Durham E-Theses

An economic geography of consumer movement and expenditure patterns in county Durham

Christopher N. Jensen-Butler

How to cite:

Jensen-Butler, Christopher N. (1970) An economic geography of consumer movement and expenditure patterns in county Durham. Doctoral thesis, Durham University.

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 https://etheses.durham.ac.uk/id/eprint/10388/ 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.

AN ECONOMIC GEOGRAPHY OF CONSUMER MOVEMENT

AND EXPENDITURE PATTERNS IN COUNTY DURHAM.

DIAGRAMS:

To accompany a Thesis submitted for the
degree of Doctor of Philosophy, in the
University of Durham.
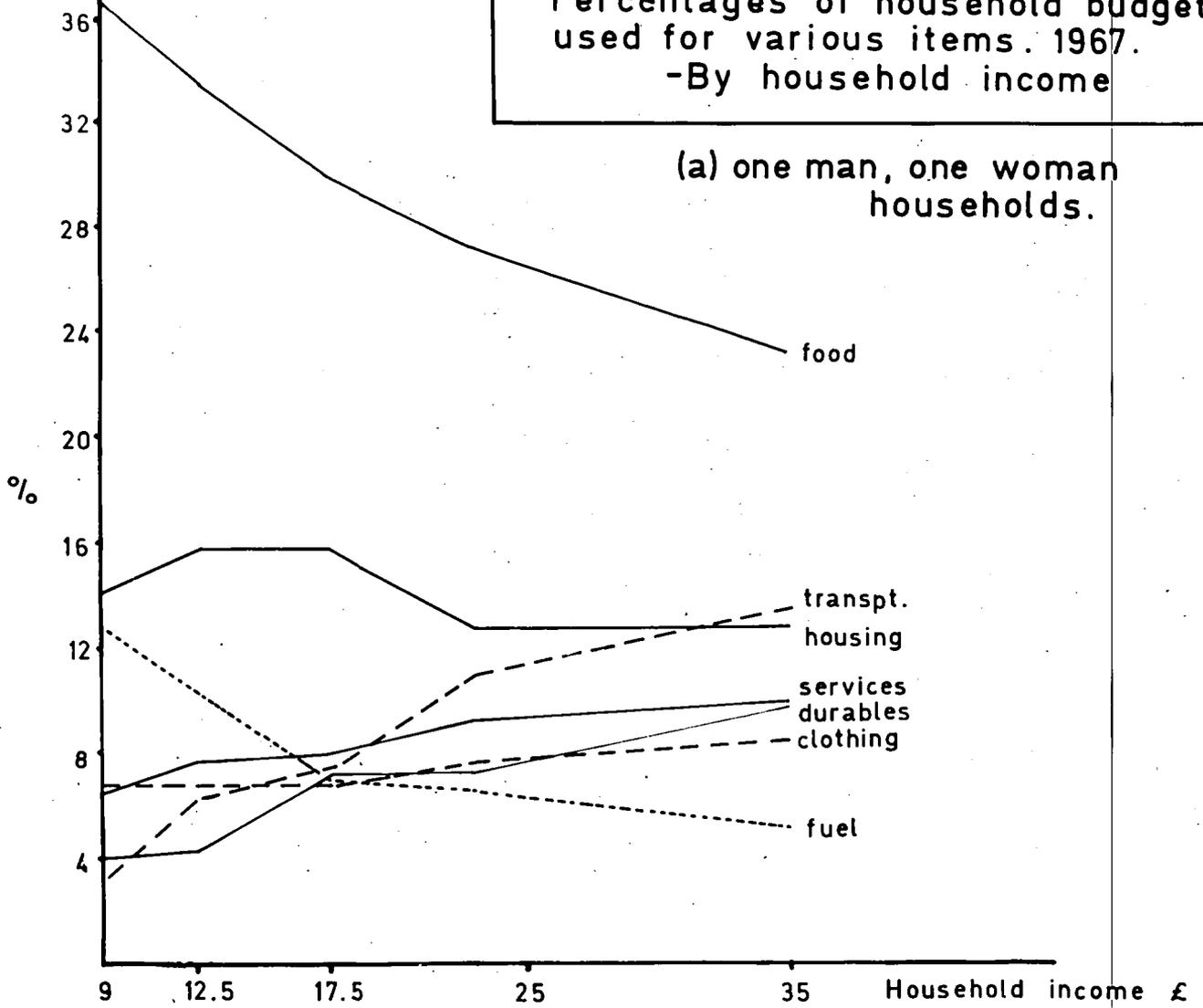

CHRISTOPHER N. JENSEN - BUTLER. B.A.

December 1970.
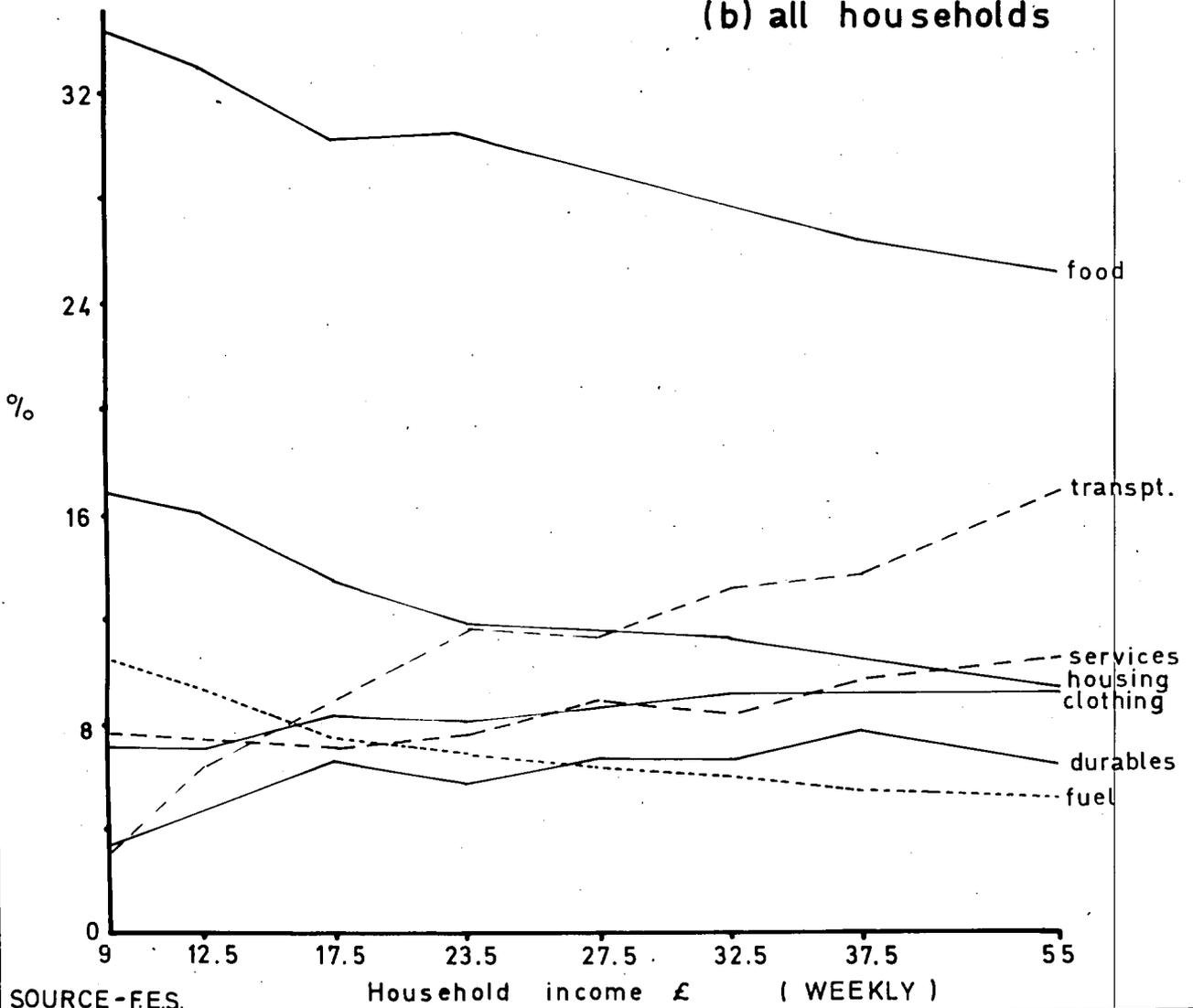
Percentages of household budgets used for various items. 1967. -By household income
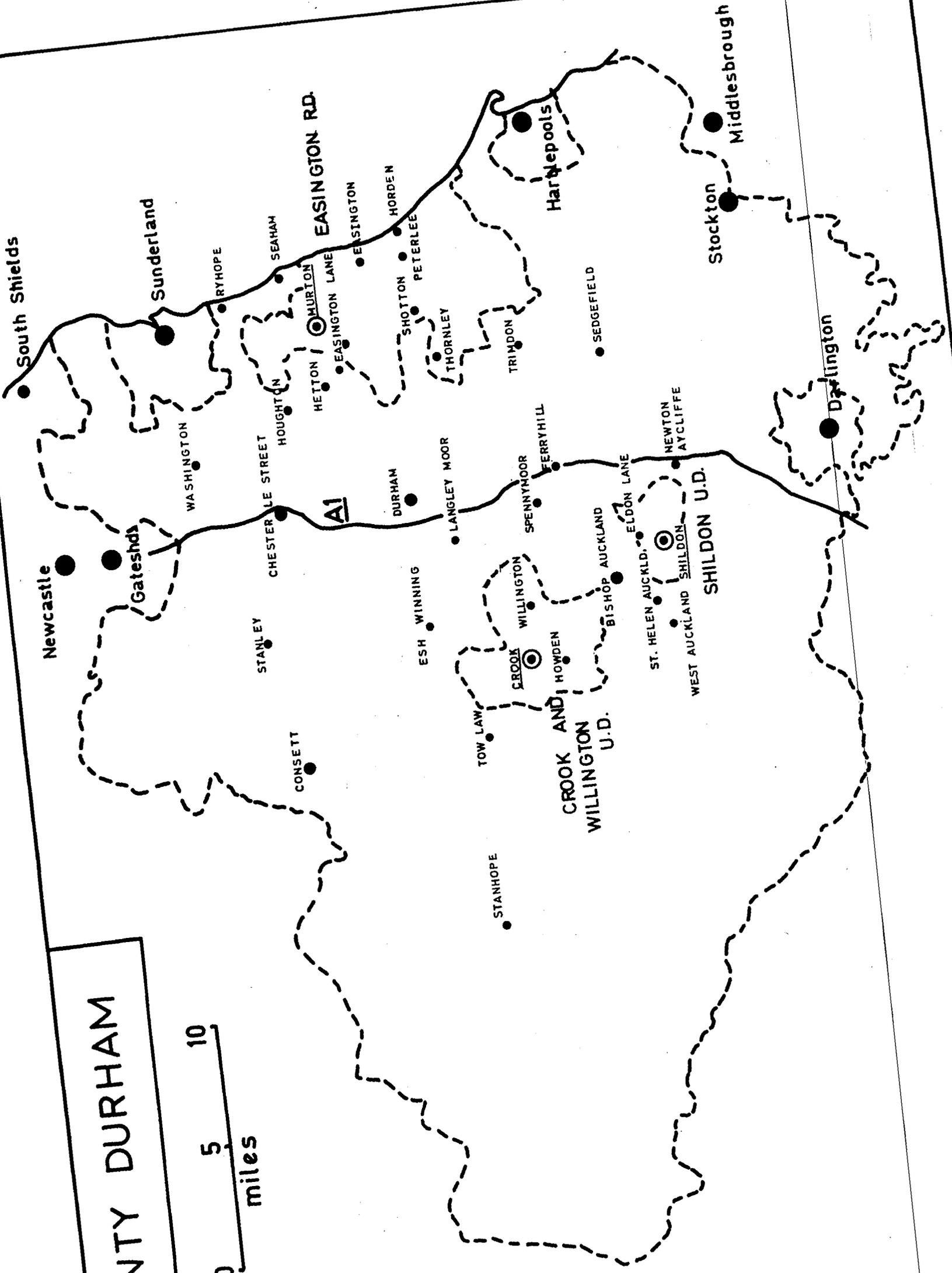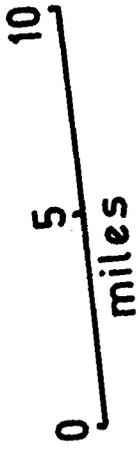
(a) one man, one woman households.

food

transpt.
housing
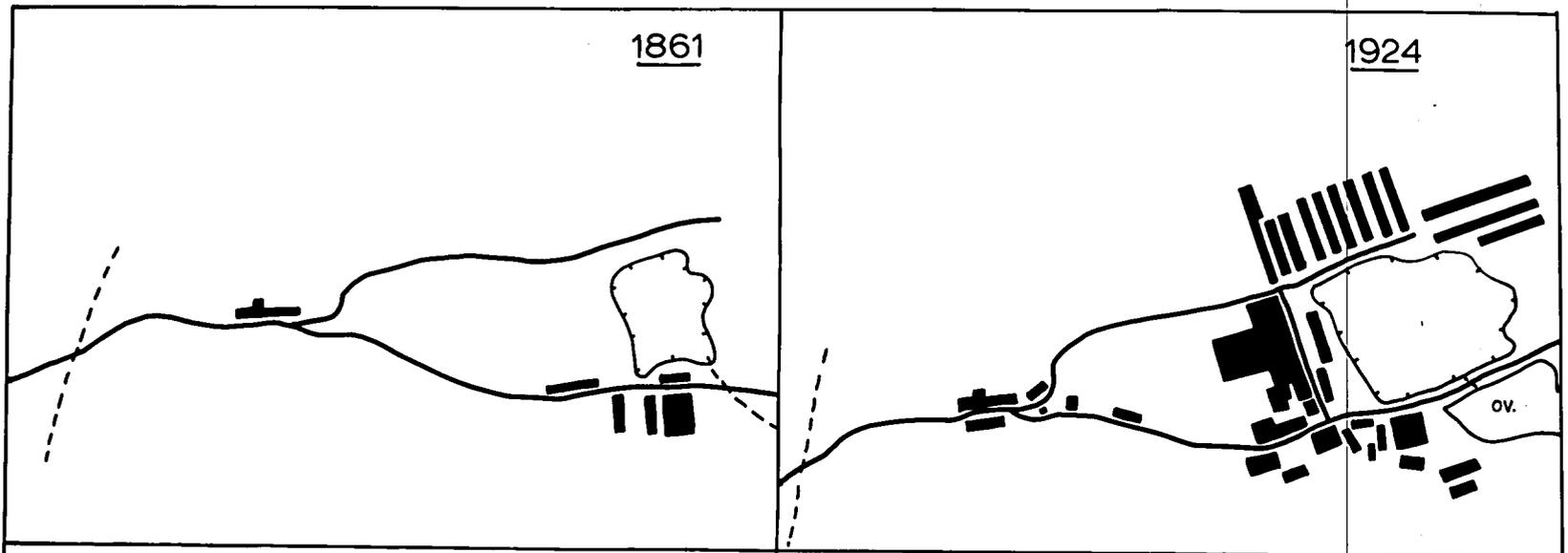services
durables
clothing
fuel

Household income £

(b) all households

food

transpt.

services
housing
clothing

durables
fuel

SOURCE-F.E.S.   Household income £   (WEEKLY)

1.

COUNTY DURHAM

miles

0   5   10

South Shields

Newcastle

Gateshead

Sunderland

RYHOPE

SEAHAM

EASINGTON RD.

MURTON

EASINGTON LANE

HETTON

HOUGHTON

WASHINGTON

CHESTER LE STREET

A1

STANLEY

CONSETT

DURHAM

LANGLEY MOOR

ESH WINNING

STANHOPE

TOW LAW

CROOK

HOWDEN

WILLINGTON

CROOK AND
WILLINGTON U.D.

BISHOP AUCKLAND

SPENNYMOOR

FERRYHILL

SEDGEFIELD

TRIMDON

THORNLEY

SHOTTON

PETERLEE

EASINGTON

HORDEN

Hartlepools

Middlesbrough

Stockton

ELDON LANE

NEWTON
AYCLIFFE

SHILDON

SHILDON U.D.

ST. HELEN AUCKLD.
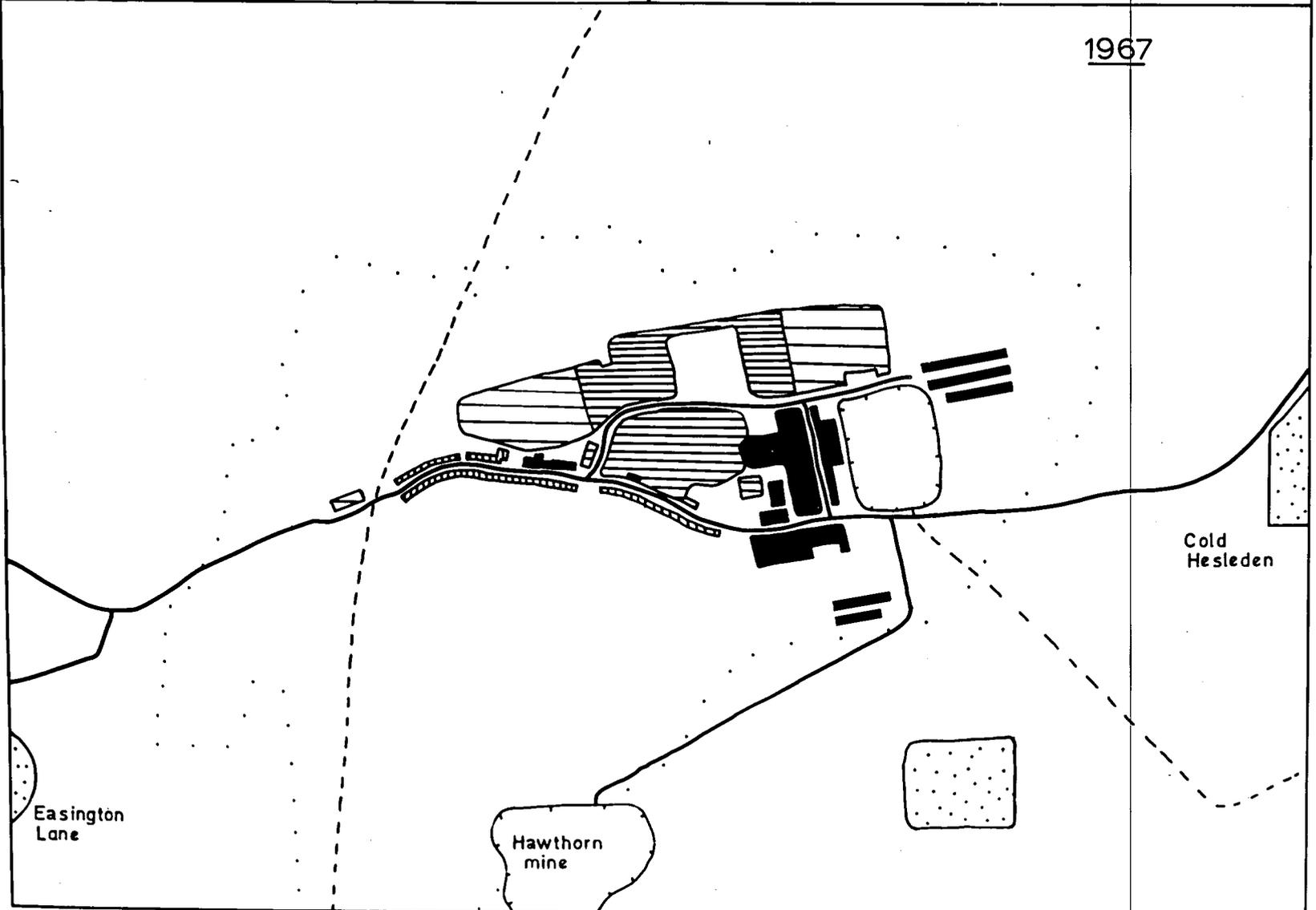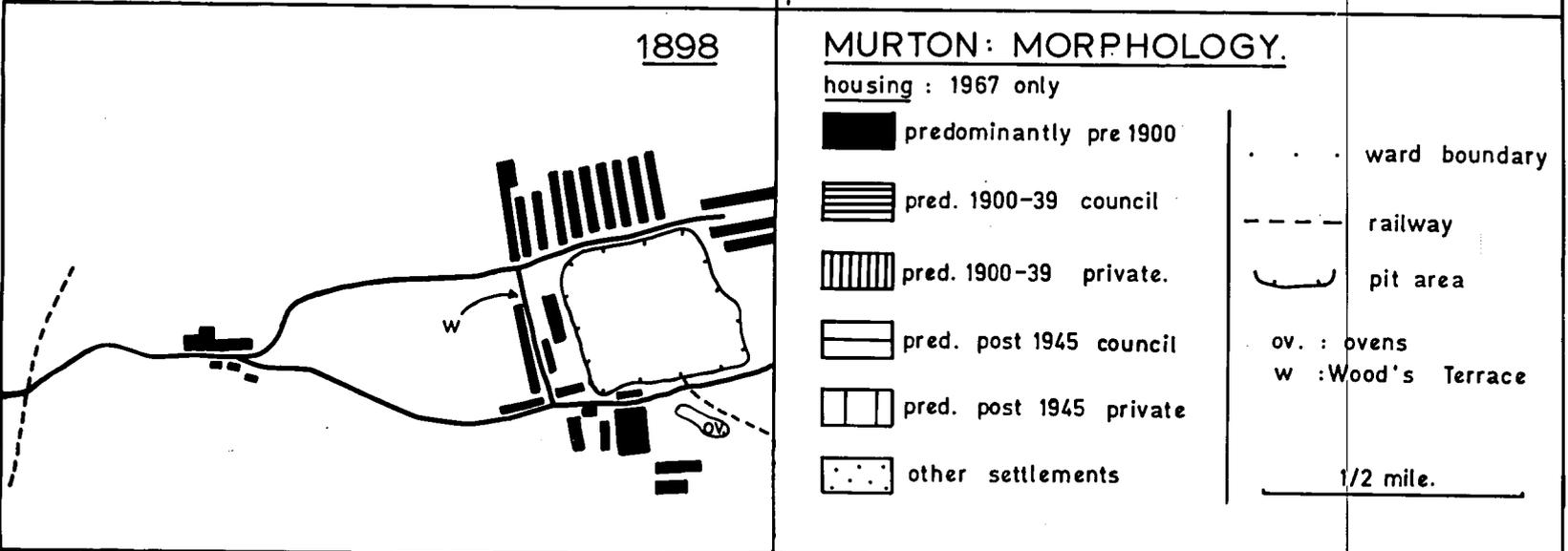
WEST AUCKLAND

Darlington

MURTON: MORPHOLOGY.

1861

1924

1898

housing : 1967 only

- ■ predominantly pre 1900
- ▤ pred. 1900-39 council
- ▥ pred. 1900-39 private.
- ▭ pred. post 1945 council
- ▯ pred. post 1945 private
- ⋯ other settlements
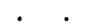
· · · · ward boundary

– – – railway

‿ pit area
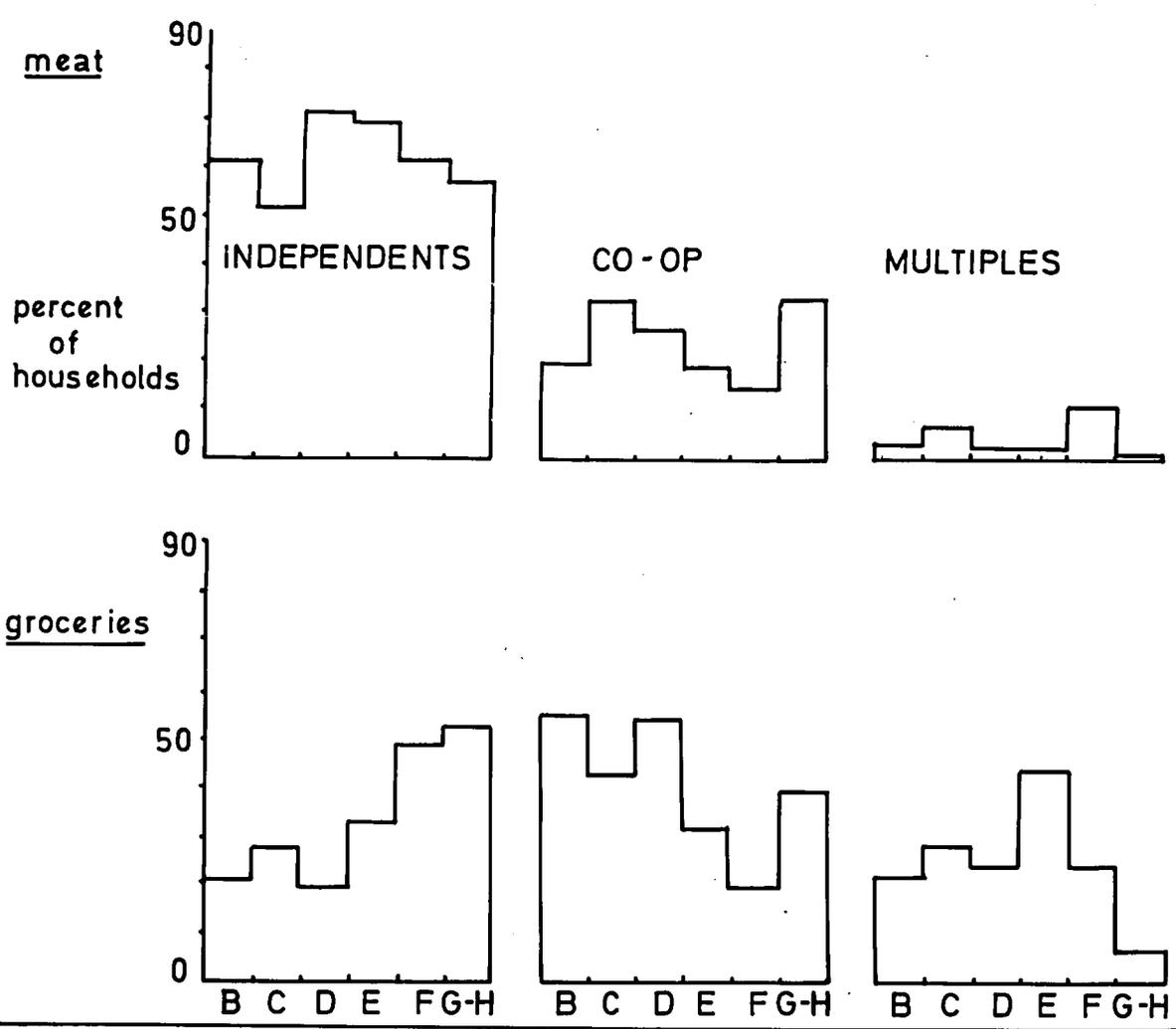
ov. : ovens
w : Wood's Terrace

1/2 mile.

1967

Cold Hesleden

Easington Lane

Hawthorn mine

INCOME GROUP AND HOUSEHOLD PURCHASE PATTERNS: MURTON.

(b)

meat

percent of households

INDEPENDENTS   CO-OP   MULTIPLES
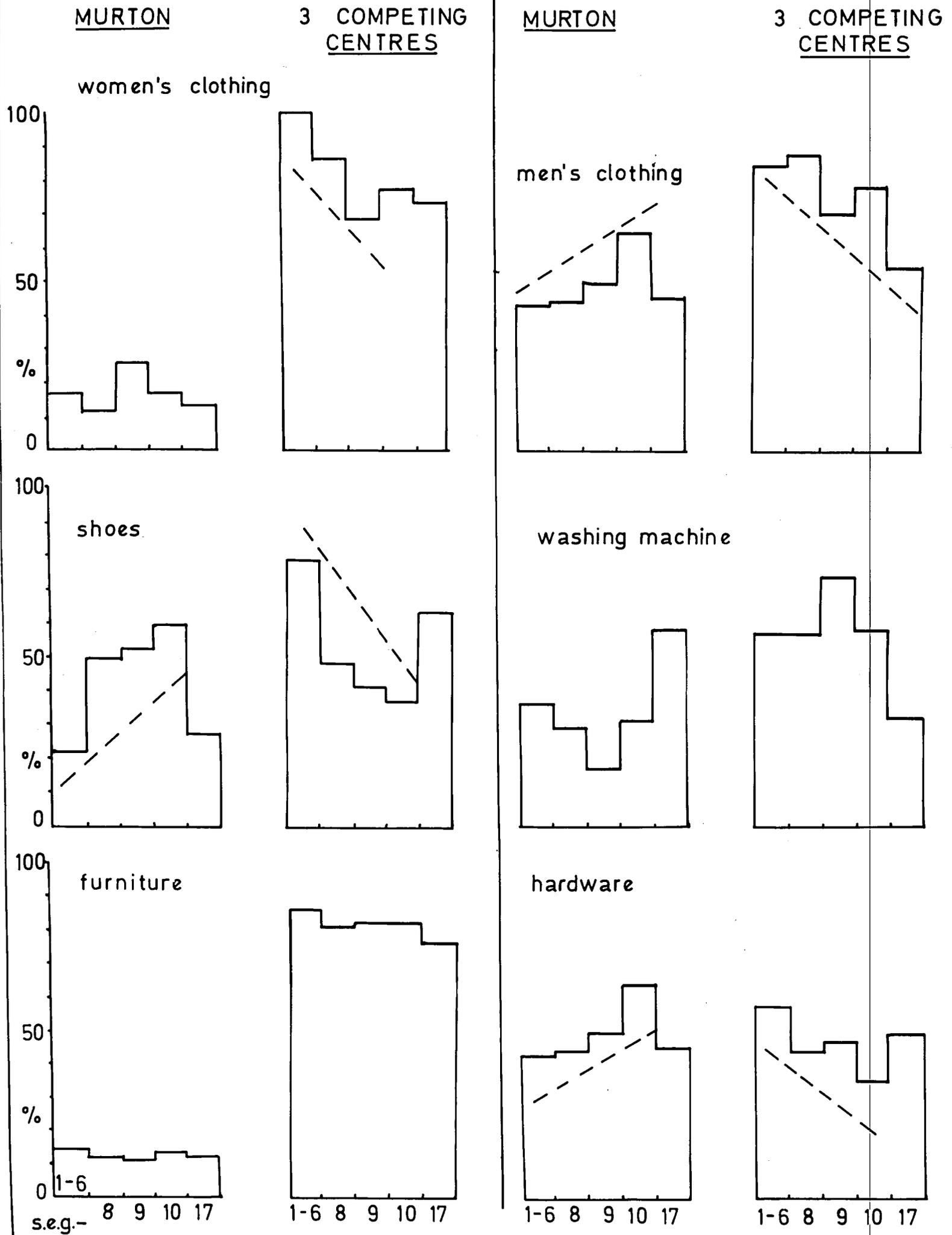
groceries

B C D E F G-H   B C D E F G-H   B C D E F G-H
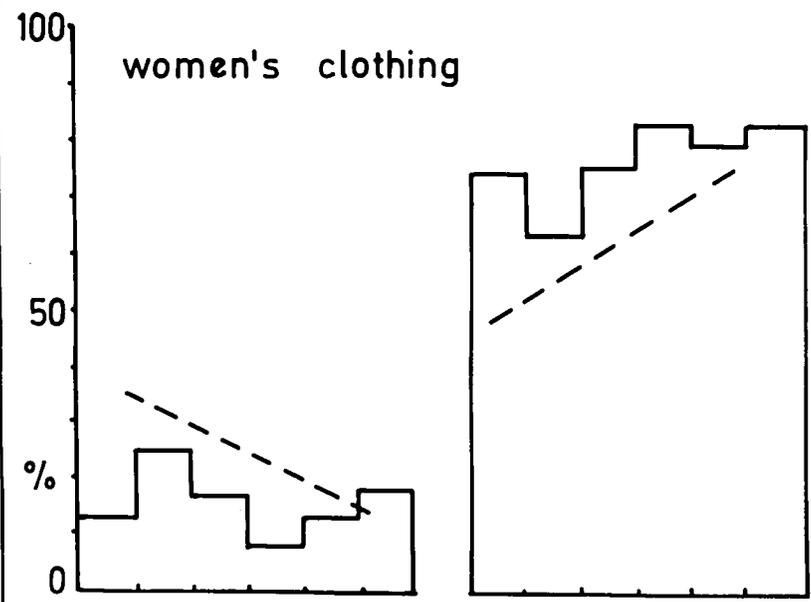
SOCIO-ECONOMIC GROUP AND HOUSEHOLD PURCHASE PATTERNS: MURTON.

