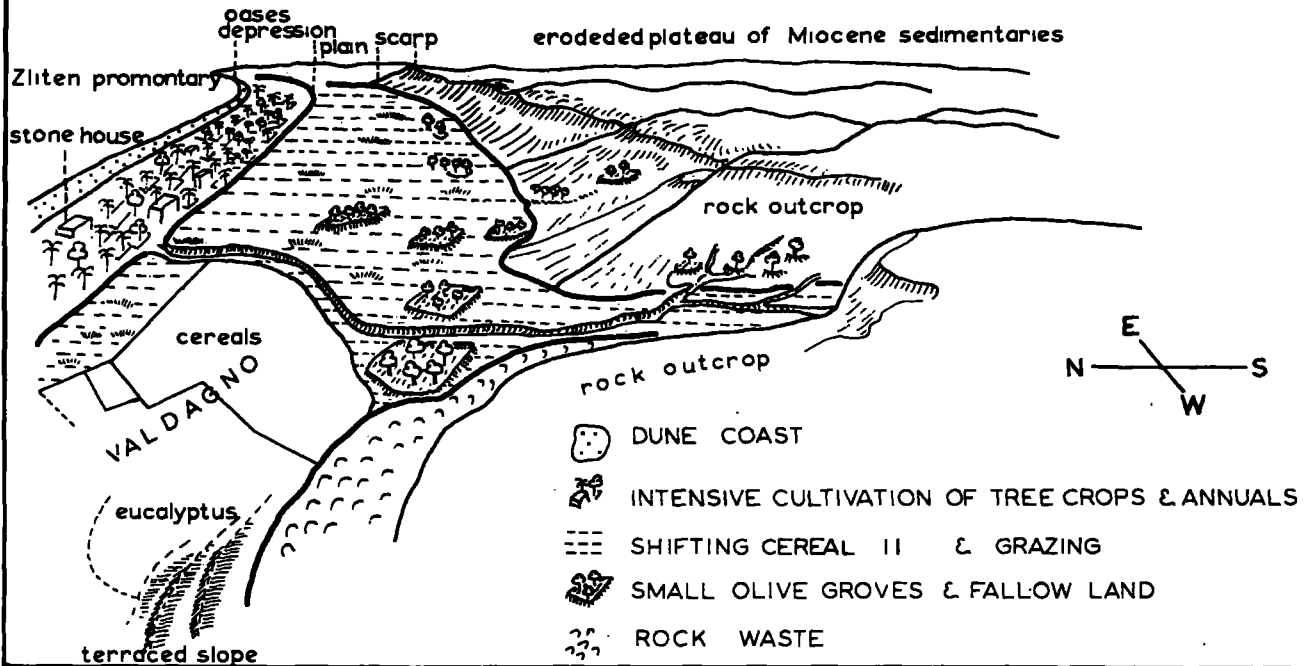
— 200 - 200mm's isohyet

▨ - SEDENTARY AGRICULTURE



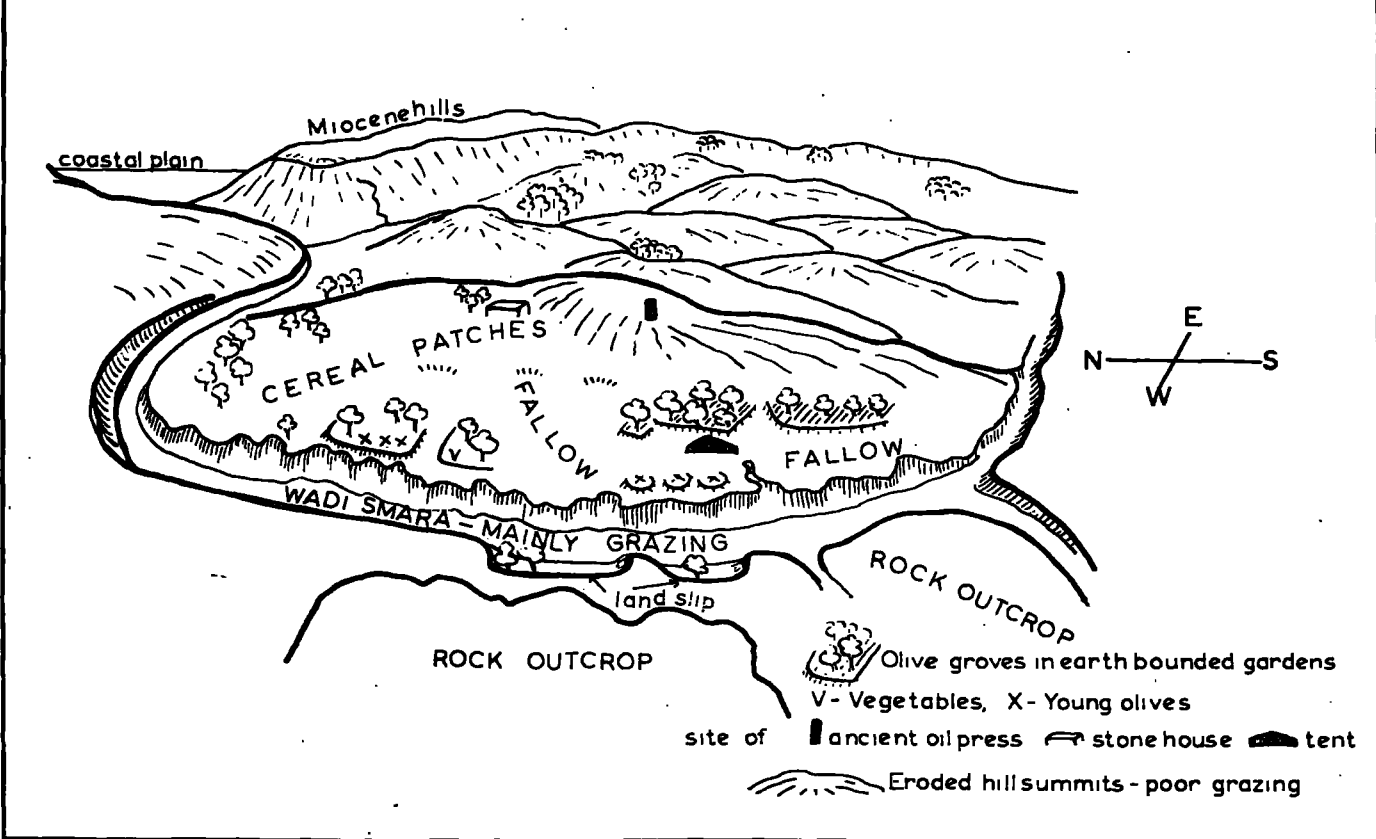
SKETCH MAP fig 23

LAND USE ON THE COASTAL PLAIN SOUTH OF ZLITEN & HOMS



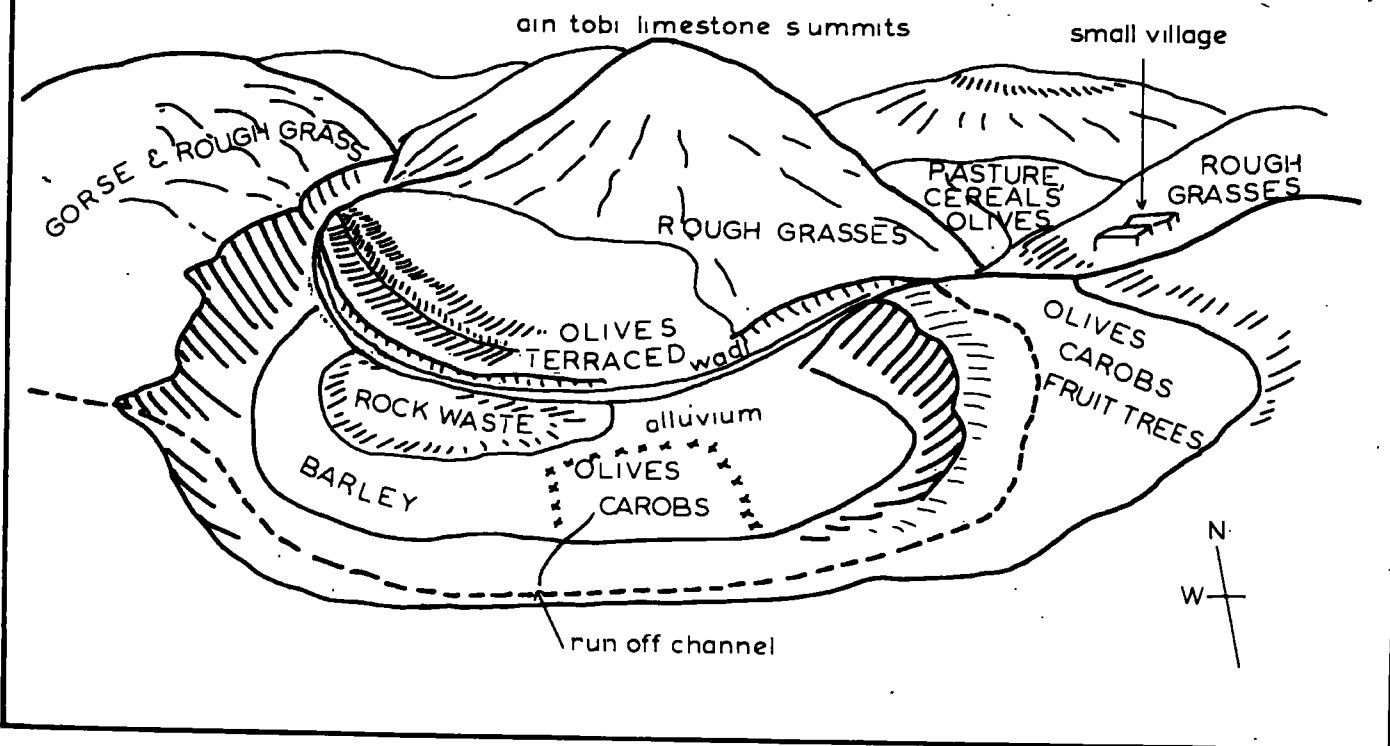
SKETCH MAP fig 24

TYPICAL LAND USE ON THE LOW HILL ZONE



SKETCH MAP  
FIG 25

LAND USE-NORTHERN JEBEL  
(MIDDLE TRACT OF WADI GHERRUN TO THE N.W. OF CUSSABAT)



SKETCH MAP  
FIG 26

LAND USE-NORTHERN JEBEL  
(UPPER BASIN OF WADI MSABA N. OF TARHUNA)

