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Fig 1.1

THE STUDY AREA; REGIONAL CONTEXT

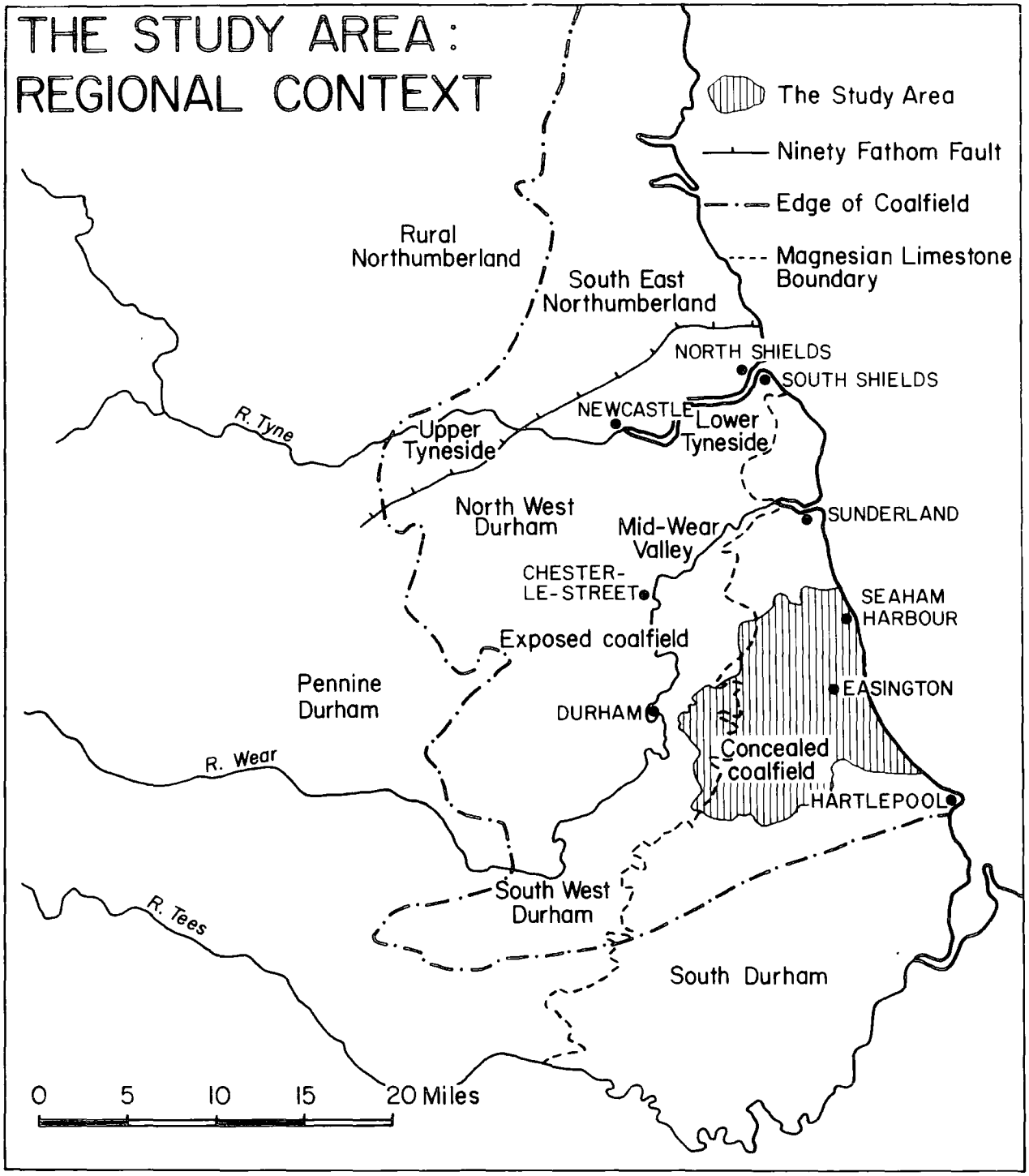

THE STUDY AREA:
REGIONAL CONTEXT
The Study Area
Ninety Fathom Fault
Edge of Coalfield
Magnesian Limestone Boundary
Rural Northumberland
South East Northumberland
NORTH SHIELDS
SOUTH SHIELDS
NEWCASTLE
Upper Tyneside
Lower Tyneside
R. Tyne
North West Durham
Mid-Wear Valley
SUNDERLAND
CHESTER-LE-STREET
SEAHAM HARBOUR
Exposed coalfield
Pennine Durham
DURHAM
EASINGTON
Concealed coalfield
HARTLEPOOL
R. Wear
South West Durham
R. Tees
South Durham
0 5 10 15 20 Miles

FIG. 1.2

THE STUDY AREA: ADMINISTRATIVE UNITS c1840.

SOURCE

TITHE MAPS U.D.D.P.D.

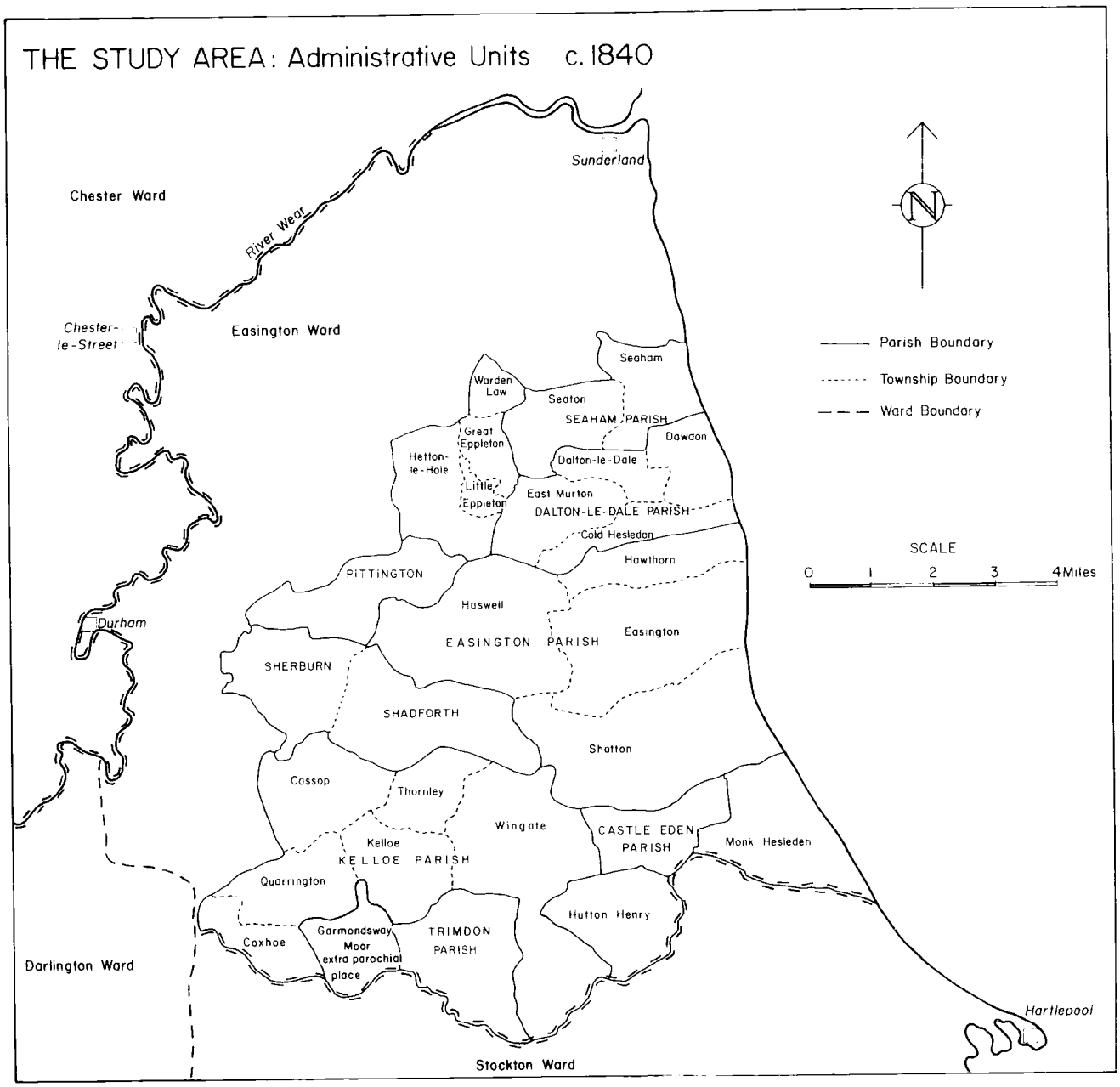

THE STUDY AREA: Administrative Units c. 1840
Sunderland
Chester Ward
River Wear
Chester-le-Street
Easington Ward
Seaham
Warden Law
Seaton
SEAHAM PARISH
Great Eppleton
Dawdon
Hetton-le-Hole
Dalton-le-Dale
Little Eppleton
East Murton
DALTON-LE-DALE PARISH
Cold Hesledon
Hawthorn
PITTINGTON
Haswell
EASINGTON PARISH
Easington
Durham
SHERBURN
SHADFORTH
Shotton
Cassop
Thornley
Wingate
CASTLE EDEN PARISH
Monk Hesleden
Kelloe
KELLOE PARISH
Quarrington
Hutton Henry
Coxhoe
Garmondsway Moor extra parochial place
TRIMDON PARISH
Darlington Ward
Hartlepool
Stockton Ward
Parish Boundary
Township Boundary
Ward Boundary
SCALE
0 1 2 3 4 Miles

FIG. 1.3

EAST DURHAM: COLLIERY SINKINGS BY 1850

SOURCES.

AN ACCOUNT OF THE STRATA IN NORTHUMBERLAND AND DURHAM AS PROVED BY BORINGS AND SINKINGS, (1878).
N.E.I.M.M.E.