(a)

meat

percent of households

INDEPENDENTS   CO-OP   MULTIPLES

groceries

socio economic group:

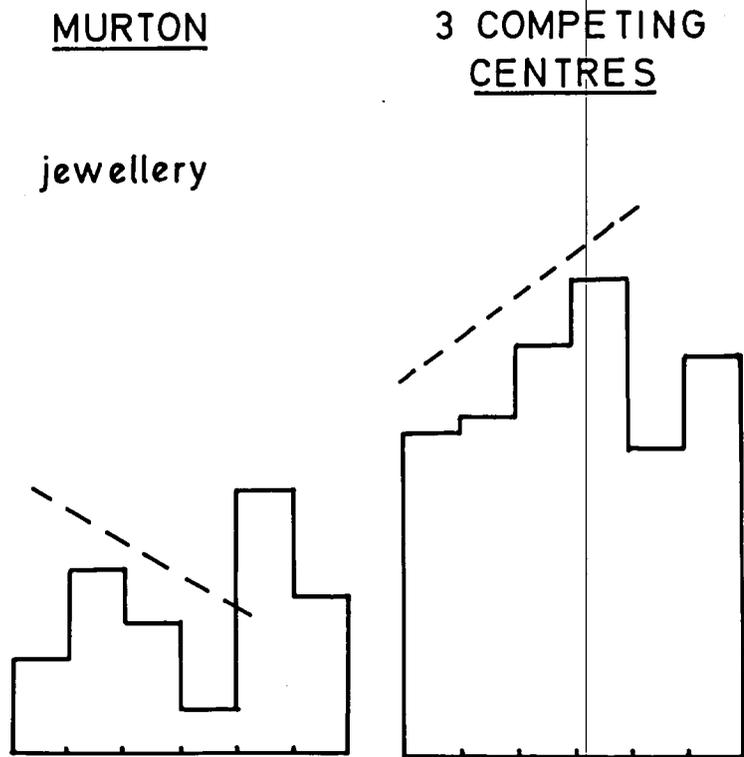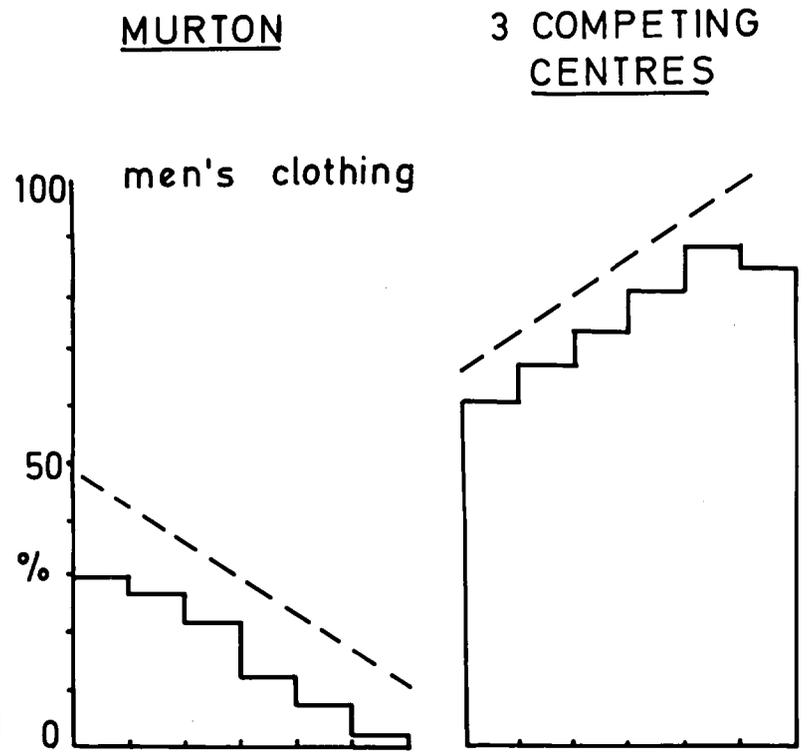1-6 8 9 10 17 18-21   1-6 8 9 10 17 18-21   1-6 8 9 10 17 18-21

4.
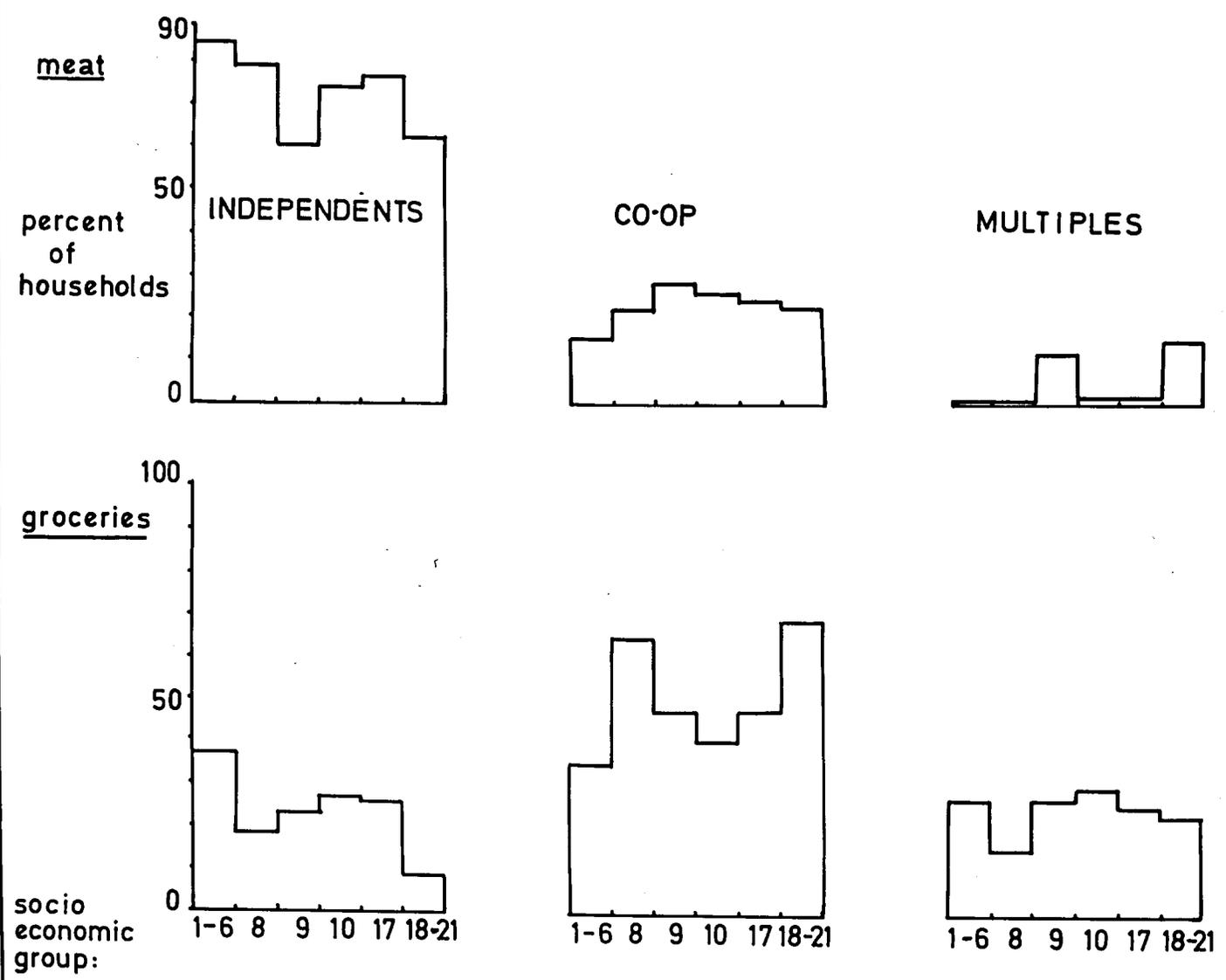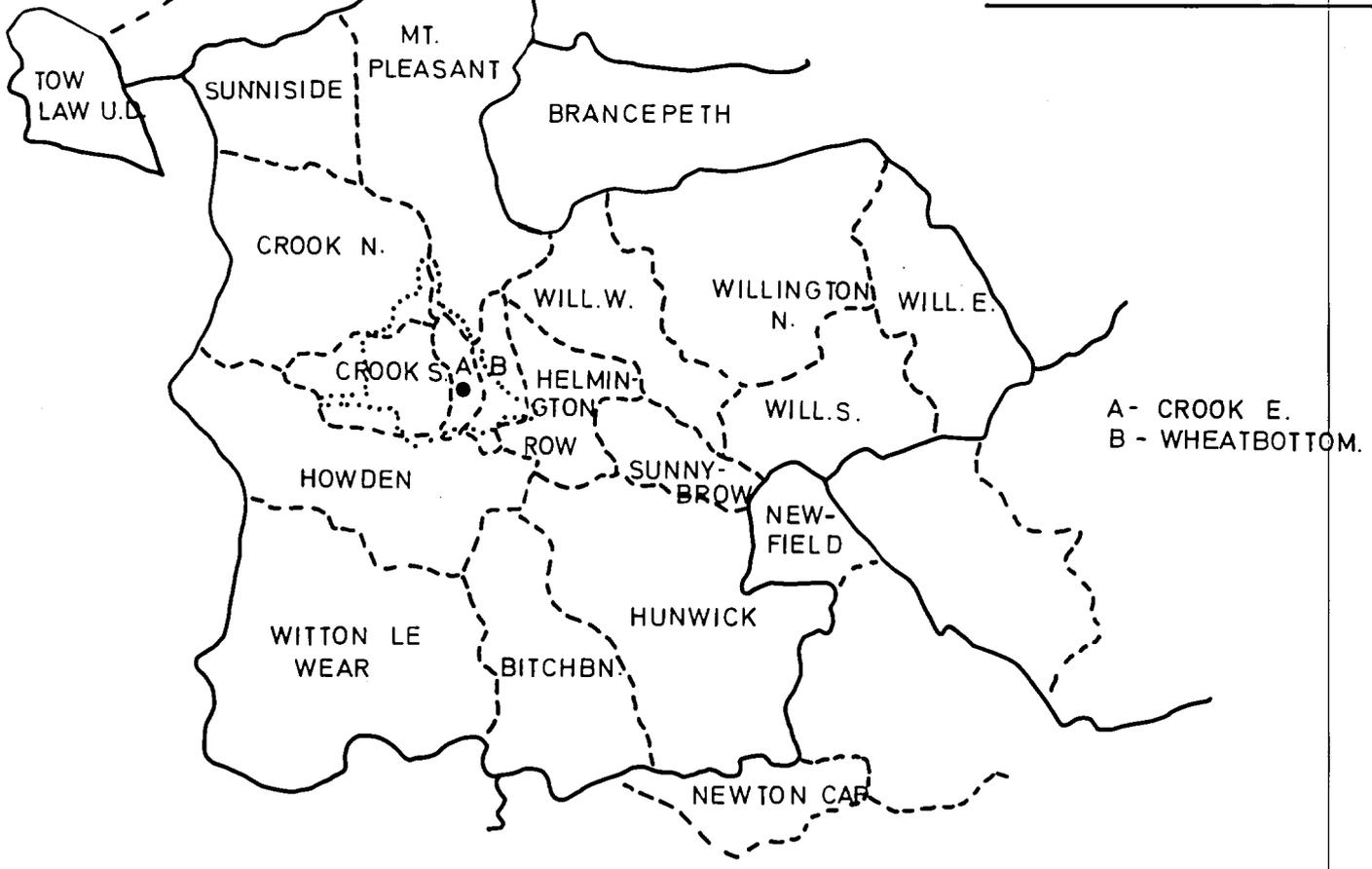
HOUSEHOLD SOCIO-ECONOMIC GROUP AND PURCHASE PATTERNS: MURTON

HOUSEHOLD INCOME GROUP AND PURCHASE PATTERNS: MURTON.

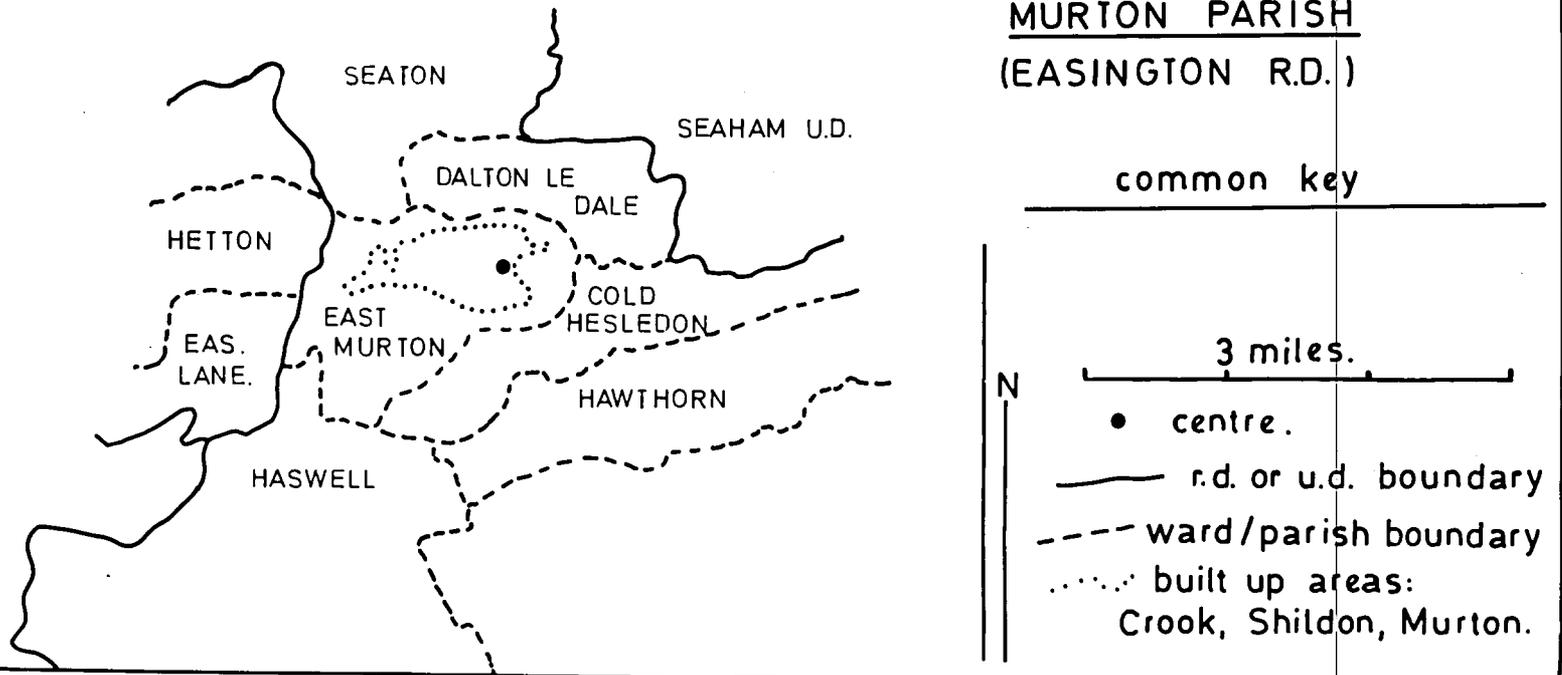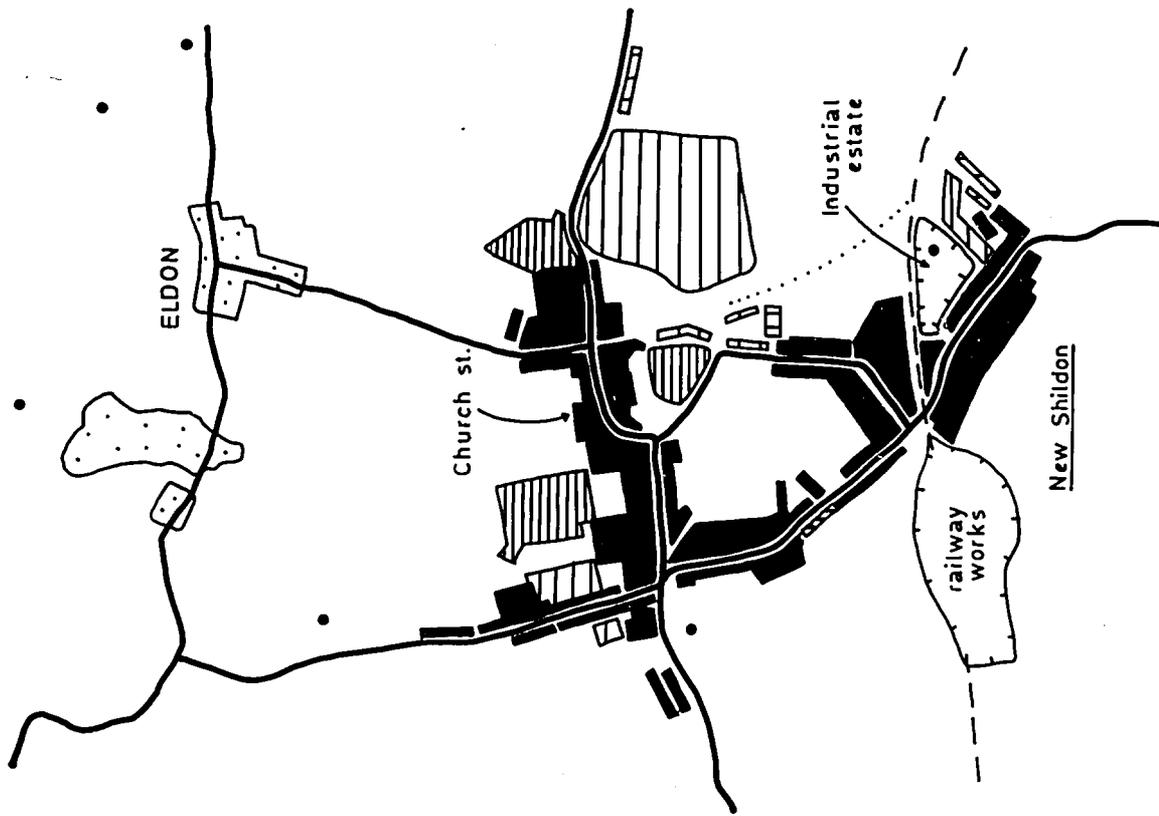MURTON   3 COMPETING CENTRES   MURTON   3 COMPETING CENTRES

men's clothing   jewellery

women's clothing   hardware

shoes   furniture

income group: B C D E F G-H

CROOK U.D. : WARDS.

TOW LAW U.D.

SUNNISIDE

MT. PLEASANT

BRANCEPETH

CROOK N.

WILL. W.

WILLINGTON N.

WILL. E.

CROOK S.

A B

HELMINGTON ROW

WILL. S.

A- CROOK E.
B - WHEATBOTTOM.

HOWDEN

SUNNY-BROW

NEWFIELD

HUNWICK

WITTON LE WEAR

BITCHBN.

NEWTON CAP

SHILDON U.D. : WARDS

BA. 4. BA. 3.

COUNDON GRANGE

WINDLESTONE

ST. ANDREW AUCKLAND

ELDON

AUCKLD. TCE.

A B

A- CENTRAL
B- SUNNYDALE

BYERLEY

THICKLEY

MIDDRIDGE

NEWTON AYCLIFFE

MURTON PARISH
(EASINGTON R.D.)

SEATON

SEAHAM U.D.

DALTON LE DALE

HETTON

EAS. LANE.

EAST MURTON

COLD HESLEDON

HAWTHORN

HASWELL

common key

3 miles.

N

● centre.

—— r.d. or u.d. boundary

- - - ward/parish boundary

······ built up areas:
Crook, Shildon, Murton.

7.

SHILDON: MORPHOLOGY

HOUSING (1967 ONLY)

■	mainly pre 1900
▥	mainly 1900-1939
▤	mainly 1900-1939 private
▦	mainly post 1945 :council
▦	mainly post 1945 :private
⬚	other settlements
○	pit
●	disused pit
– – –	railway
········	disused railway

3 m.

1860
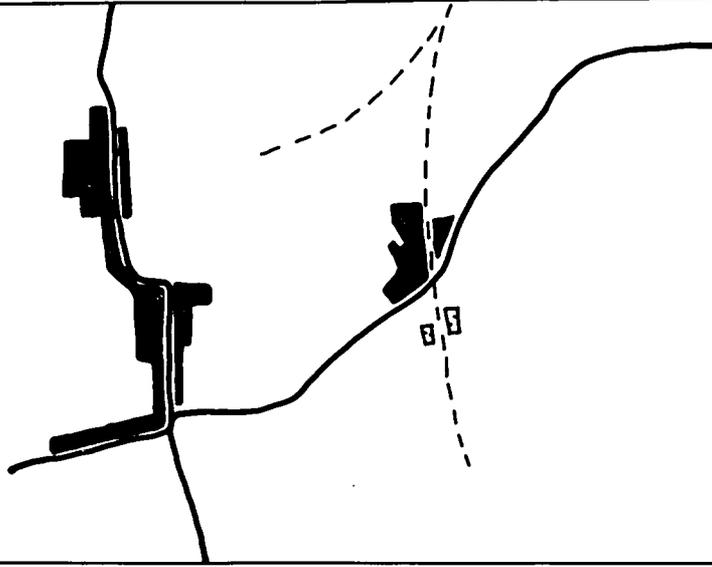
1894
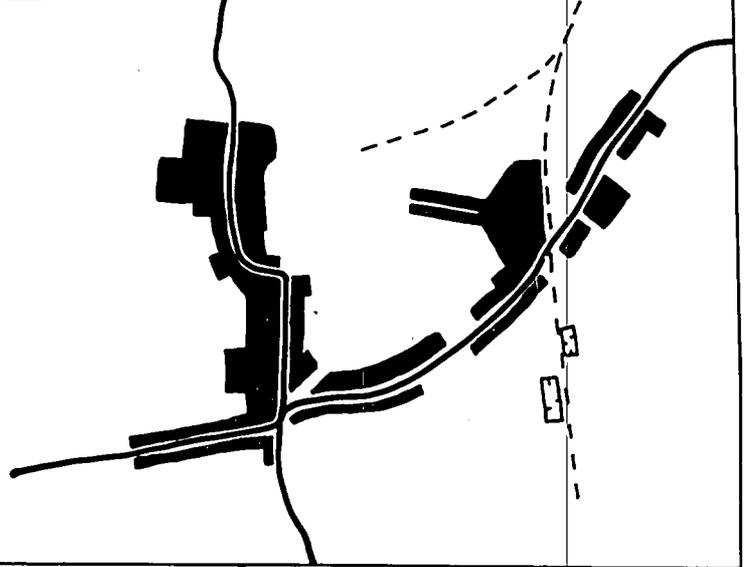
1924
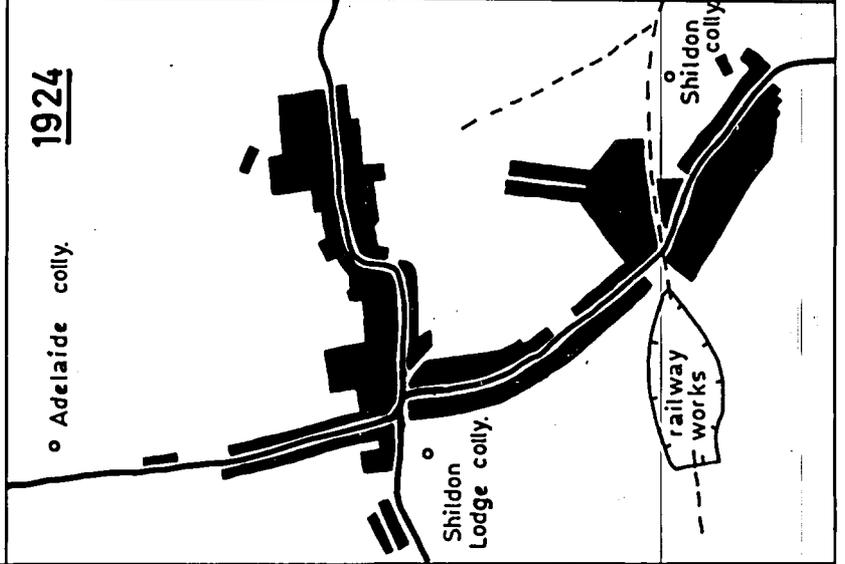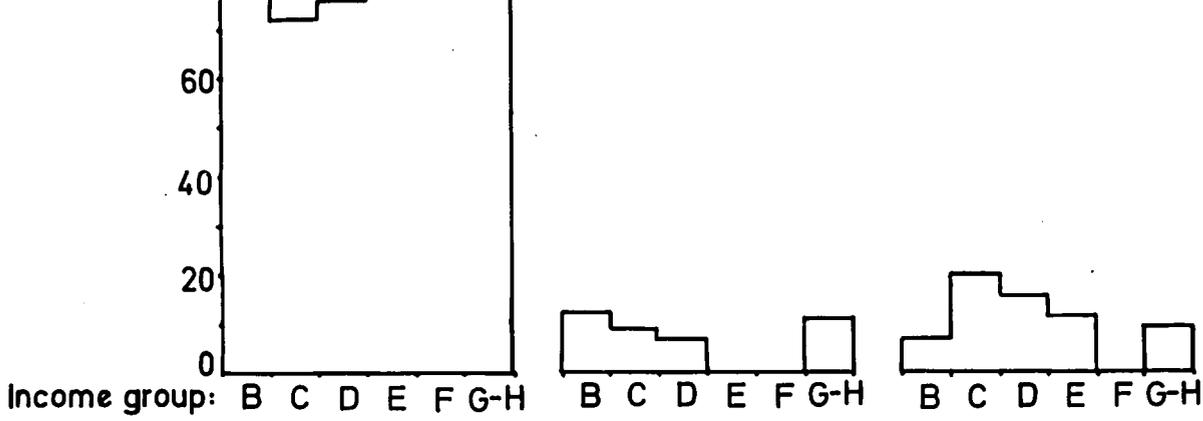
○ Adelaide colly.

Shildon Lodge colly.

Shildon colly.

railway works

1967
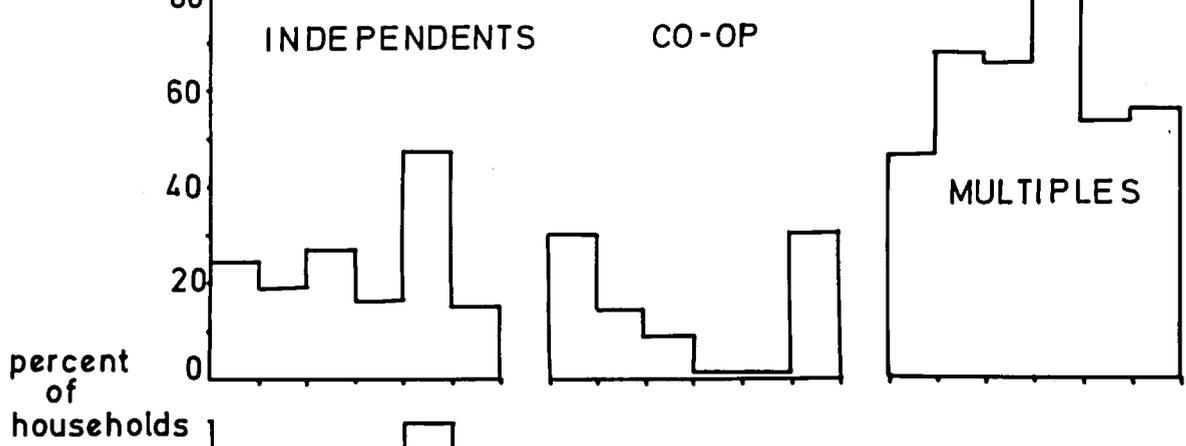
ELDON

Church st.

Industrial estate

railway works

New Shildon

INCOME GROUP AND HOUSEHOLD PURCHASE PATTERNS - SHILDON

Groceries

INDEPENDENTS   CO-OP

MULTIPLES

percent
of
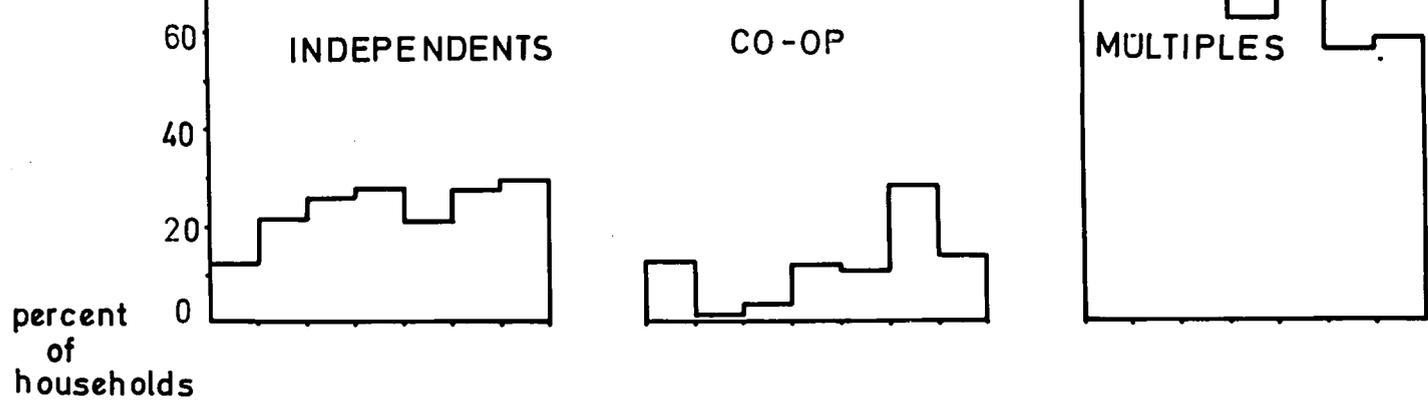households

Meat

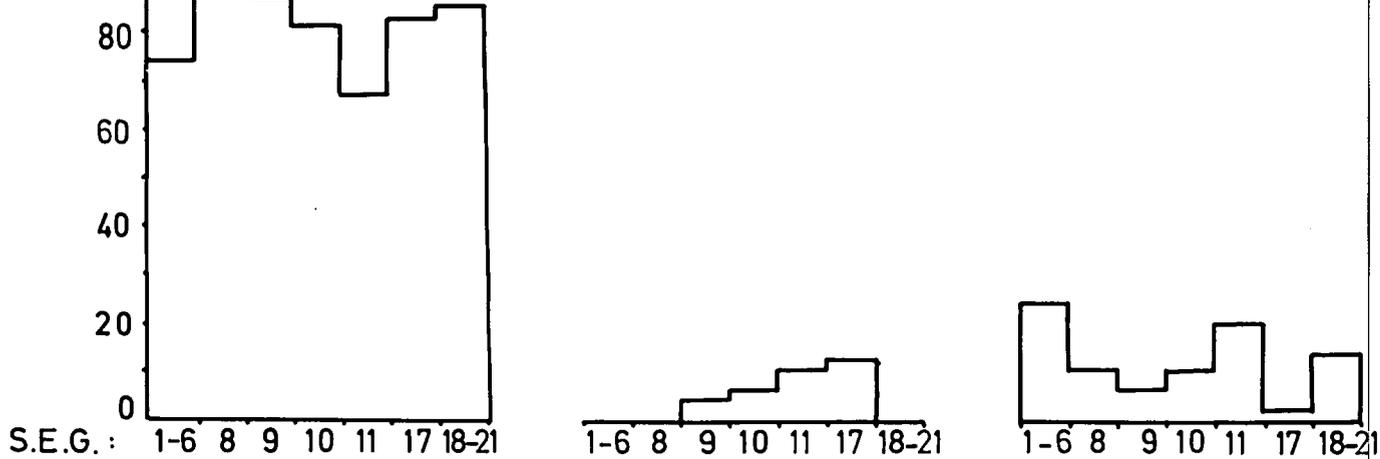Income group: B C D E F G-H   B C D E F G-H   B C D E F G-H

SOCIO-ECONOMIC GROUP AND HOUSEHOLD PURCHASE PATTERNS - SHILDON

Groceries

INDEPENDENTS   CO-OP   MULTIPLES

percent
of
households

Meat

S.E.G. : 1-6 8 9 10 11 17 18-21   1-6 8 9 10 11 17 18-21   1-6 8 9 10 11 17 18-21

9.

SHILDON 5 COMPETING CENTRES
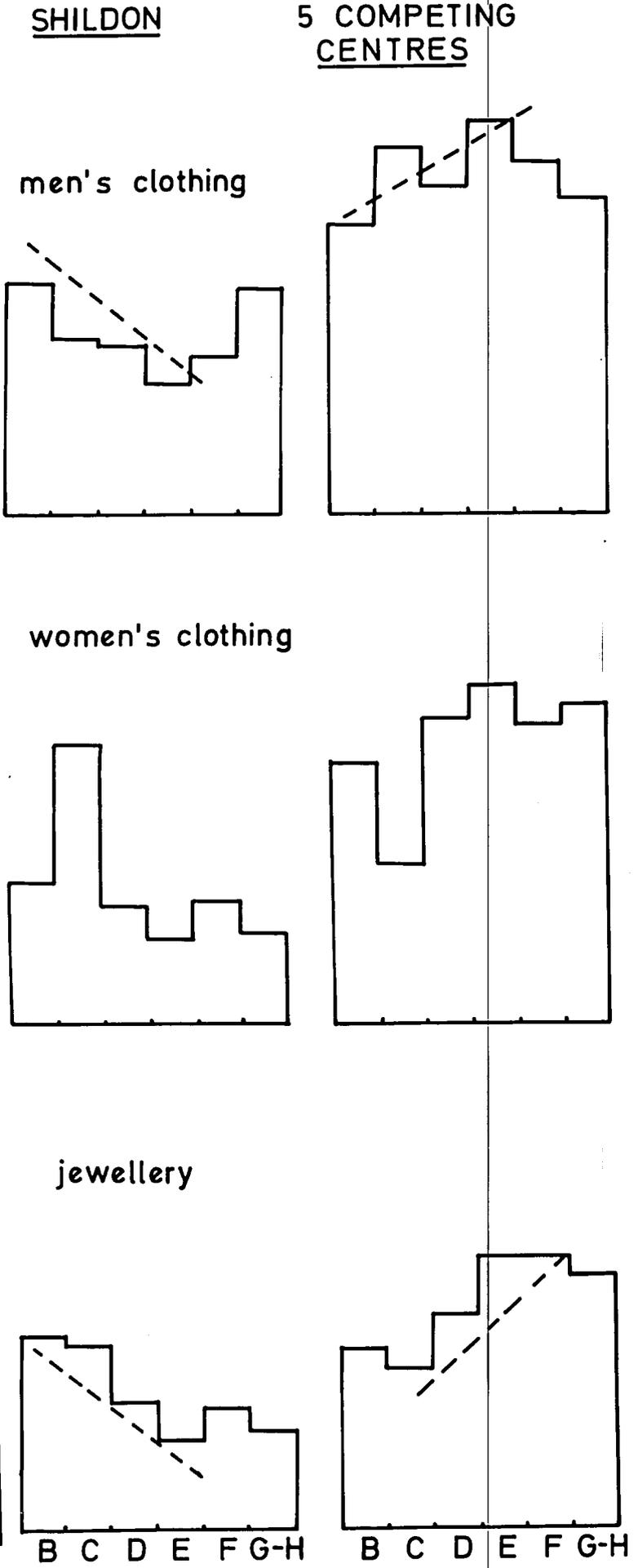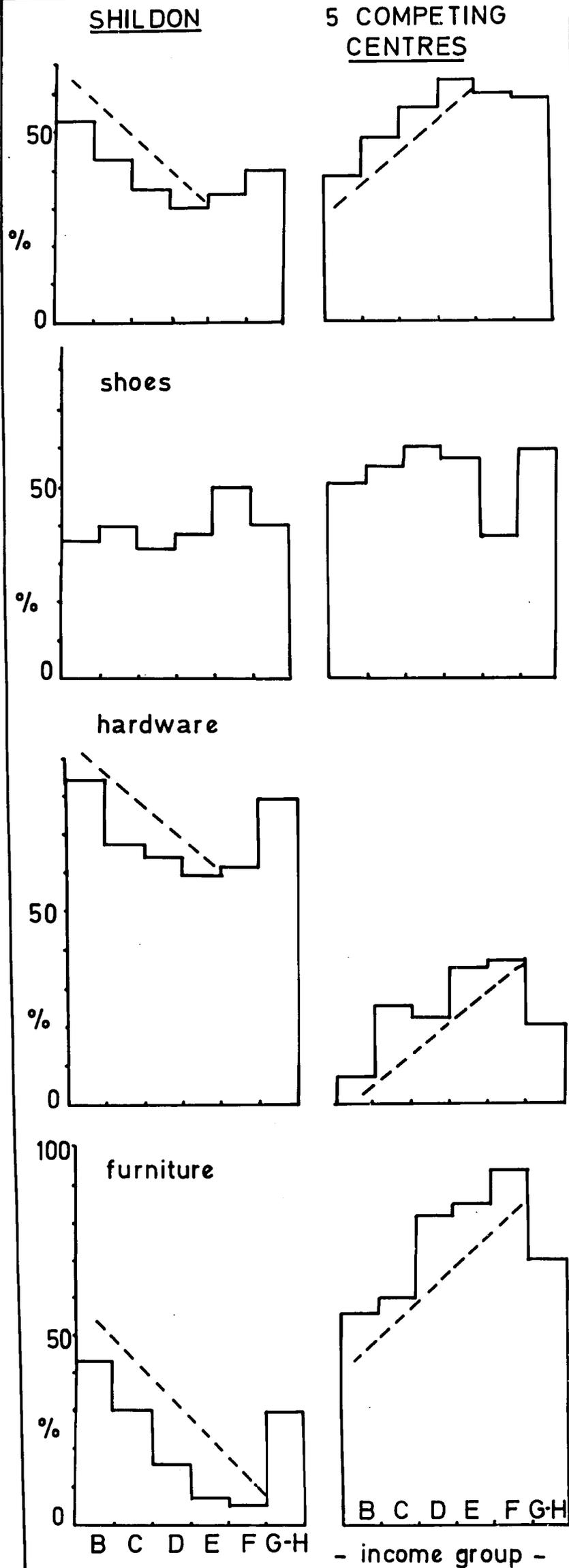
HOUSEHOLD SOCIO-ECONOMIC GROUP AND PURCHASE PATTERNS: SHILDON.

all durables

shoes

hardware

furniture

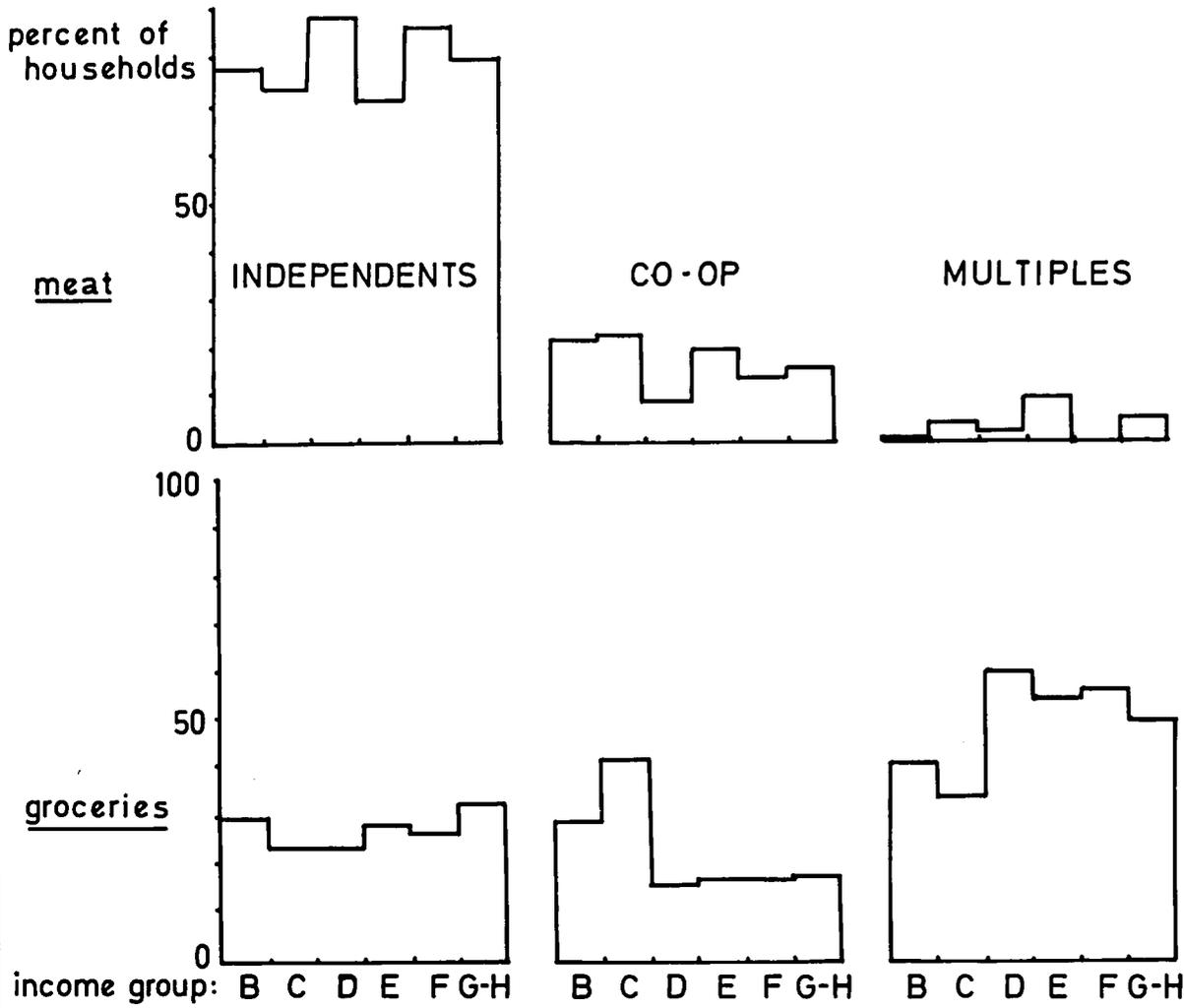men's clothing

women's clothing

washing machine

S.E.G.- 1-6 8 9 10 11 17

HOUSEHOLD INCOME GROUP AND PURCHASE PATTERNS: SHILDON.