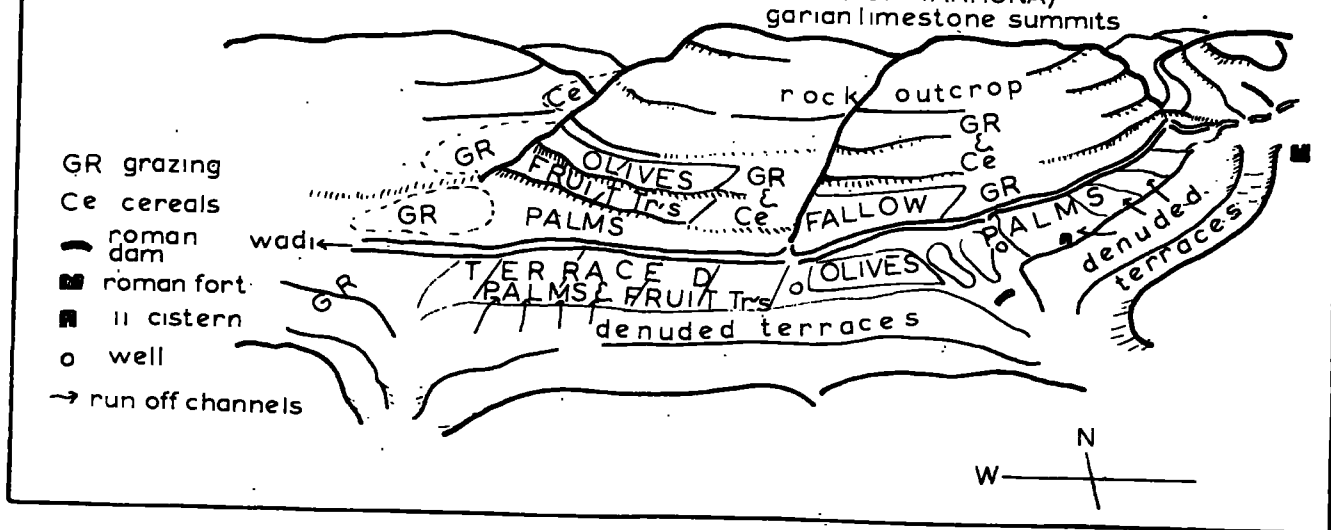




Fig 27

### DISTRIBUTION OF ROMAN REMAINS (after GOODCHILD)

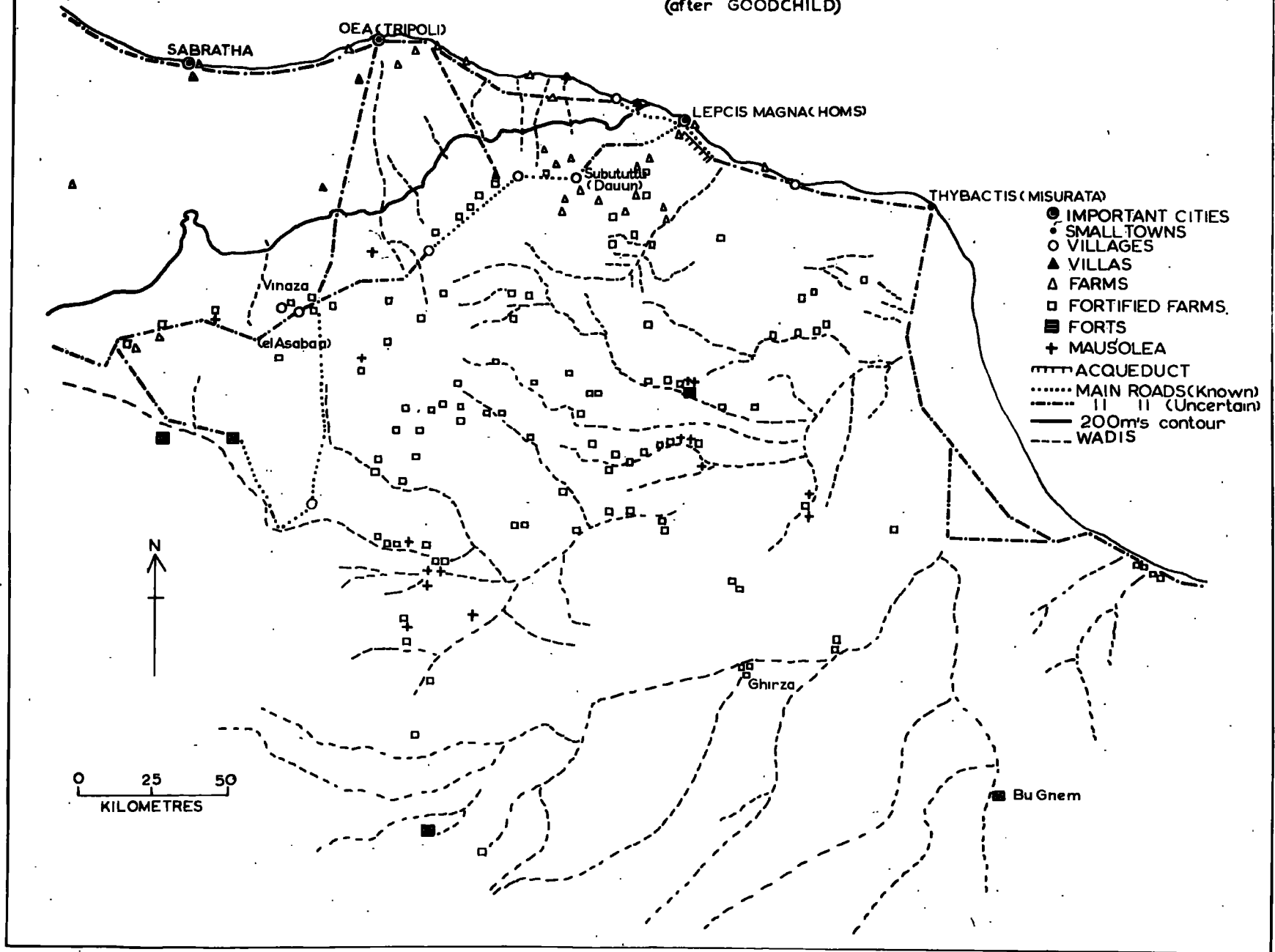


Fig 28

ADMINISTRATIVE REGIONS OF NORTHERN TRIPOLITANIA

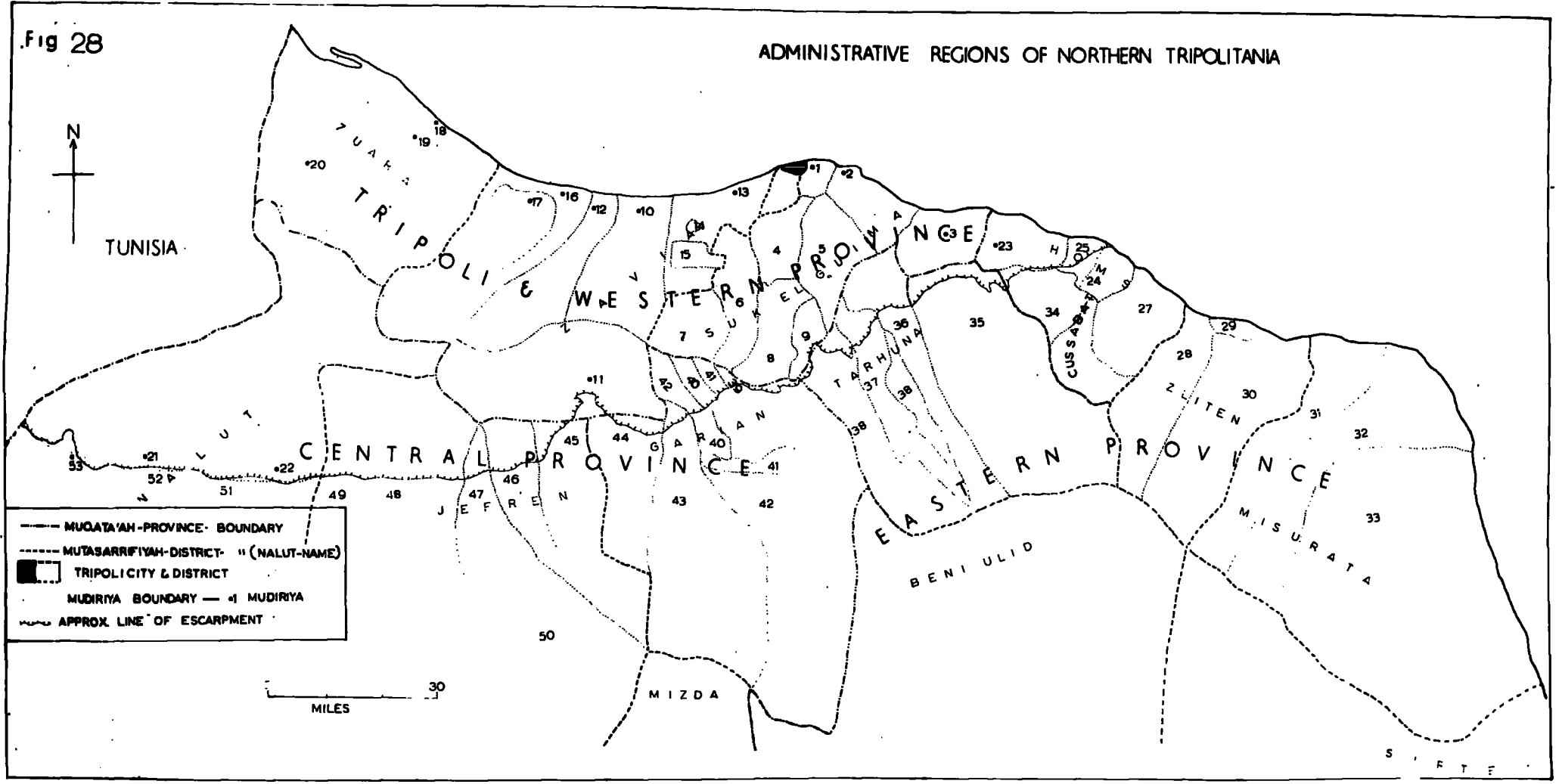


Fig 29

LOCATION OF SETTLEMENT

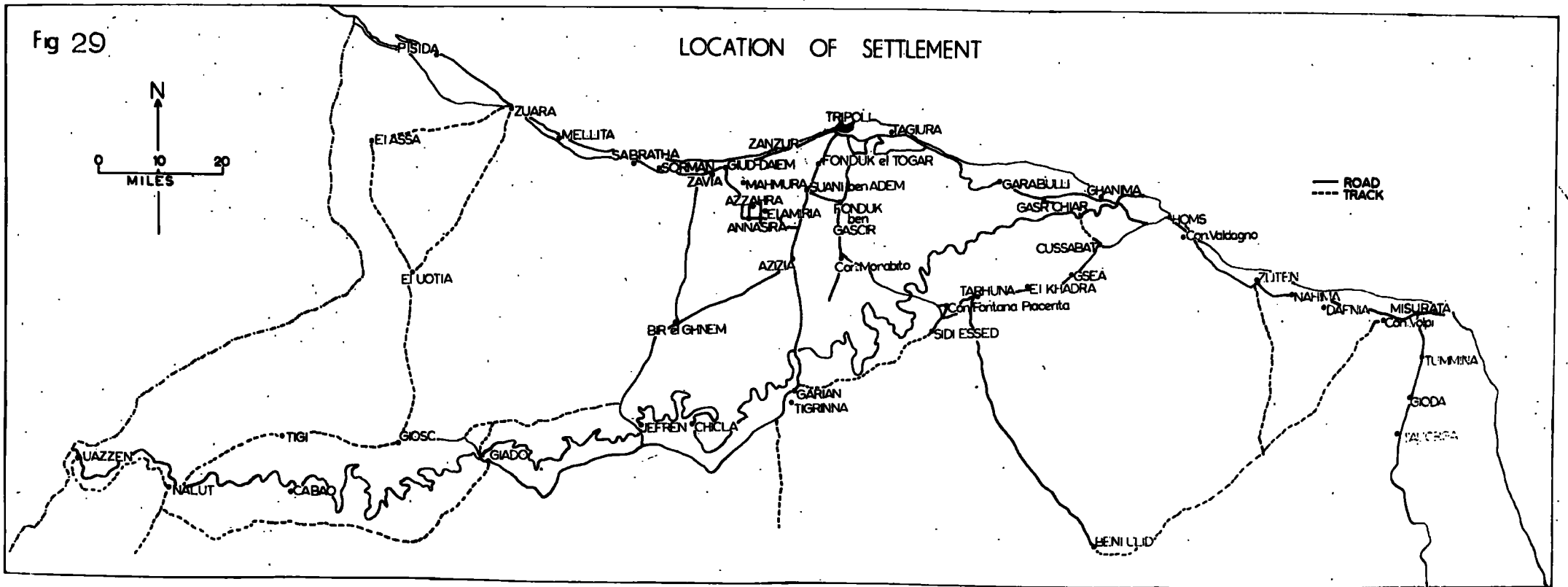


Fig 30

POPULATION CHANGES 1911-1954  
percentage difference

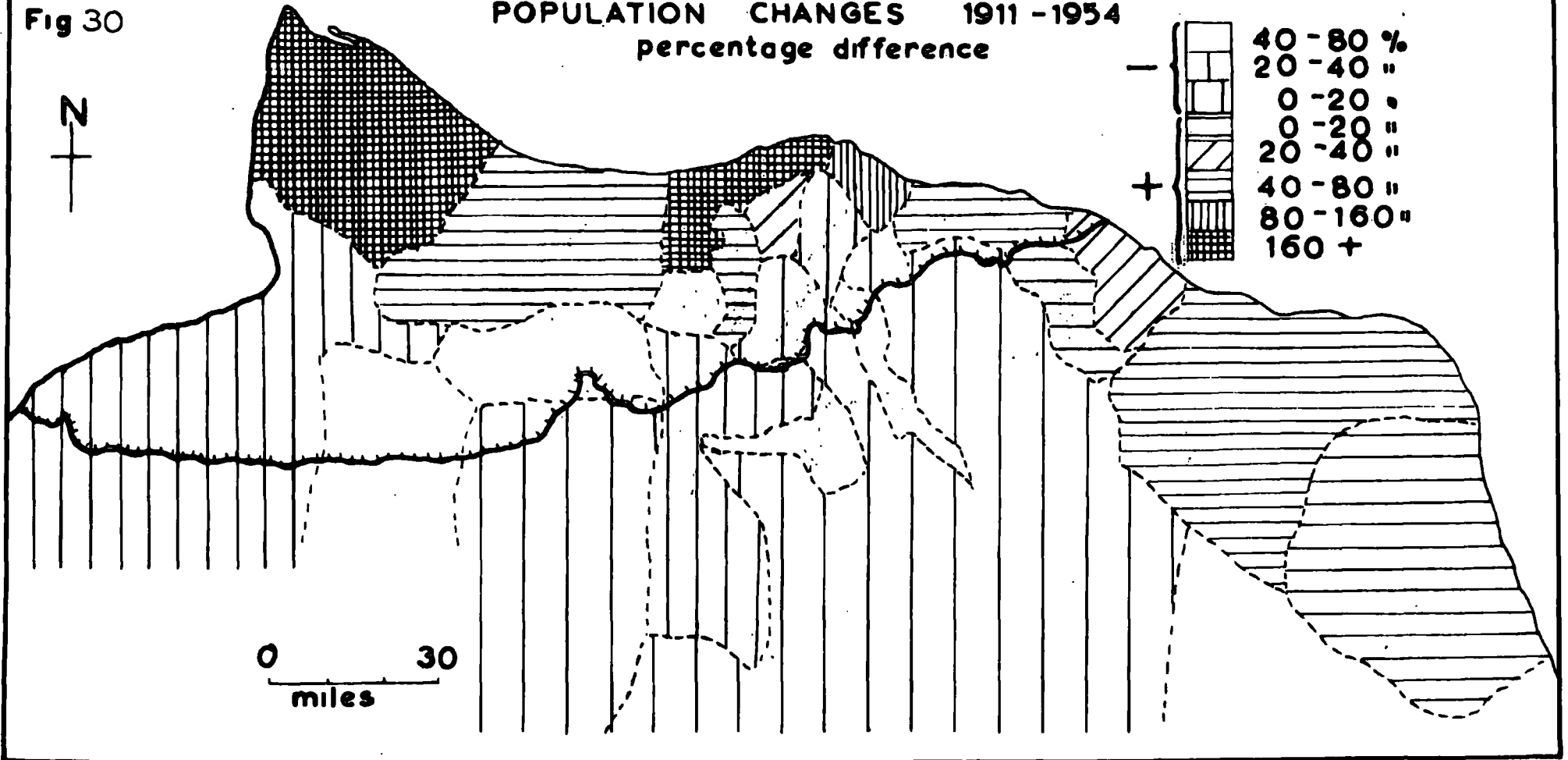