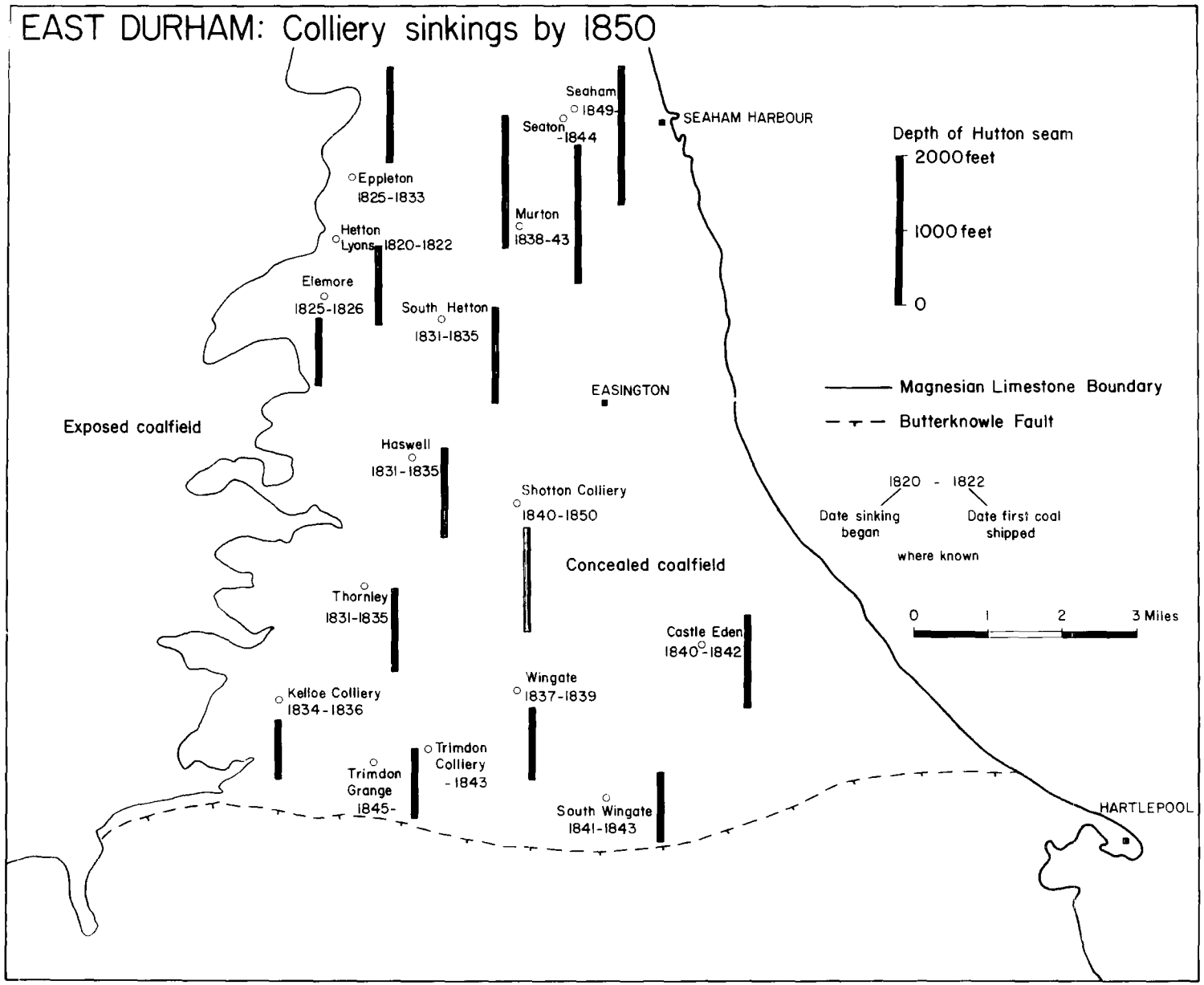

EAST DURHAM: Colliery sinkings by 1850
Seaham
1849-
Seaton
-1844
SEAHAM HARBOUR
Depth of Hutton seam
2000 feet
1000 feet
0
Eppleton
1825-1833
Murton
1838-43
Hetton
Lyons
1820-1822
Elemore
1825-1826
South Hetton
1831-1835
EASINGTON
Magnesian Limestone Boundary
Butterknowle Fault
Exposed coalfield
Haswell
1831-1835
Shotton Colliery
1840-1850
1820 - 1822
Date sinking began
Date first coal shipped
where known
Concealed coalfield
Thornley
1831-1835
Castle Eden
1840-1842
0 1 2 3 Miles
Wingate
1837-1839
Kelloe Colliery
1834-1836
Trimdon
Grange
1845-
Trimdon
Colliery
-1843
South Wingate
1841-1843
HARTLEPOOL

FIG. 2.1

EAST DURHAM: MAJOR LANDOWNERS MID 1840s.

SOURCES.

BELL J.T.W. PLAN OF THE HARTLEPOOL COAL DISTRICT, 1:25000 (1843), NEIMME

VARIOUS TITHE MAPS U.D.D.P.D.

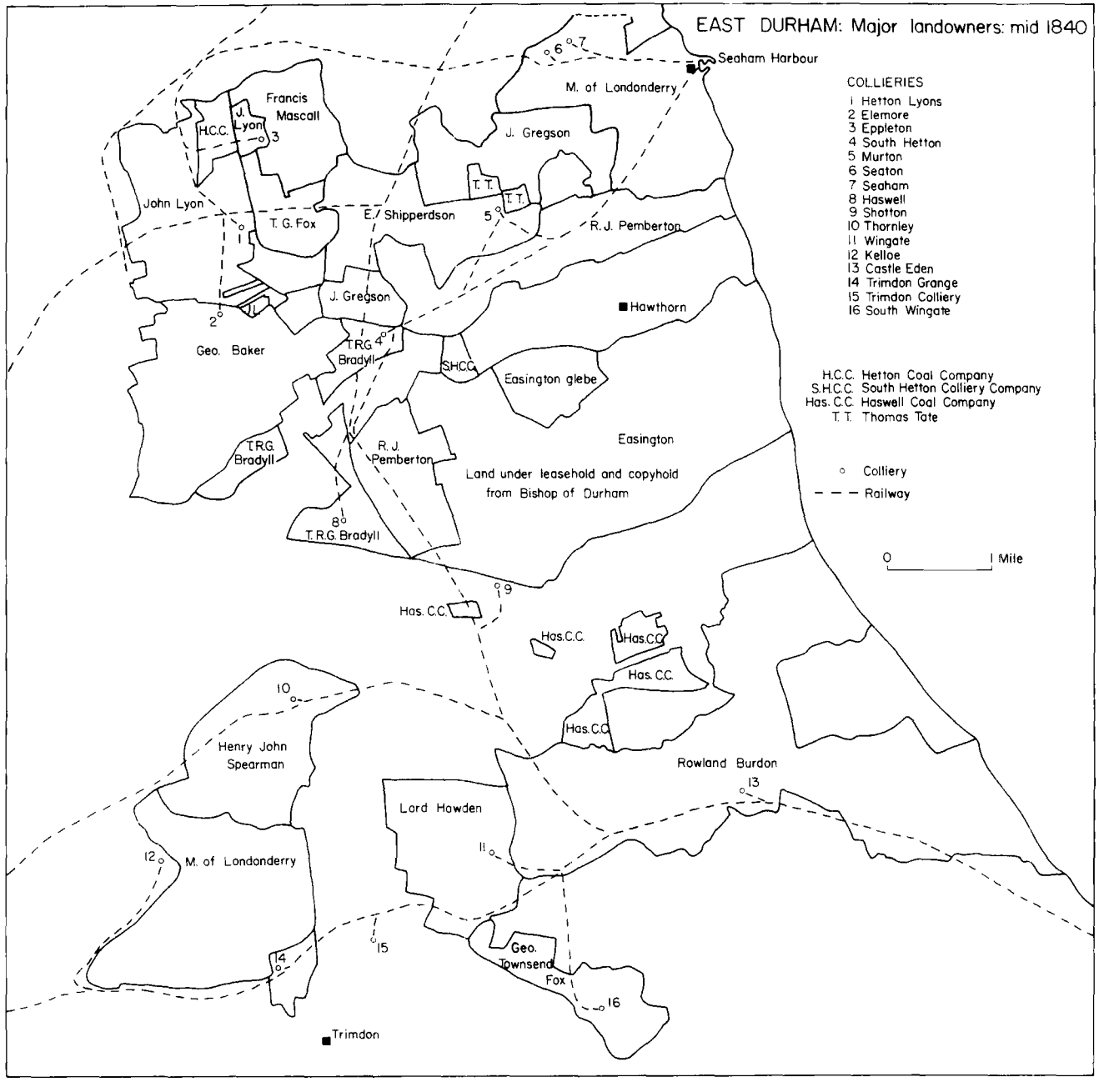

EAST DURHAM: Major landowners: mid 1840
Seaham Harbour
M. of Londonderry
J. Gregson
Francis Mascall
J. Lyon
H.C.C.
John Lyon
T. G. Fox
E. Shipperdson
T. T.
R. J. Pemberton
Hawthorn
J. Gregson
Geo. Baker
T.R.G. Bradyll
S.H.C.C.
Easington glebe
Easington
R. J. Pemberton
Land under leasehold and copyhold from Bishop of Durham
Has. C.C.
Henry John Spearman
Rowland Burdon
Lord Howden
M. of Londonderry
Geo. Townsend Fox
Trimdon
COLLIERIES
1 Hetton Lyons
2 Elemore
3 Eppleton
4 South Hetton
5 Murton
6 Seaton
7 Seaham
8 Haswell
9 Shotton
10 Thornley
11 Wingate
12 Kelloe
13 Castle Eden
14 Trimdon Grange
15 Trimdon Colliery
16 South Wingate
H.C.C. Hetton Coal Company
S.H.C.C. South Hetton Colliery Company
Has. C.C. Haswell Coal Company
T. T. Thomas Tate
Colliery
Railway
0
1 Mile

FIG 2.2

THE ENGROSSMENT OF THE ESTATE OF THE LYON FAMILY, 1776-1826, HETTON-LE-HOLE.

IT CAN BE SEEN FROM THE TITHE EVIDENCE THAT THE ESTATE OF THE LYON FAMILY HAD NOT CHANGED IN EXTENT BETWEEN 1826 AND 1839.

SOURCES.

PLAN OF THE ESTATE OF THE HON. THOS. LYON (1776). WATSON COLL. VOL.45 N.E.I.M.M.E.

PLAN OF HETTON ESTATE (1826), N.C.B. COLL. P/23. D.C.R.O.

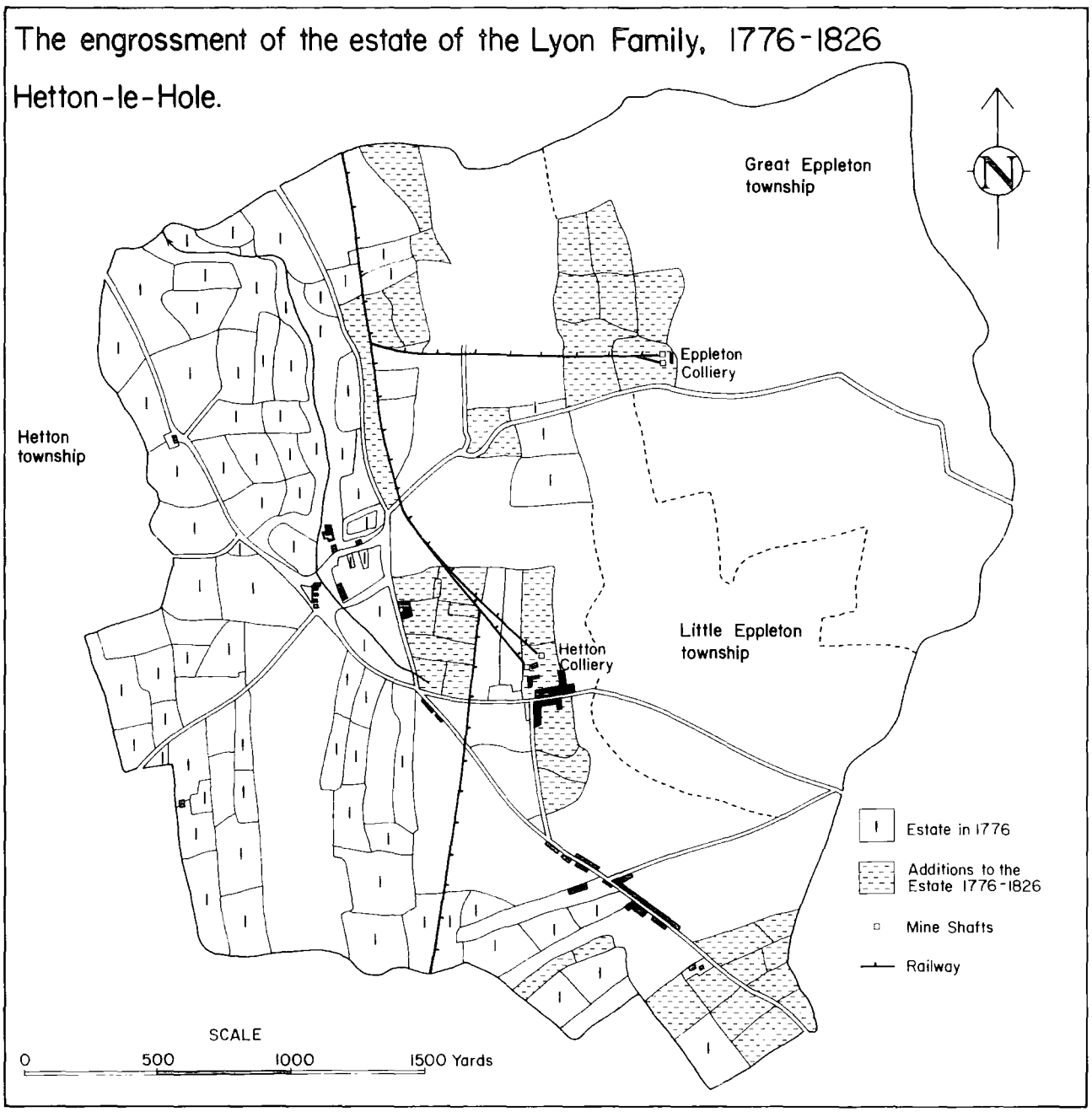

The engrossment of the estate of the Lyon Family, 1776-1826
Hetton-le-Hole.
Great Eppleton township
Eppleton Colliery
Hetton township
Hetton Colliery
Little Eppleton township
N
Estate in 1776
Additions to the Estate 1776-1826
Mine Shafts
Railway
SCALE
0
500
1000
1500 Yards

FIG. 2.3

HUTTON HENRY TOWNSHIP: FARM SHAPE, FIELD PATTERN AND LOCATION OF SETTLEMENT. 1838.