SHILDON   5 COMPETING CENTRES

shoes

men's clothing

hardware

women's clothing

furniture

jewellery

B C D E F G-H

- income group -

CROOK: MORPHOLOGY

1860

- Billy row
- N. Roddymoor
- Pease's west
- Roddymoor

1890

1924

Legend:

■	mainly pre 1900
▥	mainly 1900-39: council.
▤	mainly 1900-39: private.
▯	mainly post 1945: council.
▭	mainly post 1945: private
⬚	other settlements.

⬭ : roddymoor pit and coke ovens.

╱ : railway

x : pit

m : market place

HOUSING: 1967 MAP ONLY

N

⊢————⊣ 1/2 mile.

1967

- Roddymoor
- Mt. Pleasant wd.
- Billy row
- restored area
- Crook n. wd.
- Helmington row wd.
- hope st.
- Wheatbottom wd.
- Crook e. wd.
- Crook s. wd.
- high west rd.
- Howden wd.
- Howden

Legend:

- a: advance throwing-mills
- b: brickworks
- p: paton and baldwin
- m: marshall richards
- r: ramar
- ⊗: closed pit
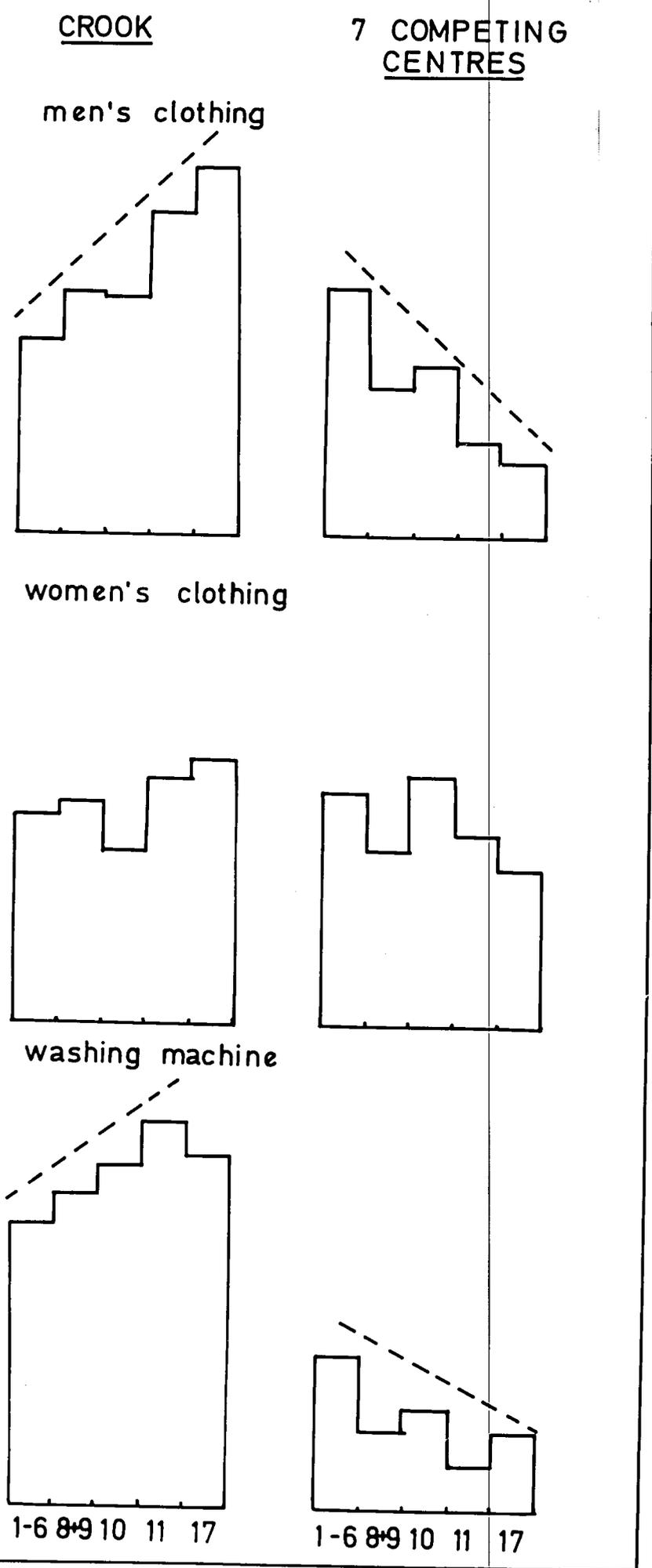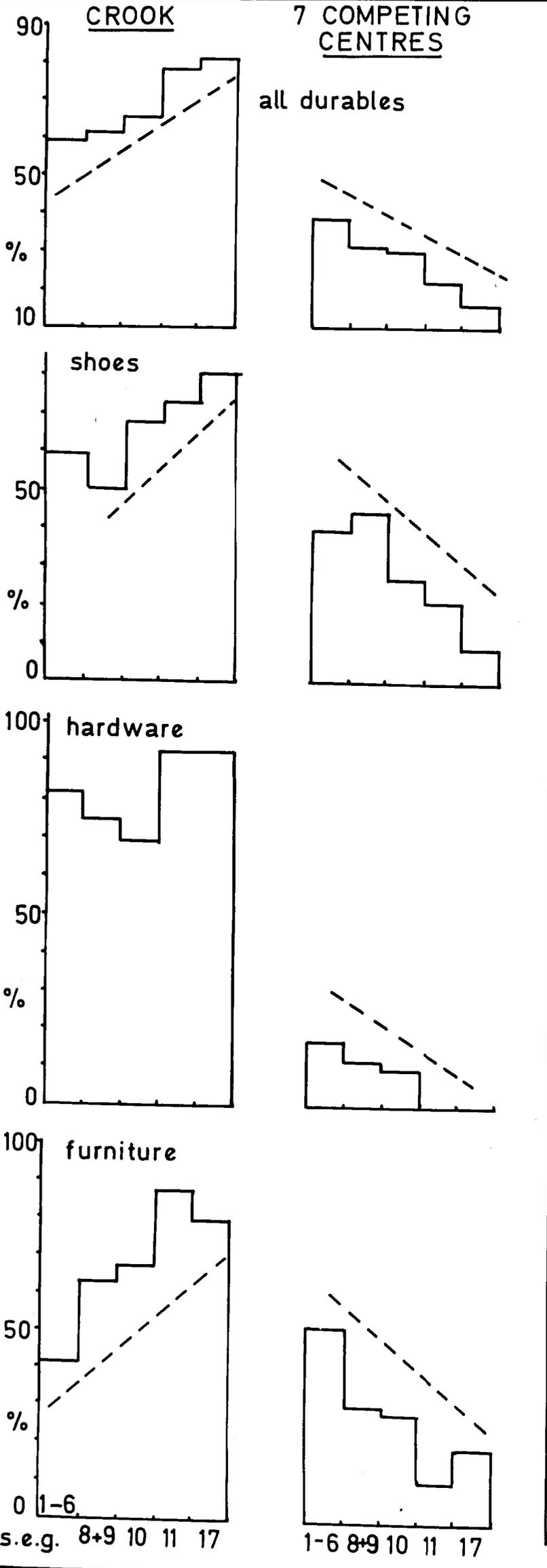- ⬚⬚⬚ : industrial estate
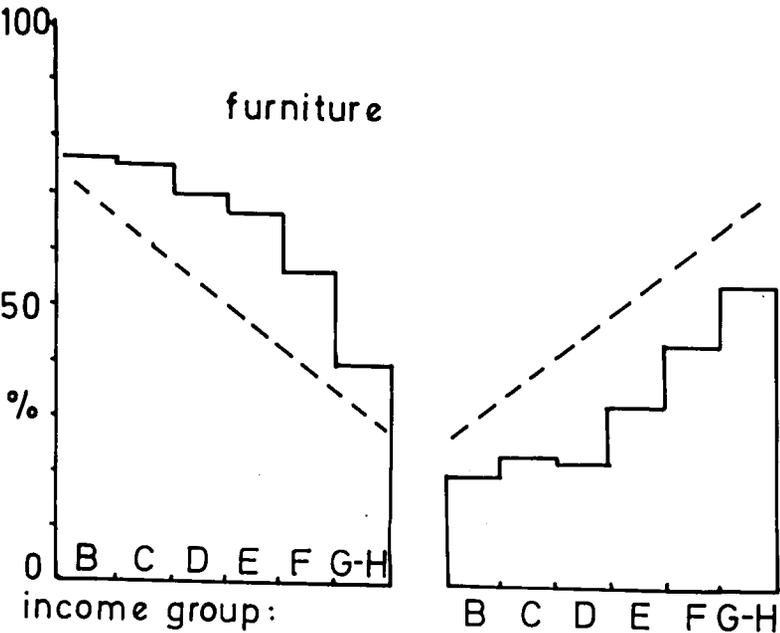- ‒‒‒ : ward boundary

12.

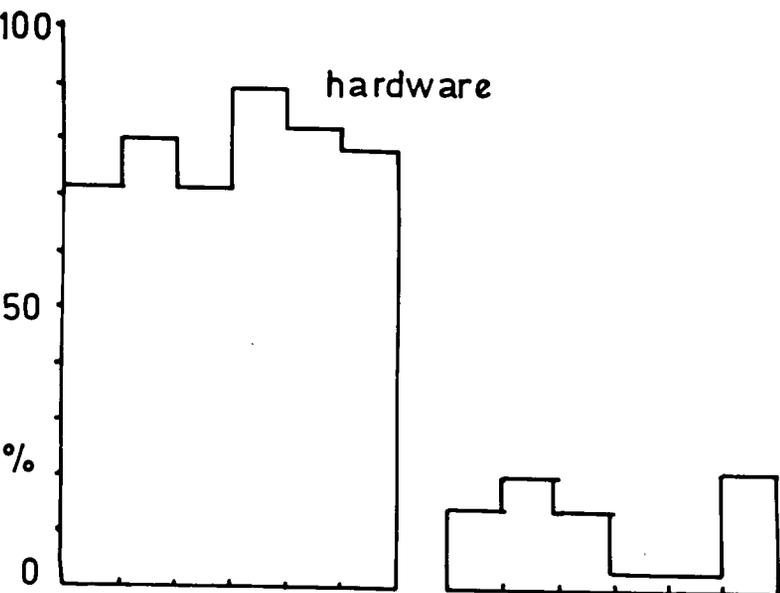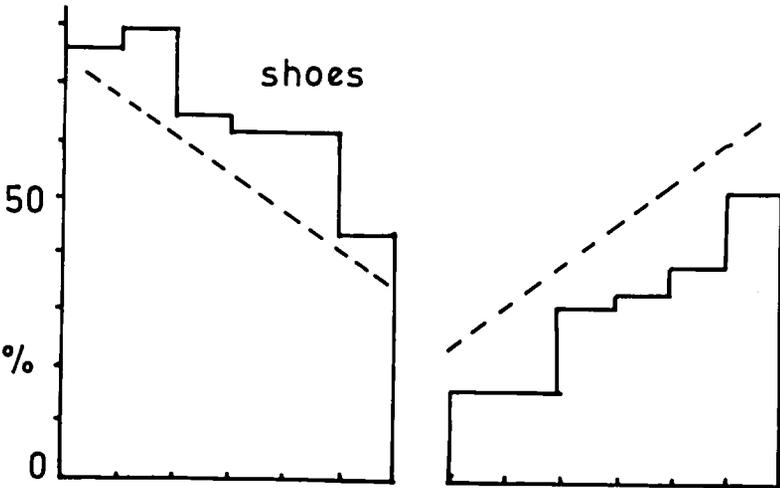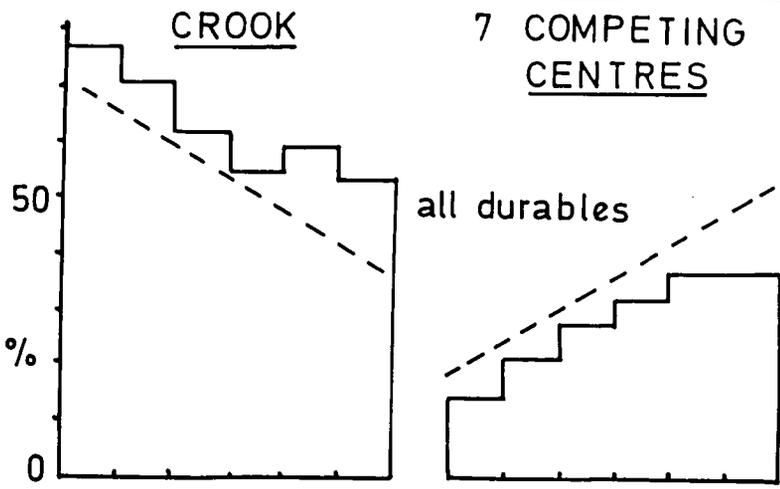INCOME GROUP AND HOUSEHOLD PURCHASE PATTERNS: CROOK.
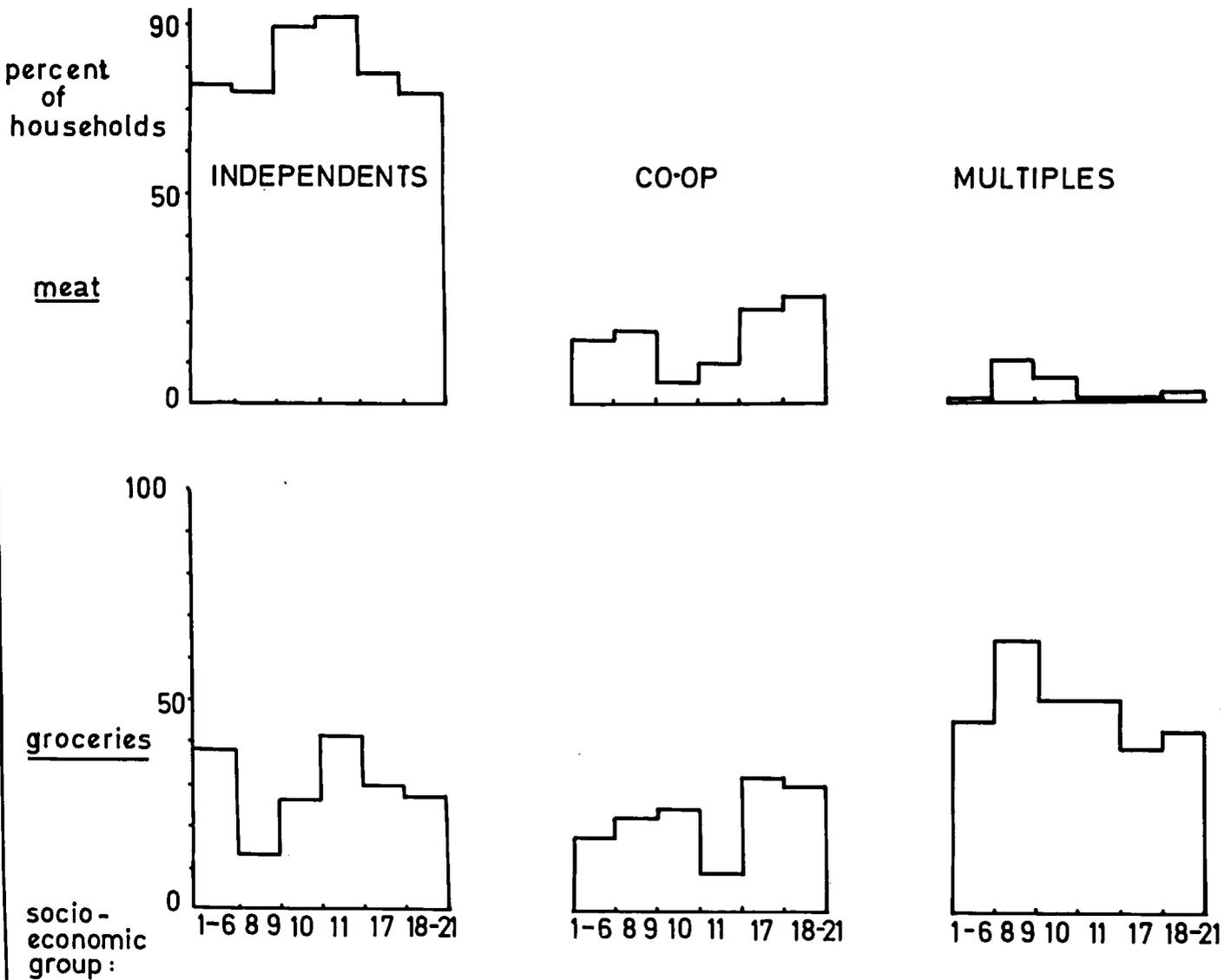
SOCIO-ECONOMIC GROUP AND HOUSEHOLD PURCHASE PATTERNS: CROOK.

HOUSEHOLD SOCIO-ECONOMIC
GROUP AND PURCHASE
PATTERNS: CROOK.
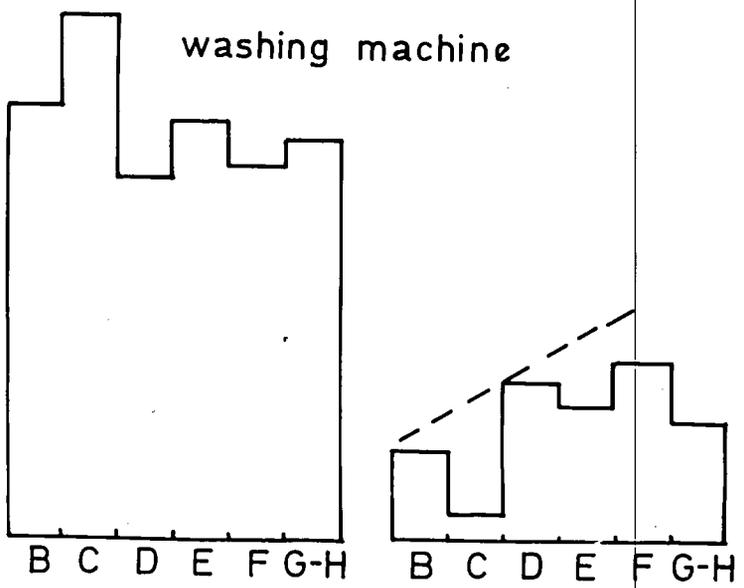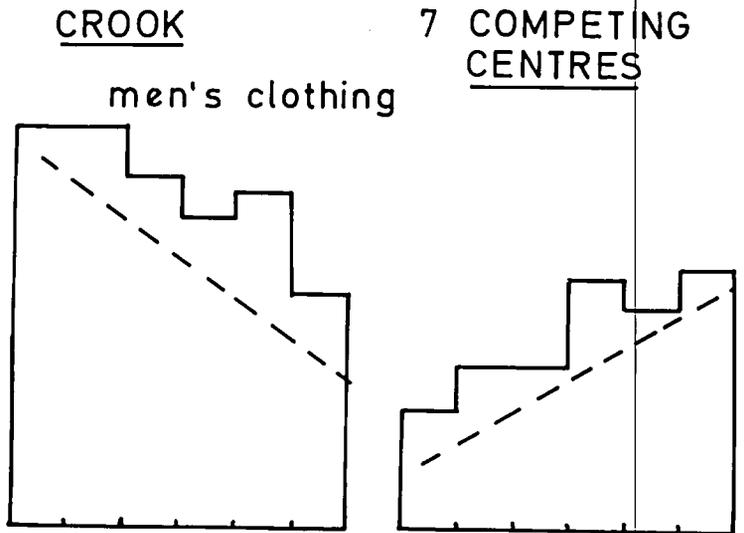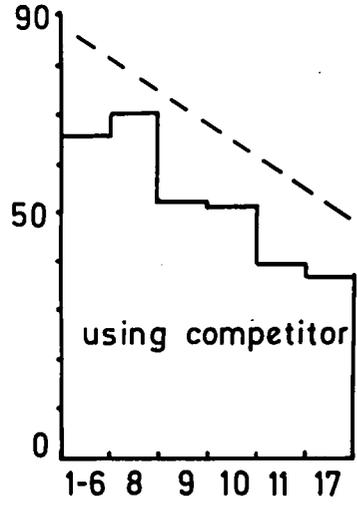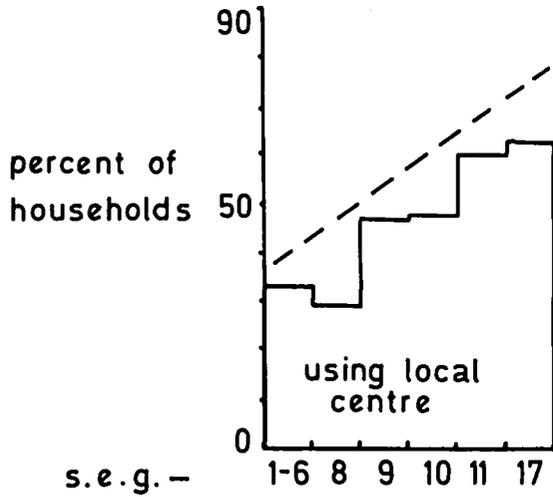
CROOK   7 COMPETING CENTRES

HOUSEHOLD INCOME GROUP AND PURCHASE PATTERNS: CROOK.

all durables

shoes

CROOK   7 COMPETING CENTRES

men's clothing

hardware

women's clothing

furniture

washing machine

B C D E F G-H
income group:

B C D E F G-H

B C D E F G-H

B C D E F G-H

15.

16.

percent of households

using local centre

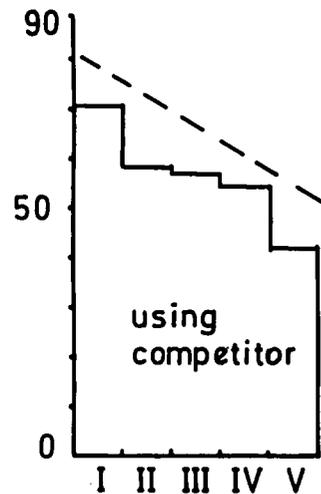s.e.g. — 1-6 8 9 10 11 17

using competitor

1-6 8 9 10 11 17

SOCIO·ECONOMIC GROUP AND HOUSE-HOLD PURCHASE PATTERNS:

all durables.

Crook, Murton and Shildon.

17.

percent of households

using local centre

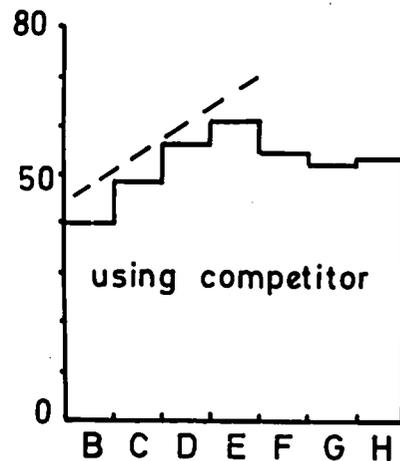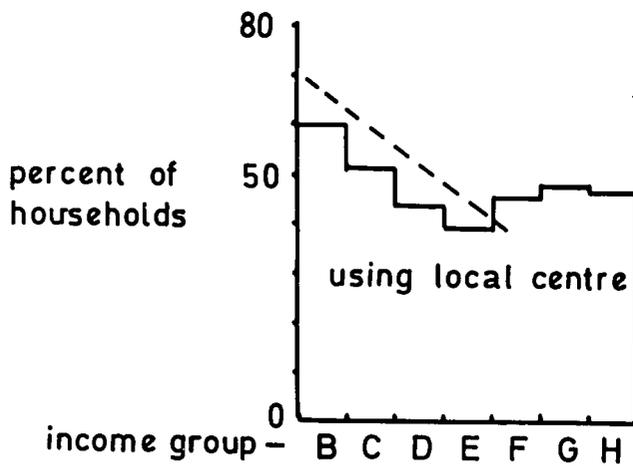social class— I II III IV V

using competitor

I II III IV V
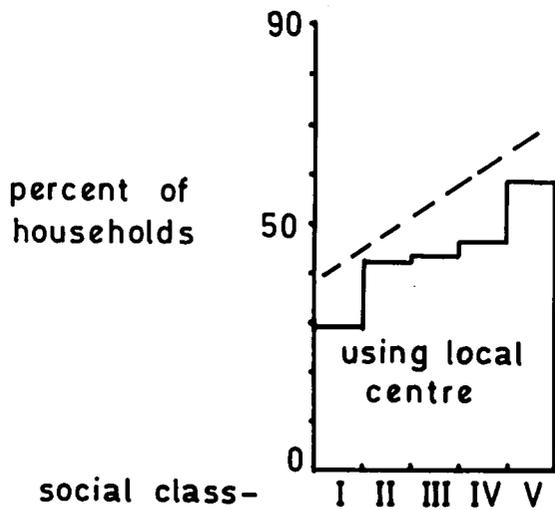
SOCIAL CLASS AND HOUSEHOLD PURCH-ASE PATTERNS:

all durables.

Crook, Murton and Shildon.

18.

percent of households

using local centre

income group — B C D E F G H
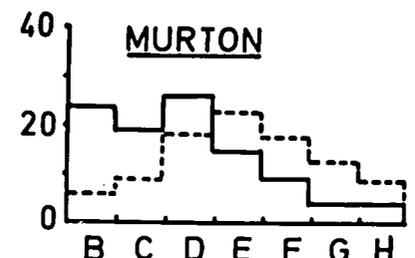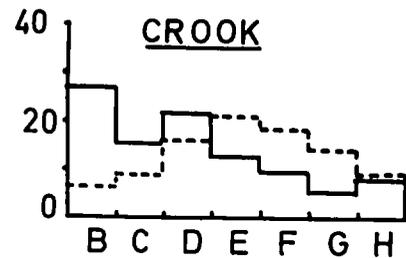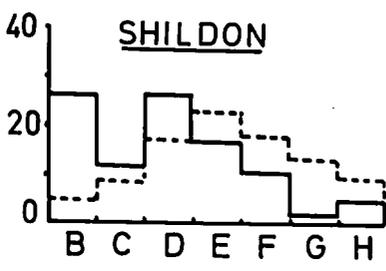
using competitor

B C D E F G H

INCOME GROUP AND HOUSEHOLD PURCHASE PATTERNS:

all durables.

Crook, Murton and Shildon.

19.

PREDICTED AND ACTUAL INCOME STRUCTURES. 1967.

SHILDON

B C D E F G H

CROOK

B C D E F G H

MURTON

B C D E F G H

---- predicted   — actual

MURTON : SHOPS. 1968

MURTON COLLIERY

Wood's terrace

closed shop

c co-op

principal roads

built up area

private food retailers

private non-food retailers

+ multiple food retailers

+ multiple non-food retailers

N

1/4 mile.

20.

New Thickley estate

INDUSTRIAL
ESTATE

New Shildon

St. John's rd.

Alma rd.

Church St.

OPEN SPACE.