Fig 31

LIBYAN SANIYA - SUK EL GIUMA OASIS

TOTAL AREA-4hectares

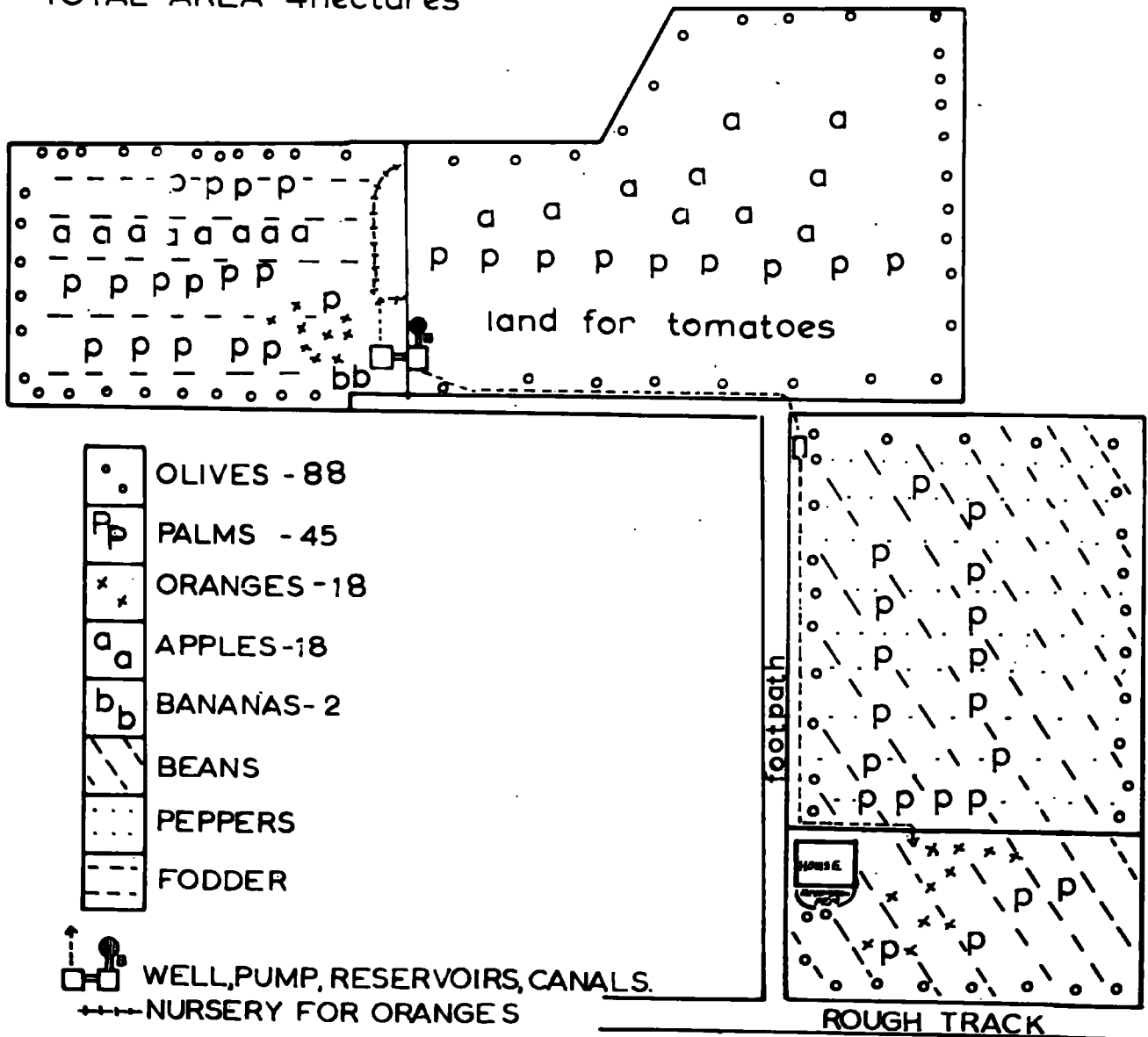


Fig 32

LIBYAN DRY GARDEN AT GASR CHIAR

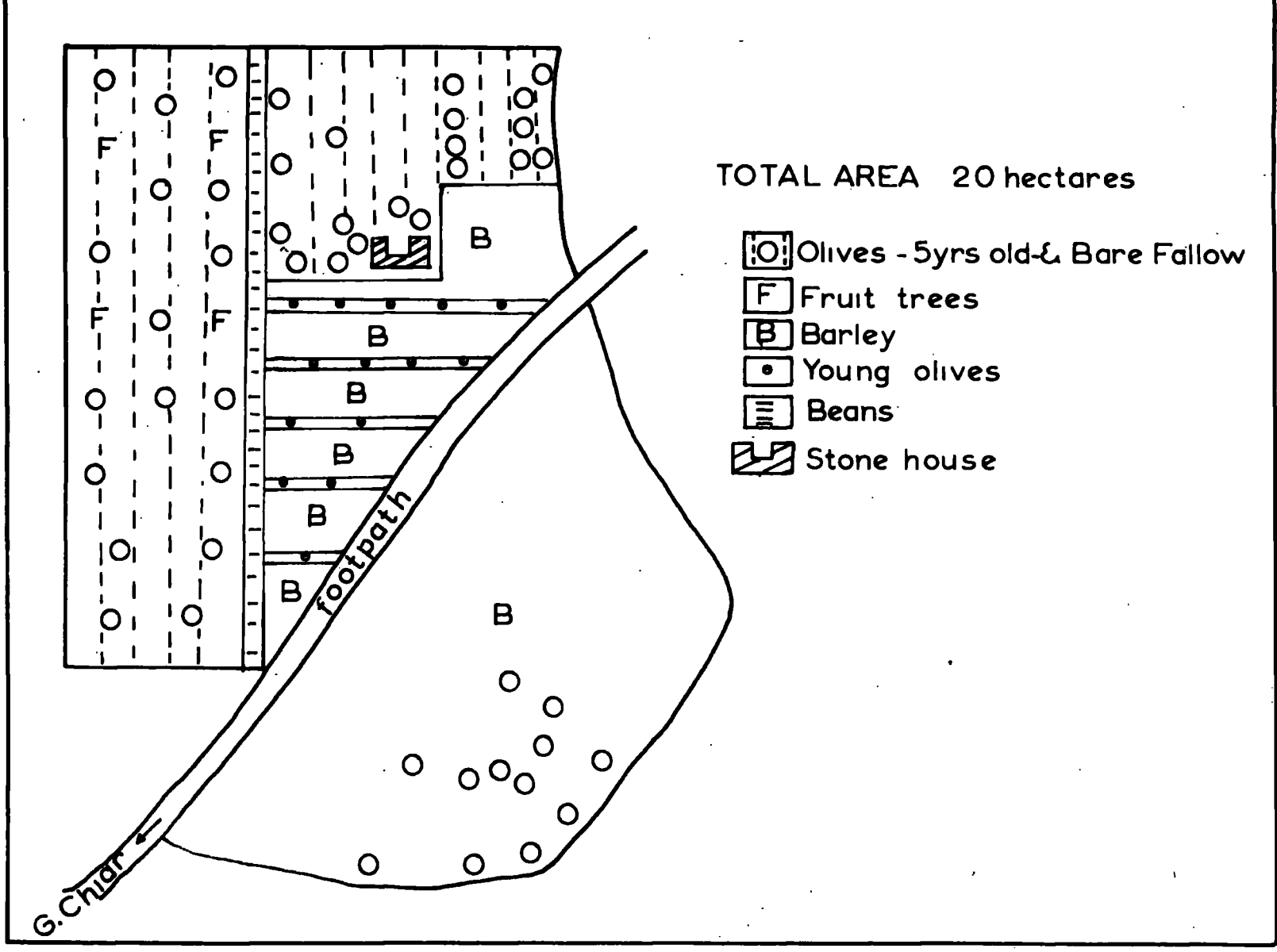


FIG 33

PATTERN OF CULTIVATION AT THE HEAD OF THE WADI HASNUN

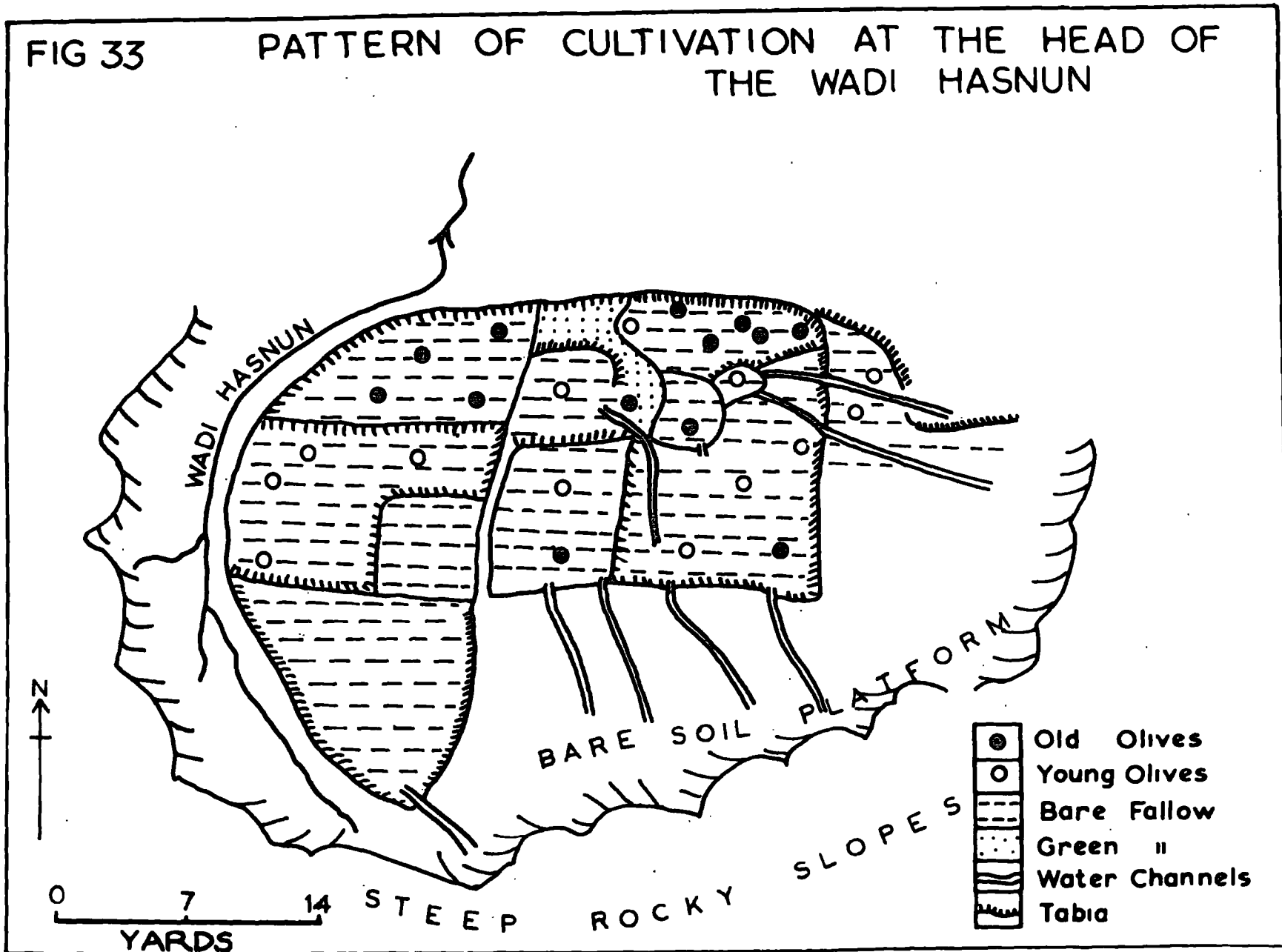


Fig 34

# FARM 72 OLIVETI

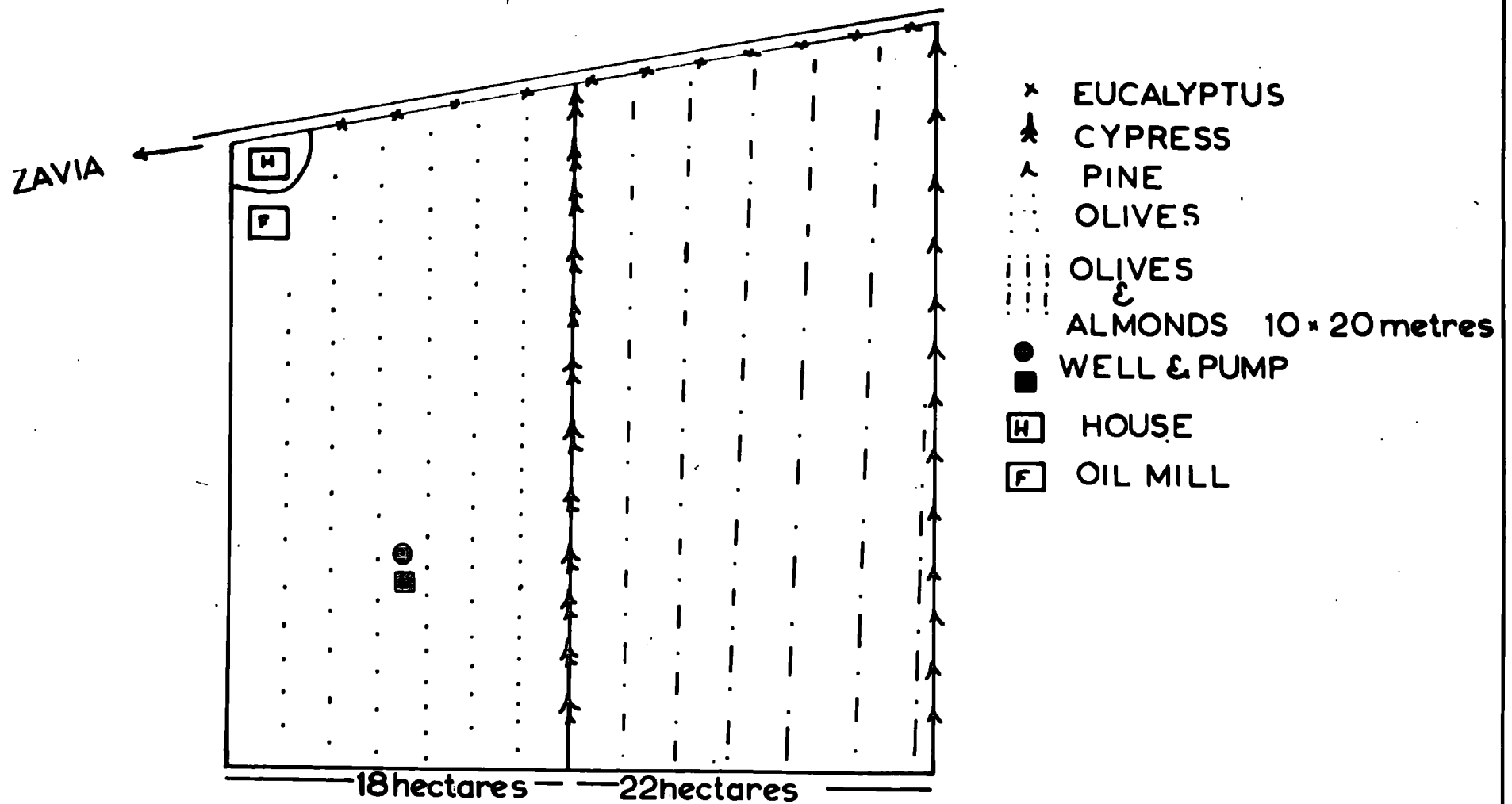




FIG 35

FARM 80 BREVEGLIERI (EL KHADRA)