SOURCE.

TITHE PLAN AND APPORTIONMENT, HUTTON HENRY TOWNSHIP, 1838. U.D.D.P.D.

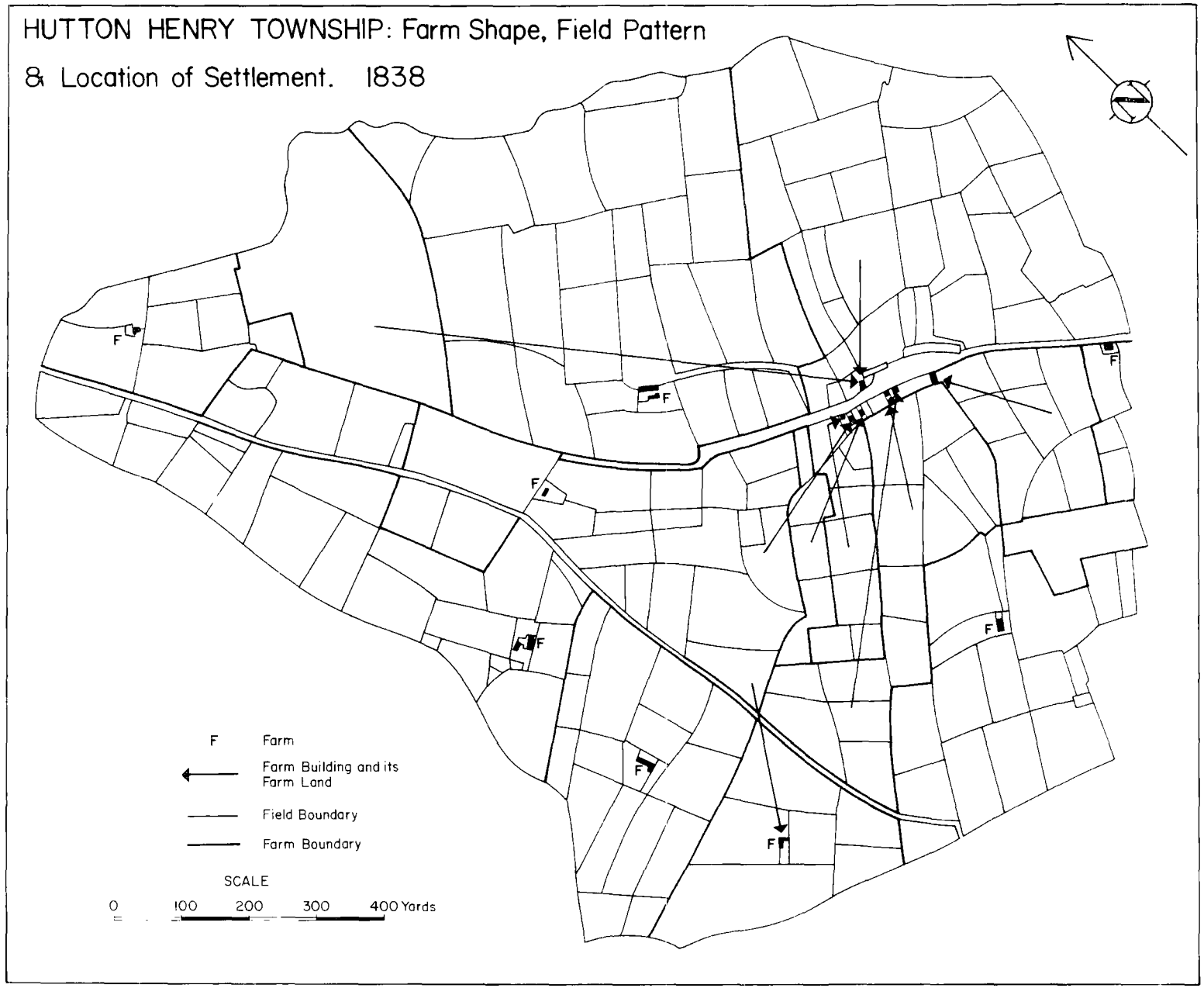

HUTTON HENRY TOWNSHIP: Farm Shape, Field Pattern
& Location of Settlement. 1838
F
Farm
Farm Building and its Farm Land
Field Boundary
Farm Boundary
SCALE
0
100
200
300
400 Yards

FIG. 2.4

MURTON TOWNSHIP: FARM SHAPE, FIELD PATTERN AND LOCATION OF SETTLEMENT, 1839.

SOURCE.

TITHE PLAN AND APPORTIONMENT, MURTON TOWNSHIP, 1839. U.D.D.P.D.

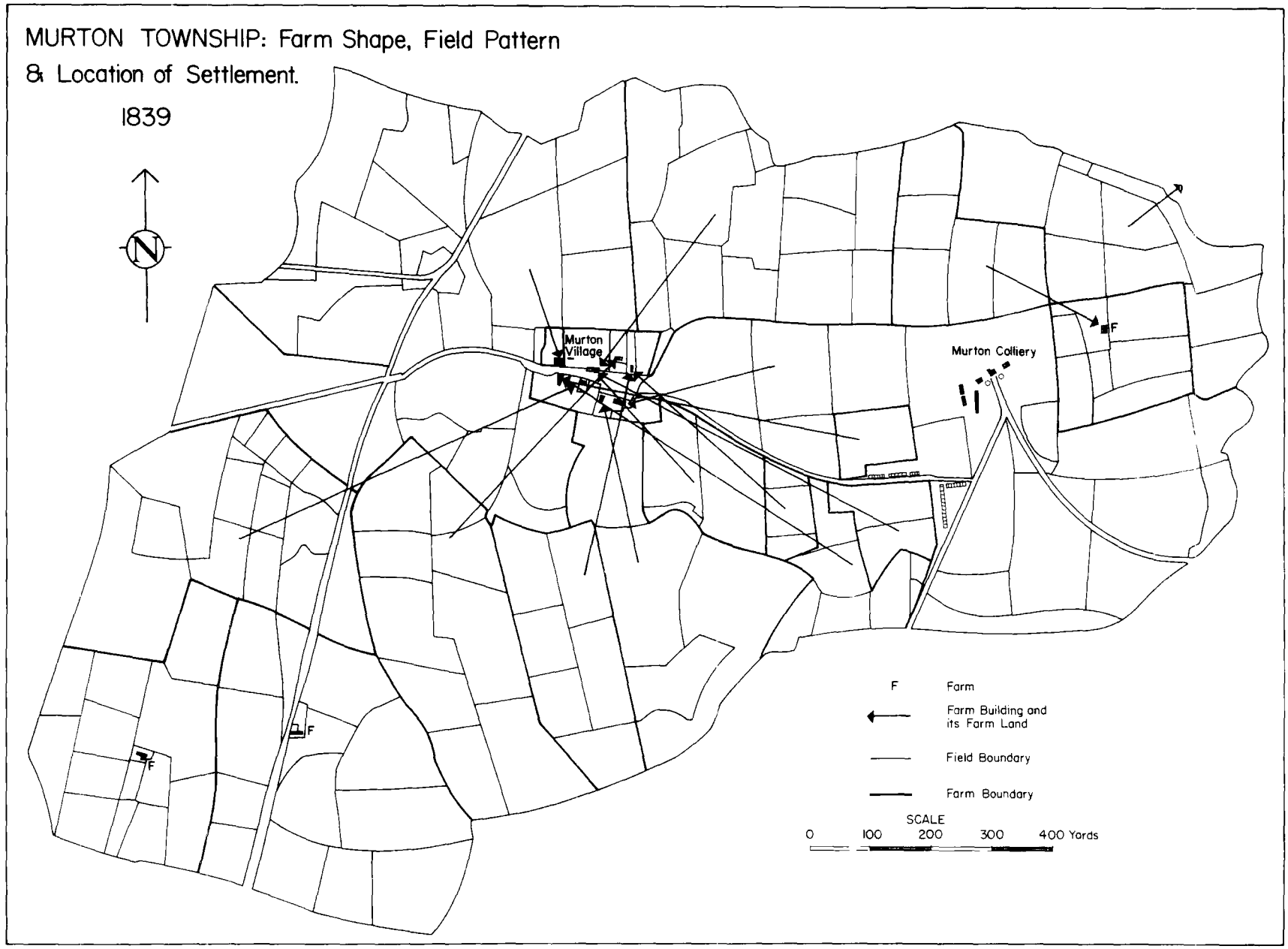

MURTON TOWNSHIP: Farm Shape, Field Pattern
& Location of Settlement.
1839
N
Murton Village
Murton Colliery
F
F
F
F Farm
Farm Building and its Farm Land
Field Boundary
Farm Boundary
SCALE
0 100 200 300 400 Yards

FIG. 2.5

QUARRINGTON TOWNSHIP: FARM SHAPE, FIELD PATTERN AND LOCATION OF SETTLEMENT, 1838.

SOURCE.

TITHE PLAN AND APPORTIONMENT, QUARRINGTON TOWNSHIP, 1838. U.D.D.P.D.