Byerley rd.
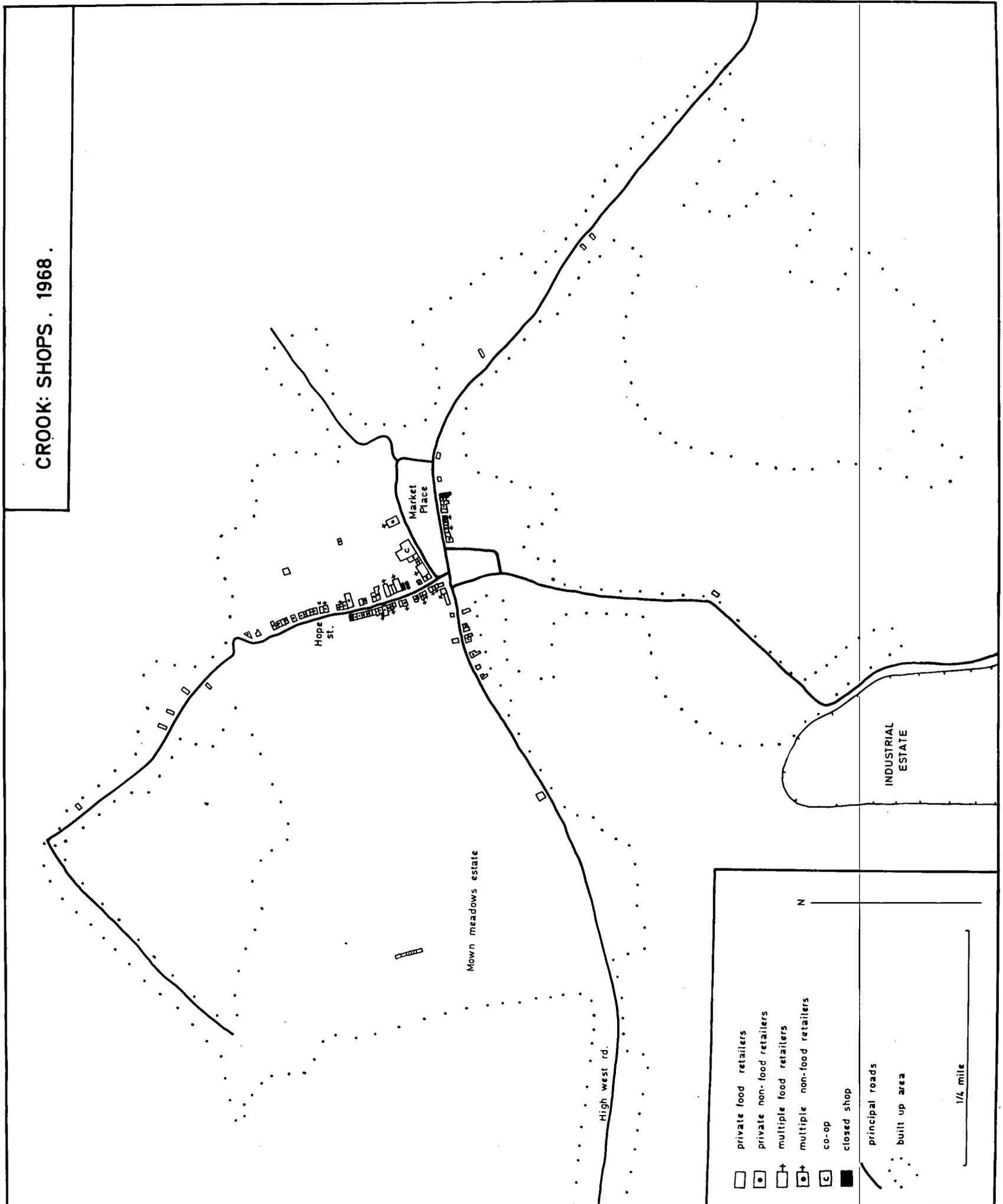
B.R. WORKS

N
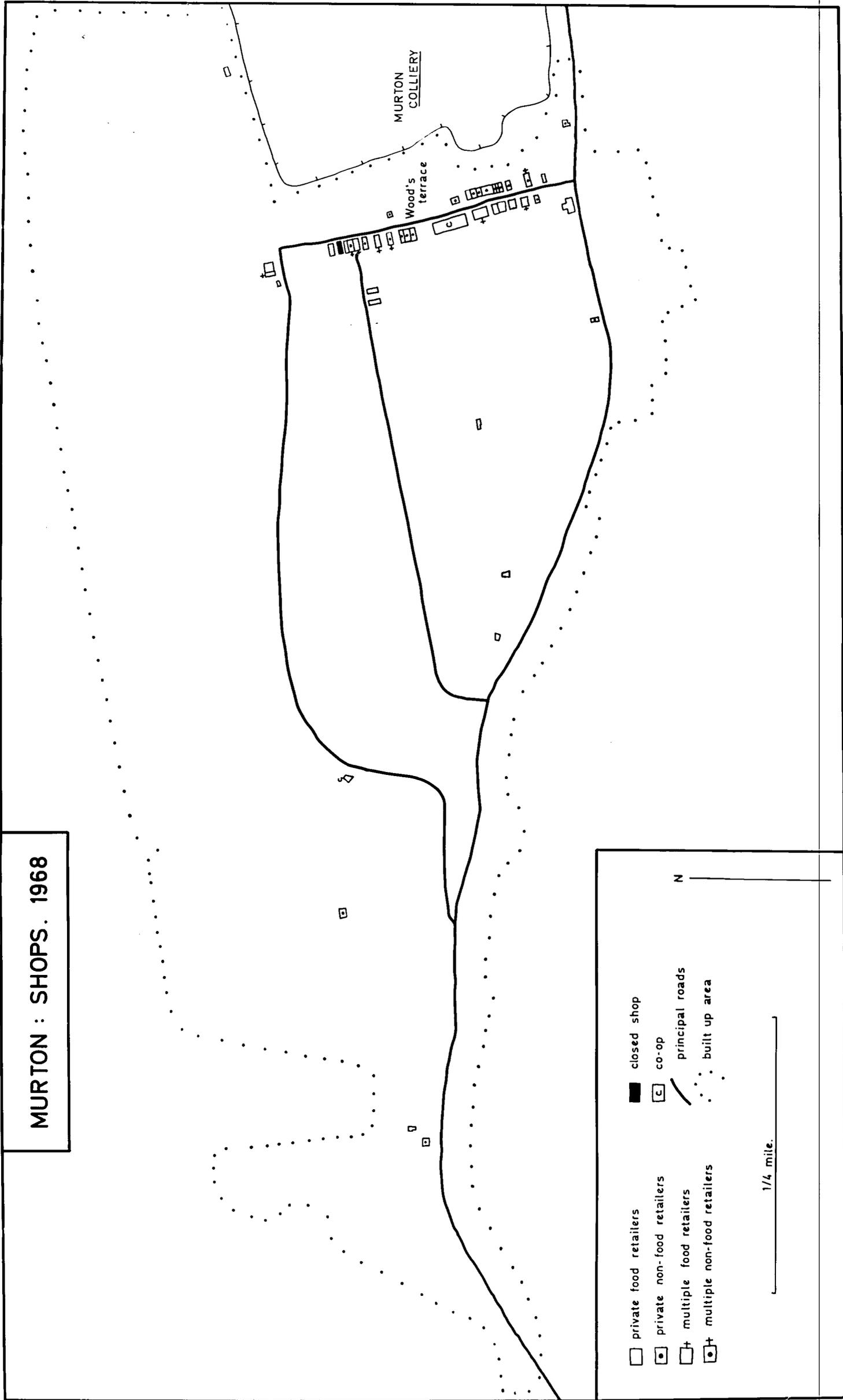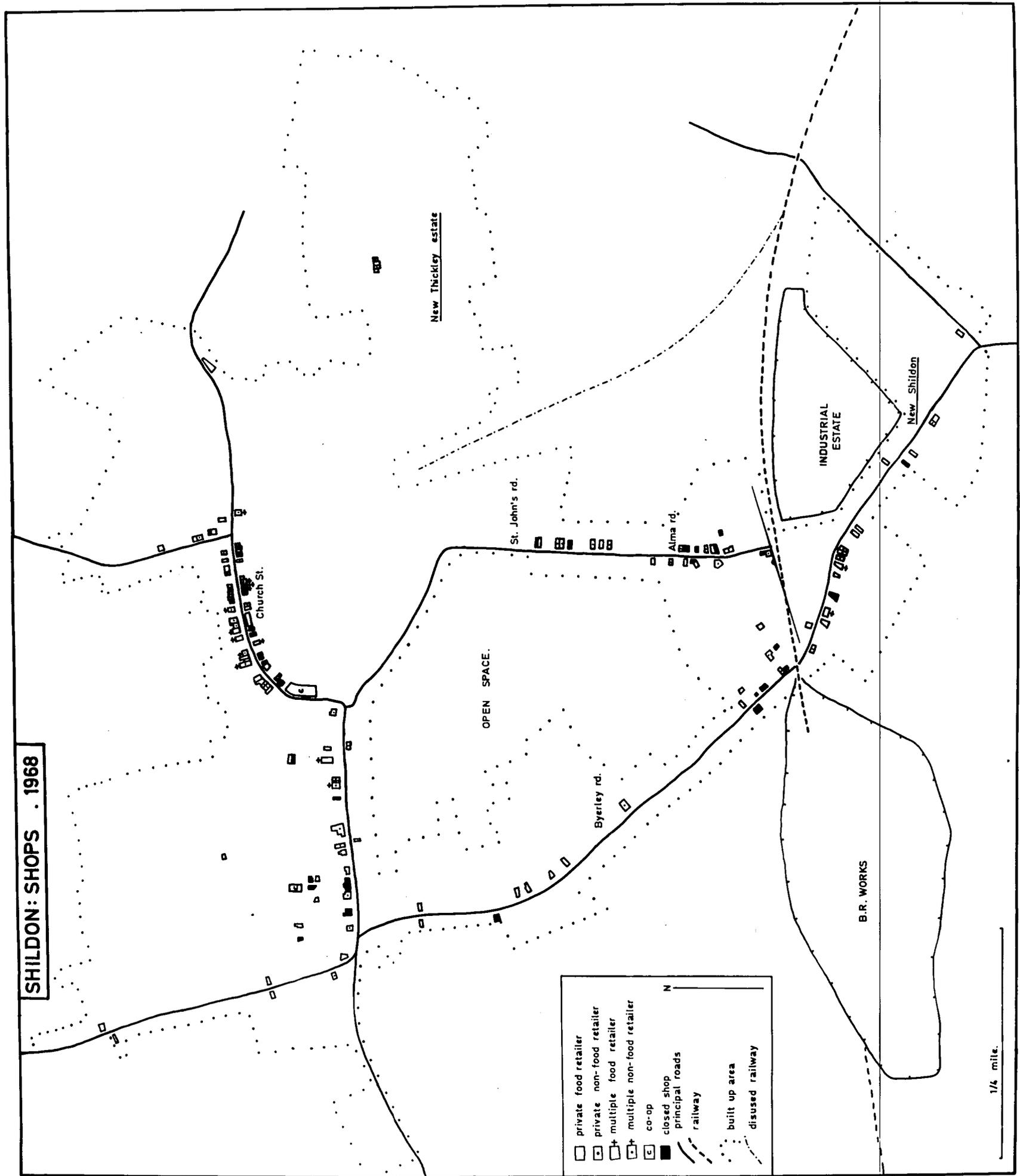
☐ private food retailer
☐ private non-food retailer
☐+ multiple food retailer
☐+ multiple non-food retailer
☐c co-op
■ closed shop
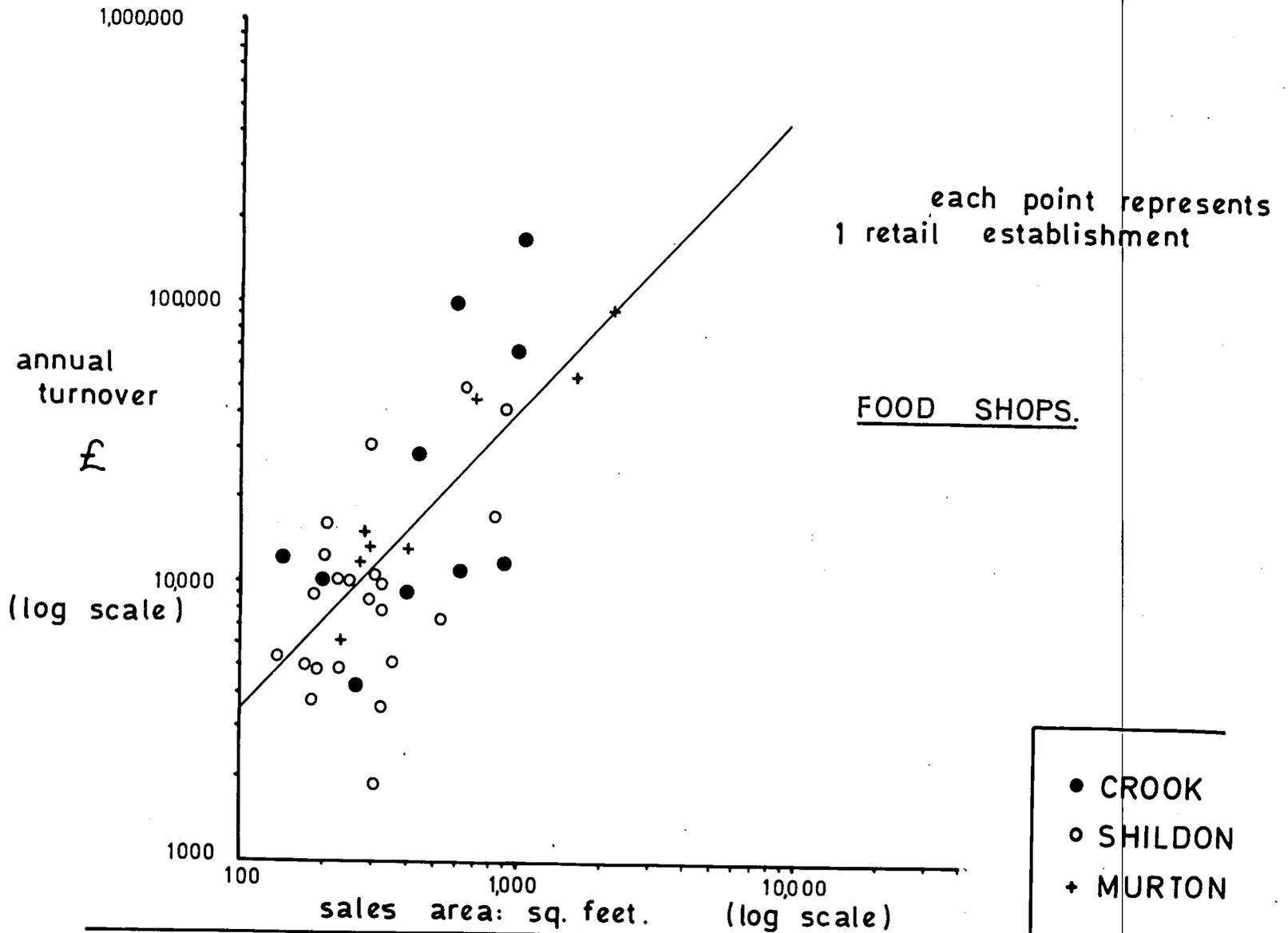principal roads
railway
built up area
disused railway

1/4 mile.

21.

CROOK: SHOPS. 1968.

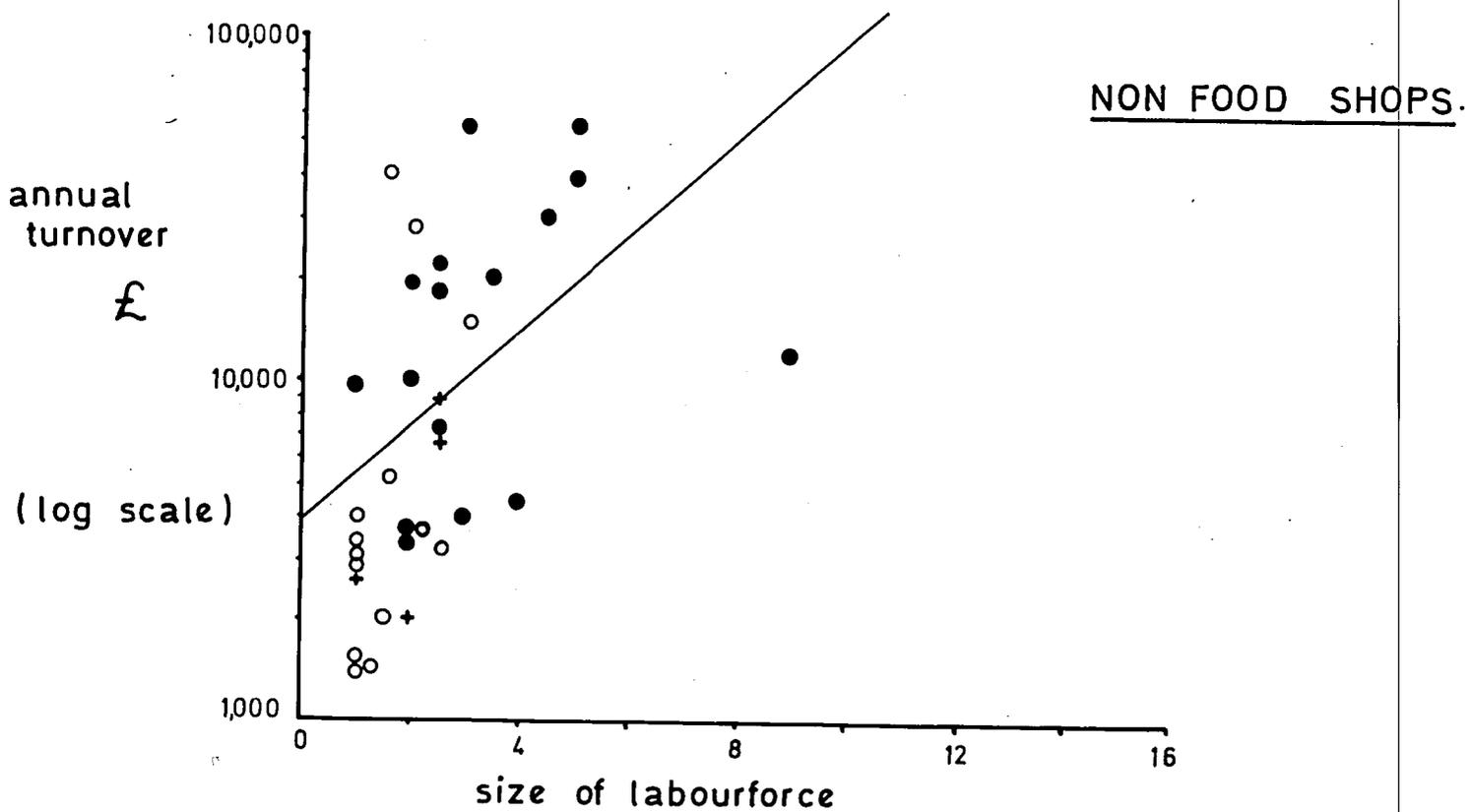Market Place

Hope St.

Mow'n meadows estate

High west rd.

INDUSTRIAL ESTATE

private food retailers
private non-food retailers
multiple food retailers
multiple non-food retailers
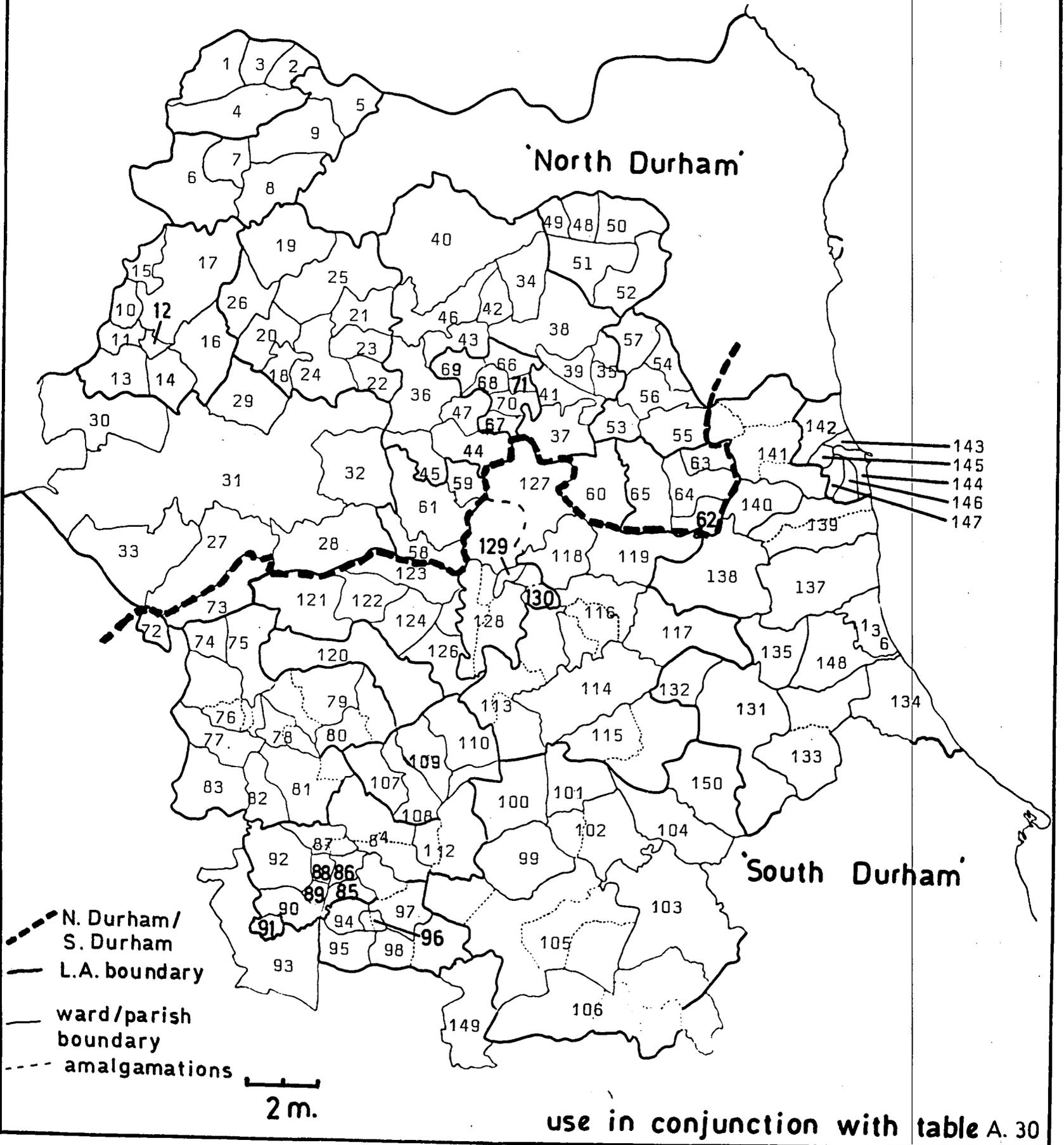co-op
closed shop

principal roads
built up area

N

1/4 mile
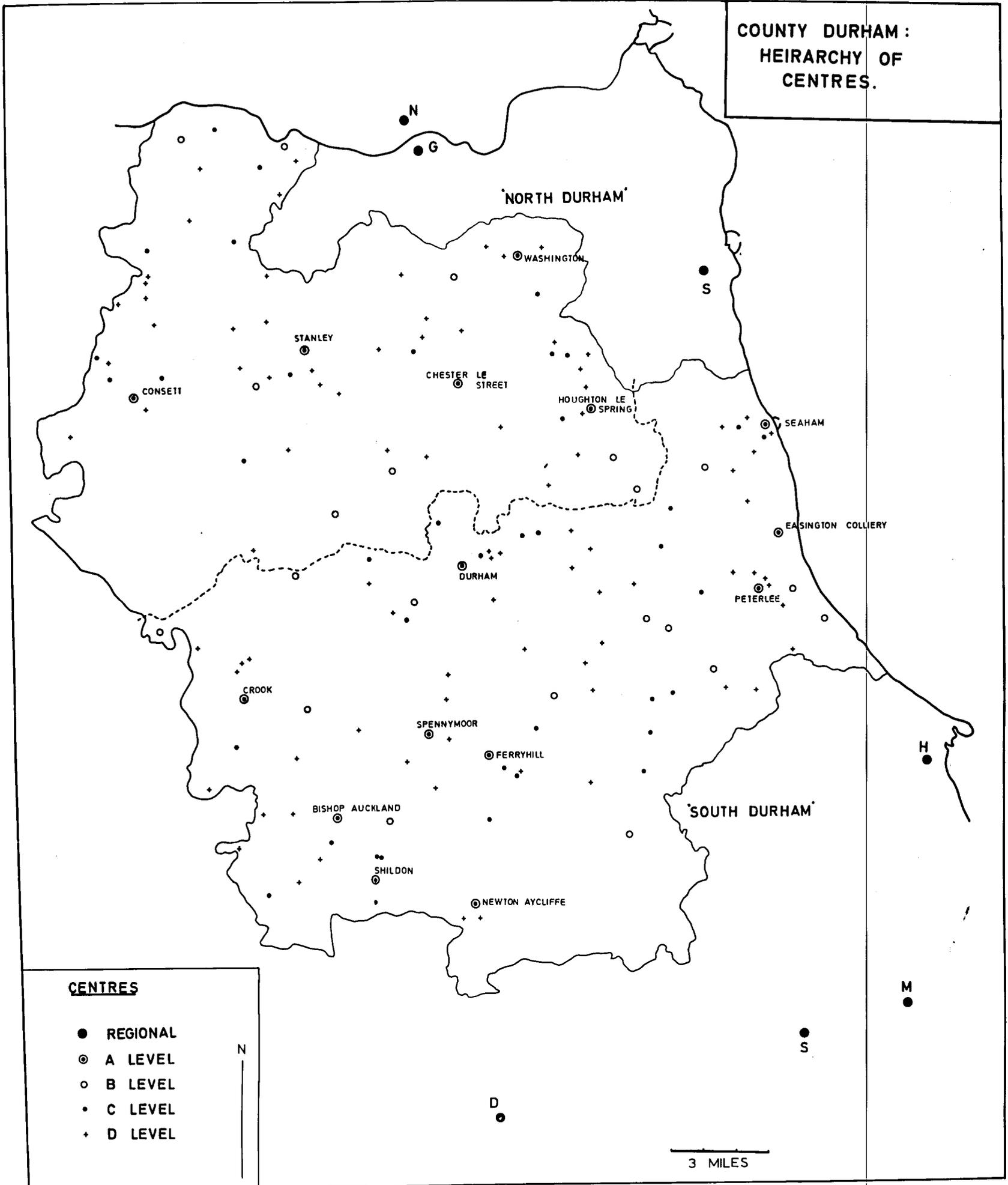
RELATIONSHIP OF TURNOVER TO SALES AREA : 3 SETTLEMENTS

each point represents 1 retail establishment

FOOD SHOPS.

annual turnover £ (log scale)

1,000,000
100,000
10,000
1000

sales area: sq. feet. (log scale)

100   1,000   10,000

• CROOK
o SHILDON
+ MURTON

RELATIONSHIP OF TURNOVER TO SIZE OF LABOURFORCE : 3 SETTLEMENTS.

NON FOOD SHOPS.

annual turnover £ (log scale)

100,000
10,000
1,000

size of labourforce

0   4   8   12   16

WARDS AND PARISHES USED IN THE ANALYSIS

'North Durham'

'South Durham'

Legend:
- N. Durham / S. Durham
- L.A. boundary
- ward/parish boundary
- amalgamations

2 m.

use in conjunction with table A. 30

COUNTY DURHAM:
HEIRARCHY OF
CENTRES.

'NORTH DURHAM'

WASHINGTON

STANLEY

CHESTER LE
STREET

HOUGHTON LE
SPRING

SEAHAM

CONSETT

EASINGTON COLLIERY

DURHAM

PETERLEE

CROOK

SPENNYMOOR

FERRYHILL

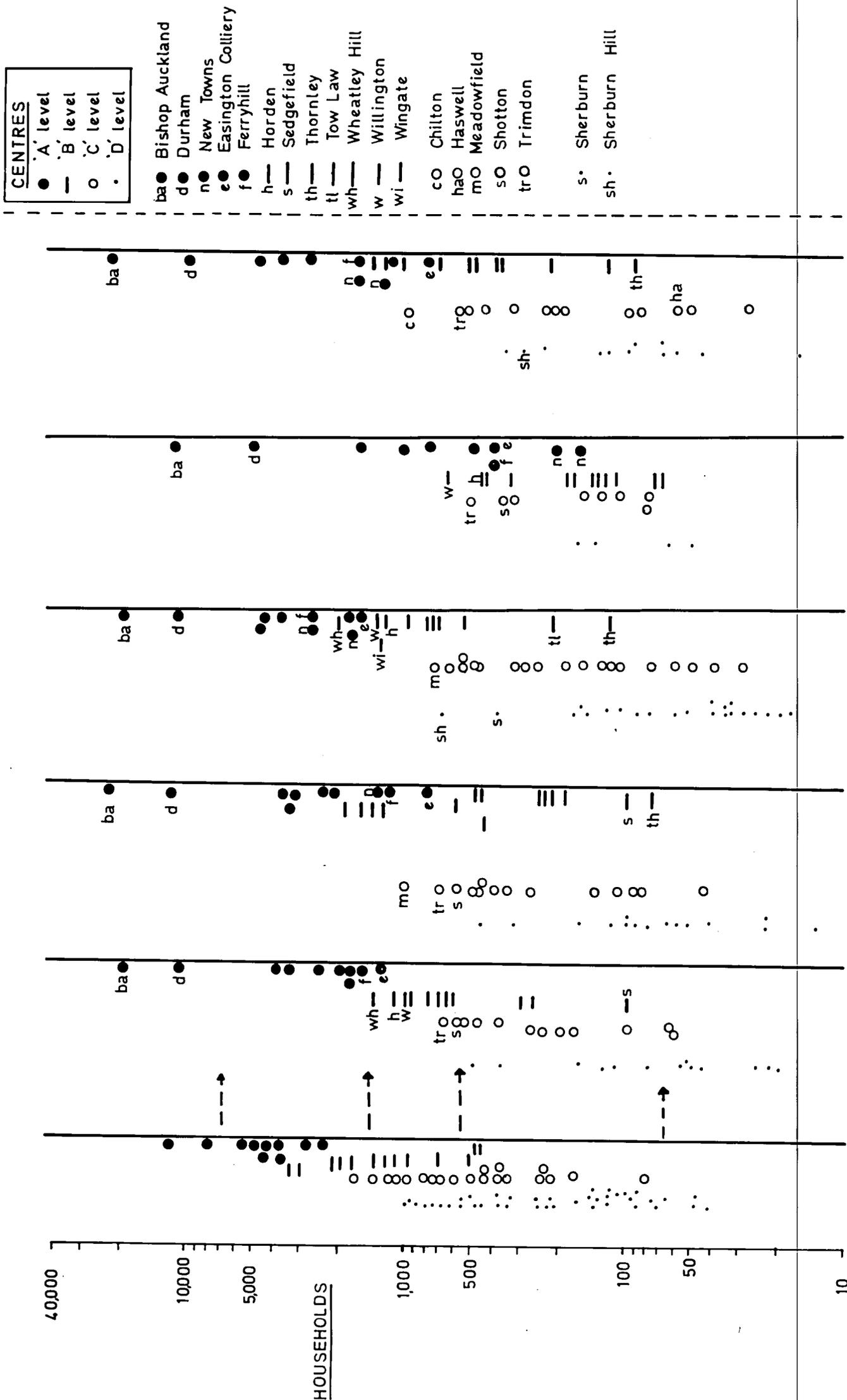'SOUTH DURHAM'

BISHOP AUCKLAND

SHILDON

NEWTON AYCLIFFE

CENTRES

● REGIONAL
◉ A LEVEL
○ B LEVEL
· C LEVEL
+ D LEVEL

N

3 MILES

25.

NUMBERS OF HOUSEHOLDS SERVED AT EACH HEIRARCHICAL LEVEL :
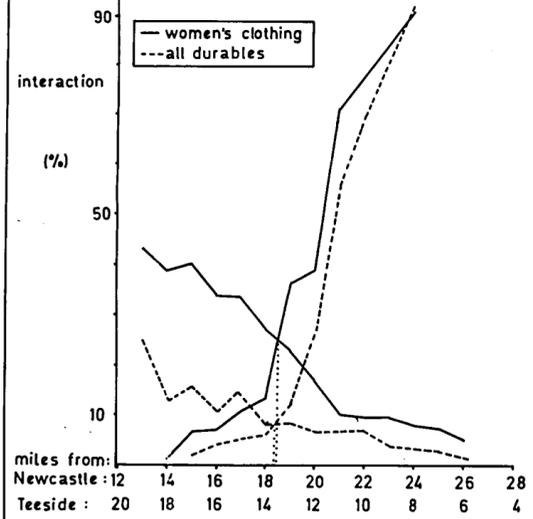CENTRES IN SOUTH DURHAM.

CENTRES

●	'A' level
—	'B' level
o	'C' level
.	'D' level

ba ● Bishop Auckland
d ● Durham
n ● New Towns
e ● Easington Colliery
f ● Ferryhill
h — Horden
s — Sedgefield
th — Thornley
tl — Tow Law
wh — Wheatley Hill
w — Willington
wi — Wingate

co o Chilton
ha o Haswell
mo o Meadowfield
so o Shotton
tr o Trimdon

s . Sherburn
sh . Sherburn Hill

HOUSEHOLDS

40,000
10,000
5,000
1,000
500
100
50
10

GROCERIES   ALL DURABLES   SHOES   WASHING MACHINE   WOMEN'S CLTHG.   FURNITURE

REGIONAL AND A LEVEL CENTRES USED IN TRADE AREA ANALYSIS

NEWCASTLE

SUNDERLAND

SEAHAM

DURHAM

EASINGTON COLLIERY

PETERLEE

CROOK

SPENNYMOOR

FERRYHILL

BISHOP AUCKLAND

SHILDON

NEWTON AYCLIFFE

2m

STOCKTON

MIDDLESBRO'

TEESIDE

DARLINGTON
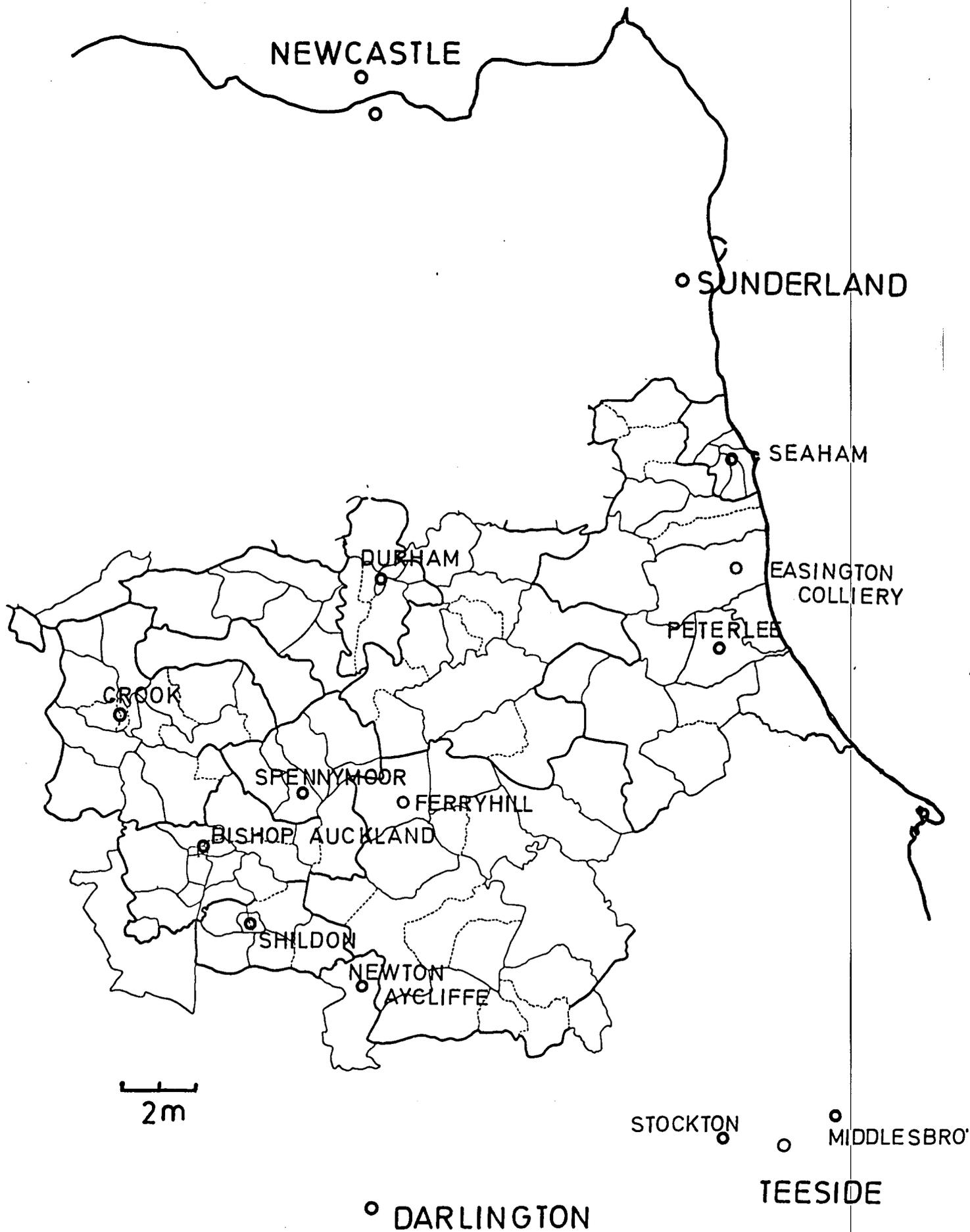
DISTANCE DECAY FUNCTIONS

28.

ORIENTATION TO NEWCASTLE AND TEESIDE: REGIONAL CENTRE INTERACTION.

interaction (%)

— women's clothing
--- all durables

miles from:								
Newcastle :	12	14	16	18	20	22	24	26	28
Teeside :	20	18	16	14	12	10	8	6	4

29.