TOTAL AREA 56 hectares

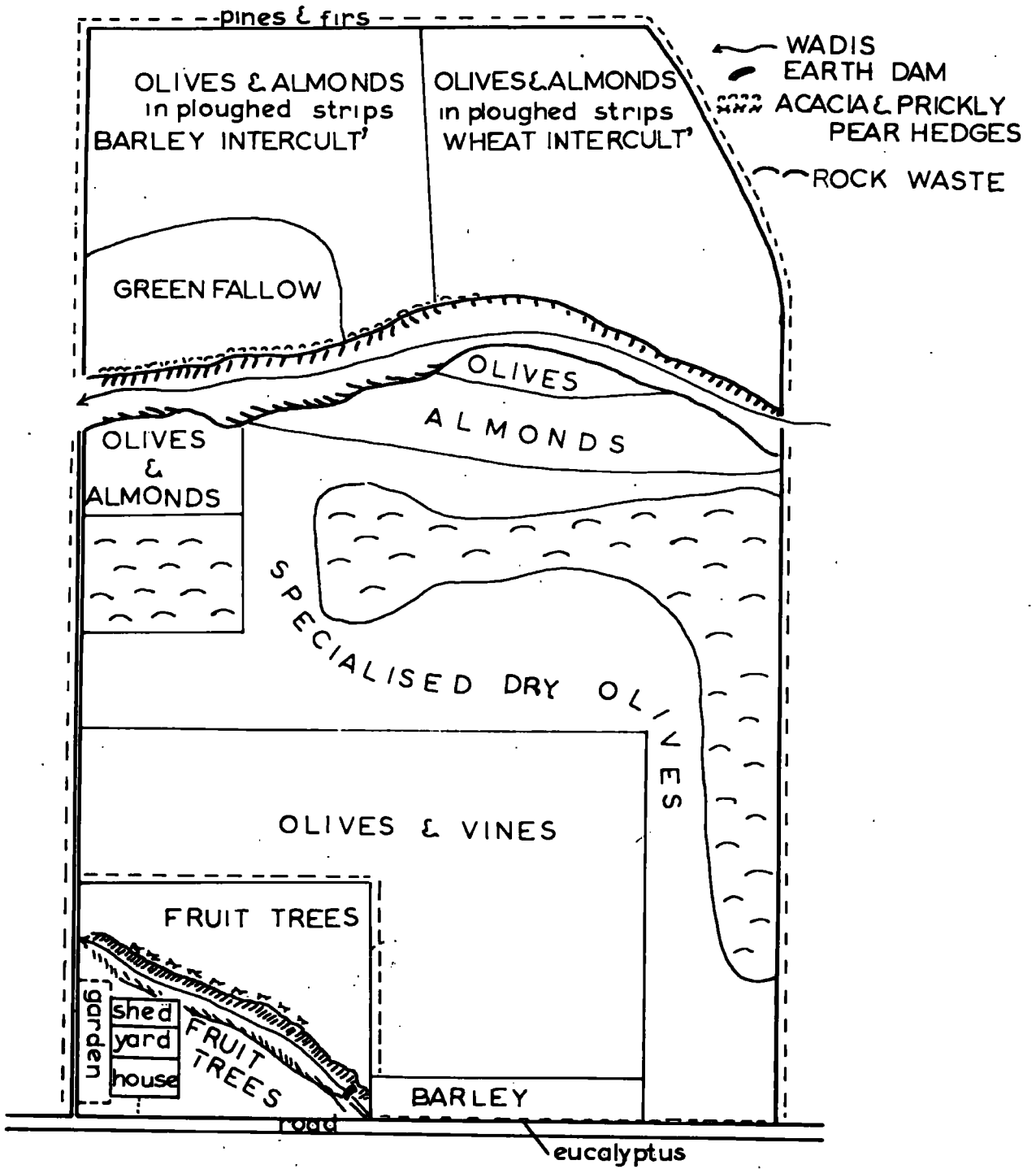
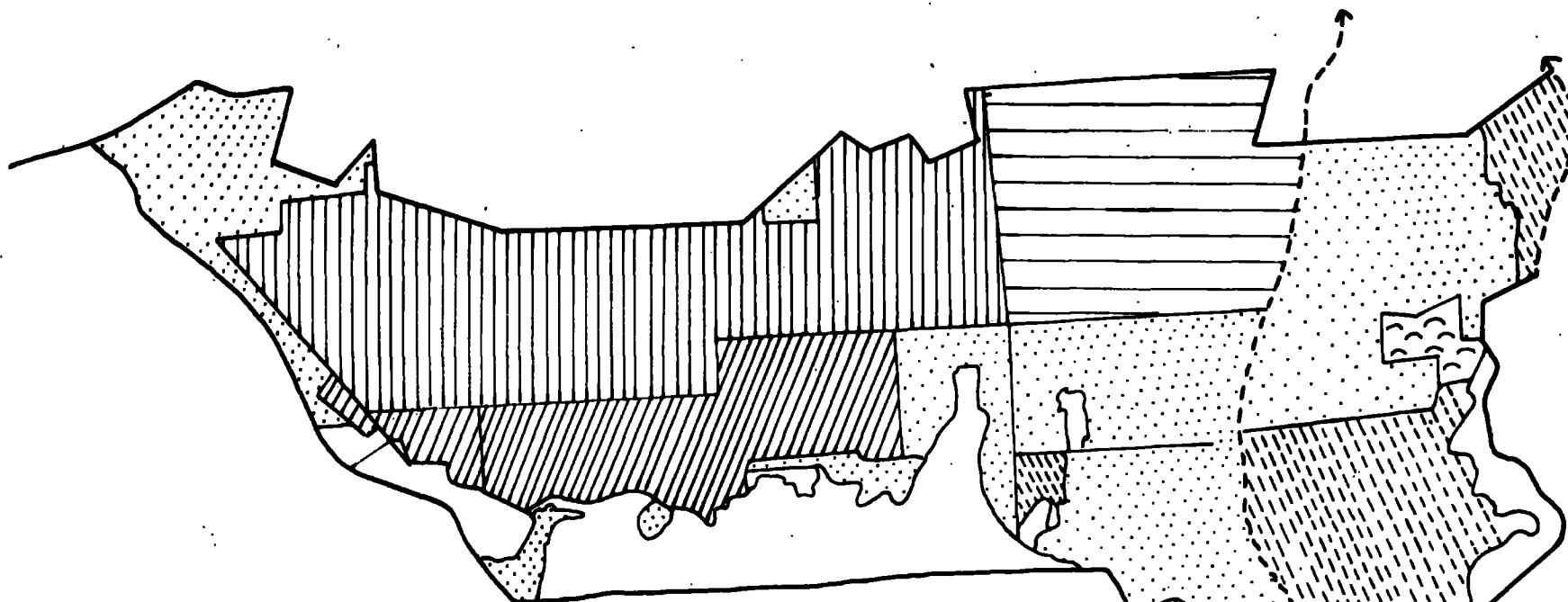


Fig 36

LAND USE - VALDAGNO ESTATE










	Uncultivated Rock Waste	243.75 hectares
	Irrigated plots-Olives, Vines, Annuals	376.50 hectares
	Dry farmed olives 20x10metres	159.50
	Irrigated olives 10 x 10	226.0
	Dry farmed olives irregular	12.0
	Eucalyptus, Pine, Cypress	
	Development Area	368.63