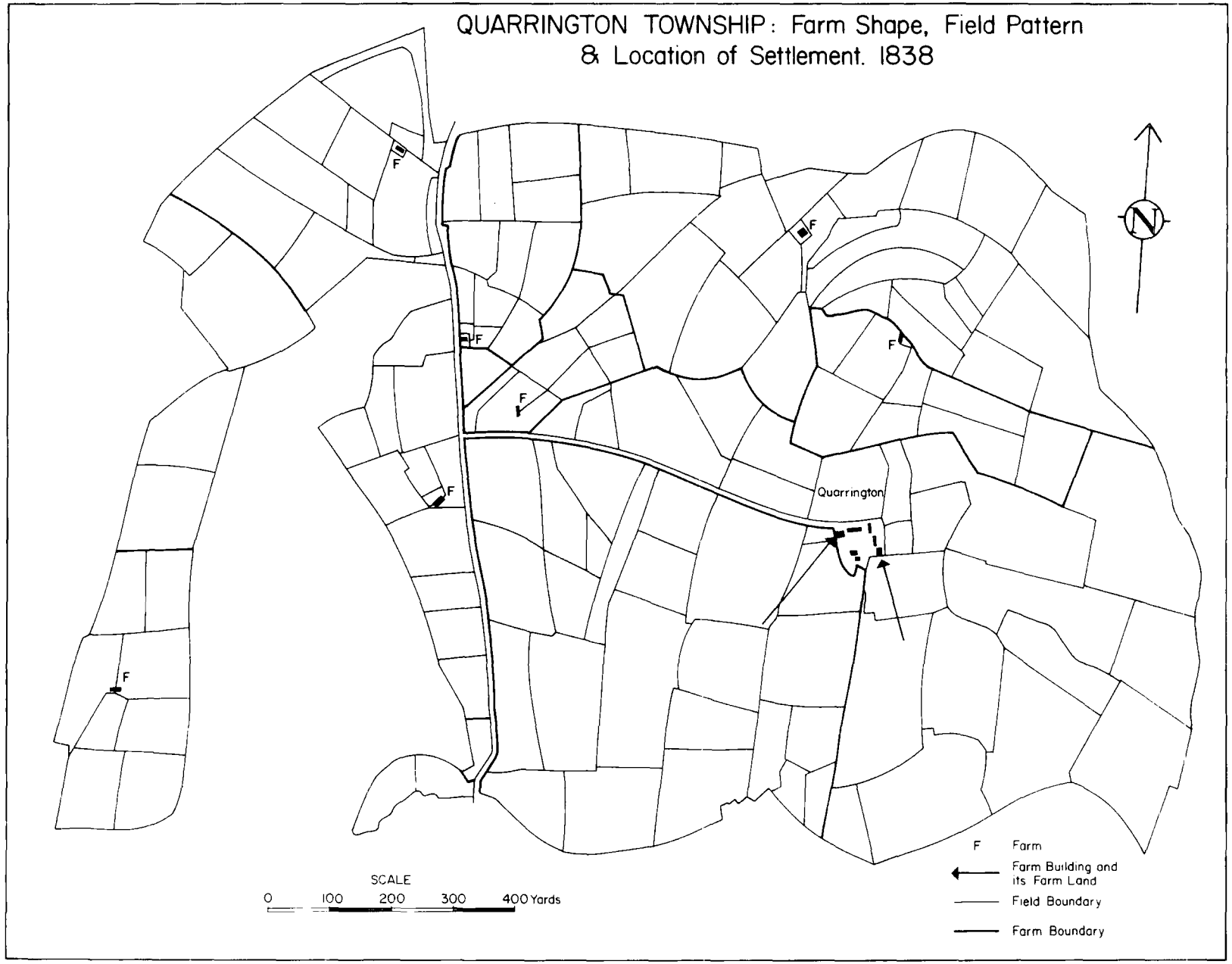

QUARRINGTON TOWNSHIP: Farm Shape, Field Pattern
& Location of Settlement. 1838
N
Quarrington
F
F
F
F
F
F
SCALE
0 100 200 300 400 Yards
F Farm
Farm Building and its Farm Land
Field Boundary
Farm Boundary

FIG. 2.6

THORNLEY TOWNSHIP: FARM SHAPE, FIELD PATTERN AND LOCATION OF SETTLEMENT, 1844.

SOURCE.

TITHE PLAN AND APPORTIONMENT, THORNLEY TOWNSHIP, 1844. U.D.D.P.D.

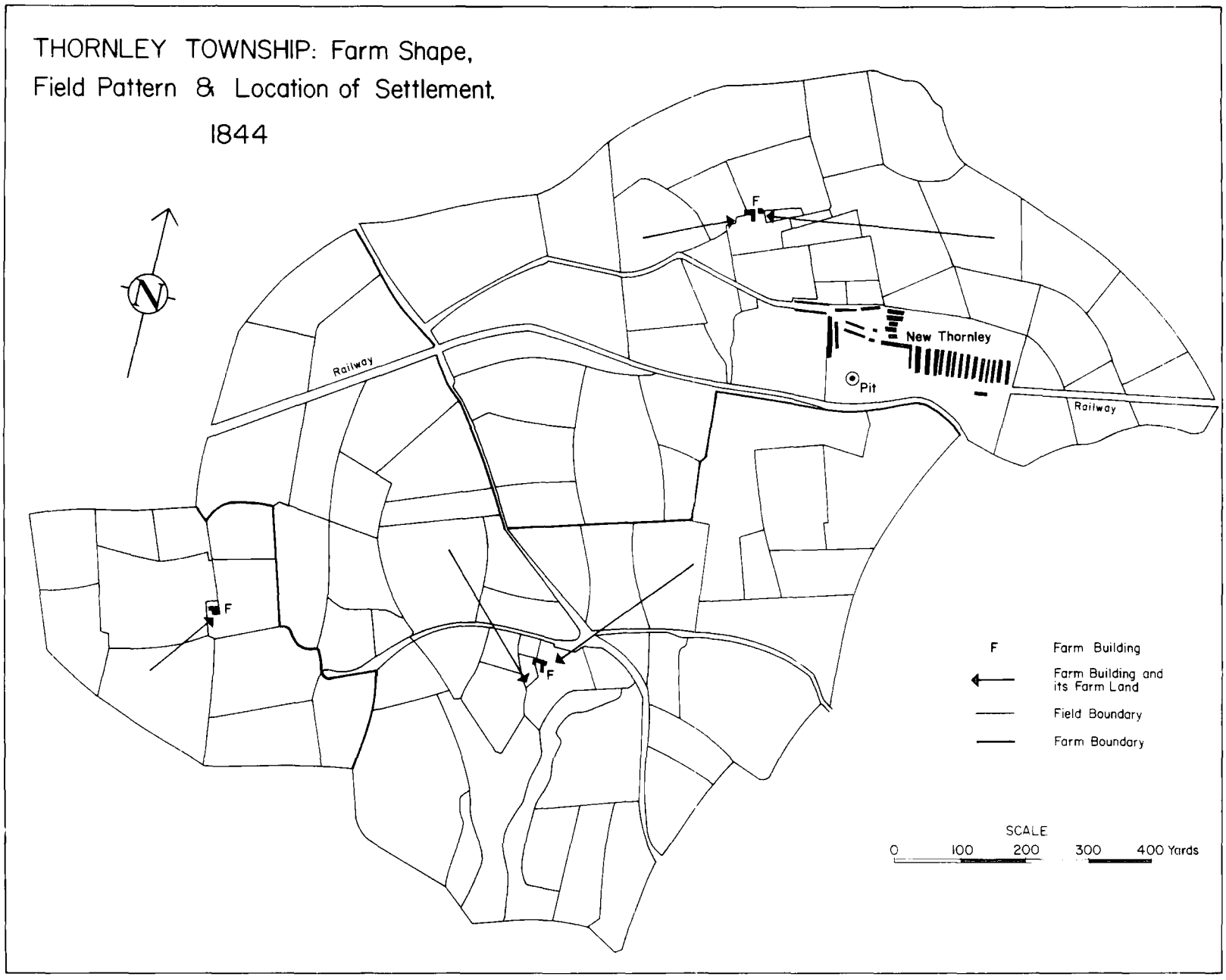

THORNLEY TOWNSHIP: Farm Shape,
Field Pattern & Location of Settlement.
1844
N
Railway
Railway
New Thornley
Pit
F
F
F
F Farm Building
Farm Building and its Farm Land
Field Boundary
Farm Boundary
SCALE
0 100 200 300 400 Yards

FIG. 2.7

ENCLOSURES IN COUNTY DURHAM 1550-1750

SOURCE.

HODGSON R.I. "THE PROGRESS OF ENCLOSURE IN COUNTY DURHAM, 1550-1870," IN (EDS) FOX H.S.A. & BUTLIN R.A. CHANGE IN THE COUNTRYSIDE, (1979), Fig. 1, 84

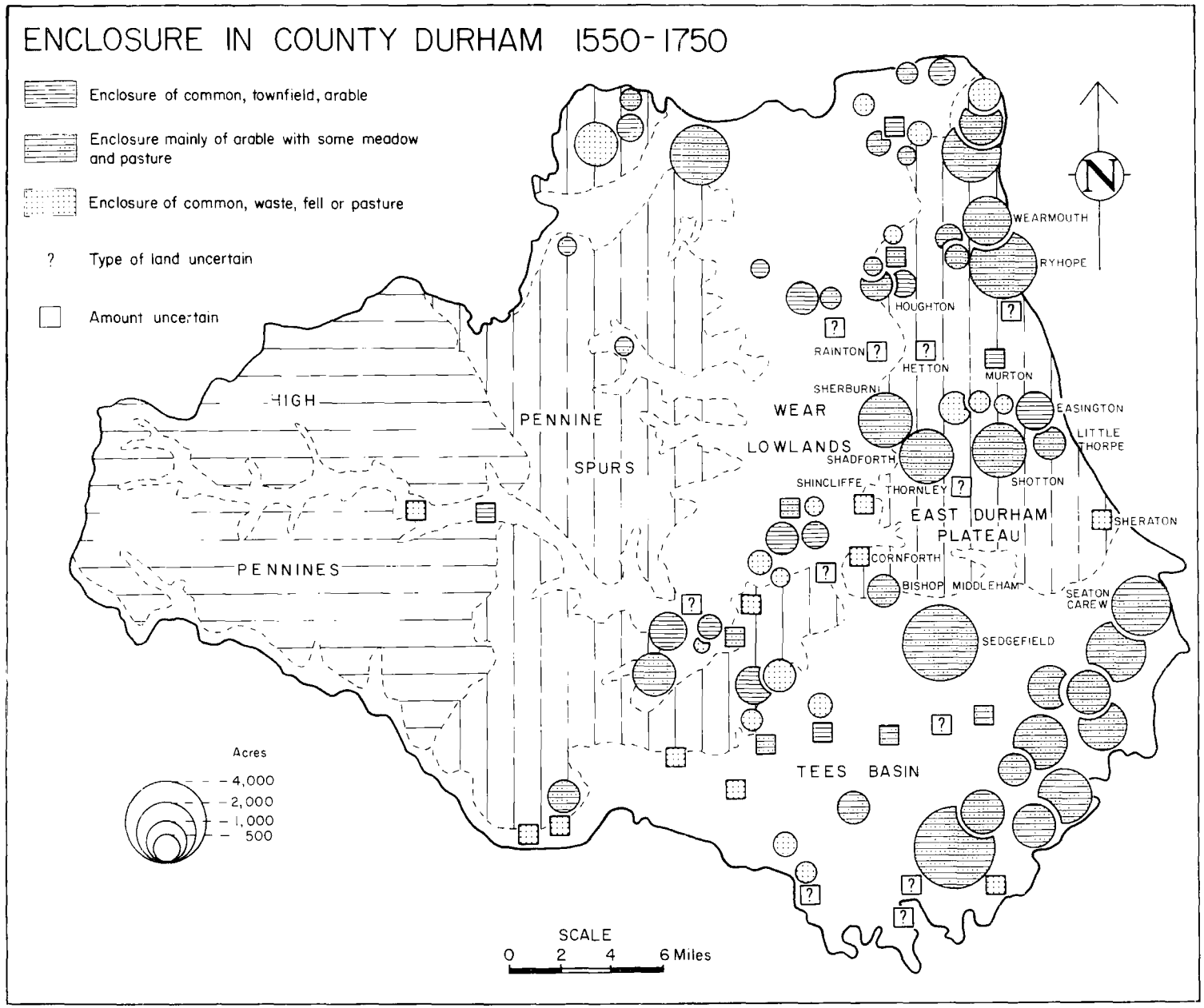

ENCLOSURE IN COUNTY DURHAM 1550-1750
Enclosure of common, townfield, arable
Enclosure mainly of arable with some meadow and pasture
Enclosure of common, waste, fell or pasture
? Type of land uncertain
Amount uncertain
N
WEARMOUTH
RYHOPE
HOUGHTON
RAINTON
HETTON
MURTON
SHERBURN
EASINGTON
LITTLE THORPE
SHADFORTH
SHINCLIFFE
THORNLEY
SHOTTON
SHERATON
CORNFORTH
BISHOP MIDDLEHAM
SEATON CAREW
SEDGEFIELD
HIGH PENNINES
PENNINE SPURS
WEAR LOWLANDS
EAST DURHAM PLATEAU
TEES BASIN
Acres
4,000
2,000
1,000
500
SCALE
0 2 4 6 Miles

FIG. 2.8

ENCLOSURES IN COUNTY DURHAM 1751 - 1870.

SOURCE.

AS FOR FIG. 2.7, FIG. 2, 85.