ORIENTATION TO NORTHERN AND SOUTHERN REGIONAL CENTRES

northern axis: (mid-point, Newcastle-Sunderland)

southern axis: (mid point, Teeside-Darlington)

interaction (%)

— women's clothing
--- all durables

miles from:								
northern axis :	8	10	12	14	16	18	20	22	24
southern axis :	24	22	20	18	16	14	12	10	8
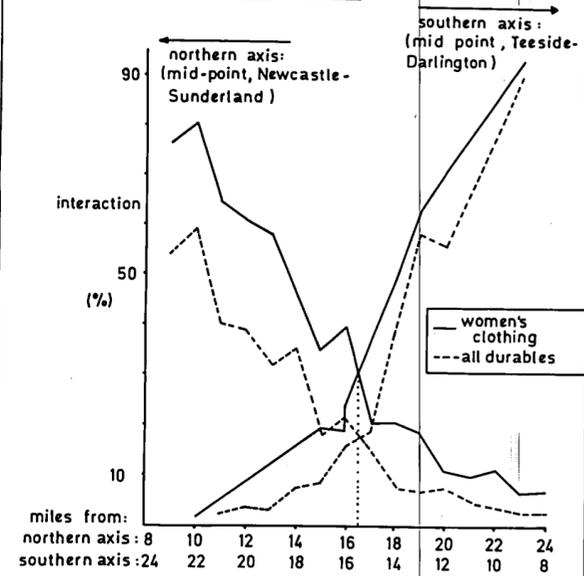
30.

'A' CENTRES: THEORETICAL DISTANCE DECAY

interaction

— men's clothing
— — women's clothing
····· chemist goods

distance
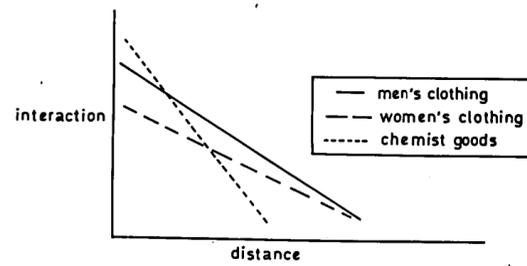
32.

COMPETITION BETWEEN DURHAM AND BISHOP AUCKLAND

interaction (%)

— chemist goods
--- all durables

miles from:								
DURHAM	1	2	3	4	5	6	7	8	9
BISHOP A.	8	7	6	5	4	3	2	1	0
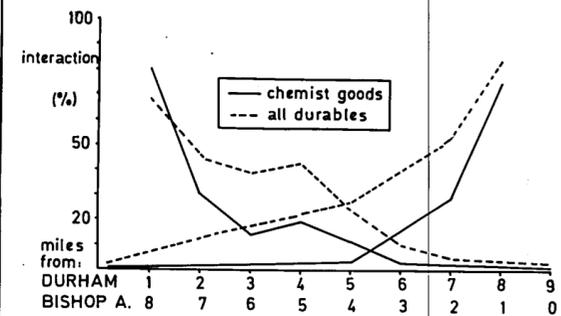
31.

BISHOP AUCKLAND PLUS DURHAM: INTERACTION AT DIFFERENT MILES RADIUS.

interaction (%)

— men's clothing
— — women's clothing
--- chemist goods
····· all durables

1 3 5 7 9 11
miles from centre
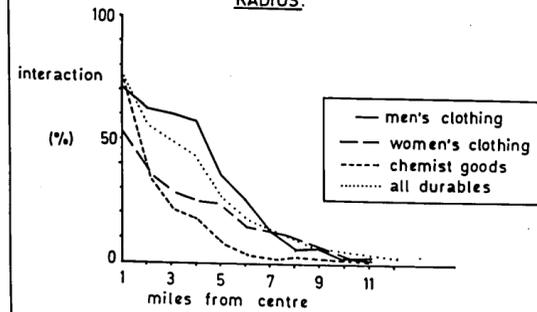
33.

CROOK PLUS SPENNYMOOR : INTERACTION AT DIFFERENT MILES RADIUS.

interaction (%)

— — women's clothing
····· all durables
— washing machine
--- chemist goods

1 2 3 4 5 6 7
miles from centre

28. — 33.
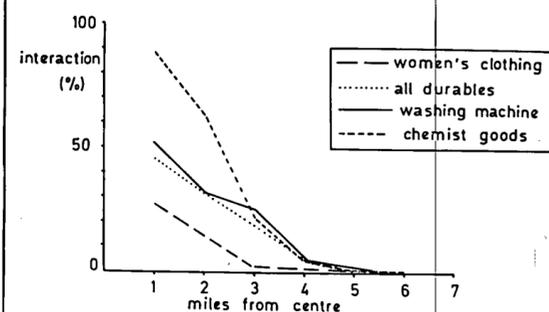
INTERACTION WITH NEWCASTLE
PLUS SUNDERLAND FOR:

(a) WOMEN'S CLOTHING PURCHASE

2m.

(b) ALL DURABLE GOODS
PURCHASE

2 m.

%

70+
60-70
50-60
40-50
30-40
20-30
10-20
under 10

34.
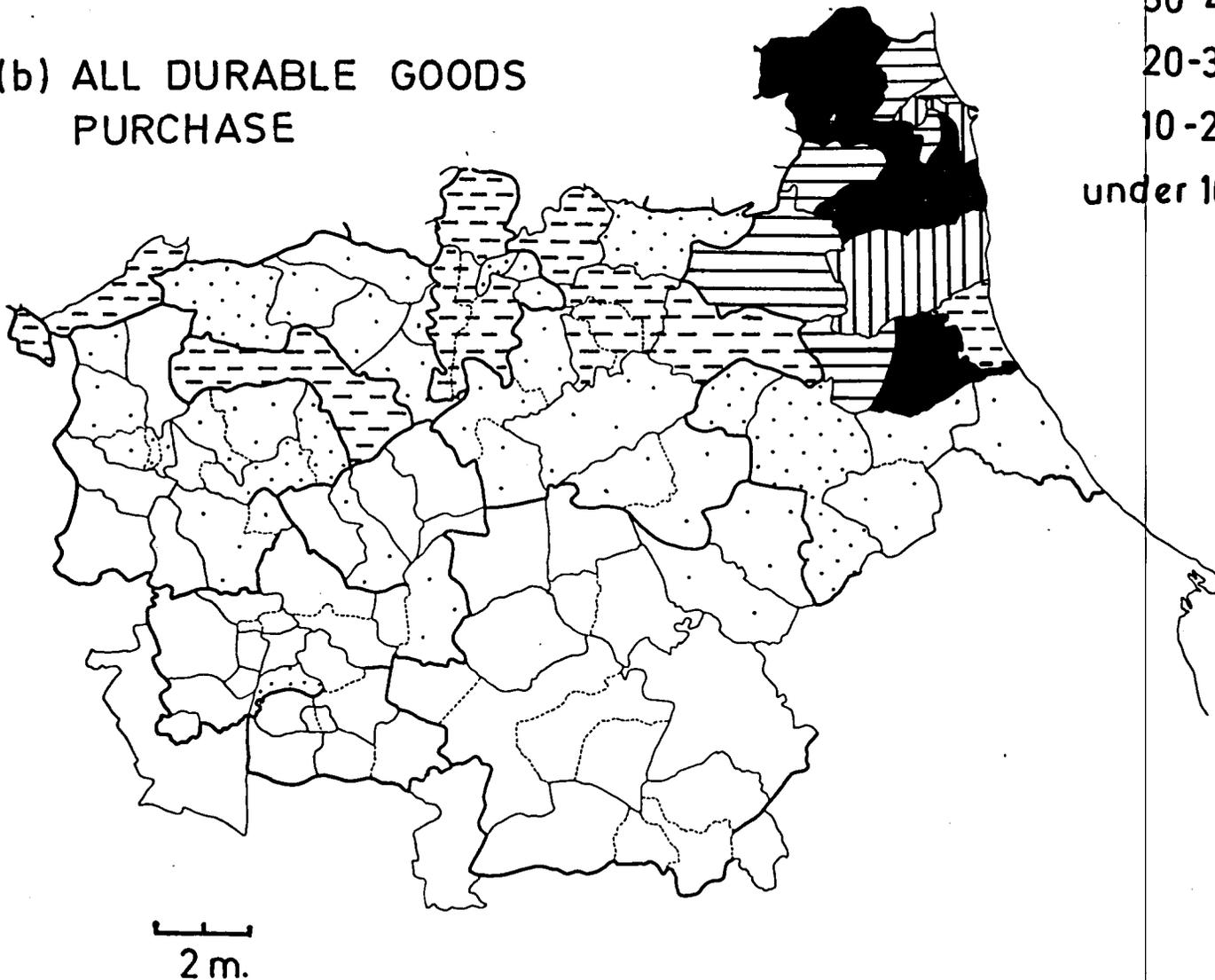
INTERACTION WITH TEESIDE PLUS
DARLINGTON FOR WOMEN'S
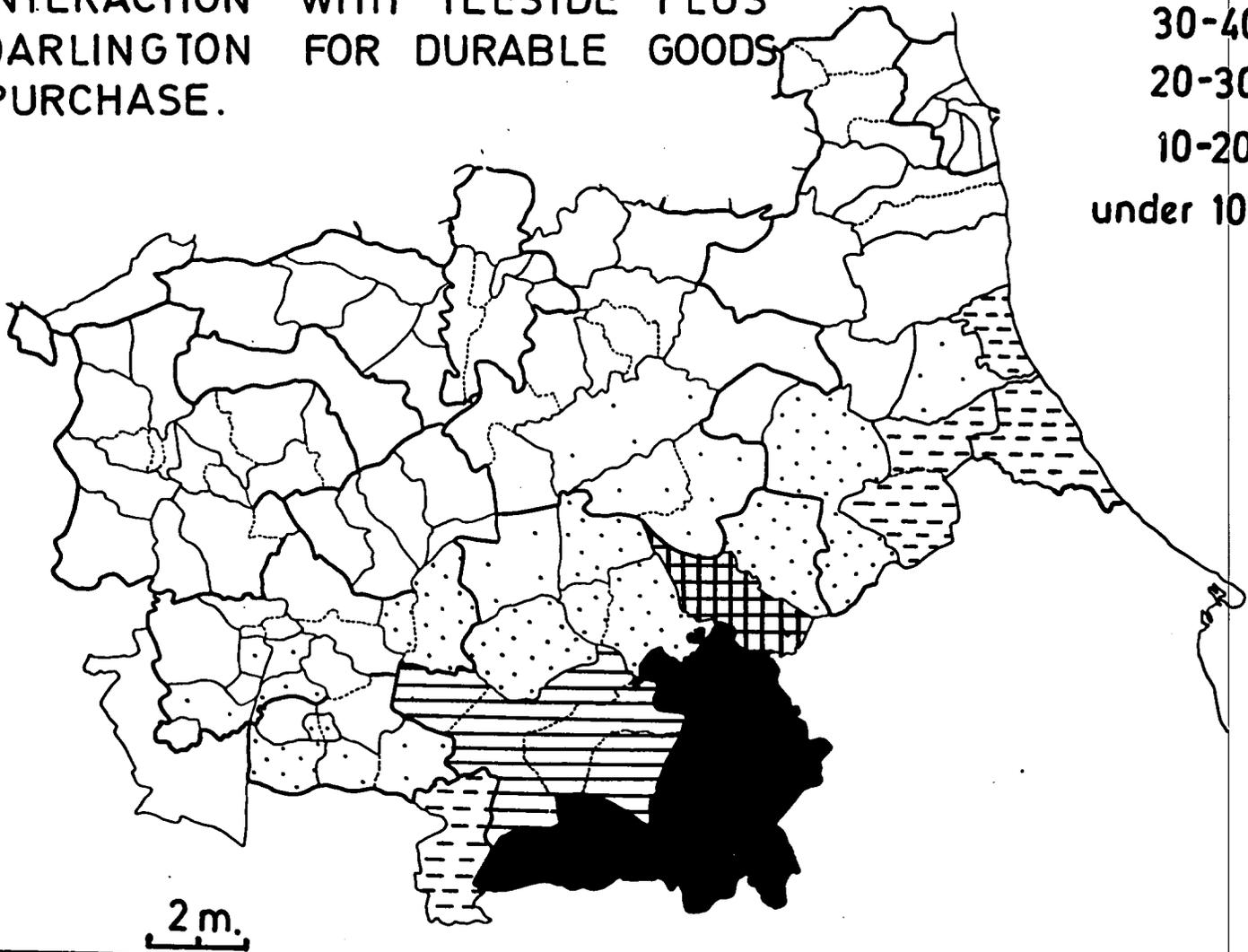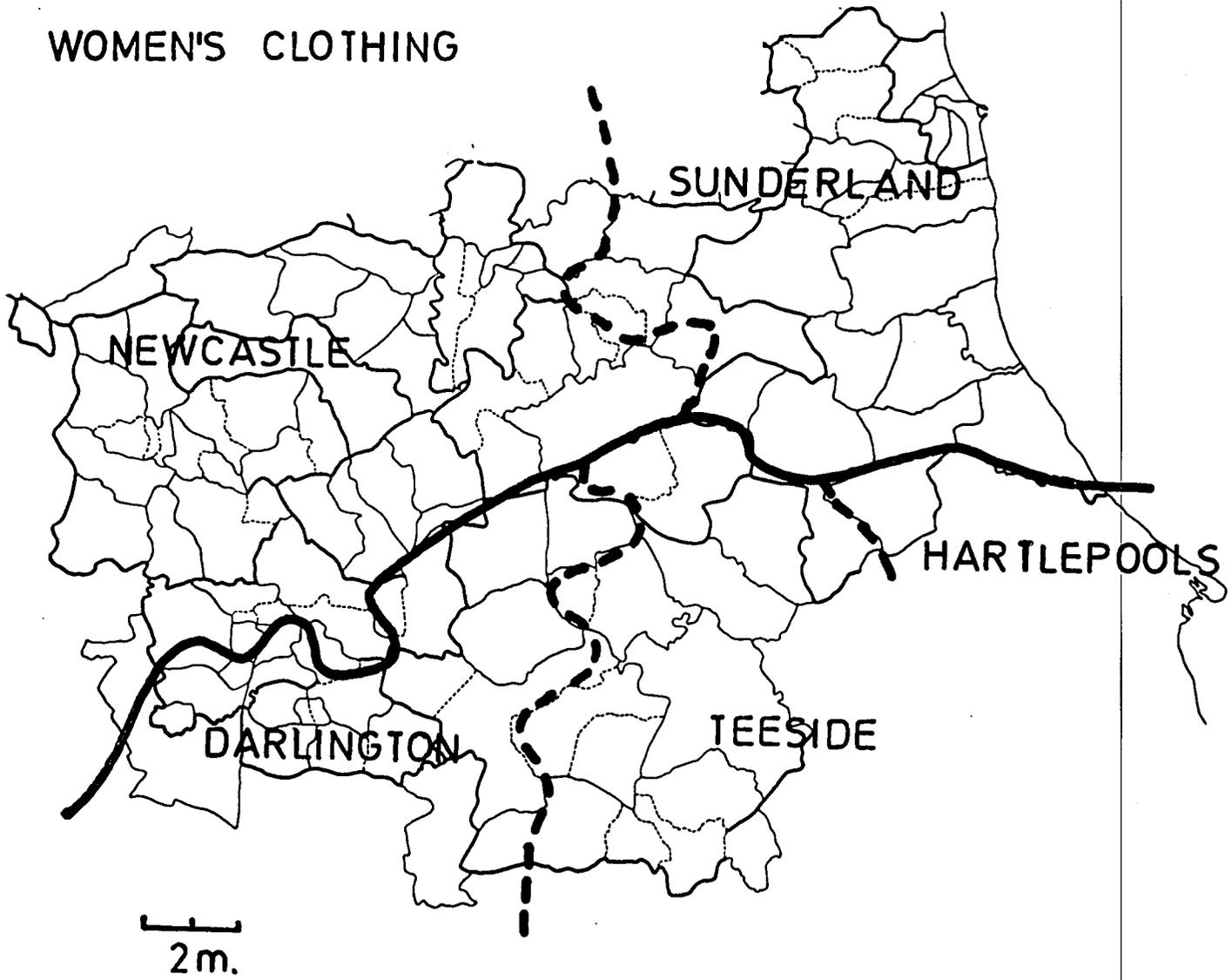CLOTHING PURCHASE.

2 m.
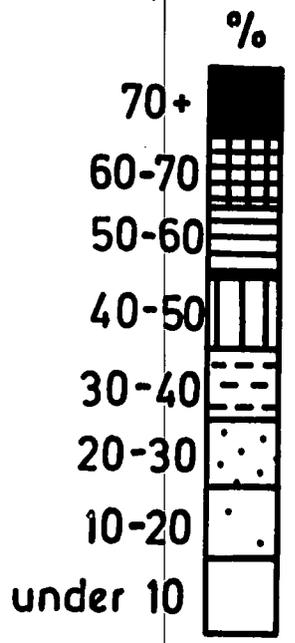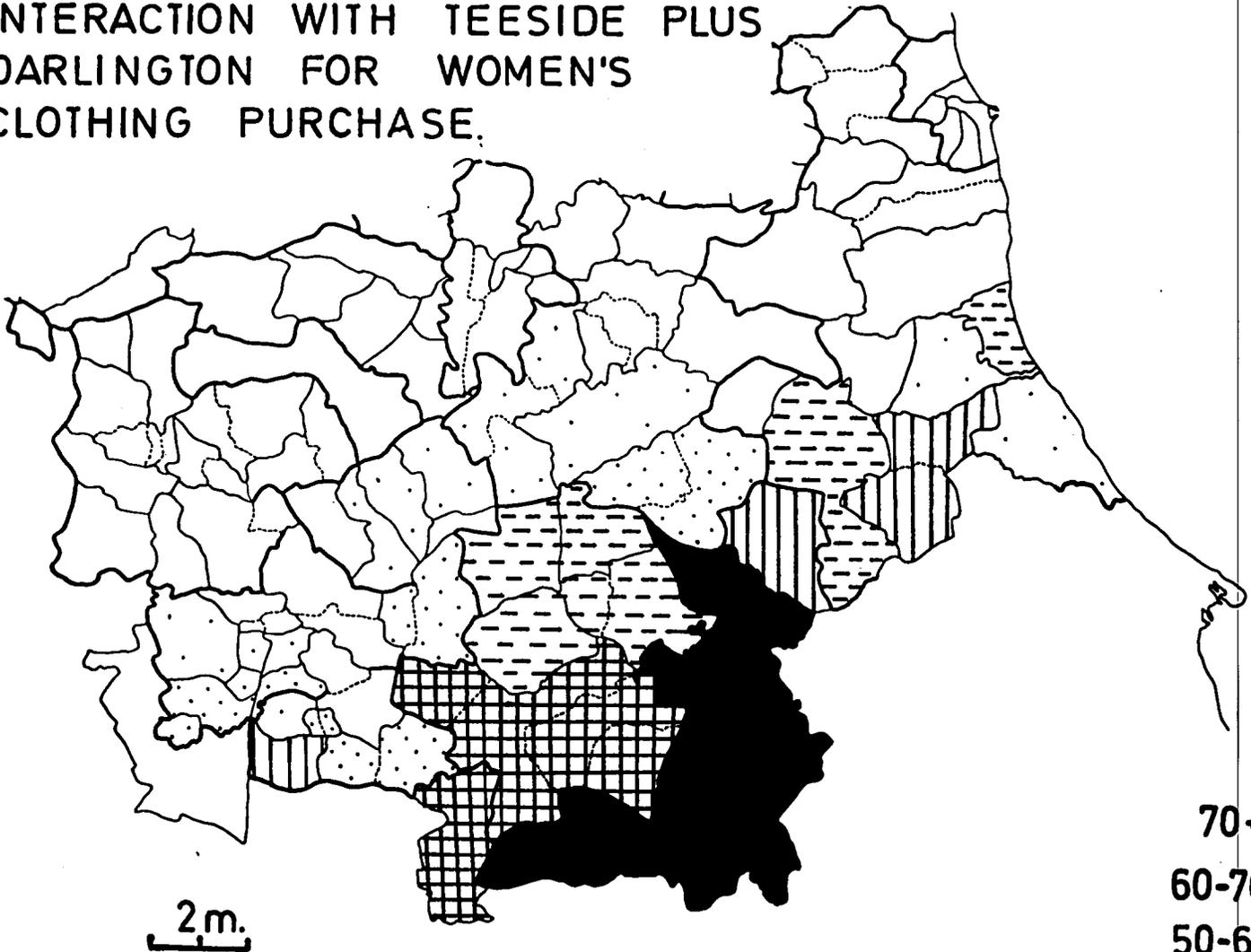
INTERACTION WITH TEESIDE PLUS
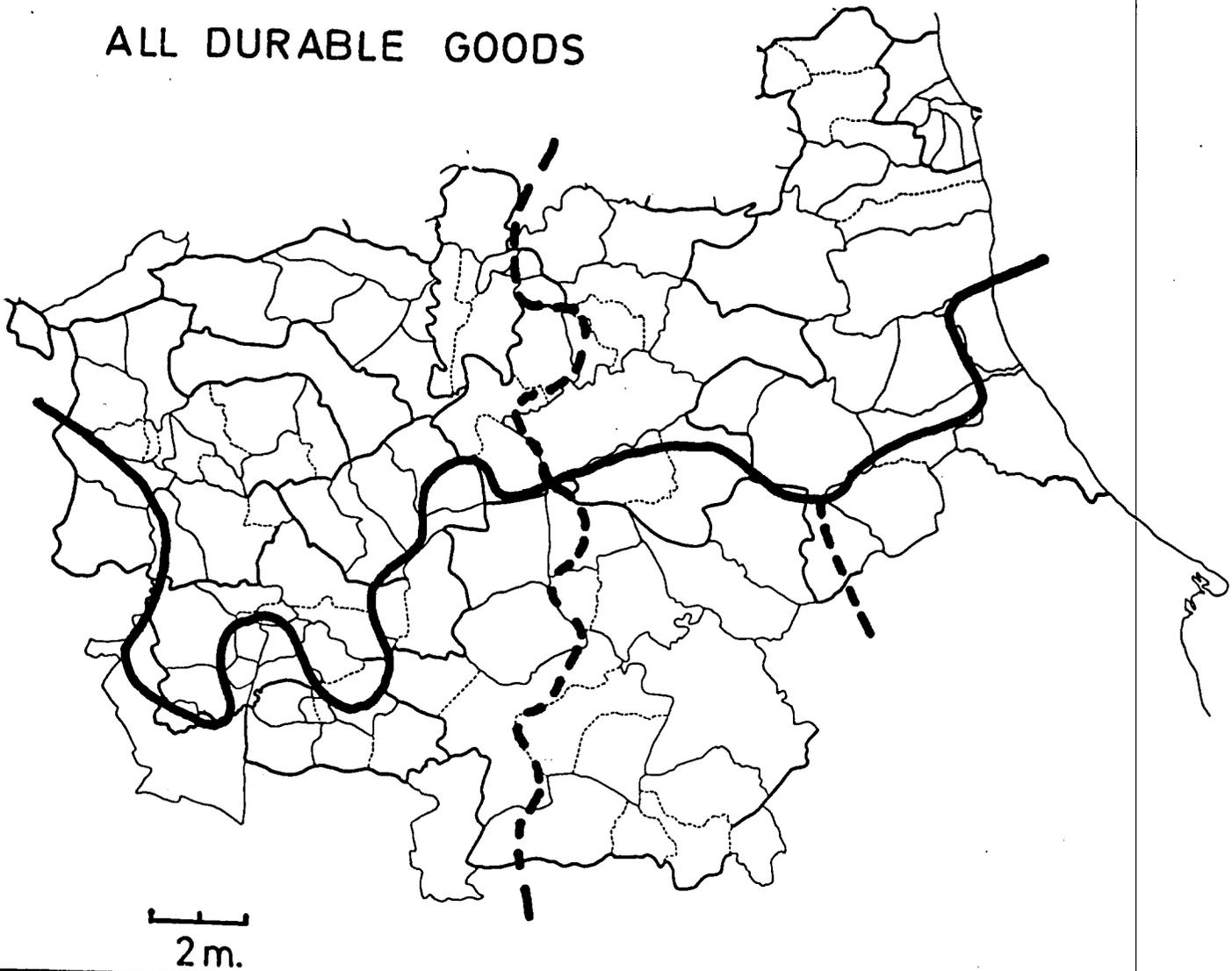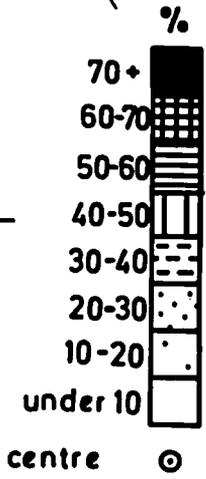DARLINGTON FOR DURABLE GOODS
PURCHASE.

2 m.

%

70+
60-70
50-60
40-50
30-40
20-30
10-20
under 10

REGIONAL CENTRE UMLANDS:

WOMEN'S CLOTHING

SUNDERLAND

NEWCASTLE

HARTLEPOOLS

DARLINGTON

TEESIDE

2 m.

ALL DURABLE GOODS

2 m.

INTERACTION WITH BISHOP AUCKLAND
AND DURHAM FOR GROCERY
PURCHASE.
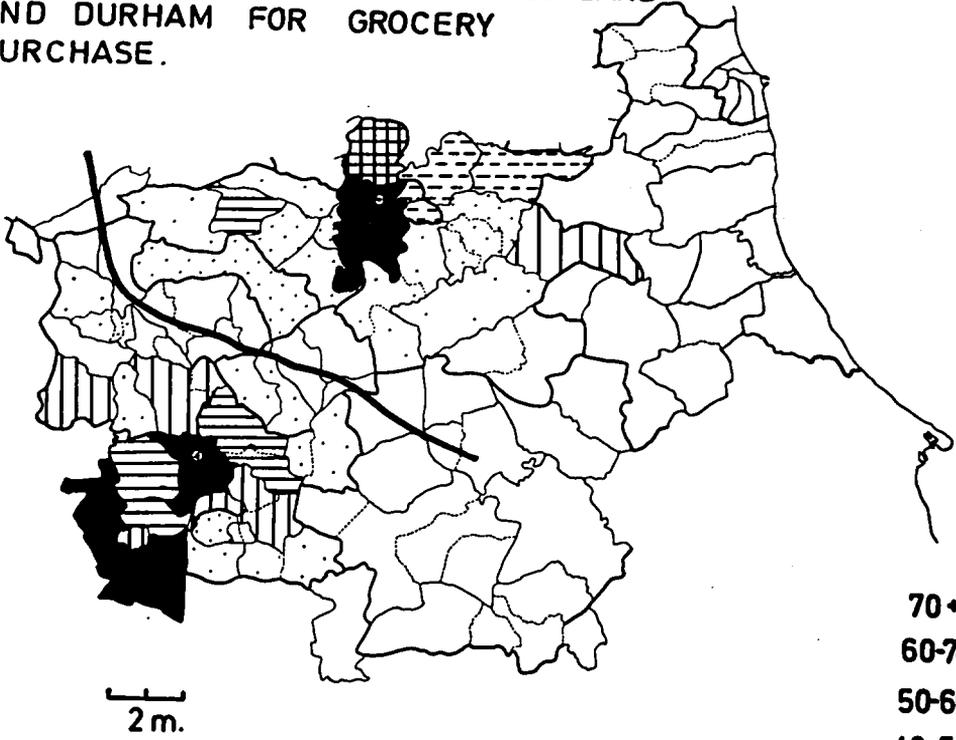
INTERACTION WITH BISHOP AUCKLAND
FOR DURABLE GOODS PURCHASE.
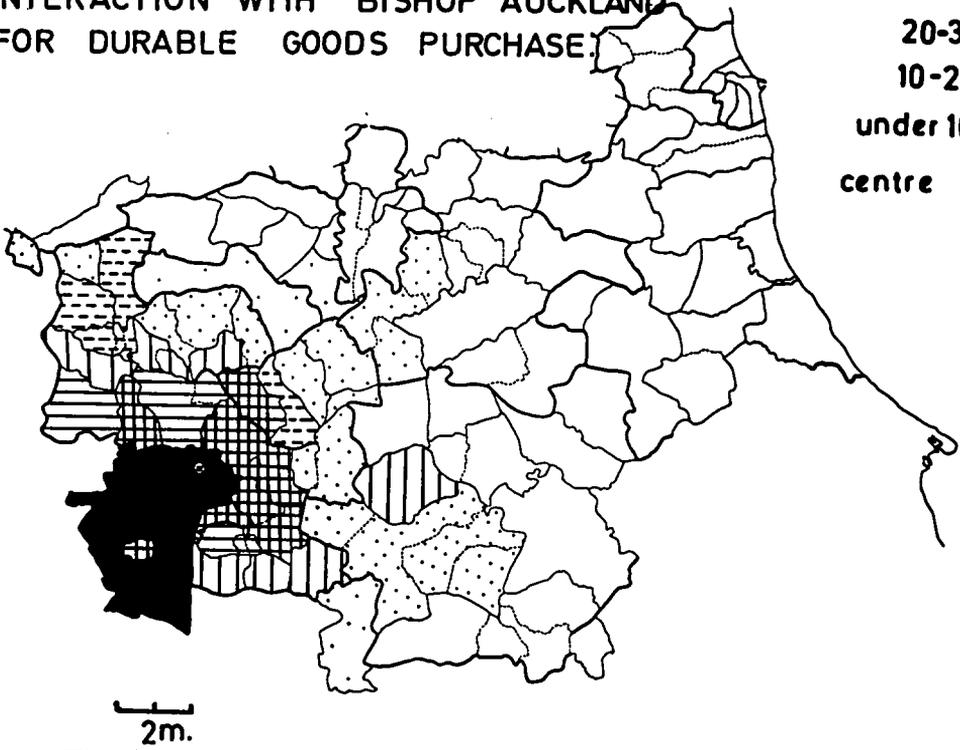
INTERACTION WITH DURHAM
FOR DURABLE GOODS PURCHASE.

%
70 +
60-70
50-60
40-50
30-40
20-30
10-20
under 10
centre ⊙

2 m.

2m.

2m.
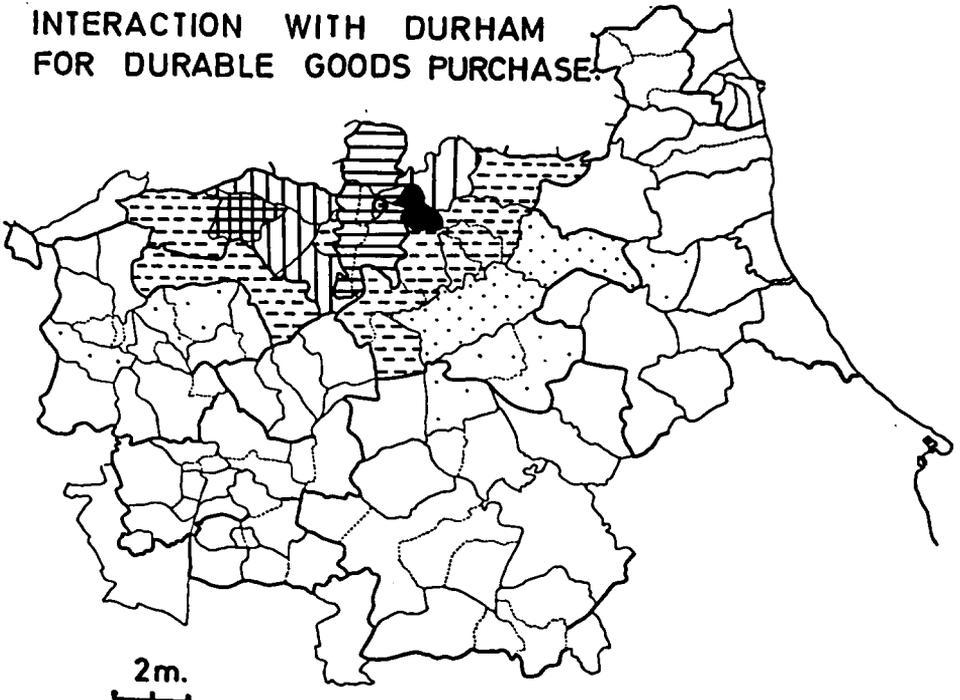
INTERACTION WITH 6 WEAK 'A'
LEVEL CENTRES FOR:

DURABLE GOODS:

2 m.
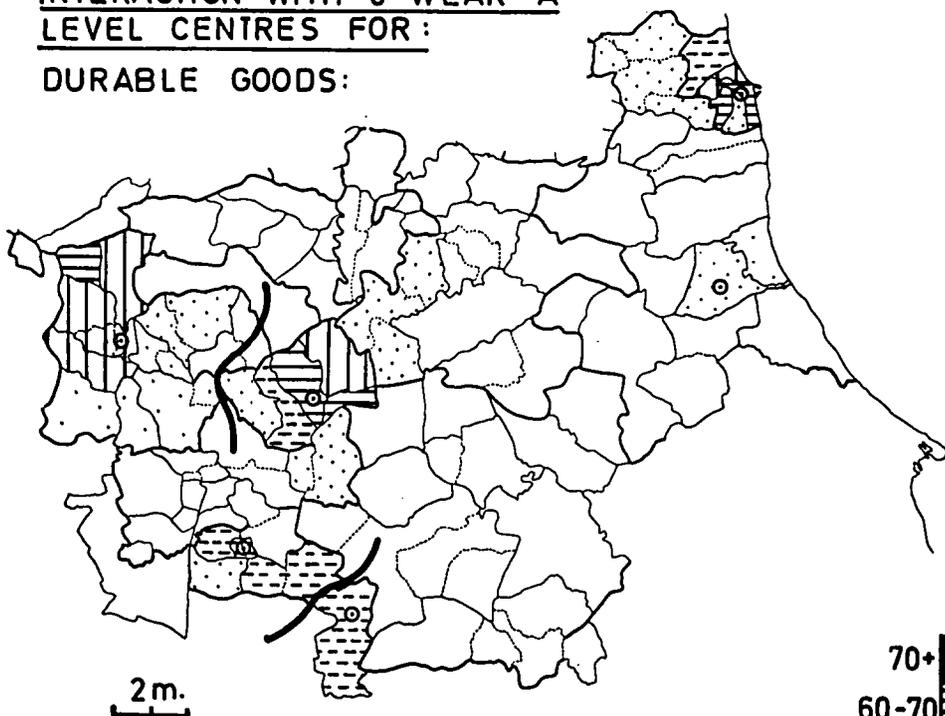
WASHING MACHINE PURCHASE:

%
70+
60-70
50-60
40-50
30-40
20-30
10-20
under 10

centres ⊙

2 m.

GROCERY PURCHASE:

2 m.