FIG 37

YIELDS PER TREE OF OLIVES

1952/3 - 1955/6

O OLIVETTI

B BIANCHI

I HASCIAN

M MICCA

C CORRADINI

--- IRRIGATED

— DRY FARMED

KILOGRAMS

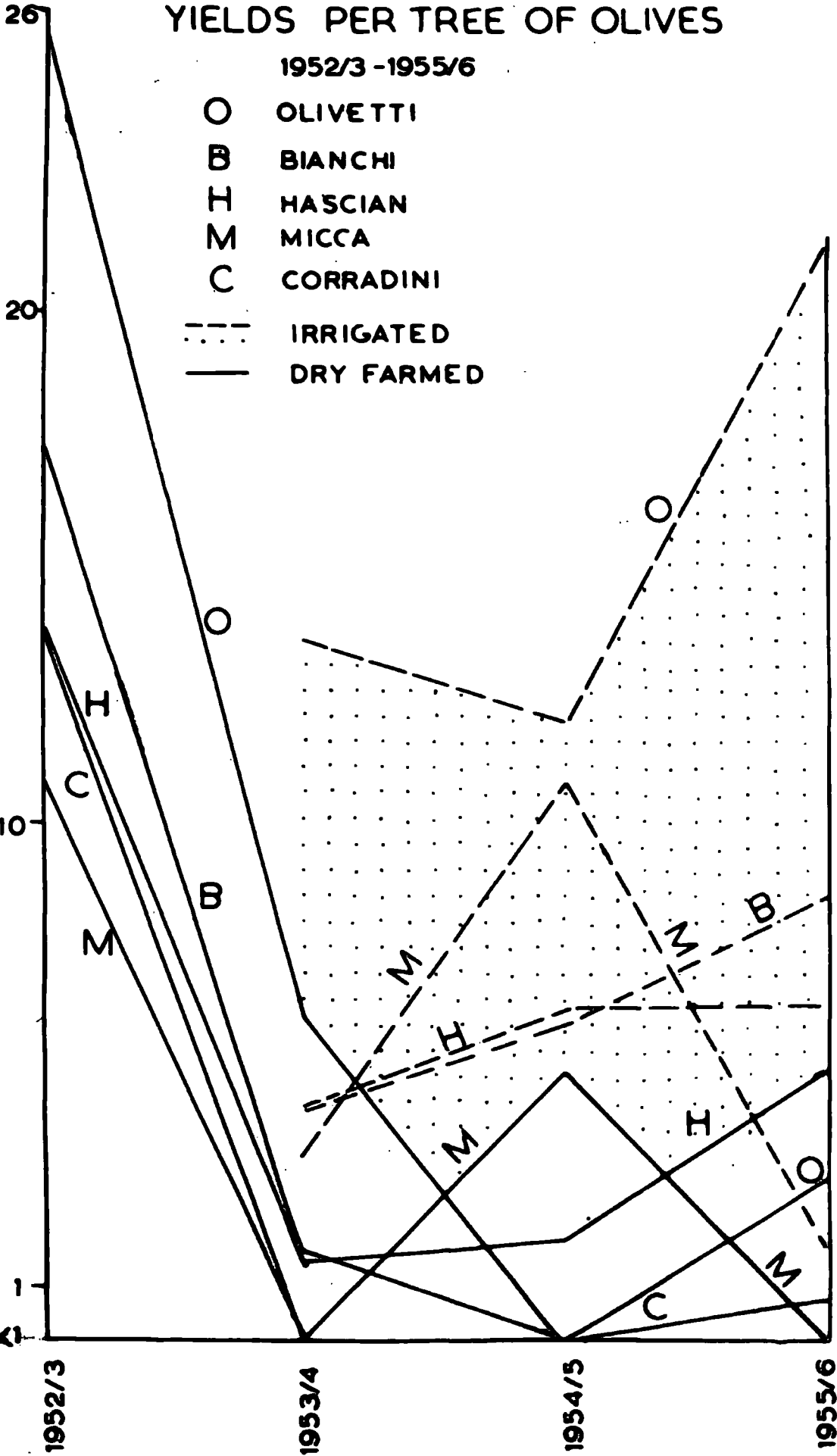


FIG 38

PRODUCTION OF OLIVE OIL IN THE WORLD AND MEDITERRANEAN

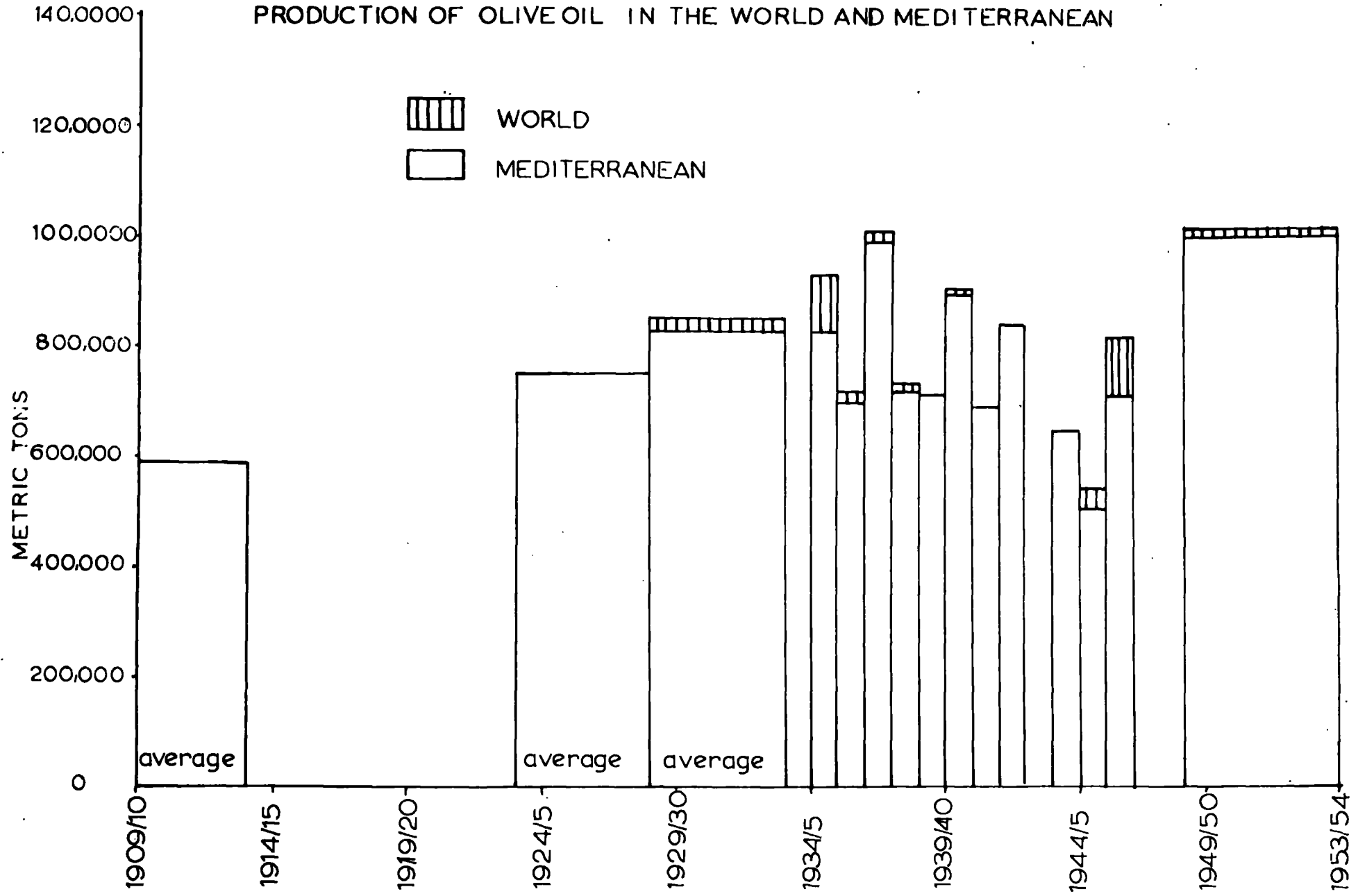


FIG 39

PRODUCTION OF OLIVES, OLIVE OIL & SANSA OIL  
IN TRIPOLITANIA

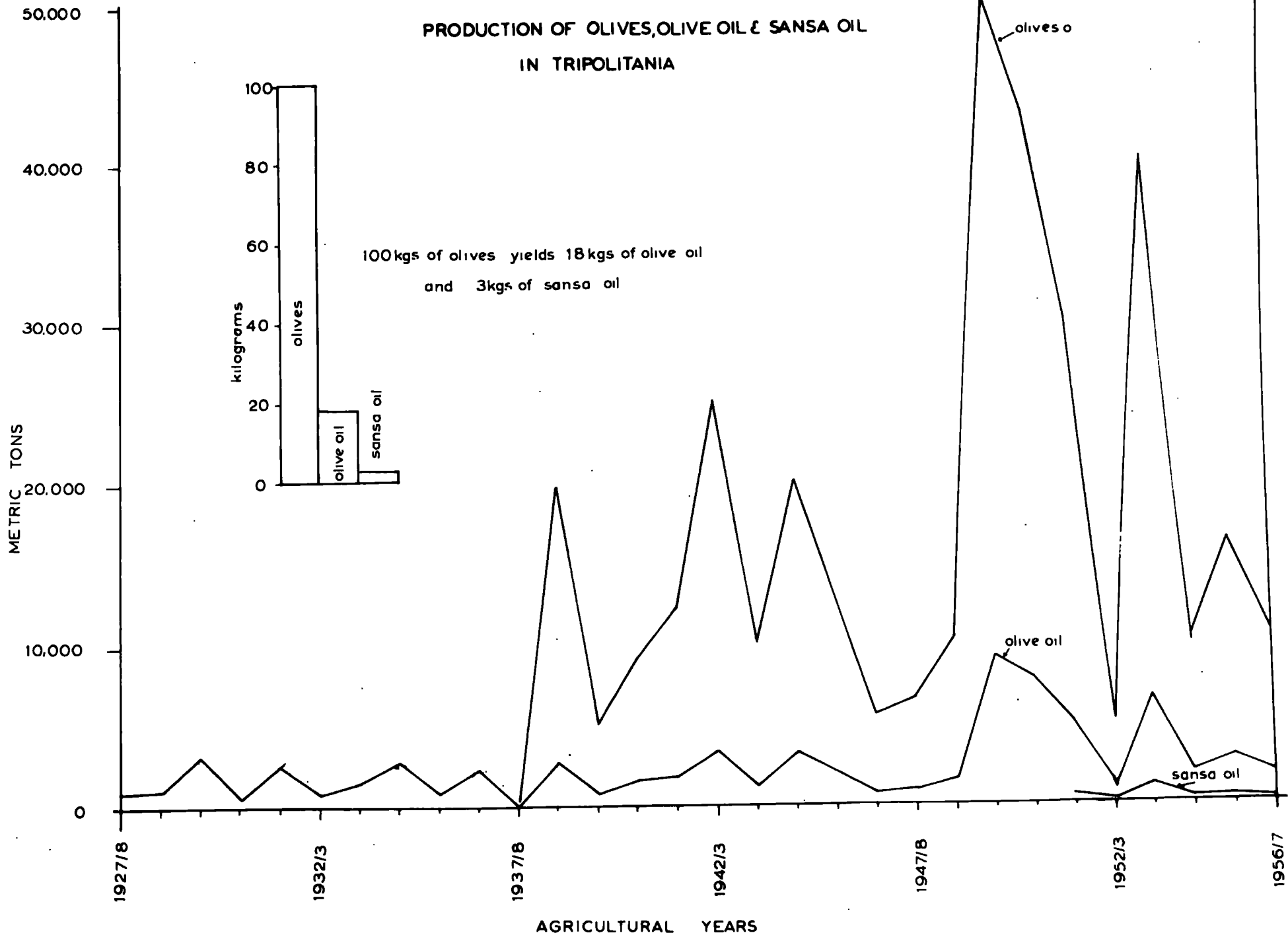


FIG 40

# DISTRIBUTION OF OIL PRESSES in 1953

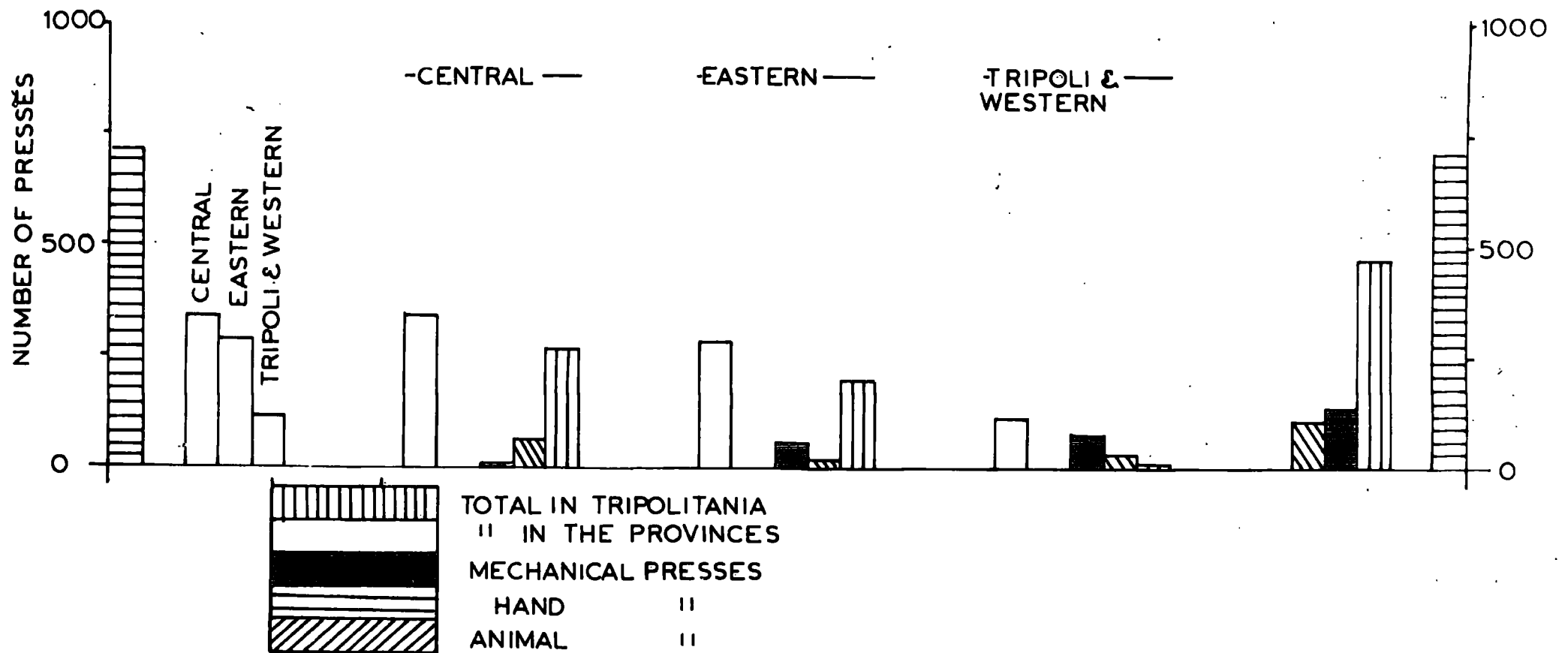
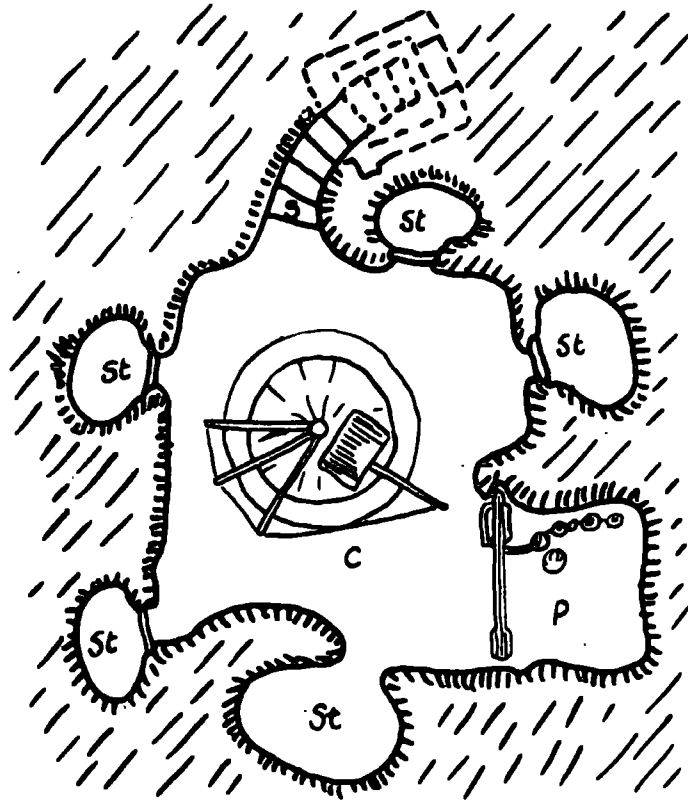