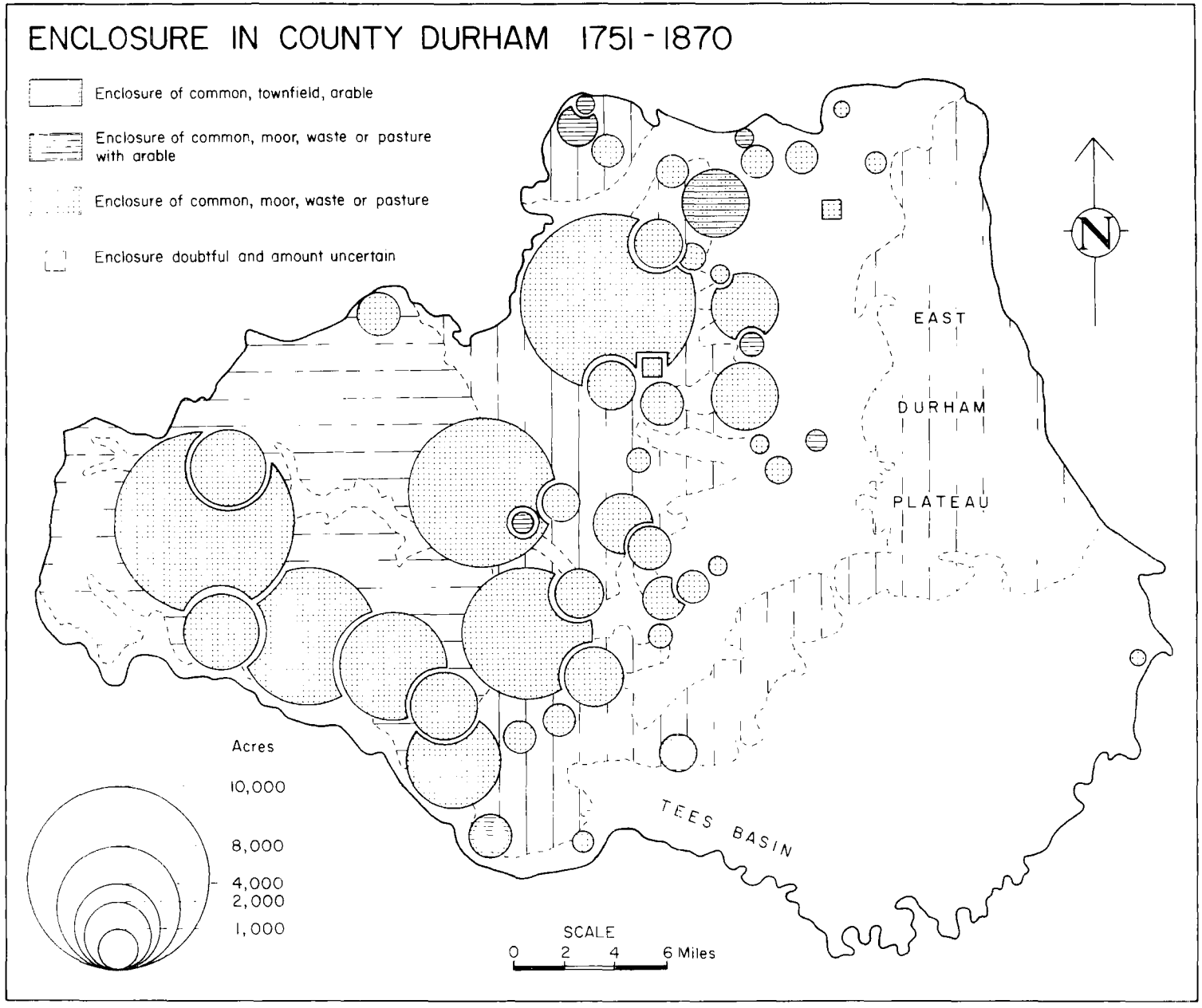

ENCLOSURE IN COUNTY DURHAM 1751 - 1870
Enclosure of common, townfield, arable
Enclosure of common, moor, waste or pasture with arable
Enclosure of common, moor, waste or pasture
Enclosure doubtful and amount uncertain
N
EAST
DURHAM
PLATEAU
TEES BASIN
Acres
10,000
8,000
4,000
2,000
1,000
SCALE
0 2 4 6 Miles

FIG. 2.9

EAST DURHAM: LAND USE PATTERNS c.1840.

SOURCE.

TITHE FILES P.R.O. KEW

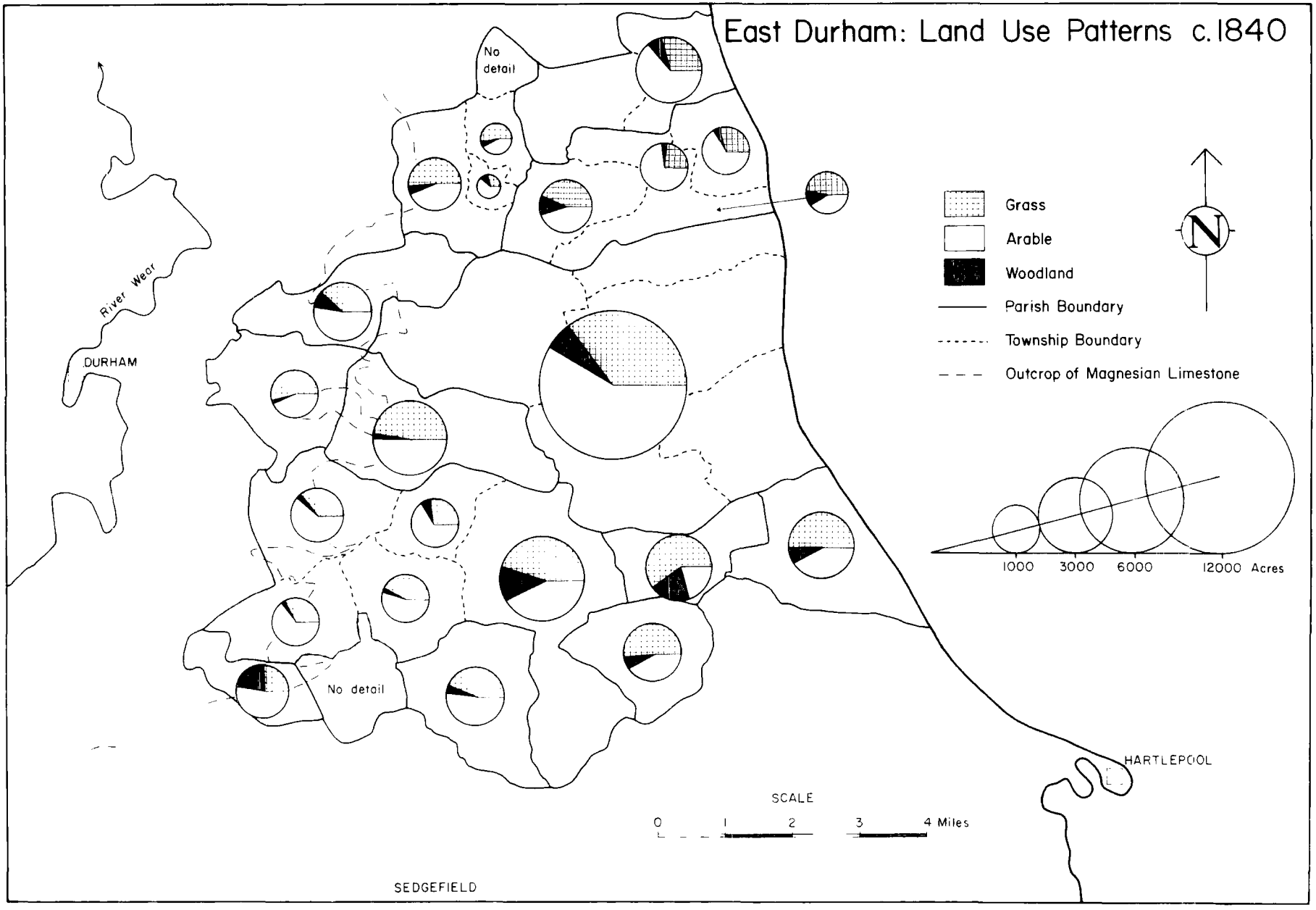

East Durham: Land Use Patterns c.1840
No detail
River Wear
DURHAM
No detail
HARTLEPOOL
SEDGEFIELD
Grass
Arable
Woodland
Parish Boundary
Township Boundary
Outcrop of Magnesian Limestone
N
1000
3000
6000
12000 Acres
SCALE
0
1
2
3
4 Miles

FIG. 2.10

EAST DURHAM: ARABLE CROPS C.1840.

SOURCE.

TITHE FILES

P.R.O. KEW

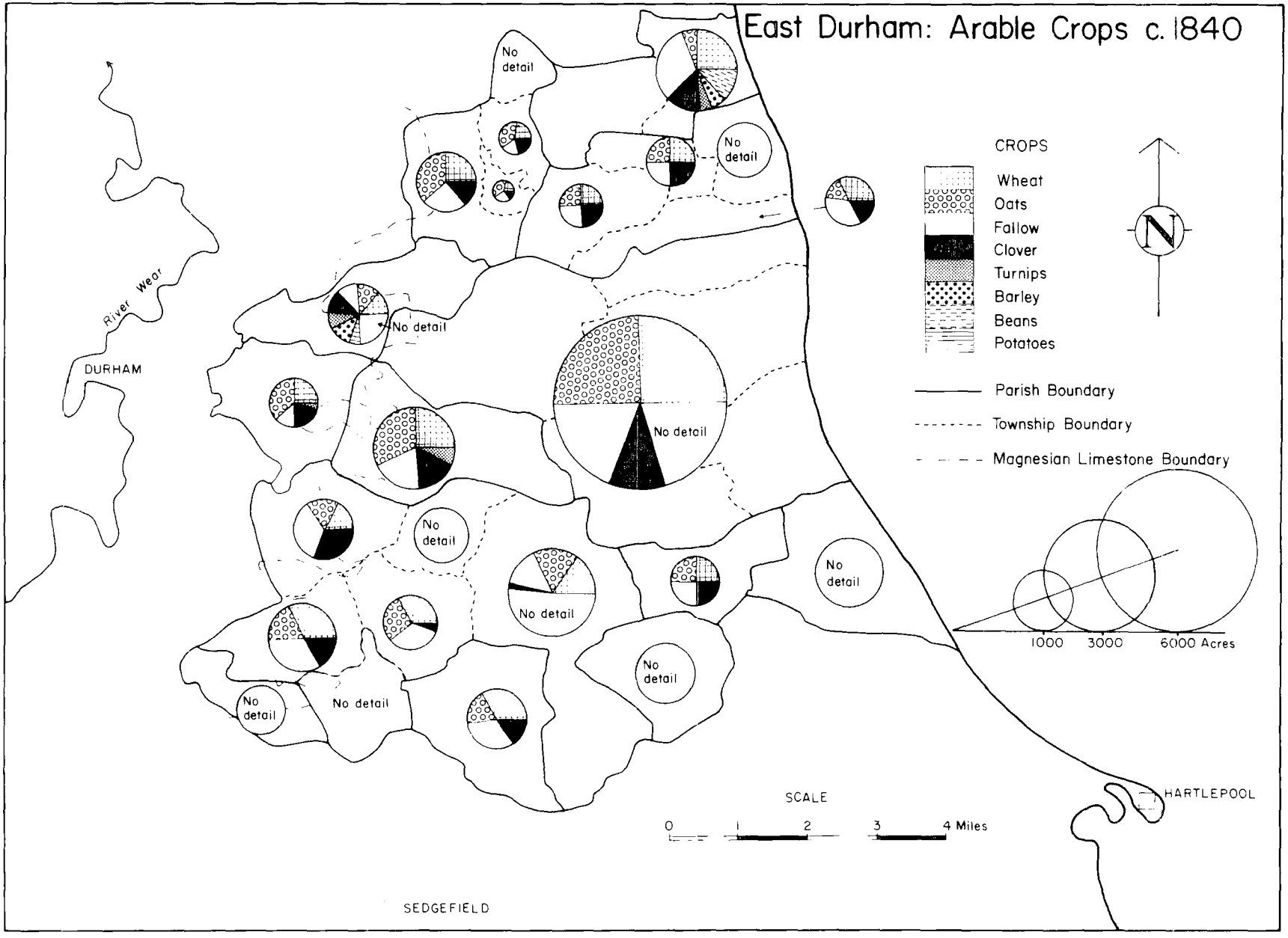

East Durham: Arable Crops c. 1840
No detail
No detail
No detail
No detail
No detail
No detail
No detail
No detail
No detail
No detail
River Wear
DURHAM
CROPS
Wheat
Oats
Fallow
Clover
Turnips
Barley
Beans
Potatoes
N
Parish Boundary
Township Boundary
Magnesian Limestone Boundary
1000
3000
6000 Acres
SCALE
0
1
2
3
4 Miles
HARTLEPOOL
SEDGEFIELD

FIG. 2.11

EAST DURHAM: DRIFT DEPOSITS.