38.
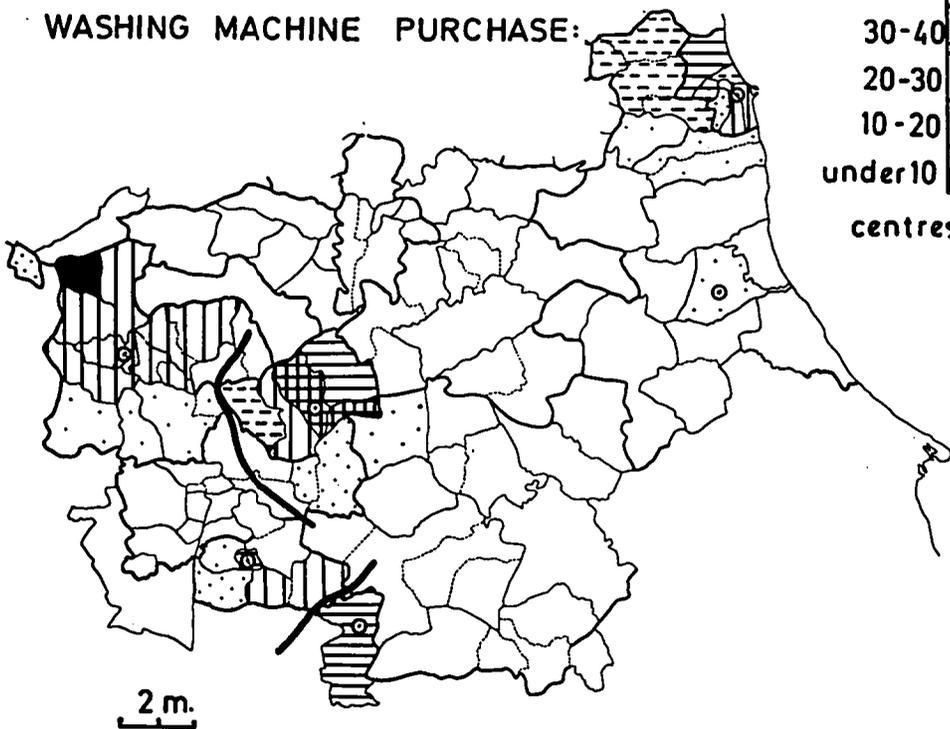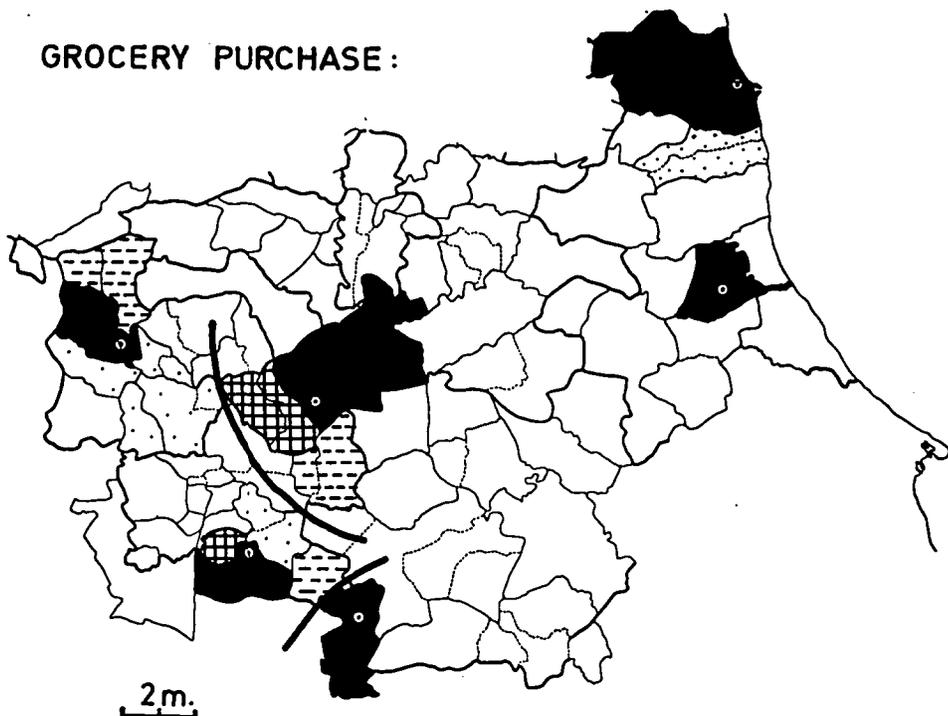
'A' AND 'B' CENTRE UMLANDS

based upon appliance purchase for
'A' and t.v. or hardware for 'B'

regional centres included
only where very dominant

Easington

S'land

Hartlepool

F'hill

Teeside

N.Ayc

2m.

umlands

—— 'A' CENTRE
····· 'B' CENTRE
- - - non emergent 'B'
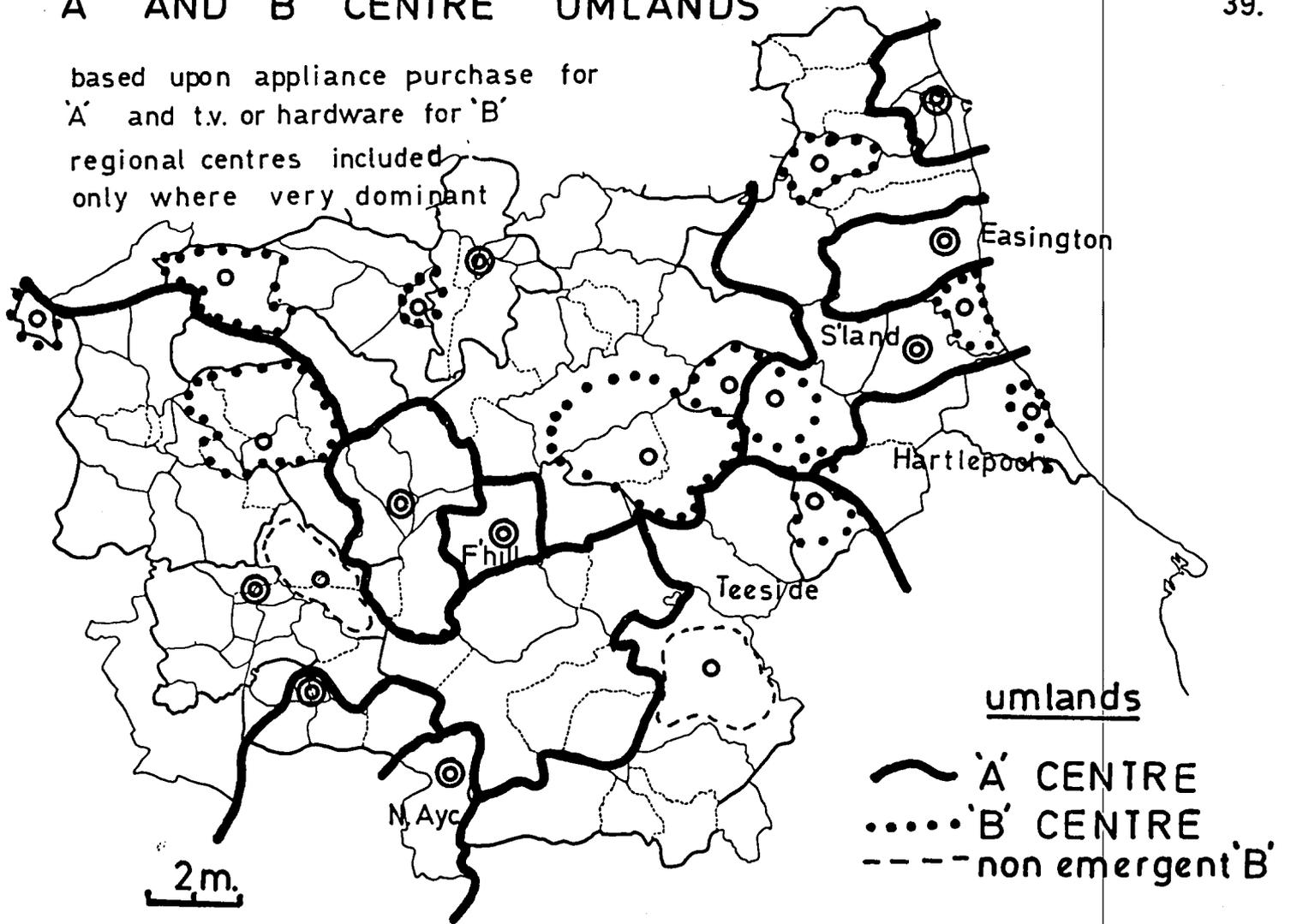
'B' CENTRES AND CHOSEN 'C' CENTRES USED IN THE ANALYSIS

SEAHAM-Q. ALEX. RD.

MURTON

CARRVILLE

USHAW MOOR

ESH WINNING

TOW LAW

LANGLEY MOOR

HORDEN

THORNLEY

SHOTTON

BLACKHALL

WHEATLEY HILL

COXHOE

WILLINGTON

HOWDEN

COUNDON

CHILTON BLDGS.

FISHBURN

COCKTON HILL

SEDGEFIELD

WEST AUCKLAND

○ B
● C

2m.
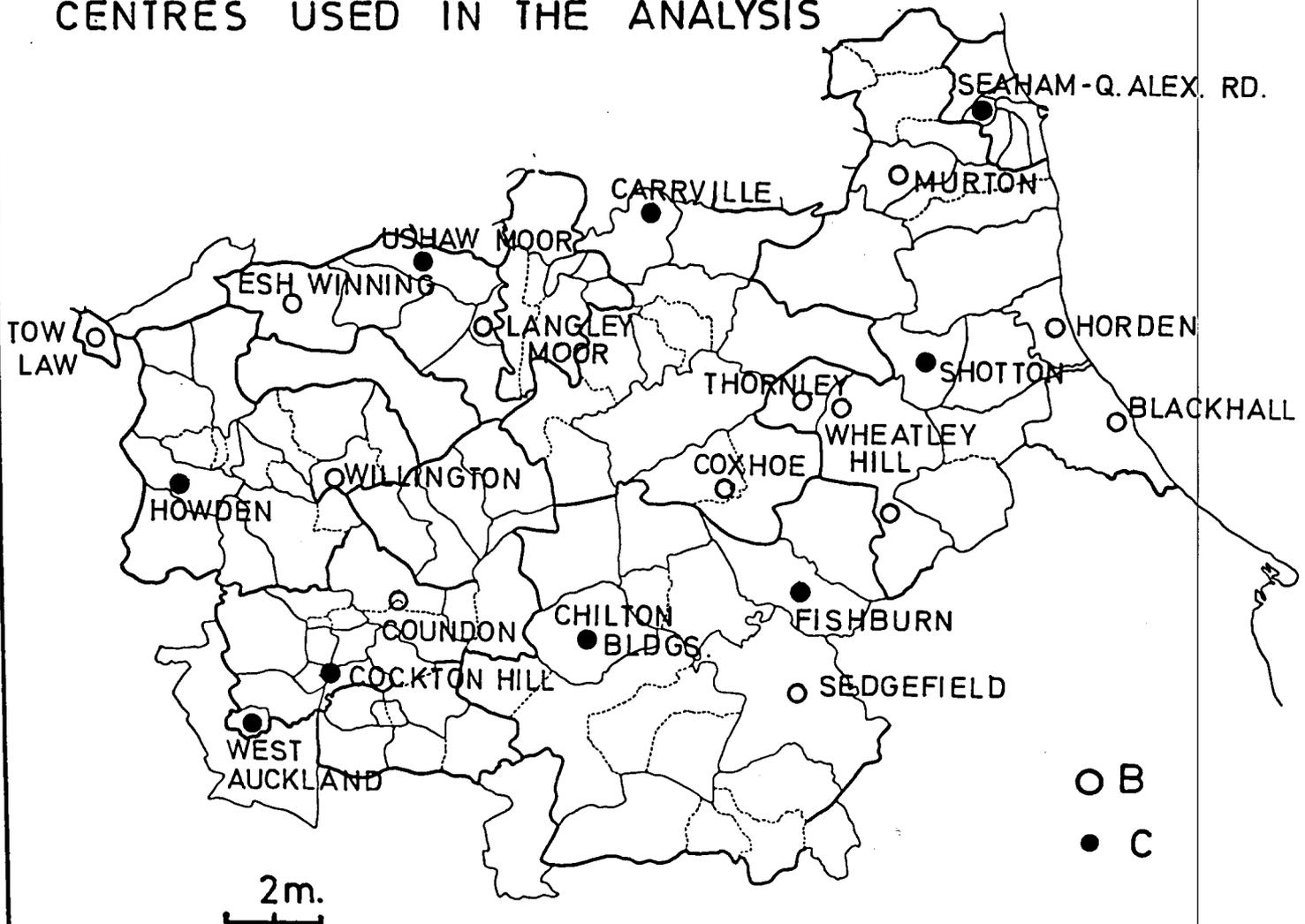
INTERACTION WITH 'B' CENTRES
FOR GROCERY PURCHASE

41.

2 m.

%

70+
60-70
50-60
40-50
30-40
20-30
10-20
under 10

centres ●

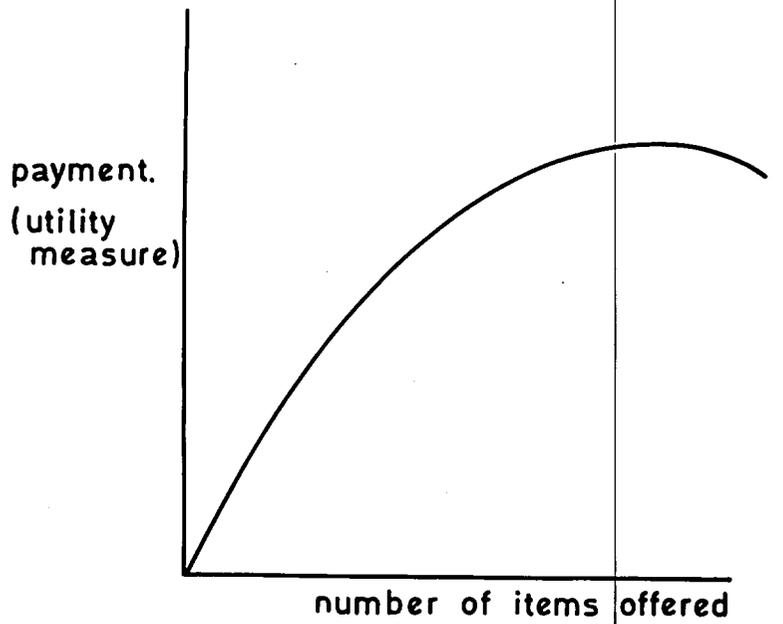FOR T.V. PURCHASE

2 m.
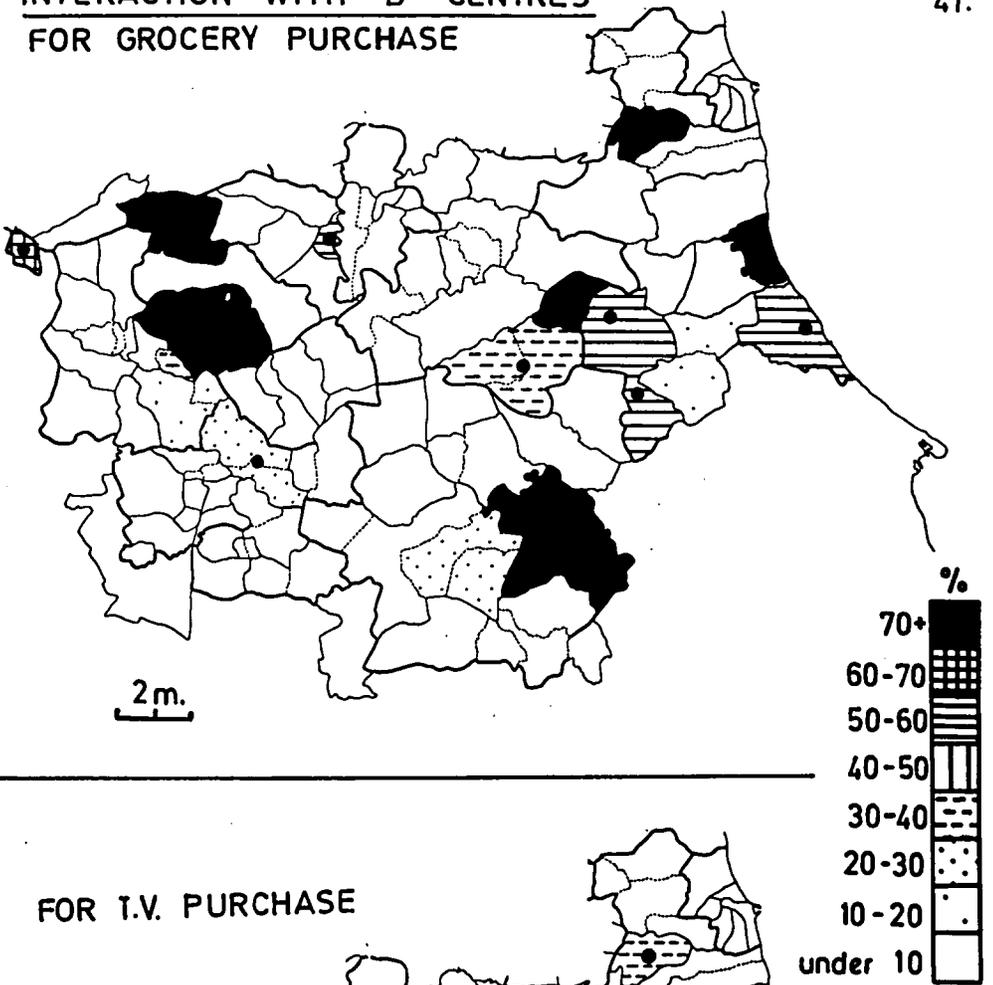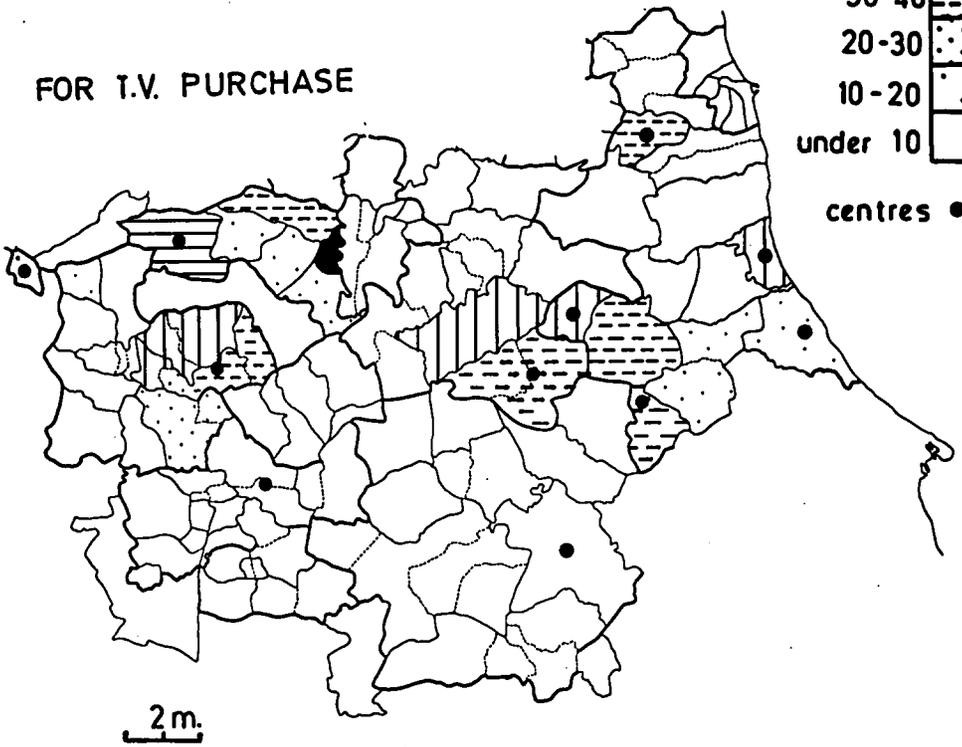
INTERACTION WITH CERTAIN
'C' CENTRES FOR GROCERY
PURCHASE
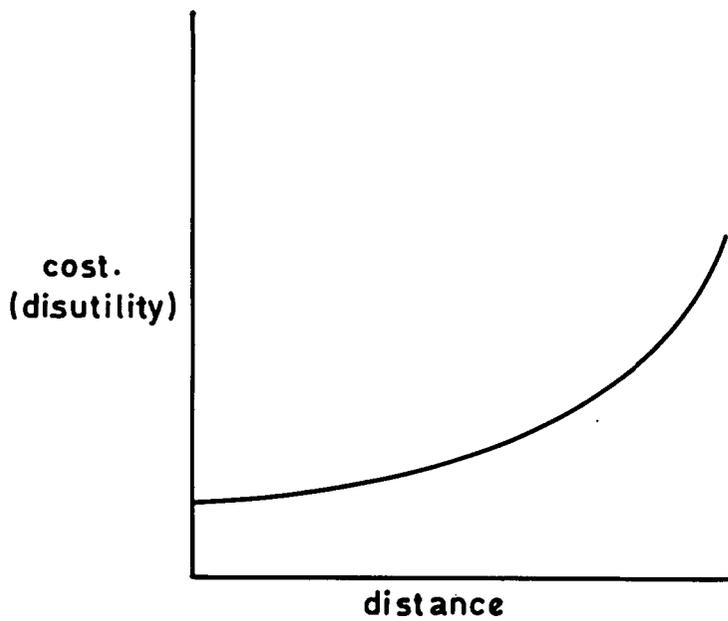
42.

2 m.
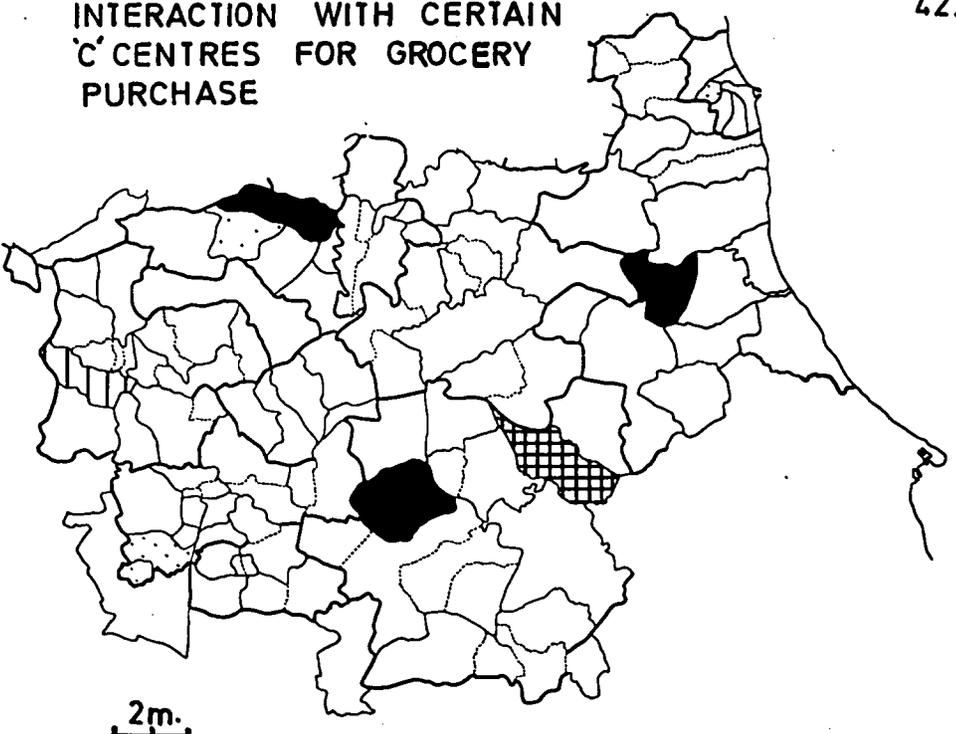
CONSUMER BEHAVIOUR: THEORETICAL ASPECTS.

43.

utility

x

y

number of items offered

44.

payment.
(utility
measure)

number of items offered

45.

cost.
(disutility)

distance

46.

number
of
items

distance

47.

payment
and
cost.

(utility and
disutility)
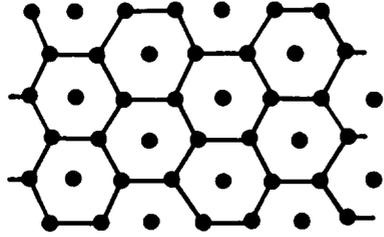
distance   Dx

48.

functions

establishments
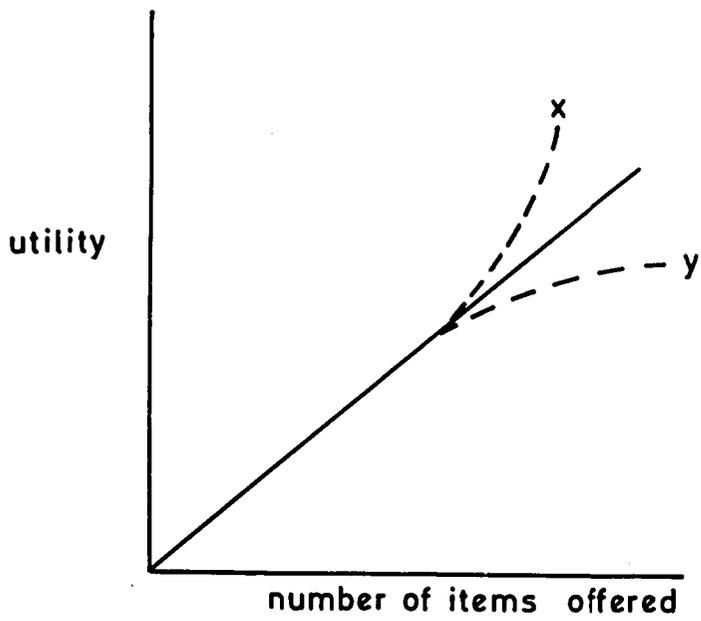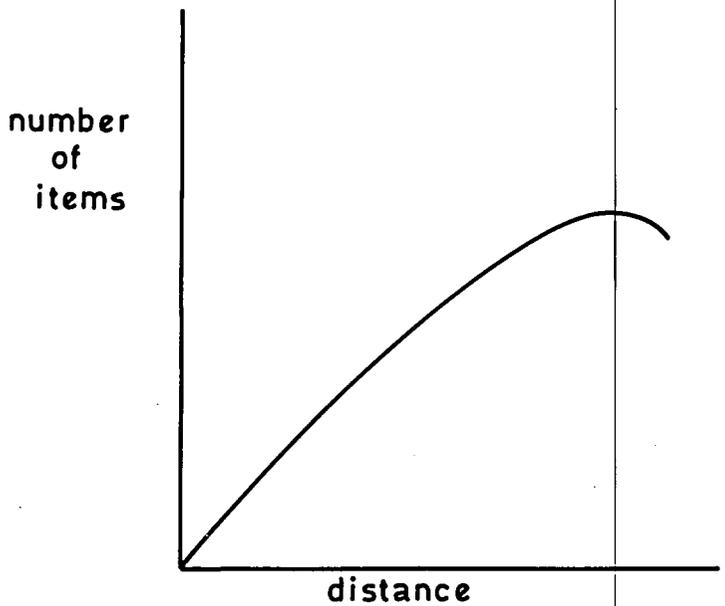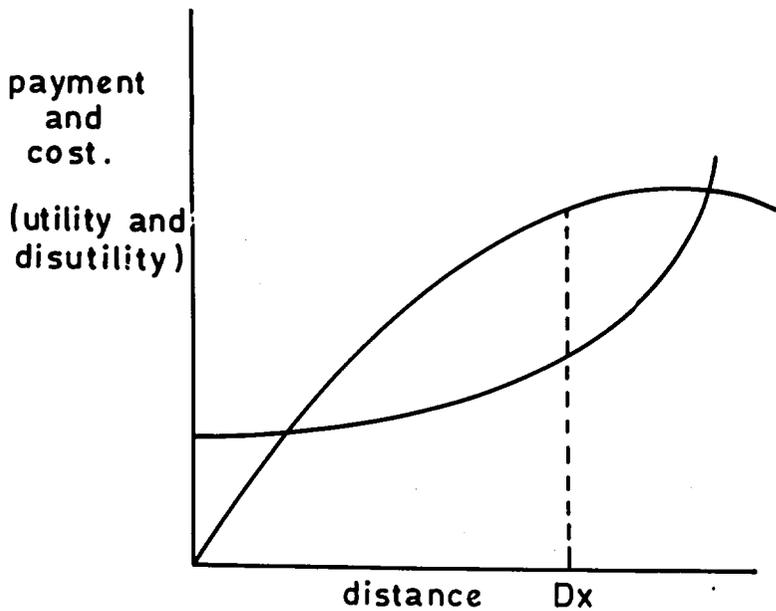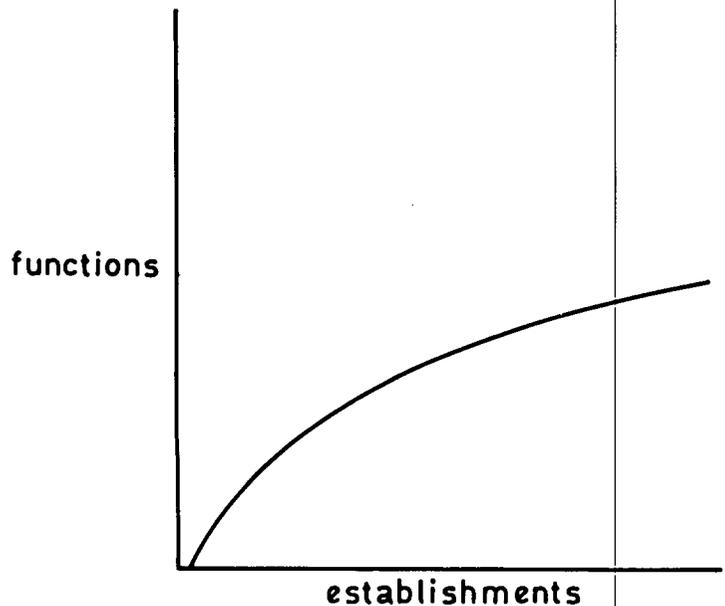
ASPECTS OF CENTRAL PLACE THEORY: REFORMULATIONS.