Fig 41

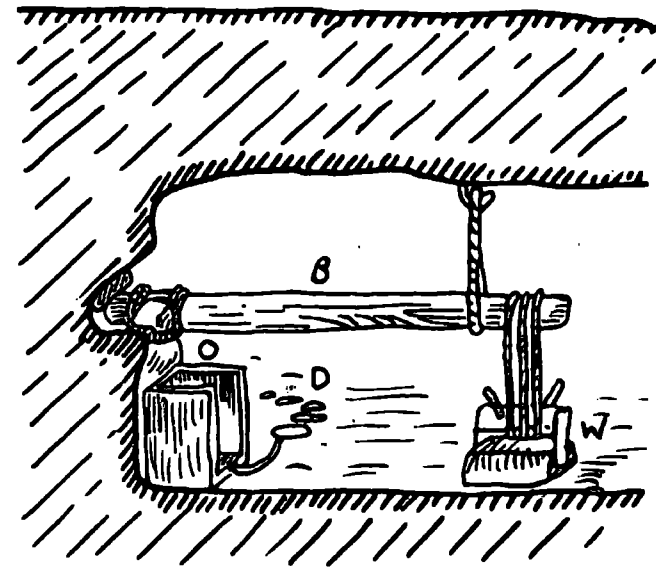
# INDIGENOUS OIL MILL - MASARA

## PLAN



- S - Steps
- st - Storage Recesses
- C - Crushing Cover
- P - Press

## PRESS



- B - Wooden beam
- D - Distilling bowls
- W - Weight
- O - Container for olwas

FIG 4.2

MODERN OIL MILL IN TARHUNA - PLAN

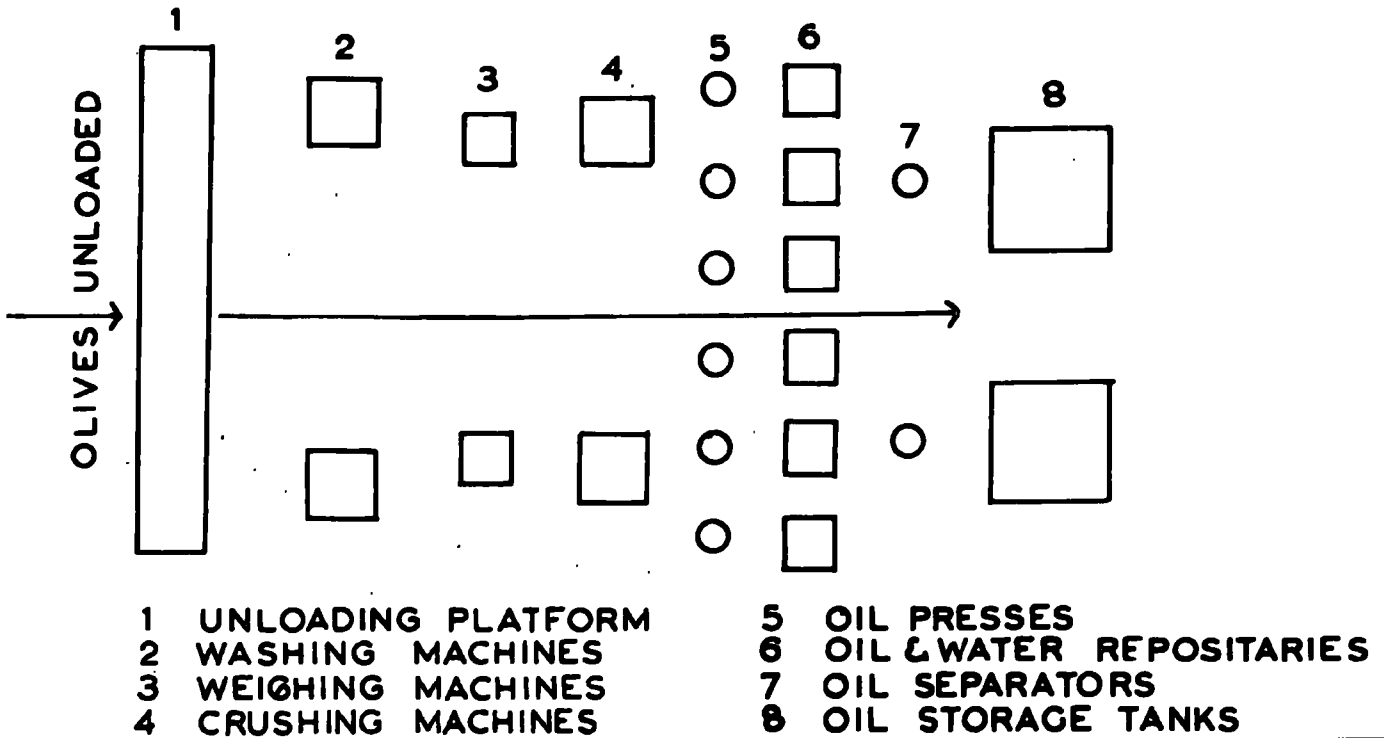


FIG 4.3 COOPERATIVE OIL MILL IN GARIAN - PLAN

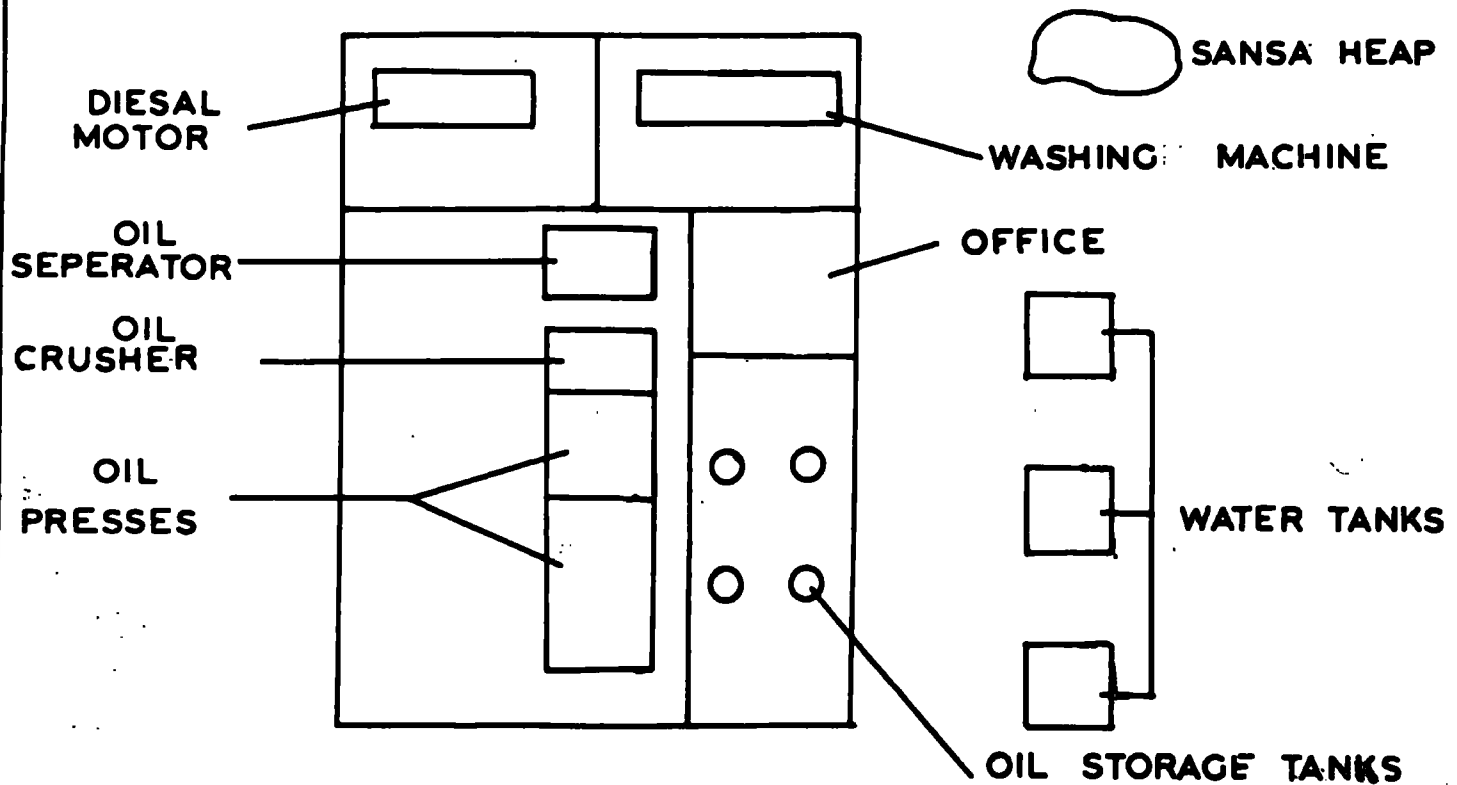




FIG 44

TRADE IN EDIBLE OILS

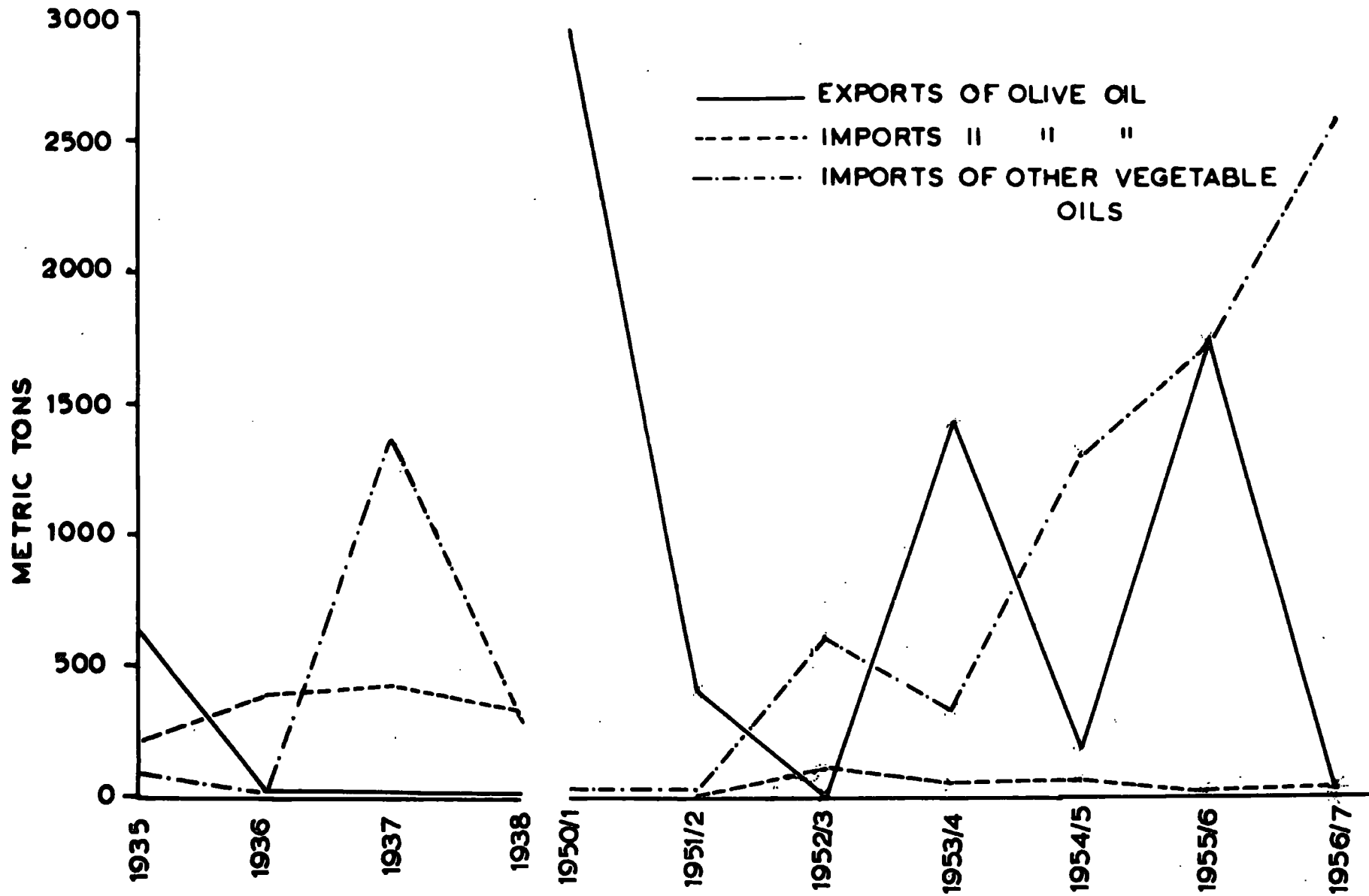


PLATE 1



JEBEL SCARP AT GARIAN  
OVERLOOKING THE PLAIN OF  
GUASSEM

PLATE 2



JEBEL SCARP AT GIADO  
note-the detrital cones<sup>x</sup> at the  
foot of the scarp and the  
horizontal bedding

PLATE 3

MIOCENE FORMATIONS IN THE JEBEL



PLATE 4



QUATERNARY AND RECENT DEPOSITS MASKING THE JEBEL STRATA NEAR GARIAN note - the distribution of olive and fruit trees coincides with this formation

} quaternary

PLATE 5



QUATERNARY OF THE NORTHERN PLAINS

} mobile dunes  
} quaternary  
} miocene outlier

PLATE 6



QUATERNARY OF THE UPPER WADI BASINS

note - the young olives in the foreground, roman fort in the middle distance, x eroded interfluvies in the background.

PLATE 7



DELTAIC CONES IN THE WADI  
NEAR GLADO  
note- the deltas form small  
peninsulas of moisture which  
are terraced and planted to  
trees

PLATE 8



OLIVES IN SCATTERED PATCHES  
OF WADI ALLUVIUM

PLATE 9



SOUTHERN JEFARA & JEBEL  
SCARP  
note- wind eroded surface

PLATE 10

UNDULATING PLAIN OF ASSABA



PLATE 11



QUATERNARY OF THE HIGH  
LEVEL SURFACES  
note- the moulded relief  
dotted with esparto grass

PLATE 12



THE PLAIN OF CUSSABAT  
note- the nucleated settlement  