SOURCE.

GEOLOGICAL SURVEY OF GREAT BRITAIN. DURHAM, DRIFT, SHEET 27, (1965), 1:63,360.

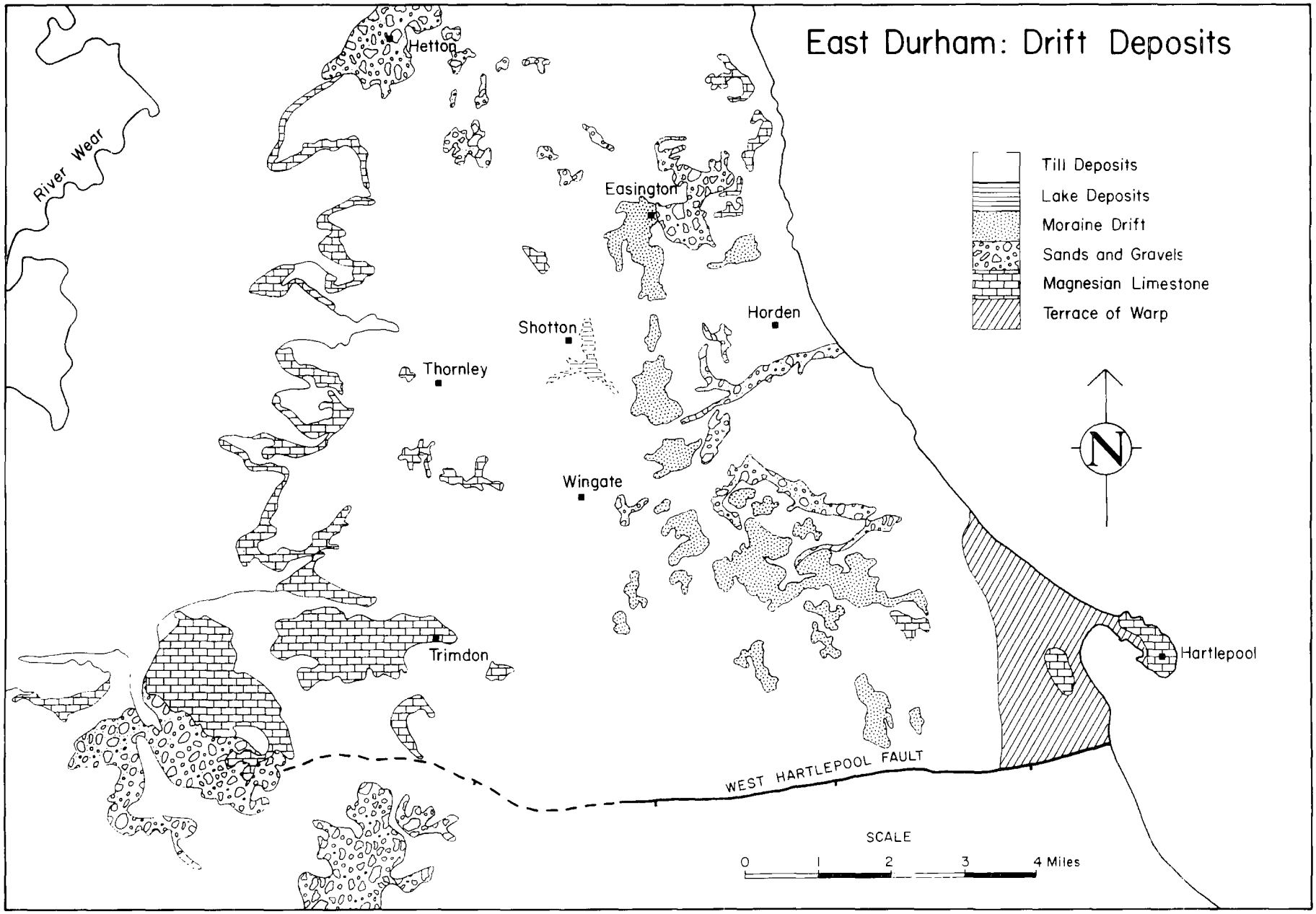

East Durham: Drift Deposits
River Wear
Hetton
Easington
Horden
Shotton
Thornley
Wingate
Trimdon
Hartlepool
WEST HARTLEPOOL FAULT
Till Deposits
Lake Deposits
Moraine Drift
Sands and Gravels
Magnesian Limestone
Terrace of Warp
N
SCALE
0 1 2 3 4 Miles

FIG. 2.12

EAST DURHAM: SOIL TYPES.

SOURCE.

McKEE R.F. AN INVESTIGATION IN THE EAST DURHAM PLATEAU INTO THE PROBLEMS OF SOIL SURVEY IN RELATION TO AGRICULTURAL PRODUCTIVITY.
UNPUBL. Ph.D. THESIS, UNIVERSITY OF DURHAM, (1965).

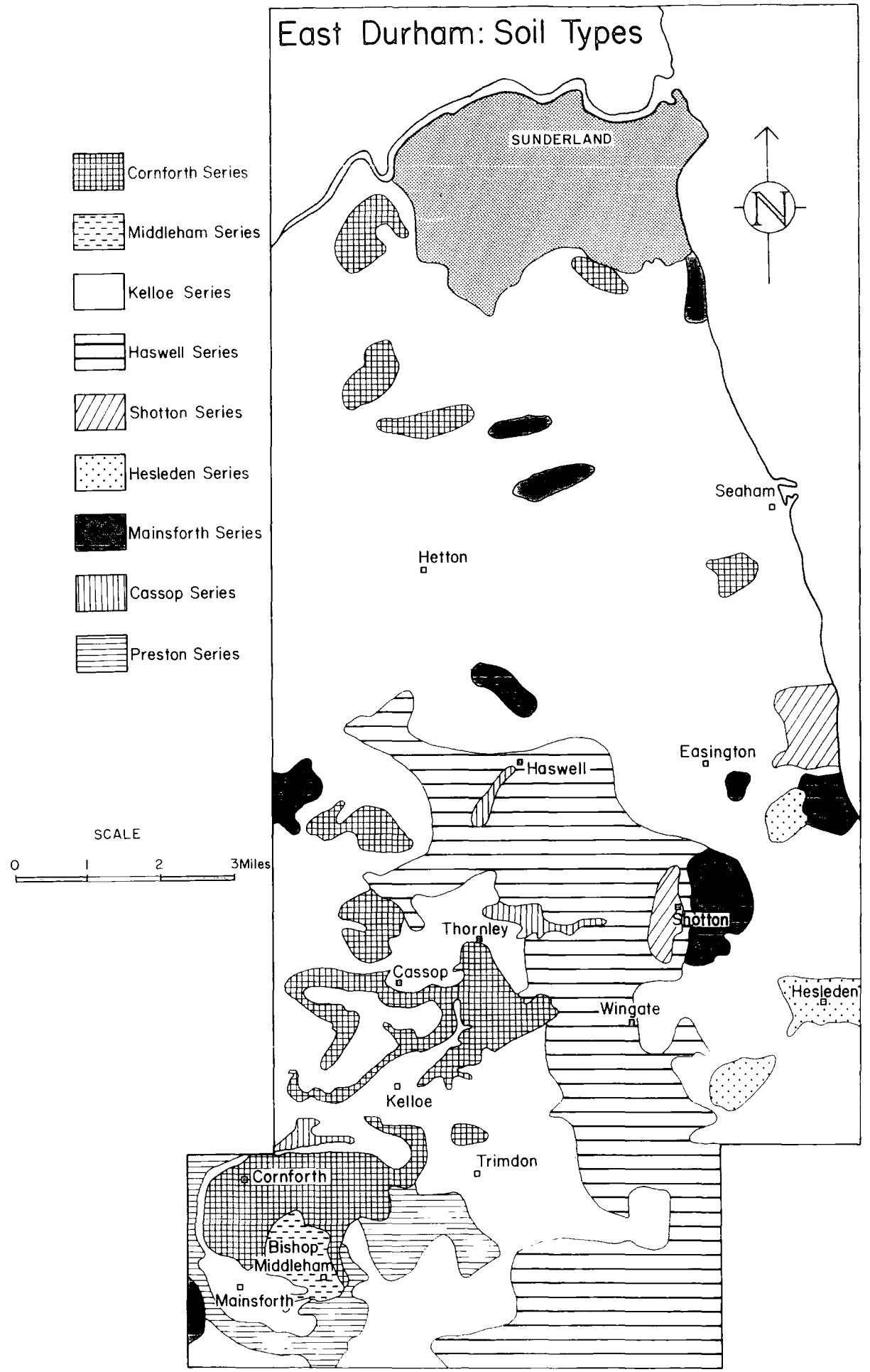

East Durham: Soil Types
SUNDERLAND
N
Cornforth Series
Middleham Series
Kelloe Series
Haswell Series
Shotton Series
Hesleden Series
Mainsforth Series
Cassop Series
Preston Series
Seaham
Hetton
Easington
Haswell
Shotton
Thornley
Cassop
Hesleden
Wingate
Kelloe
Trimdon
Cornforth
Bishop Middleham
Mainsforth
SCALE
0 1 2 3Miles

FIG. 3.1.

GENERALISED VERTICAL SECTION OF THE UPPER CARBONIFEROUS COAL MEASURES.

SOURCE.

SMITH D.B. & FRANCIS E.A.
GEOLOGY OF THE COUNTRY BETWEEN DURHAM AND WEST HARTLEPOOL, (1967), FIG.3, 14.

Generalised Vertical Section of the Coal Measures

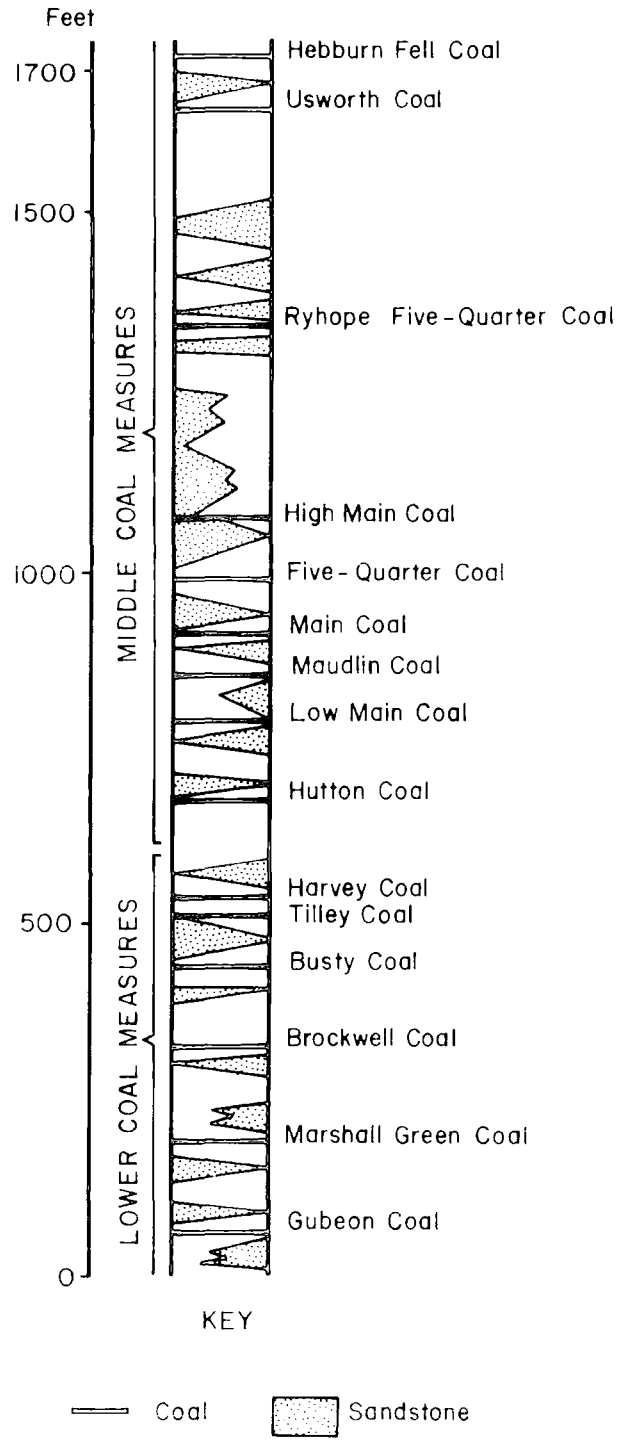


FIG. 3.2

PLAN OF THE HUTTON COAL SEAM IN EAST DURHAM.