(ii)

(iii)

(i)
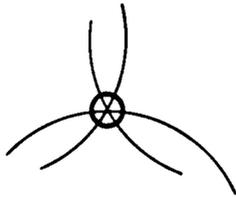
(iv) A CENTRAL PLACE SYSTEM BASED ON CIRCLES

<u>heirarchical levels of centre</u>

lowest — •

middle — ●
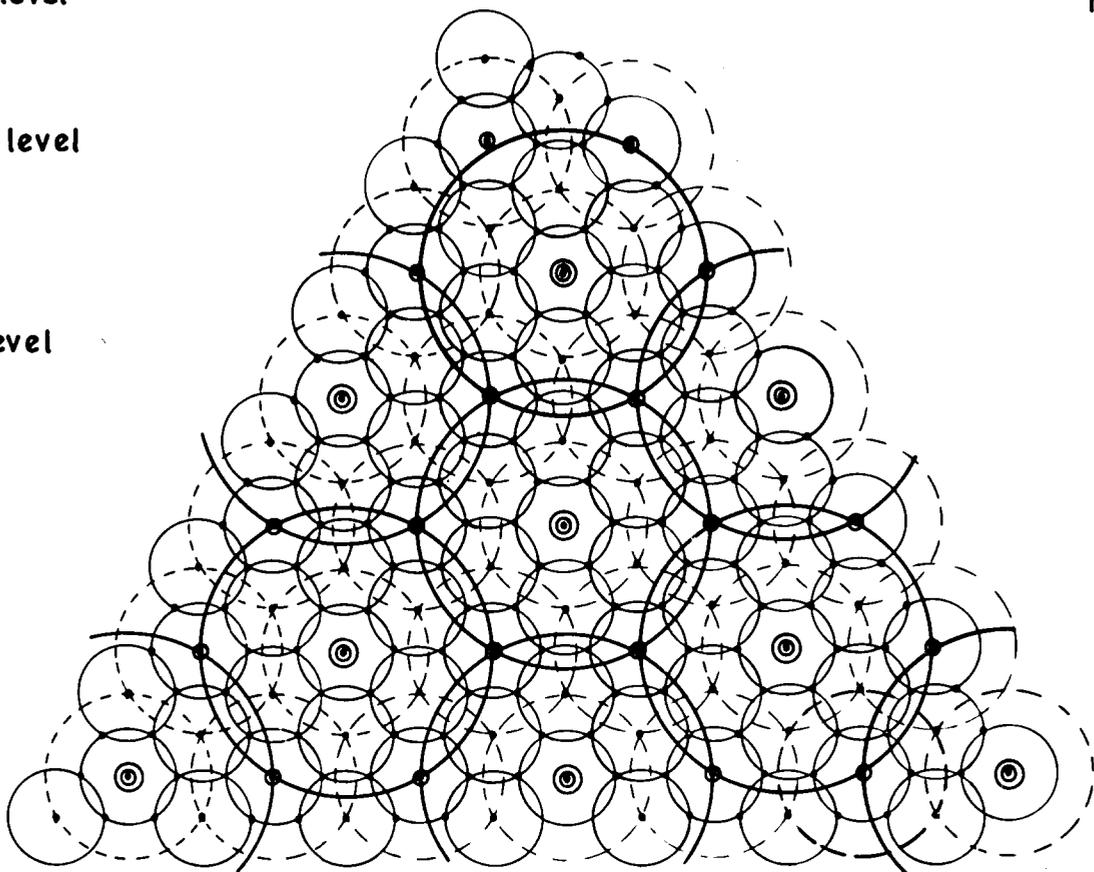
highest — ◉

<u>trade areas</u>
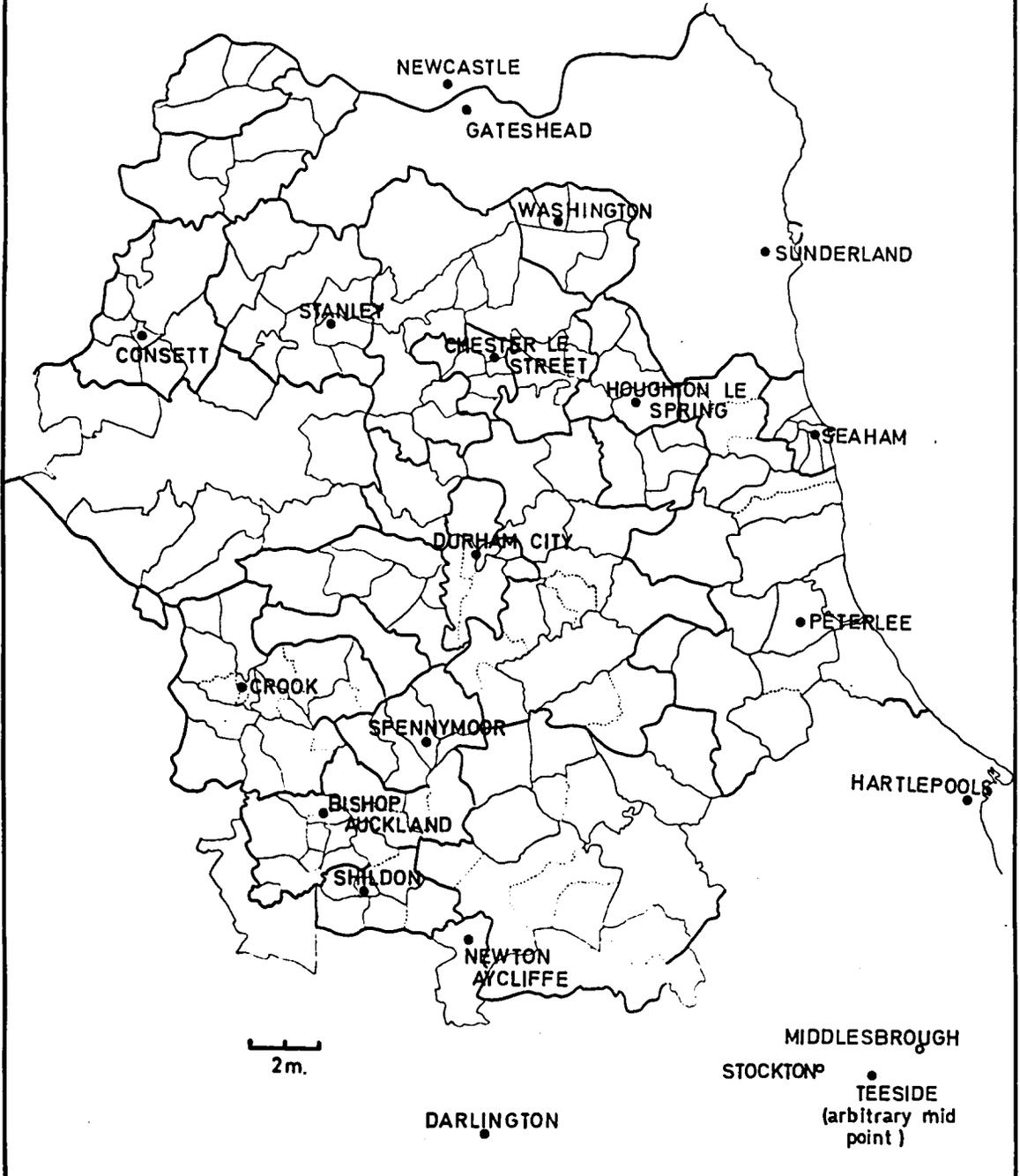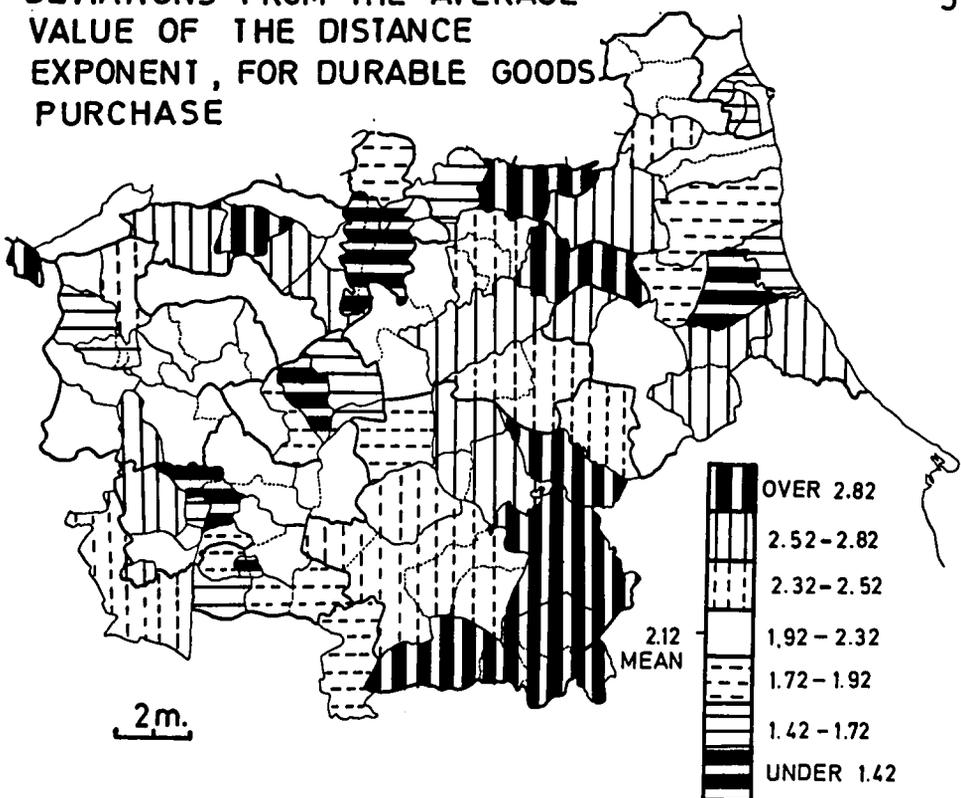
○ lowest level

middle level

highest level

50.

19 CENTRES USED IN THE GRAVITY MODEL ANALYSIS.

NEWCASTLE
GATESHEAD
WASHINGTON
SUNDERLAND
STANLEY
CONSETT
CHESTER LE STREET
HOUGHTON LE SPRING
SEAHAM
DURHAM CITY
PETERLEE
CROOK
SPENNYMOOR
HARTLEPOOLS
BISHOP AUCKLAND
SHILDON
NEWTON AYCLIFFE

2m.

MIDDLESBROUGH
STOCKTON
TEESIDE
(arbitrary mid point)
DARLINGTON

51.

DEVIATIONS FROM THE AVERAGE VALUE OF THE DISTANCE EXPONENT, FOR DURABLE GOODS PURCHASE

	OVER 2.82
	2.52 – 2.82
	2.32 – 2.52
2.12 MEAN	1.92 – 2.32
	1.72 – 1.92
	1.42 – 1.72
	UNDER 1.42

2m.

GRAVITY MODEL PREDICTION: ABSOLUTE
ERRORS.   ONE PARAMETER   MODEL.
ALL DURABLES.

2m

%

50+
40-49
30-39
20-29
under 20
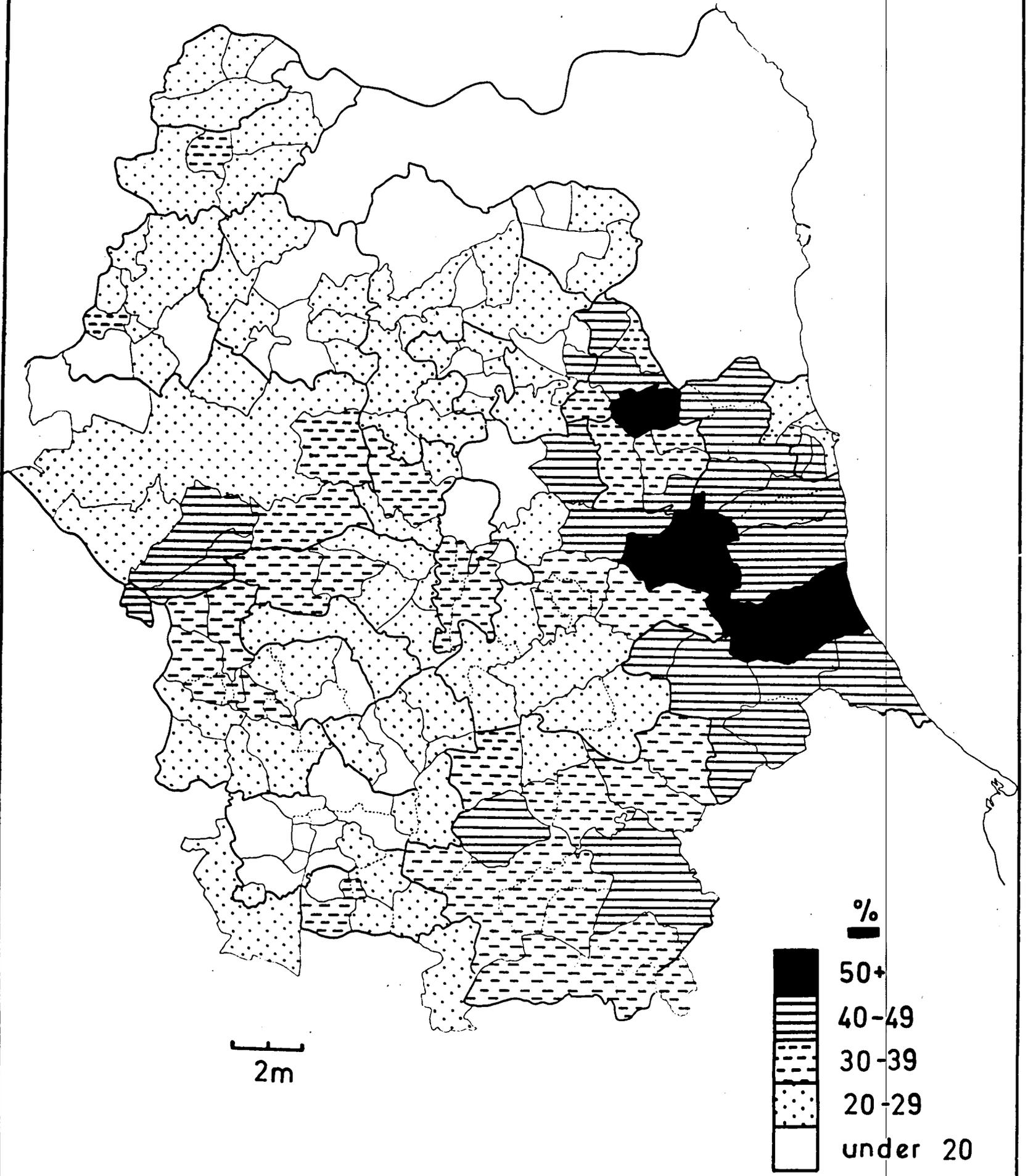
GRAVITY MODEL PREDICTION: R^2 VALUES.
ONE PARAMETER MODEL.
ALL DURABLES.

2 m.

R^2

.90 +
.80 - .89
.70 - .79
.60 - .69
.50 - .59
.40 - .49
under .39

55. GRAVITY MODEL PREDICTION: ABSOLUTE ERRORS. ONE PARAMETER MODEL. FURNITURE PURCHASE.

%
50+
40-49
30-39
20-29
under 20

2m.

54. RESIDUAL COMPETITION: ALL DURABLES.

%
60+
50-59
40-49
30-39
20-29
under 20

2m.
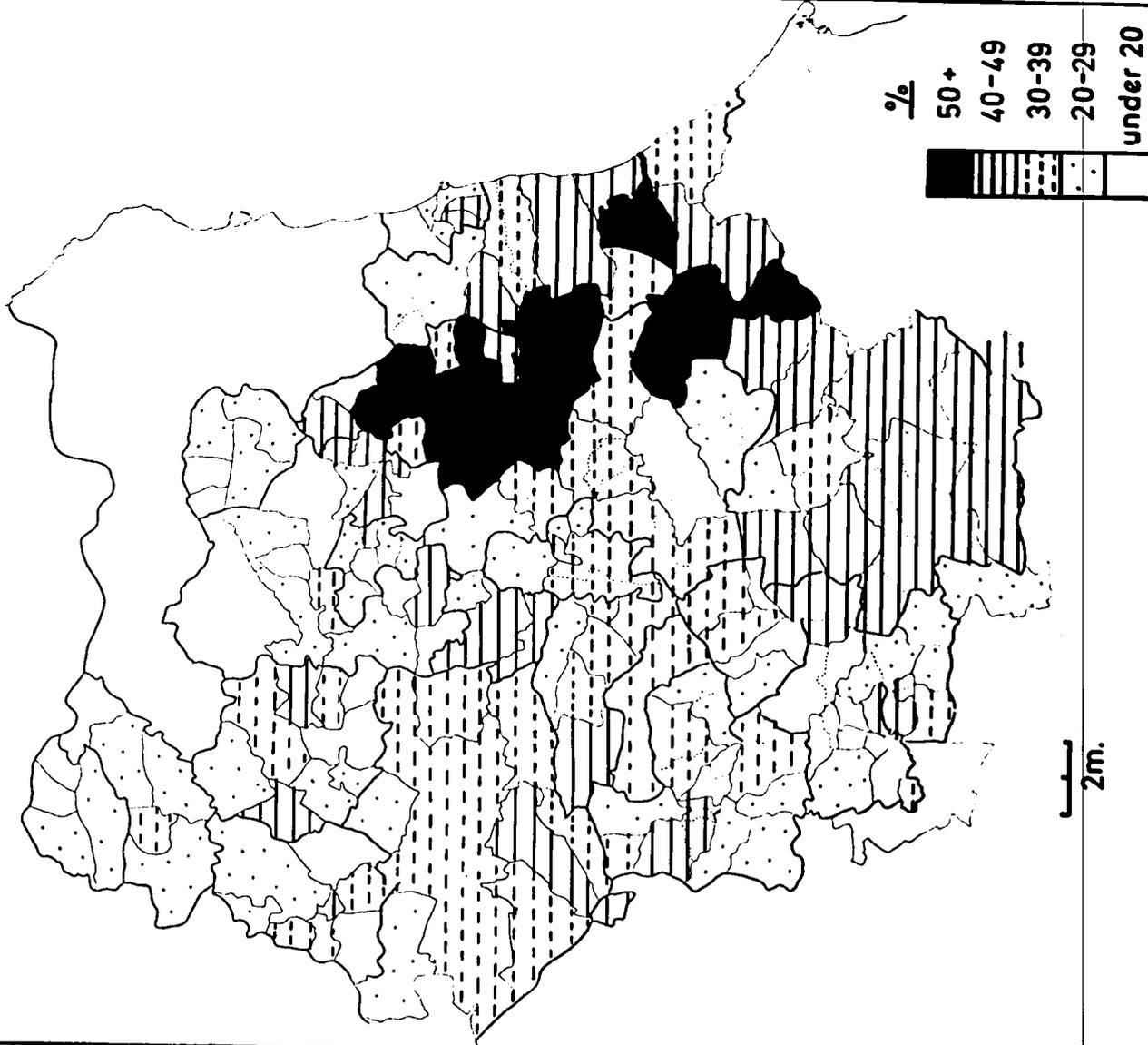
GRAVITY MODEL PREDICTION: ABSOLUTE
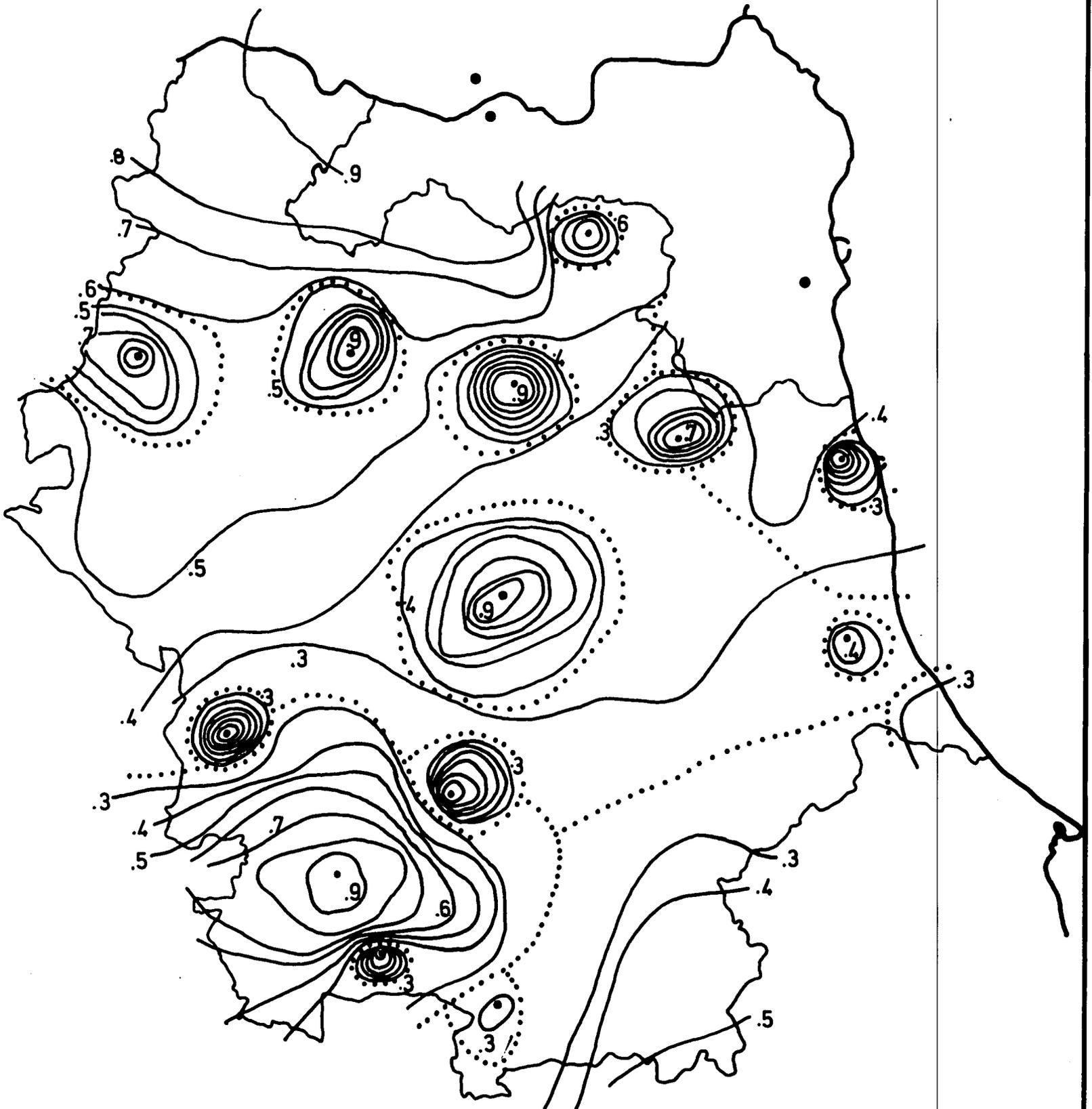ERRORS. TWO PARAMETER MODEL.
ALL DURABLES.

2m.

%
50+
40-49
30-39
20-29
under 20
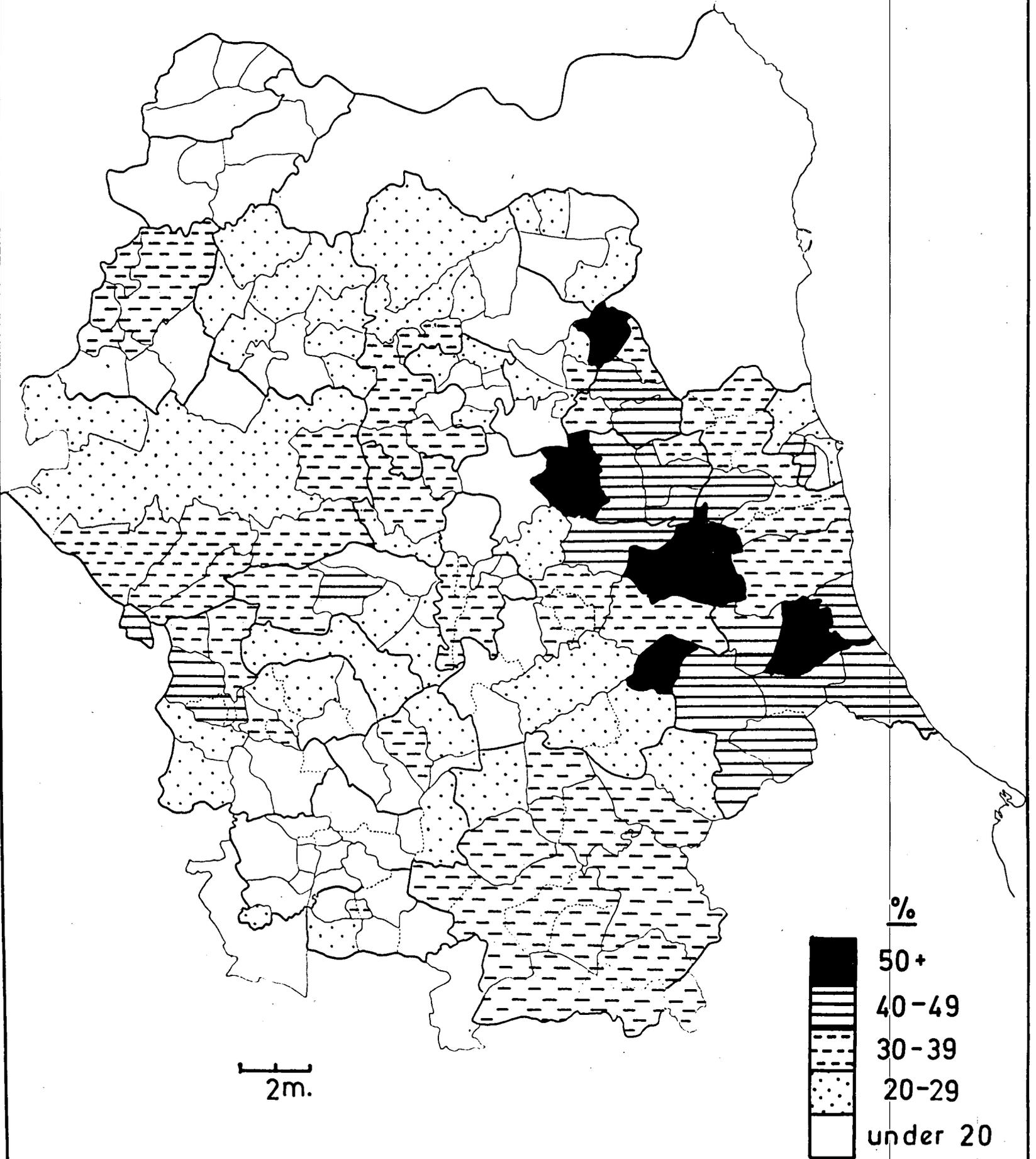
GENERAL INTERACTION PROBABILITY SURFACE.
ONE PARAMETER MODEL. ALL DURABLES.
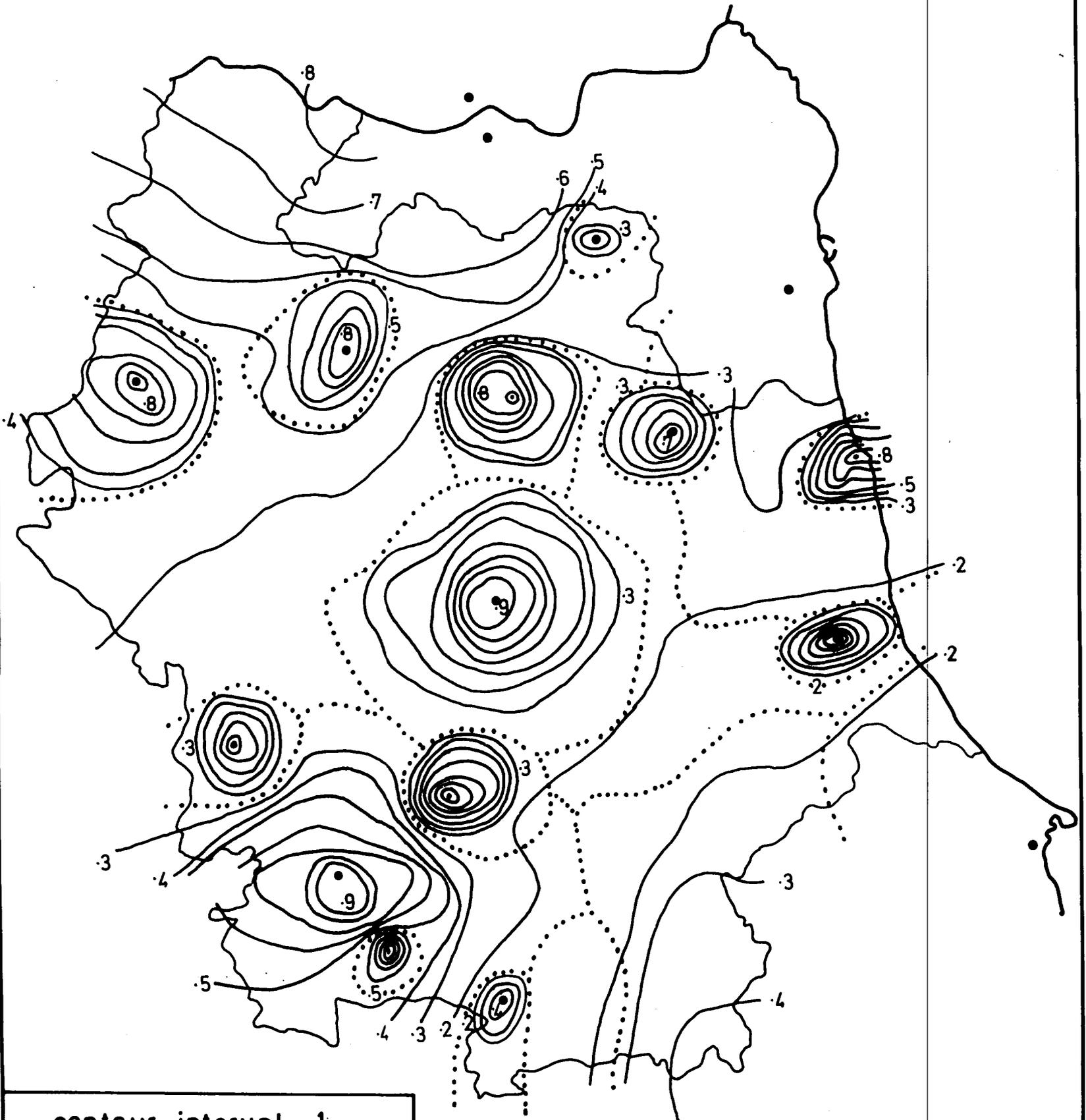
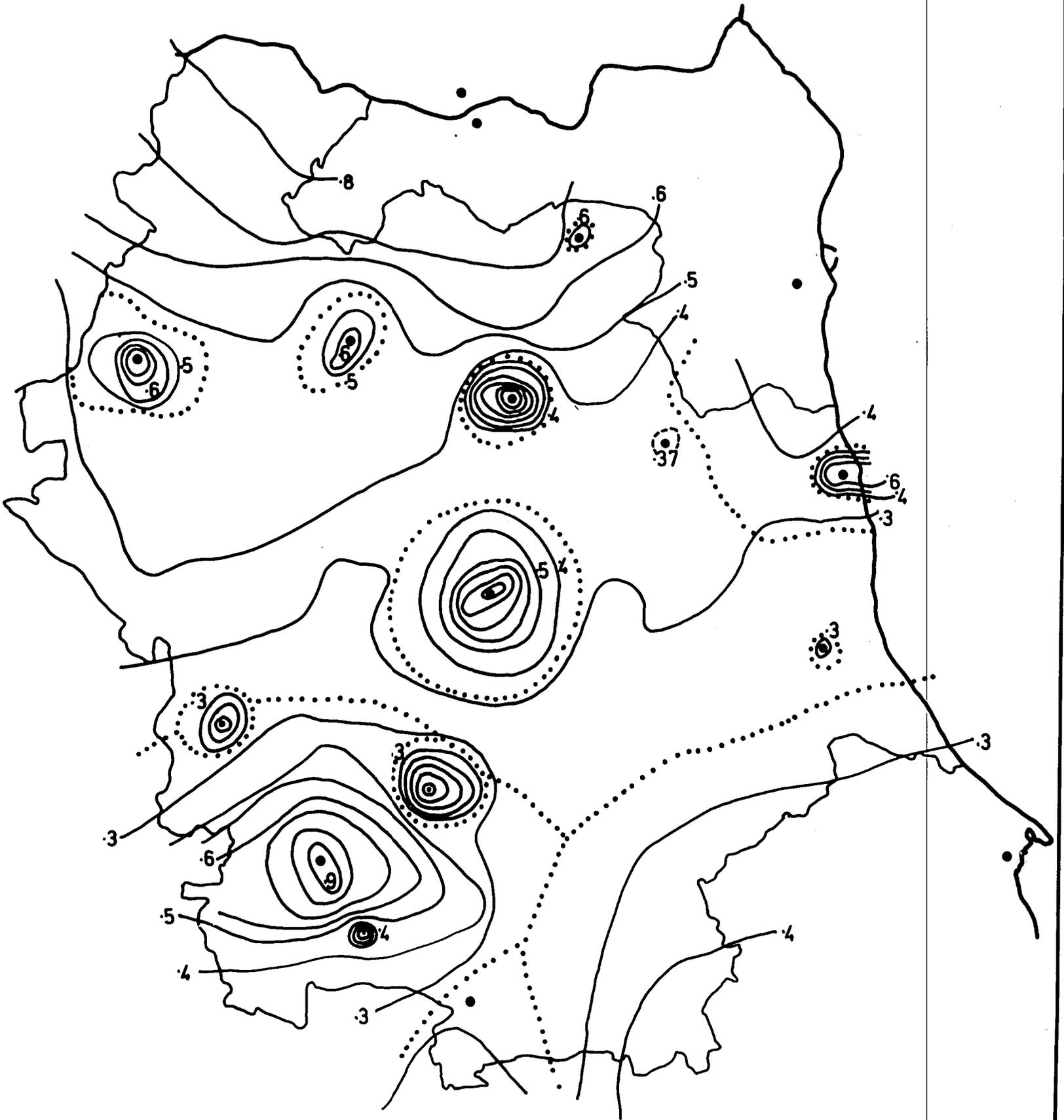contour interval .1
.... umland boundary
• centres

5 m.

GENERAL INTERACTION PROBABILITY SURFACE.
2 PARAMETER MODEL. ALL DURABLES.

contour interval .1
····· umland boundary
● centres

5 m.

INTERACTION PROBABILITY SURFACE. WOMEN'S CLOTHING PURCHASE.
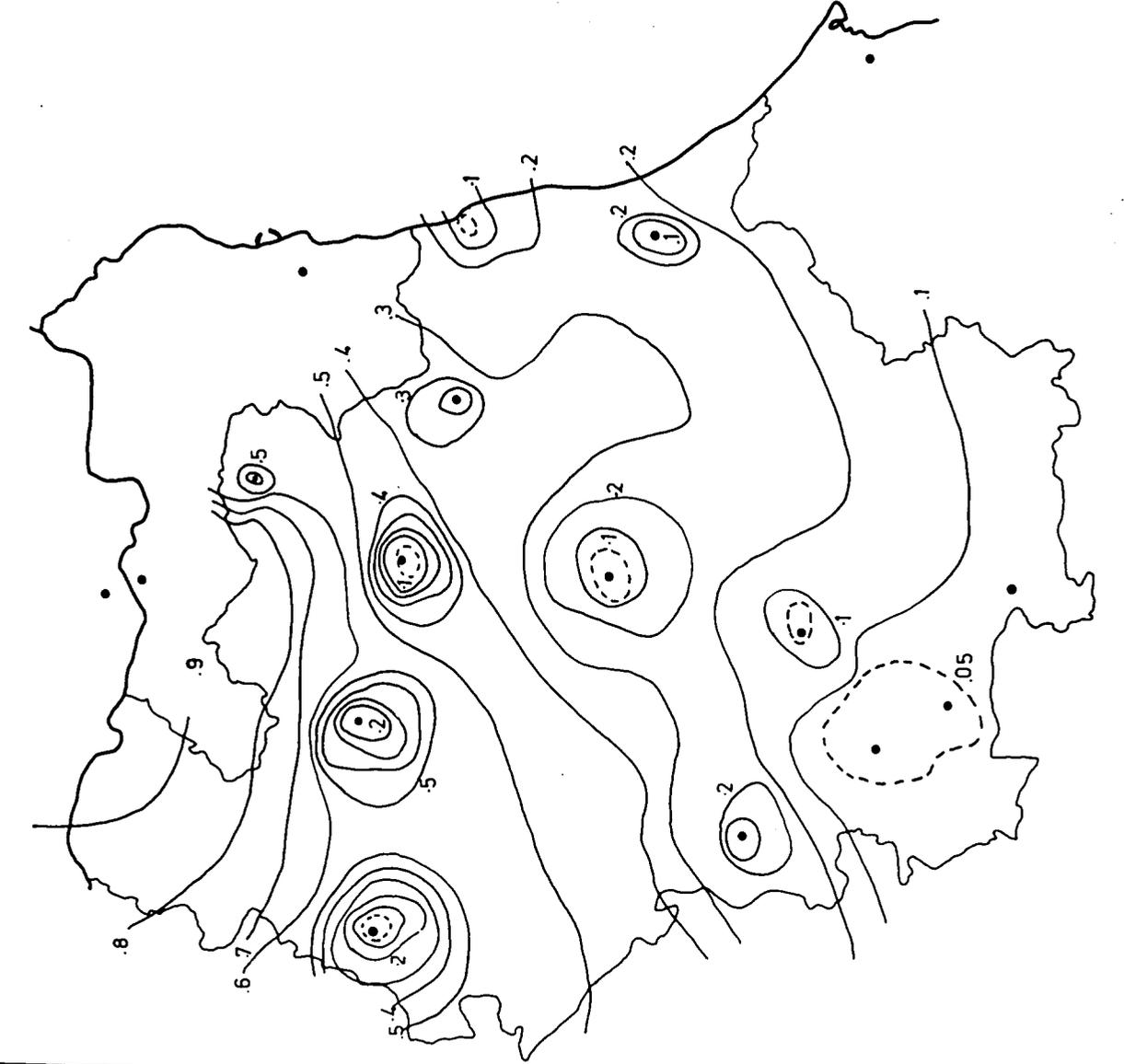
contour interval .1
..... umland
• centre

3m.

one parameter

INTERACTION PROBABILITY : 2 SURFACES: NEWCASTLE. ALL DURABLES.
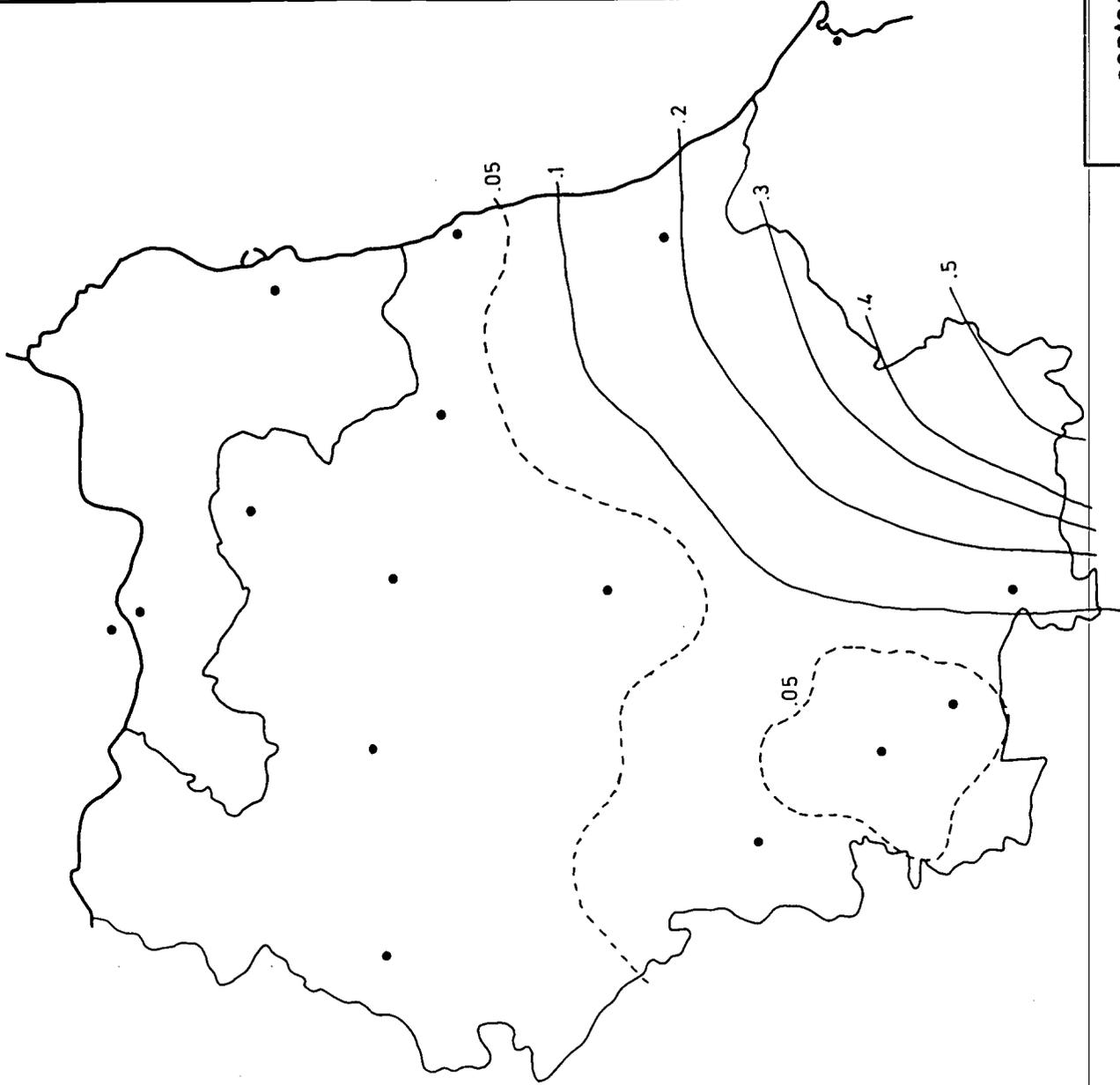
(2) 1 PARAMETER

(1) 2 PARAMETERS

contour interval .1
(excepting .05)
● centres

5m.