and high density of  
olives

PLATE 13



DISSECTED SCIOGRAN  
SURFACE  
note-olives in wadis

PLATE 14



THE SAHEL OF HOMS  
note- except for a few olives  
the deep gullies and pebble  
surface reflect the consequen-  
ces of progressive  
deforestation

PLATE 15



UPPER WADI BASIN - GASR  
DOGA  
note- the eroded terraces



PLATE 16



WIND ERODED SOILS OF THE JEFARA

outliers

PLATE 17

DUNE ENCROACHED OLIVES



PLATE 18

ERODED INTERFLUVES OF THE WADI LEBDA



PLATE 19



SILTING UP OF THE WADI MEGENIN  
AFTER HEAVY FLOODS

PLATE 20



WADI HIRA DAM

PLATE 21



LIBYAN DALU



PLATE 22a



2nd ACQUIFER ITALIAN WELL  
note-wind pumps are now being replaced  
by electric motors

PLATE 22b



ARTESIAN  
WELL

PLATE 23a



OLIVES IN THE WADI BENI ULID

PLATE 23b



OLIVES BEHIND LATERAL STONE  
DAMS AT BENI ULID

PLATE 24

LOCAL OLIVE VARIETIES

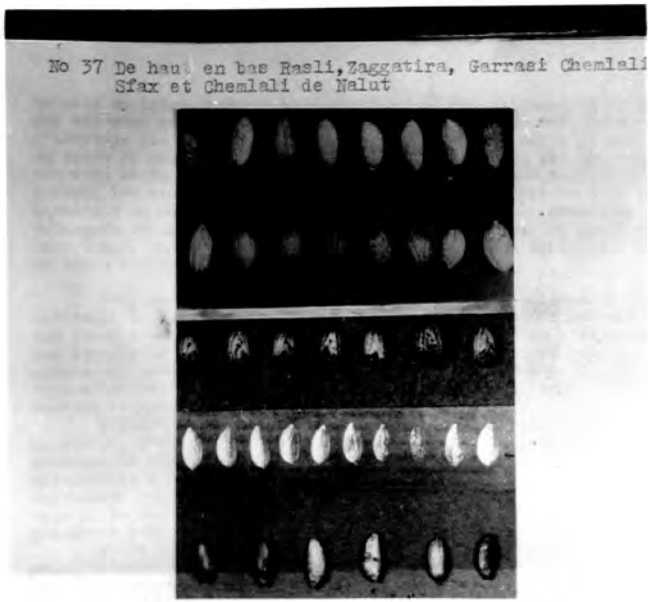


PLATE 25

CHEMLALI GRAFTS ON ITALIAN VARIETIES AT ZAVIA



PLATE 26a

PLATE 26b



PLATE 27



INTENSIVE CROPPING IN A LIBYAN GARDEN note-the crumbling tabia enclosing olives and wheat

PLATE 29

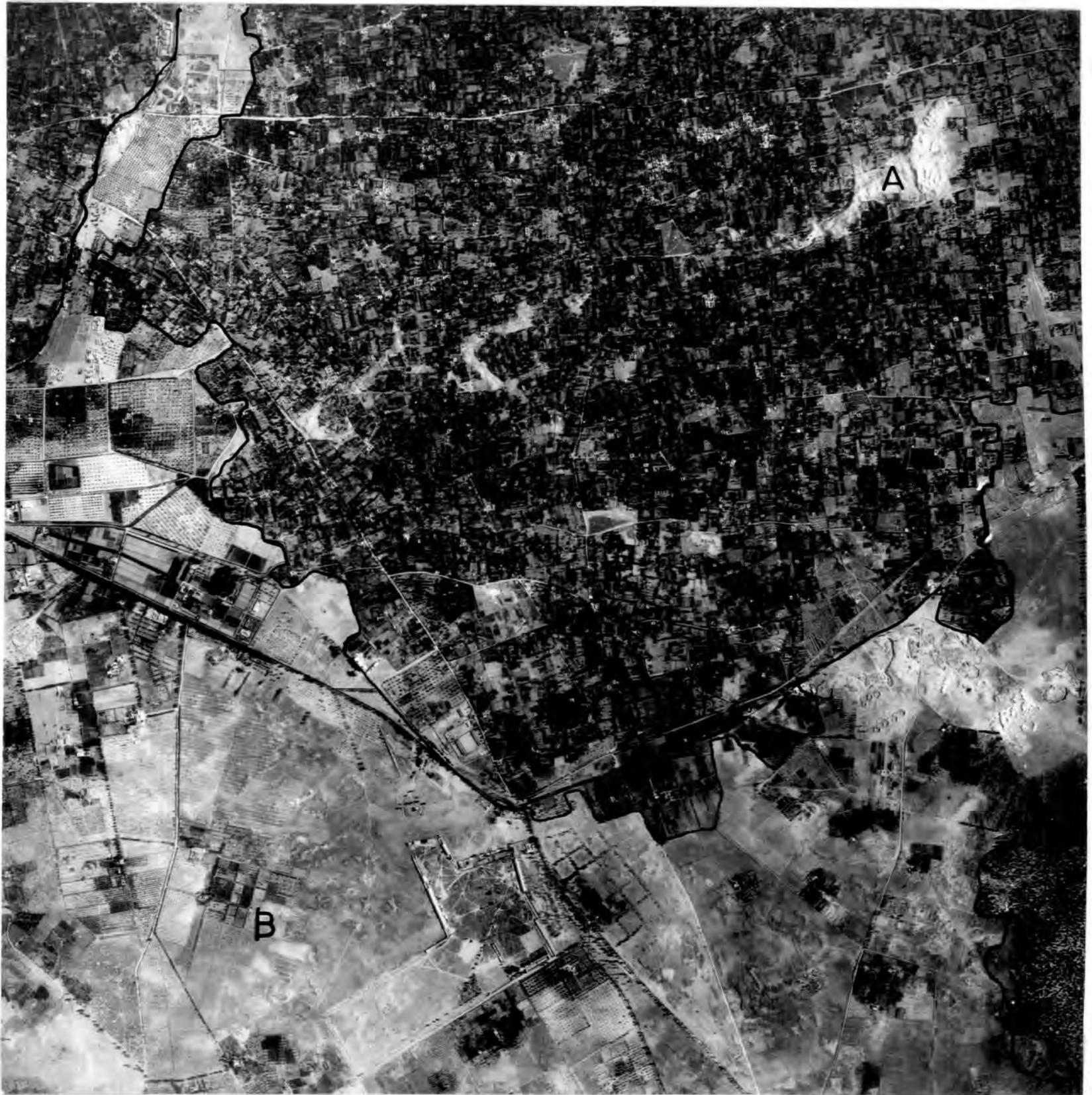


RECENT COLONISATION OF STEPPE AREAS SURROUNDING TRIPOLI OASIS

PLATE 30



LARGE ITALIAN OLIVES AT SUANI BEN ADEM



TRIPOLI OASIS AND ITS ENVIRONS

- A - libyan cultivation mosaic, with small gardens and tortuous tracks.
- B - italian private farms are dispersed extensively over undulating sandy areas surrounding the oasis depressions
- C - afforested zone





PLATE 32

DRY FARMED OLIVES AT  
GARIBALDI  
note the wide spacing of the  
trees and clean cultivation  
either side of the rows. the  
green fallow in between  
prevents soil erosion.