SOURCE

AS FOR FIG. 3.1, FIG.10, 62.

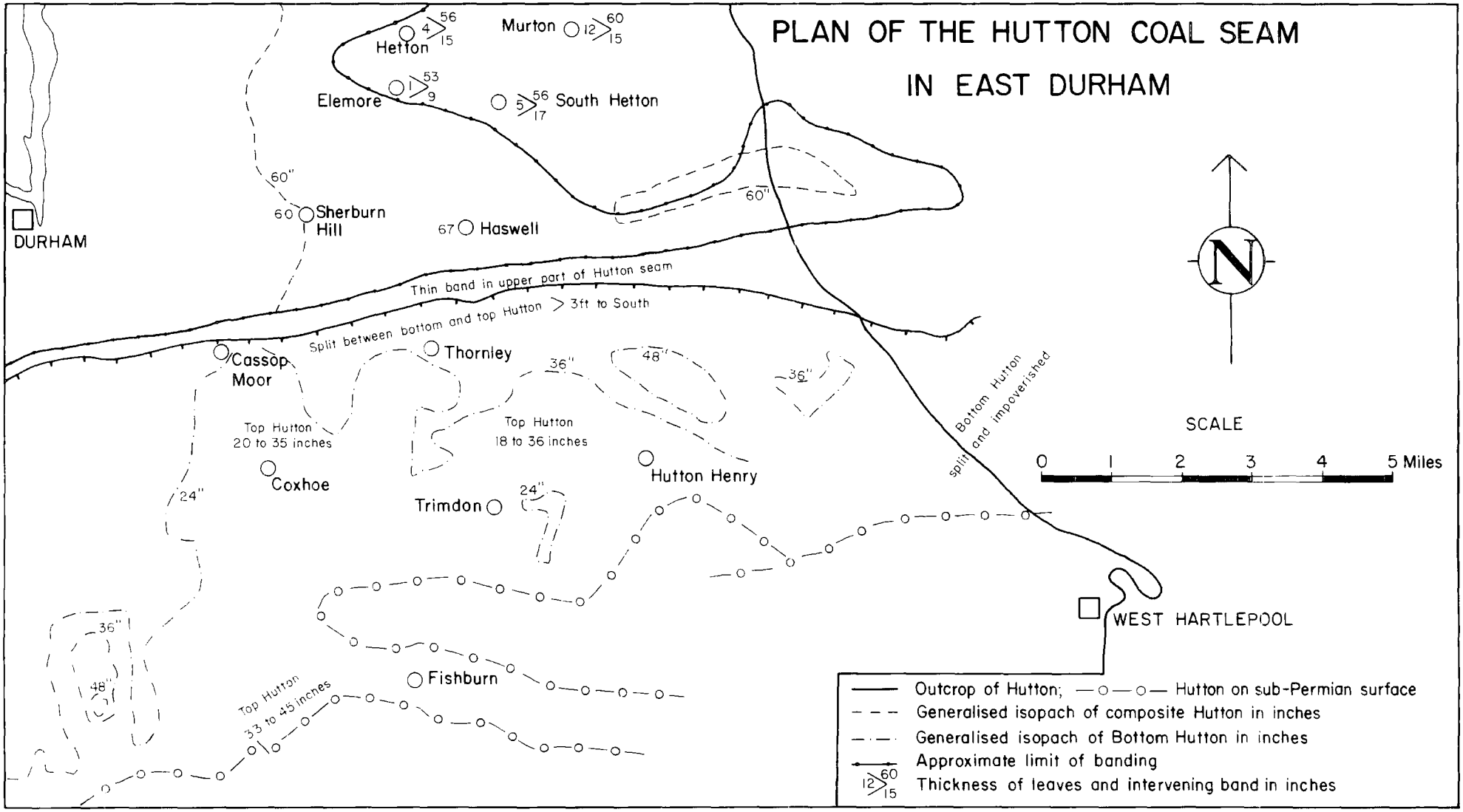

PLAN OF THE HUTTON COAL SEAM
IN EAST DURHAM
Hetton
4
56
15
Murton
12
60
15
Elemore
1
53
9
South Hetton
5
56
17
60"
60
Sherburn Hill
67
Haswell
DURHAM
Thin band in upper part of Hutton seam
Split between bottom and top Hutton > 3ft to South
Cassop Moor
Thornley
36"
48"
36"
Top Hutton
20 to 35 inches
Top Hutton
18 to 36 inches
Coxhoe
Trimdon
24"
24"
Hutton Henry
Bottom Hutton
split and impoverished
SCALE
0 1 2 3 4 5 Miles
WEST HARTLEPOOL
36"
48"
Top Hutton
33 to 45 inches
Fishburn
Outcrop of Hutton; —o—o— Hutton on sub-Permian surface
Generalised isopach of composite Hutton in inches
Generalised isopach of Bottom Hutton in inches
Approximate limit of banding
12
60
15
Thickness of leaves and intervening band in inches

FIG. 3.3.

PLAN OF THE MAIN COAL SEAM IN EAST DURHAM.

SOURCE.

AS FOR FIG. 3.2, FIG. 13, 76.

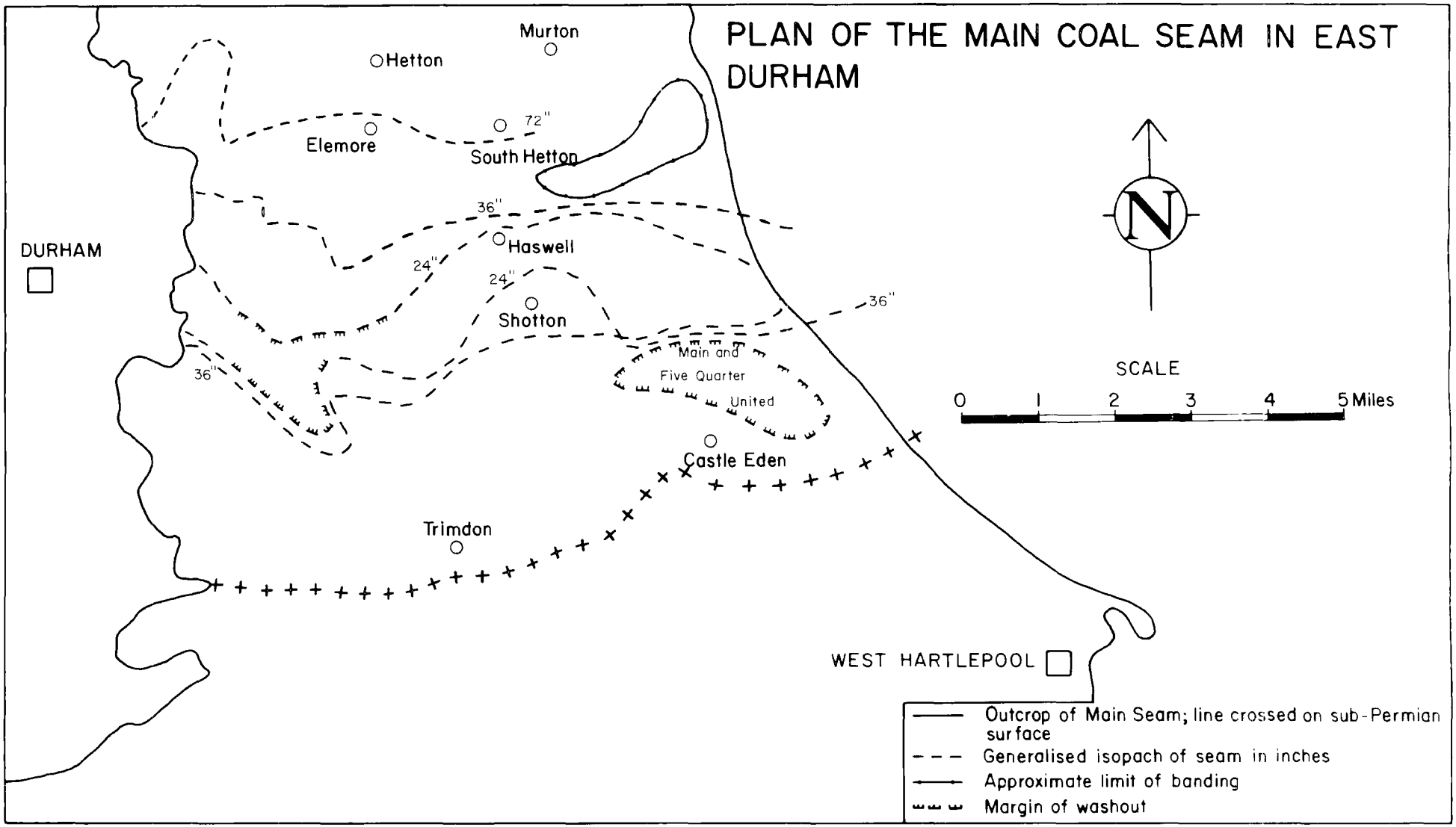

PLAN OF THE MAIN COAL SEAM IN EAST DURHAM
Murton
Hetton
72"
Elemore
South Hetton
36"
Haswell
DURHAM
24"
24"
Shotton
36"
36"
Main and
Five Quarter
United
Castle Eden
Trimdon
WEST HARTLEPOOL
N
SCALE
0 1 2 3 4 5 Miles
Outcrop of Main Seam; line crossed on sub-Permian surface
Generalised isopach of seam in inches
Approximate limit of banding
Margin of washout

FIG. 3.4

EAST DURHAM: COLLIERIES AND RAIL LINKS BY MID-NINETEENTH CENTURY.

SOURCES.

BELL J.T.W. PLAN OF THE HARTLEPOOL COAL DISTRICT, 1:25,000 (1843), N.E.I.M.M.E.

TOMLINSON W.W. THE NORTH EASTERN RAILWAY: ITS RISE AND DEVELOPMENT, (1967), 220.