INTERACTION PROBABILITY SURFACE : BISHOP AUCKLAND.
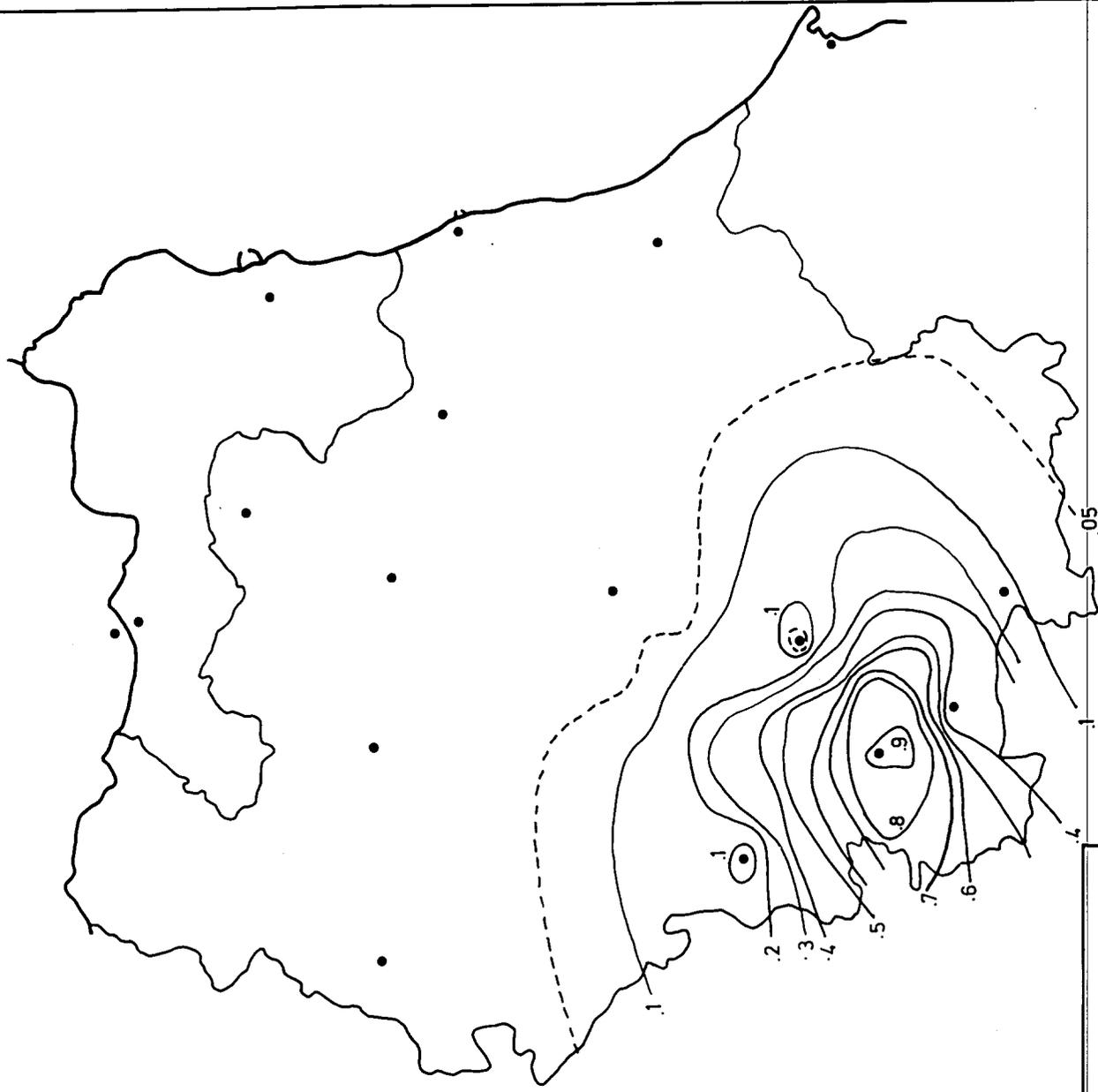ALL DURABLES.

62.

INTERACTION PROBABILITY SURFACE: TEESIDE.
ALL DURABLES.

61.

contour interval .1
(excepting .05)
● centres

5 m.

2 param.

2 param.

61. — 62.

INTERACTION PROBABILITY SURFACE:
CHESTER LE STREET. ALL DURABLES

64.

INTERACTION PROBABILITY SURFACE: DURHAM CITY.
ALL DURABLES.

63.
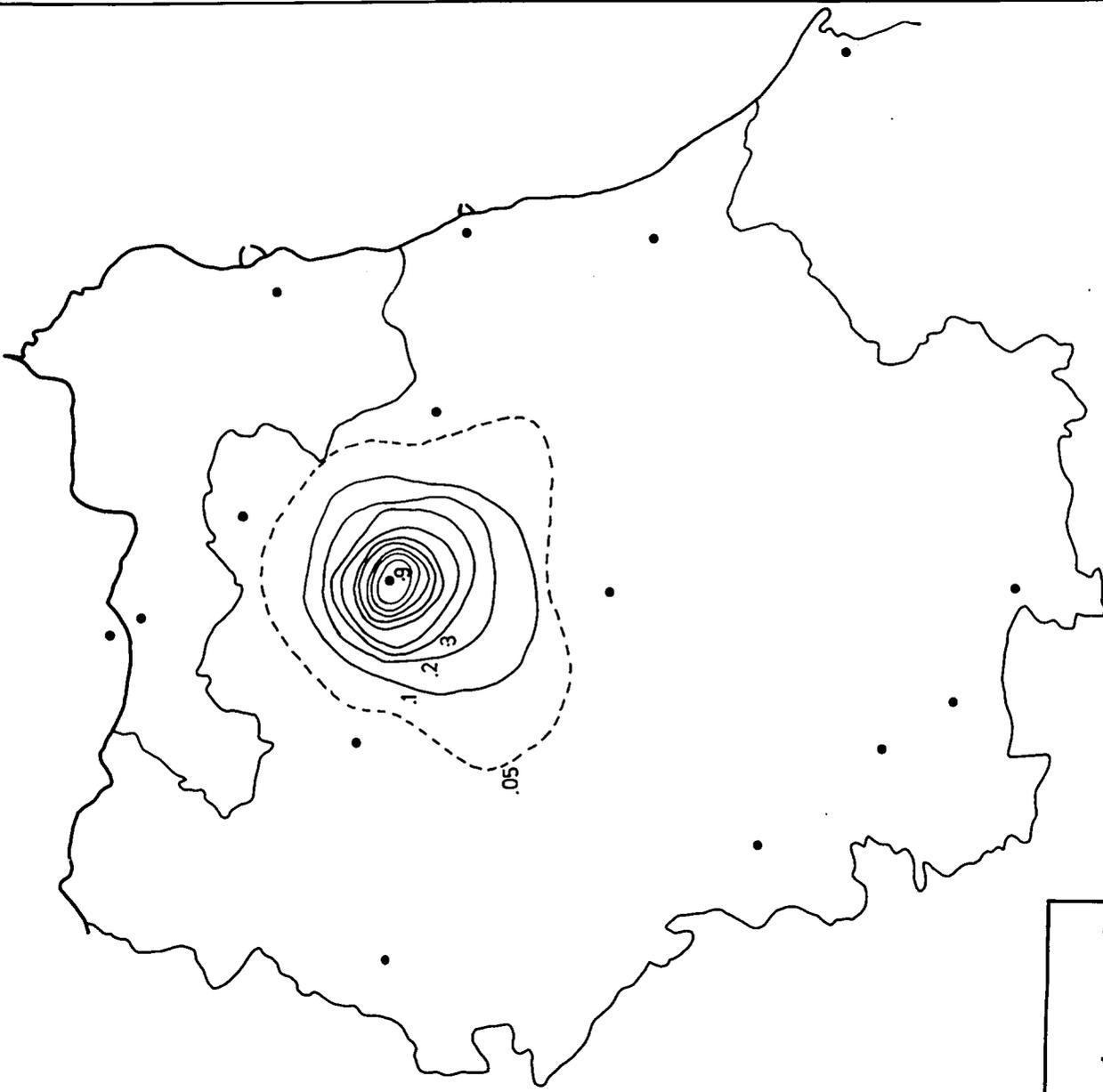
2 param.

2 param.

contour-interval .1
(excepting .05)
● centres

3 m.

RESIDUAL COMPETITION: A SURFACE SHOWING INTENSITY
OF COMPETITION: WOMEN'S CLOTHING PURCHASE.
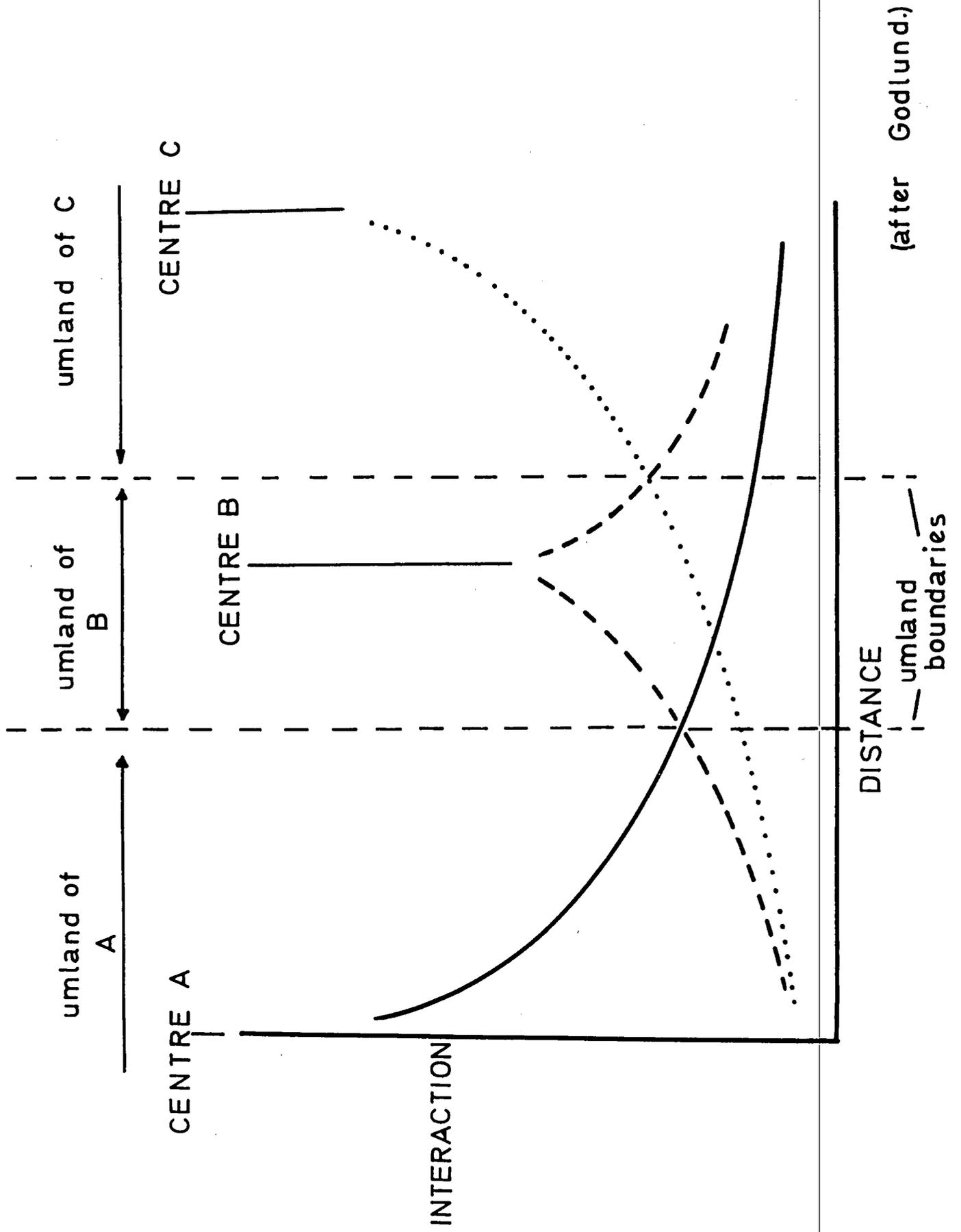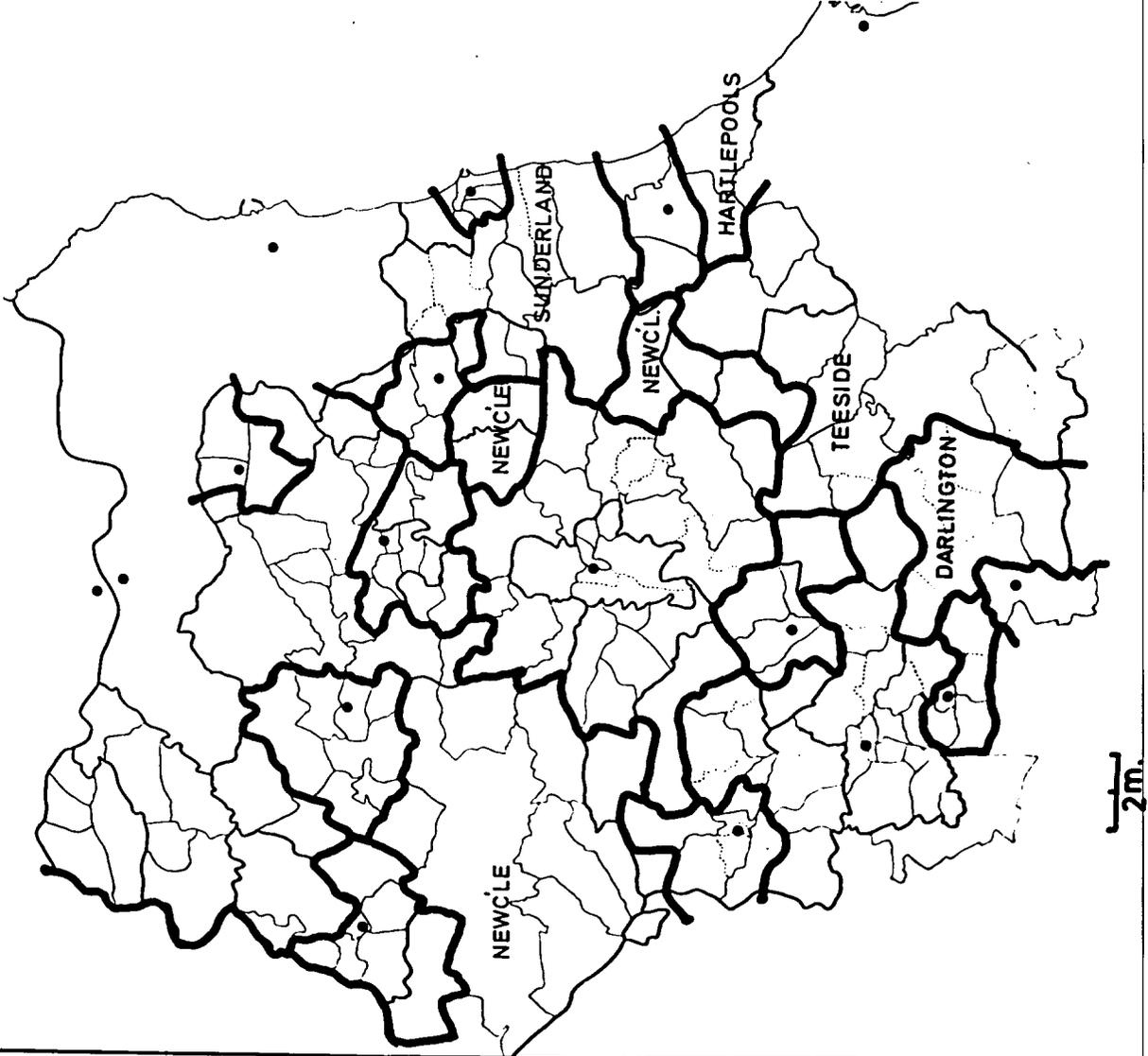isoline values represent competition intensity

66.

one parameter.

INTERACTION PROBABILITY SURFACES: SEAHAM AND
SPENNYMOOR. ALL DURABLES.

65.
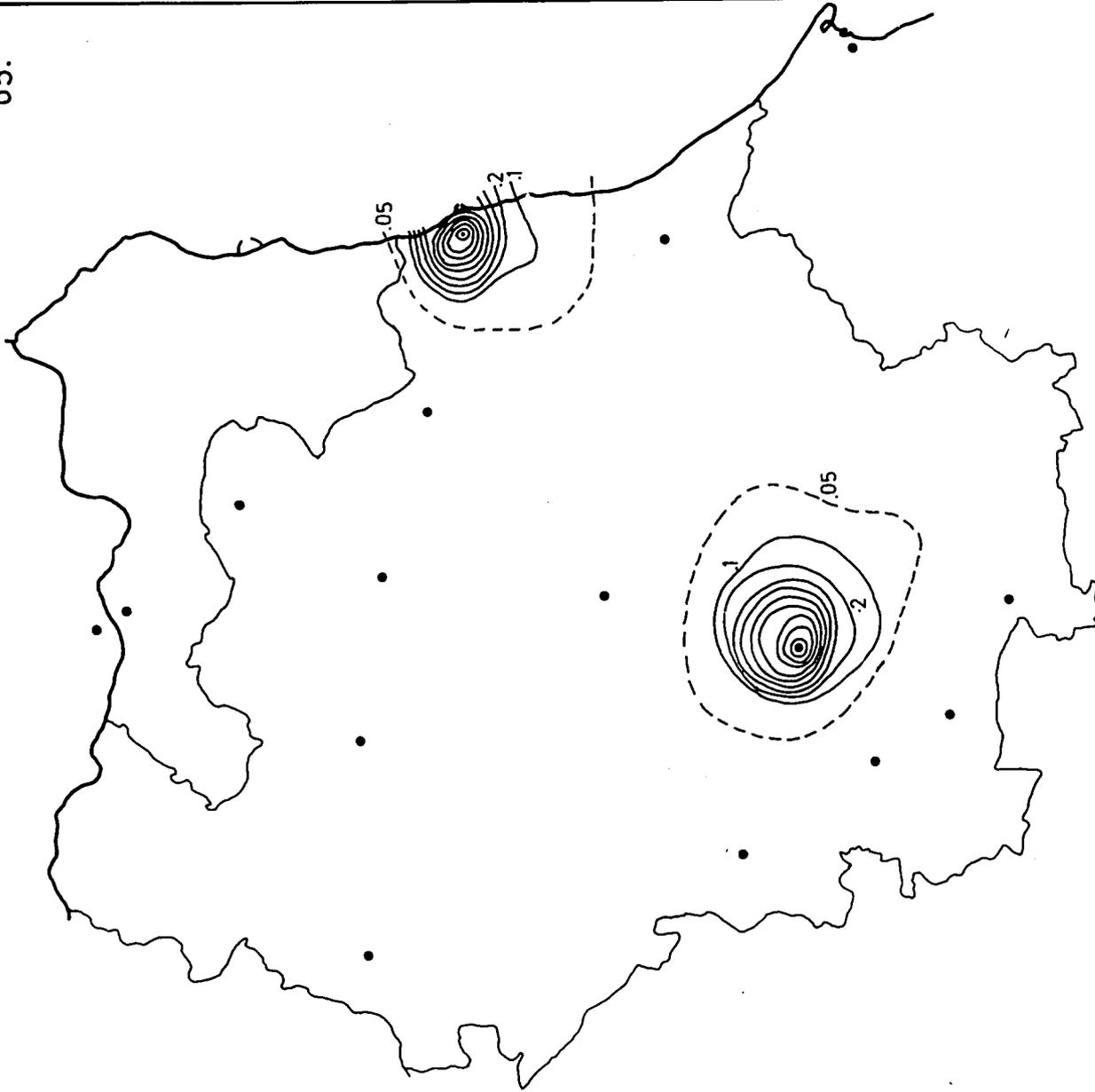
contour interval: .1
(excepting .05)
• centres

3m.

2 parameters

UMLAND: THEORETICAL DEFINITION.

umland of A | umland of B | umland of C

CENTRE A

CENTRE B

CENTRE C

INTERACTION

DISTANCE

umland boundaries

(after Godlund.)

UMLANDS BASED UPON WARDS

ACTUAL:

THEORETICAL:

— umland boundary
• centre

INTERACTION PROBABILITY SURFACE:
PREDICTION 1985.
ALL DURABLES.

70.
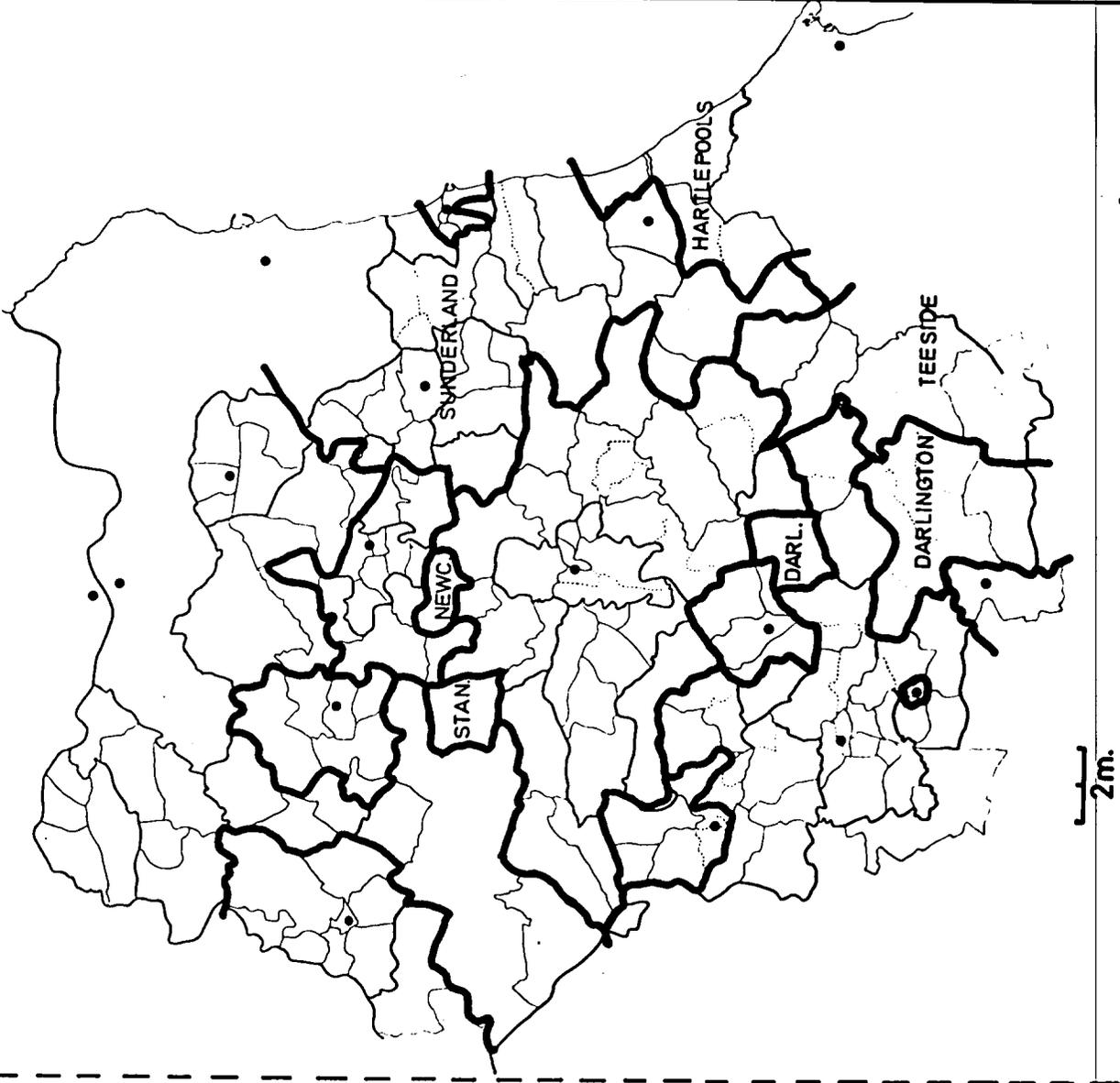
2 parameters.
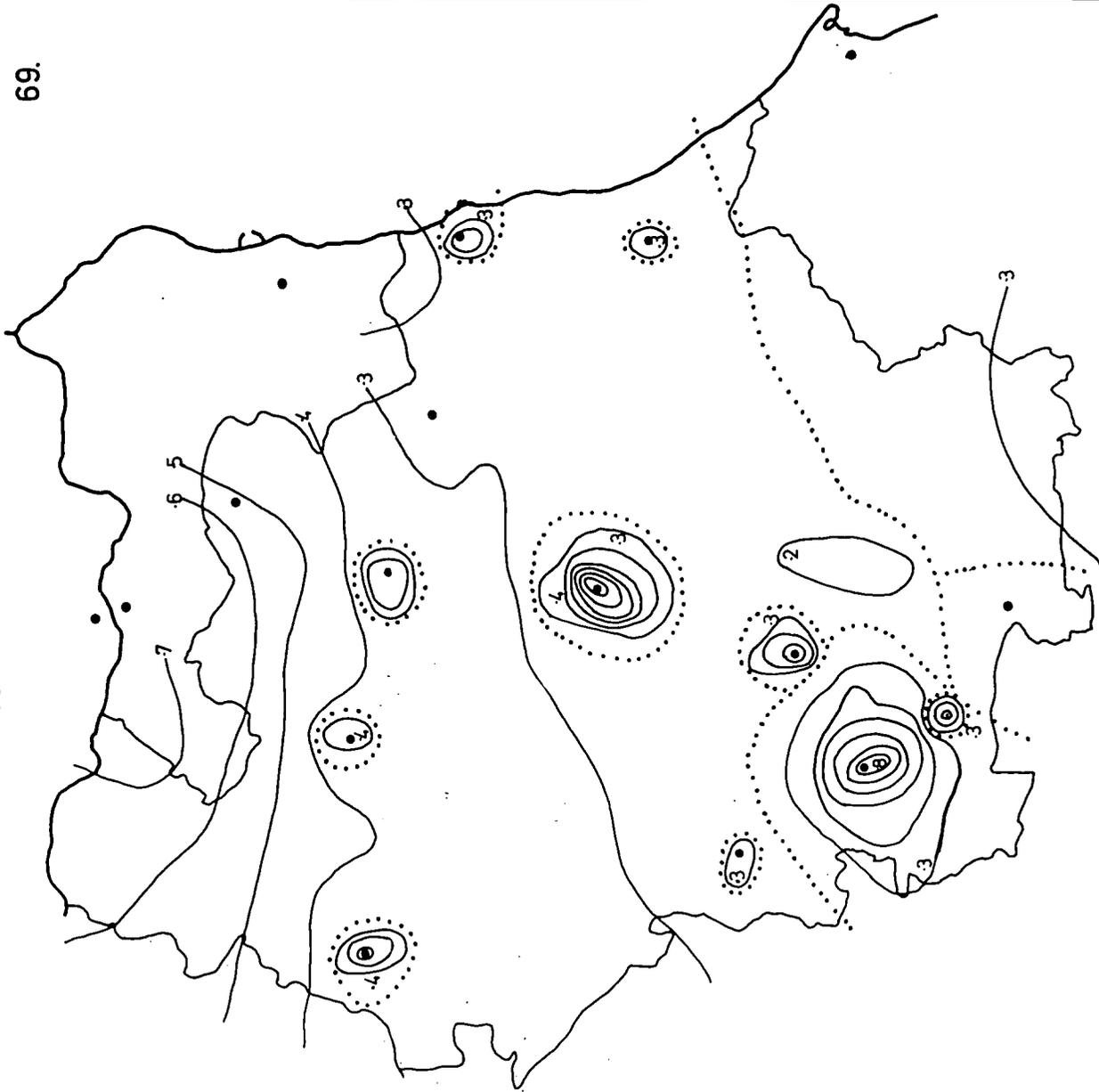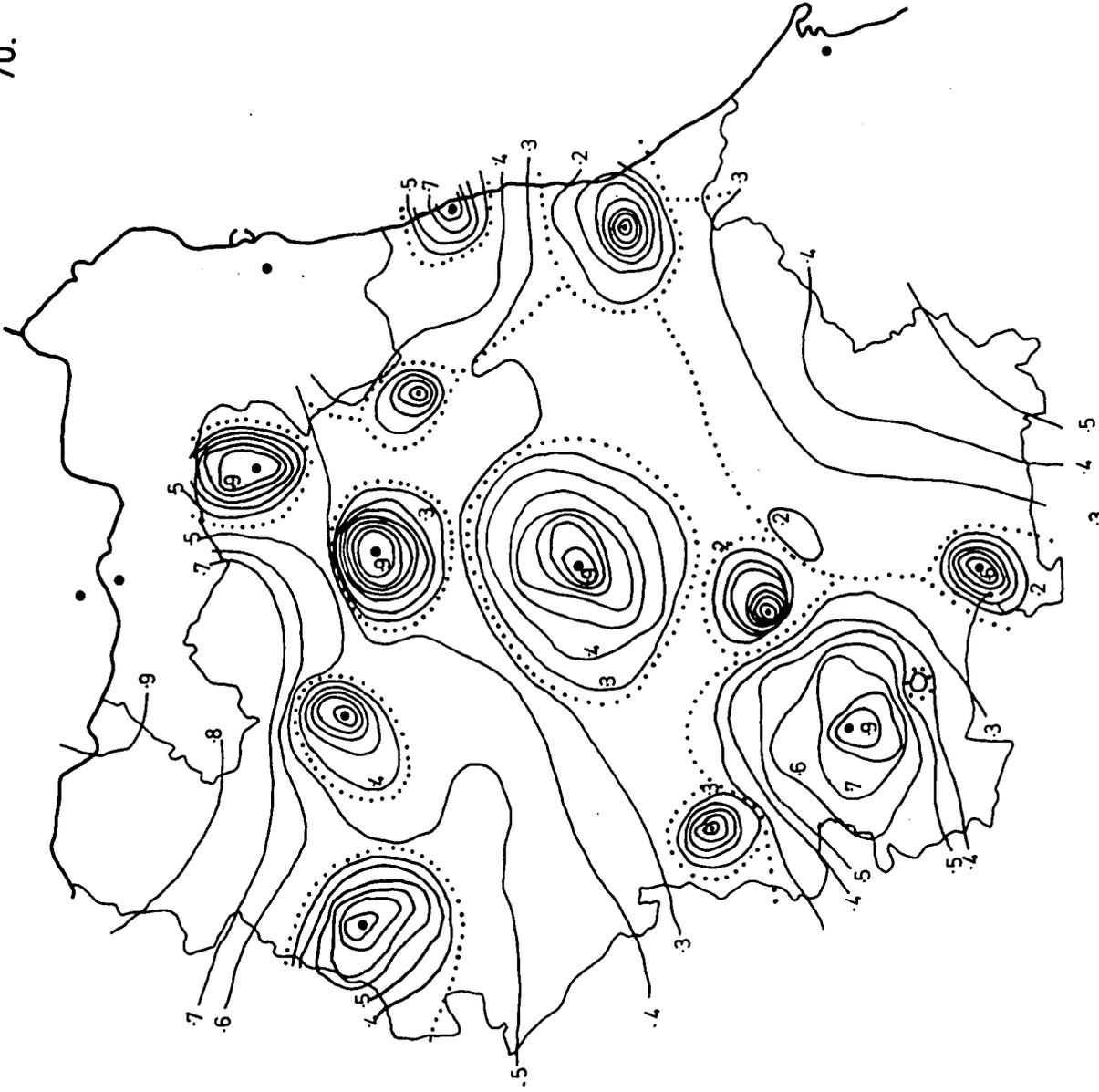
INTERACTION PROBABILITY SURFACE. ALL DURABLES.
ONE PARAMETER MODEL: EXPONENT EXPERIMENTALLY
LOWERED TO 1.3

69.

contour interval: .1
.... umland boundary
• centre
___ 3 m.

DISTANCE DECAY:
FITTED FUNCTIONS
interaction at increasing miles radius from strong 'A' centres for the purchase of men's clothing

$Y = 2.29 - .188X$

$Y = 2.34 - 1.69X$

PERCENTAGE INTERACTION (LOG$_{10}$ VALUES)

DISTANCE: MILES

DISTANCE: MILES   (LOG$_{10}$ VALUES)