PLATE 33 SOUTHERN MARGIN OF CULTIVATION IN THE JEFARA



PLATE 34



SCHECSUICH; A PIEDMONT,  
SPRINGLINE OASES.

PLATE 35 VILLAGES & OLIVES IN THE JEBEL NEAR JEFREN



PLATE 36a



OLD OLIVES ON THE  
CUSSABAT PLAIN

PLATE 36b



CUSSABAT

PLATE 37



DISSECTED NORTHERN EDGE  
OF THE EASTERN JEBEL

PLATE 38



ITALIAN OLIVE PLANTATIONS ON THE CENTRAL TARHUNA PLATEAU

PLATE 39 MARCONI: AN UNFINISHED DEMOGRAPHIC SETTLEMENT

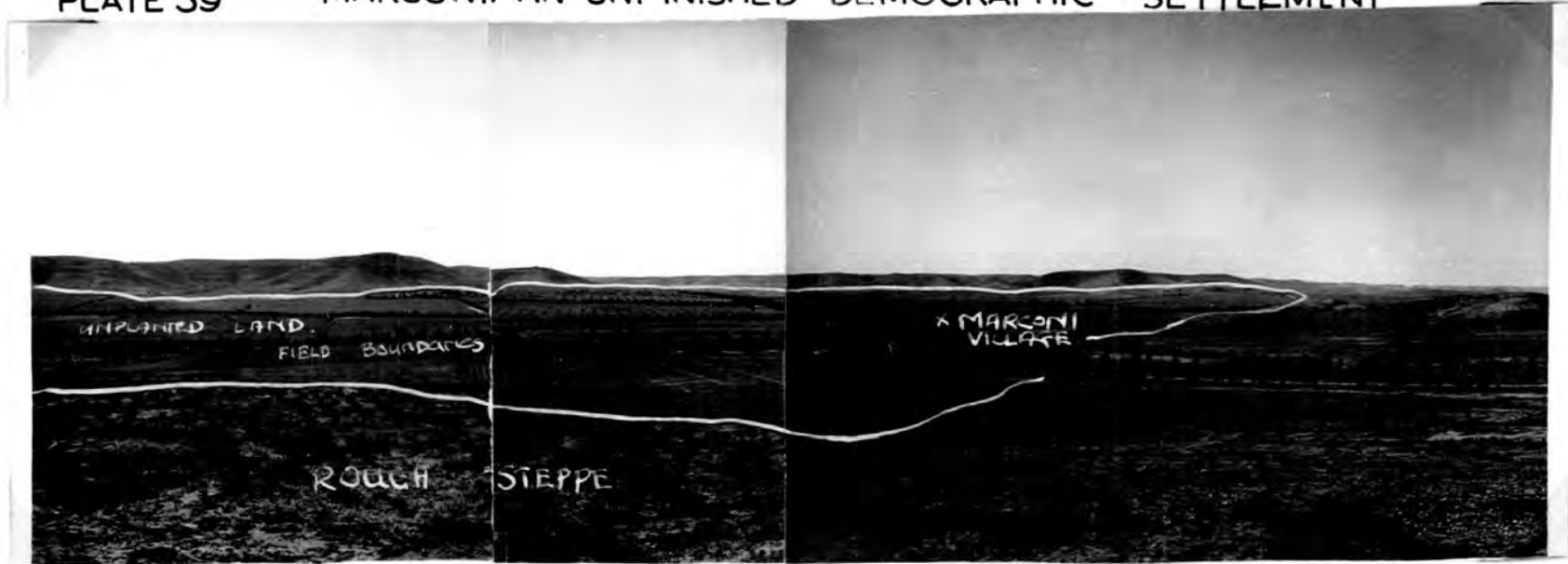


PLATE 40

TIGRINNA PLAIN  
note- italian demographic farms  
are dispersed amongst former  
libyan owned olives





PLATE 41



OLIVES DISPERSED OVER THE QUATERNARY OF THE WESTERN JEBEL

PLATE 42



CULTIVATION IN THE WADIS OF THE WESTERN JEBEL

PLATE 43a



SABRATHA

PLATE 43b



LEPTIS MAGNA

note-coarse vegetation has taken root on wind blown sands which have partially enveloped these magnificent 'oil cities'

PLATE 44



REMAINS OF ROMAN OLIVE  
FARM IN THE EASTERN  
JEBEL

PLATE 45



ROMAN MAUSOLEA 'ES SENAMA'  
(OIL STONE) IN THE CENTRAL  
JEBEL

PLATE 46



ROMAN OIL PRESSES<sup>x</sup> IN THE  
EASTERN JEBEL

PLATE 47



WADI EROSION AS A RESULT  
OF THE DESTRUCTION OF  
ROMAN DAMS

PLATE 48



BEDOUIN TENT ON THE  
PLAIN OF ASSABA

PLATE 49



PERIPHERAL DEVELOPMENT  
ZONES OF ITALIAN FARMS  
AT BIANCHI



BREVIQUERI - A TYPICAL ITALIAN DEMOGRAPHIC SETTLEMENT  
note - the rectangular layout of the farms, the predominance  
of tree crops (dots on the photo), and the encroachment  
by sand dunes of the southern farms.



PLATE 51

DEMONSTRATION TERRACING  
AT THE GARIAN STATE  
NURSERY



PLATE 52

STONE HOUSES<sup>x</sup> REPLACING  
THE TENT IN THE PLAIN OF  
ASSABA



} wadi garden with olives and  
fruit trees

PLATE 53

TABIA: TYPICAL BOUNDARY OF AN  
OASIS GARDEN  
note- the sandy track and prickly pears  
on top of the tabia



PLATE 54



NON IRRIGATED LAND  
PLANTED TO TREES  
SURROUNDING THE TRIPOLI  
OASIS  
note- sheep and goats are  
traditionally grazed on the  
water-consuming green fallow  
between the olives.

PLATE 55



LIBYAN GEDULA SYSTEM  
OF IRRIGATION

PLATE 56



DRY GARDEN IN THE WADI  
LEBDA WITH OLIVES & FRUIT  
TREES

PLATE 57



OLIVES, PALMS & FRUIT TREES IN DRY OASIS GARDENS AT MISURATA

PLATE 59



INUNDATED CULTIVATION OF OLIVES →

PLATE 58



LIBYAN DRY GARDENS AT GASR CHIAR

x STONE HOUSES

} FARM SAMPLE



INDIGENOUS ARD PLOUGH

BEATING WITH A STICK: A LIBYAN METHOD OF HARVESTING THE HIGHER OLIVE FRUITS

PLATE 61

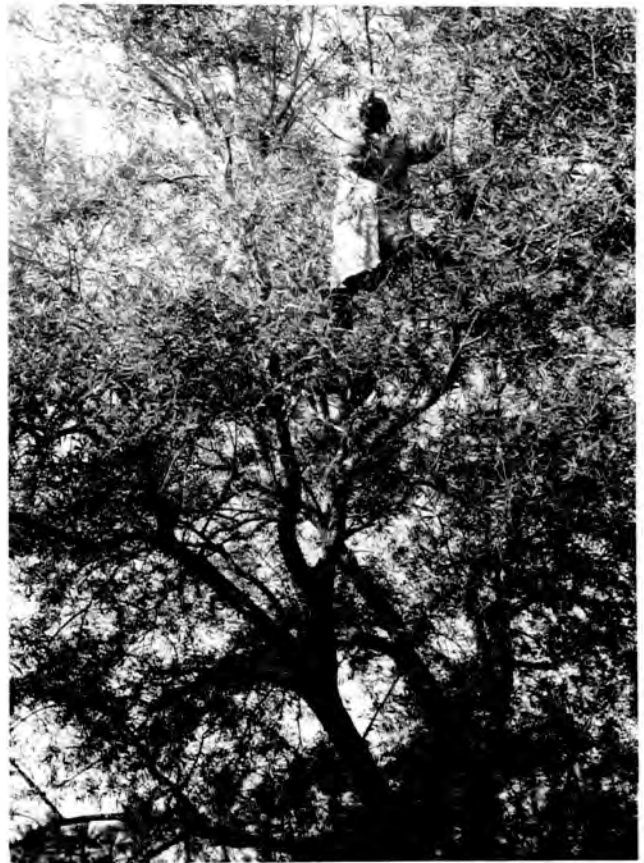


PLATE 62a



MODERN HARVESTING METHODS(1)  
note- the tripod enables the fruit to be handpicked whilst the groundsheet eliminates bruising and wastage



PLATE 62b



(2)  
LIBYAN HARVESTING TEAMS  
ON AN ITALIAN OLIVE  
PLANTATION  
note- men pick, women gather  
and bag the fruit

PLATE 62c



(3) 'GUANTES': SHEEP HORNS USED TO  
STRIP OLIVE BRANCHES OF  
THEIR FRUITS

PLATE 63

SEMI-IRRIGATION OF  
ITALIAN OLIVES AT ZAVIA  
note- the use of the  
sprinkler system, strip  
cropping and the sandy  
nature of the clean-  
weeded soils



PLATE 64



VINES INTERCULTIVATED WITH  
OLIVES AT BREVIGLIERI

PLATE 65



SPECIALISED OLIVES IN  
DRYLAND PLANTATIONS ON  
THE JEBEL

PLATE 66



LIBYAN OLIVE NURSERY  
(FARM SAMPLE 7)

PLATE 67



BADLY PRUNED OLIVE TREES  
(FARM SAMPLE 7)

PLATE 68



OLIVES IN 'GEDULA' AT VALDAGNO

PLATE 69



OLIVES & ALMONDS ON THE  
ITALIAN CONCESSION  
FONTANA PIACENTE

PLATE 70



OLIVE OVULES READY FOR  
TRANSPORT FROM SFAX TO  
TRIPOLI

PLATE 71



LIBYAN METHOD OF REJUVENATING  
OLD OLIVE TREES  
note- young shoots are allowed to grow  
from the trunk of the old tree  
which is being cut away for firewood

PLATE 72



DARB-EL-ME OIL PRESS AT  
CUSSABAT

} stone crusher

} distillation tank

PLATE 73



MECHANICAL OLIVE CRUSHER IN A  
STANDARD LIBYAN MILL

PLATE 74



COOPERATIVE OIL MILL AT  
GARIAN



PLATE 75  
SANSO OIL AND SOAP  
FACTORY AT HOMS



PLATE 76



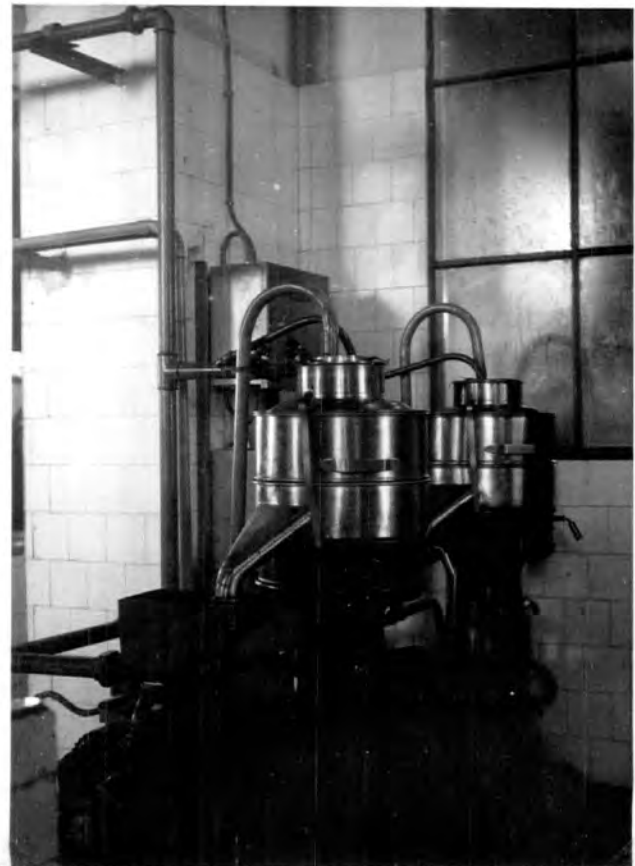
MODERN ITALIAN OIL MILL  
S.A.F.I.L.

PLATE 77a



PRESSES<sup>P</sup> & DISTILLING BARRELS<sup>D</sup> IN  
CLASSIC OIL MILL

PLATE 77b



CENTRIFUGAL OIL SEPARATORS