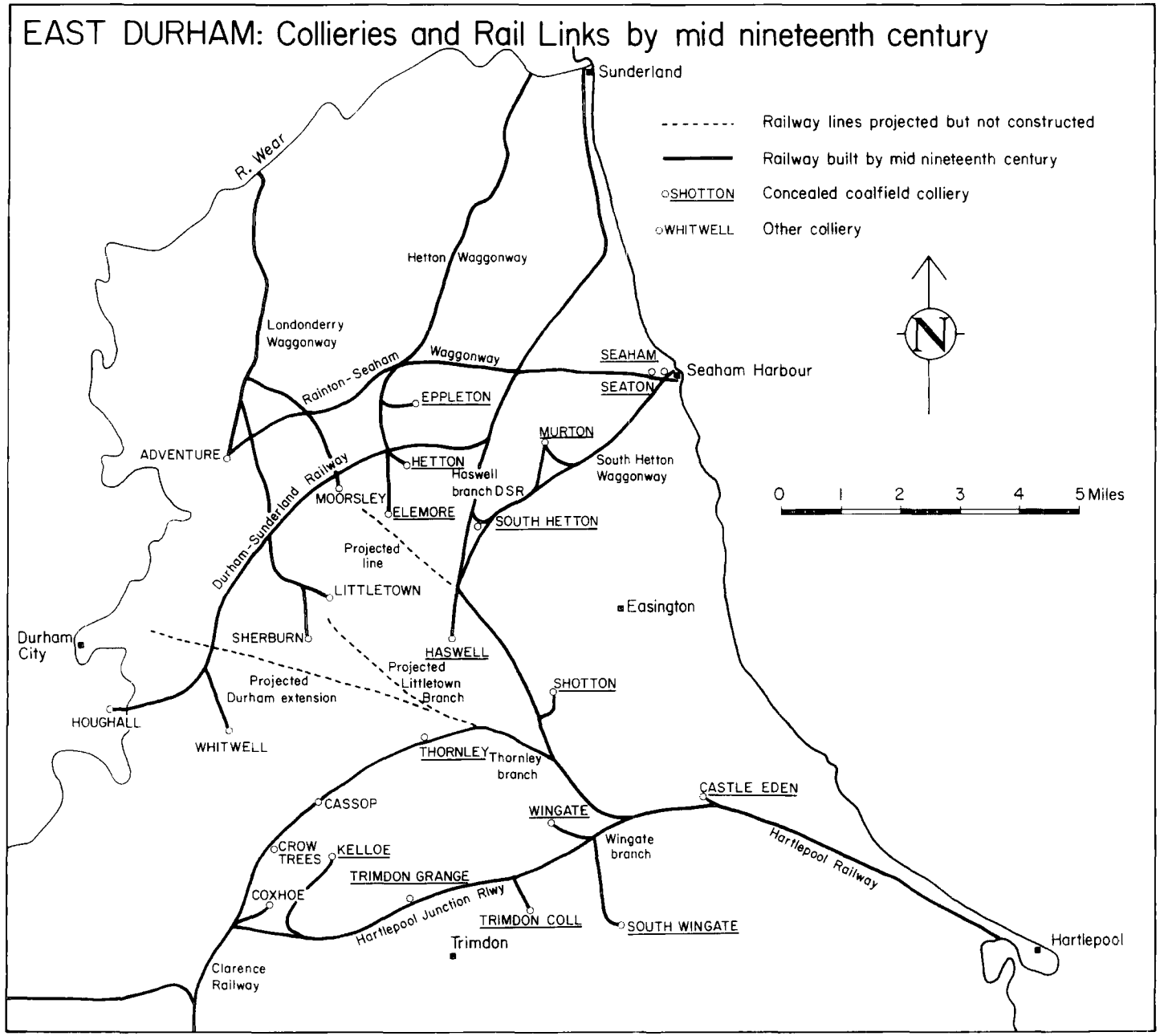

EAST DURHAM: Collieries and Rail Links by mid nineteenth century
Sunderland
Railway lines projected but not constructed
Railway built by mid nineteenth century
SHOTTON Concealed coalfield colliery
WHITWELL Other colliery
N
0 1 2 3 4 5 Miles
R. Wear
Hetton Waggonway
Londonderry Waggonway
Rainton-Seaham Waggonway
SEAHAM
Seaham Harbour
SEATON
EPPLETON
MURTON
South Hetton Waggonway
ADVENTURE
HETTON
Haswell branch D.S.R.
Durham-Sunderland Railway
MOORSLEY
ELEMORE
SOUTH HETTON
Projected line
LITTLETOWN
Easington
Durham City
SHERBURN
HASWELL
Projected Littletown Branch
Projected Durham extension
SHOTTON
HOUGHALL
WHITWELL
THORNLEY
Thornley branch
CASTLE EDEN
CASSOP
WINGATE
Wingate branch
Hartlepool Railway
CROW TREES
KELLOE
TRIMDON GRANGE
COXHOE
Hartlepool Junction Rlwy
TRIMDON COLL
SOUTH WINGATE
Trimdon
Hartlepool
Clarence Railway

FIG. 3.5

THE DEVELOPMENT OF THE NORTHUMBERLAND AND DURHAM COALFIELD.

SOURCE.

SMAILES A.E. NORTH ENGLAND (1968), FIG.37, 164.

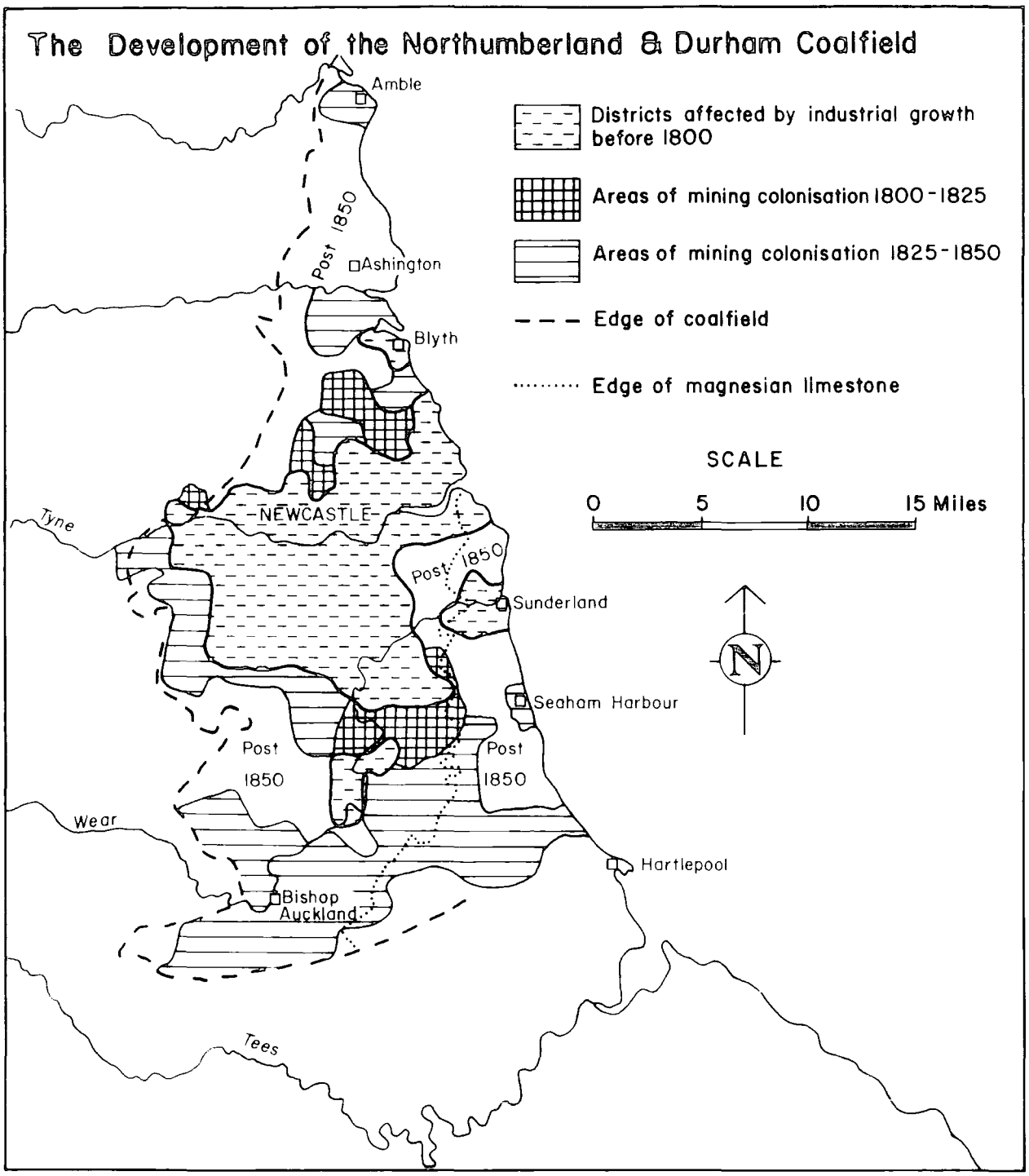
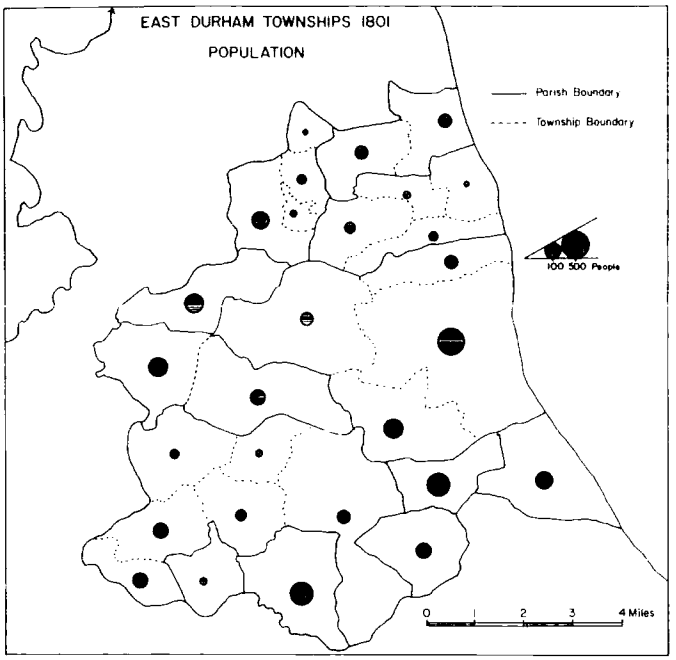

The Development of the Northumberland & Durham Coalfield
Amble
Ashington
Blyth
NEWCASTLE
Tyne
Wear
Tees
Sunderland
Seaham Harbour
Hartlepool
Bishop Auckland
Post 1850
Post 1850
Post 1850
Post 1850
Districts affected by industrial growth before 1800
Areas of mining colonisation 1800-1825
Areas of mining colonisation 1825-1850
Edge of coalfield
Edge of magnesian limestone
SCALE
0 5 10 15 Miles
N

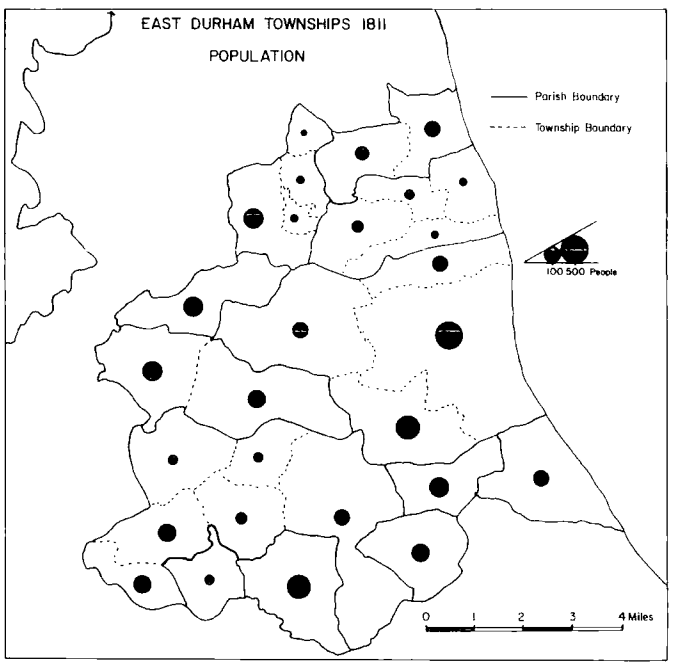
FIG. 4.1

EAST DURHAM TOWNSHIPS 1801-21, POPULATION GROWTH.

SOURCE.

PRINTED CENSUS TABLES:
ENUMERATION ABSTRACTS OF THE ANSWERS AND RETURNS TO THE POPULATION ACTS, 1801, 1811, 1821. D.U.L.


EAST DURHAM TOWNSHIPS 1801
POPULATION
Parish Boundary
Township Boundary
100 500 People
0 1 2 3 4 Miles


EAST DURHAM TOWNSHIPS 1811
POPULATION
Parish Boundary
Township Boundary
100 500 People
0 1 2 3 4 Miles

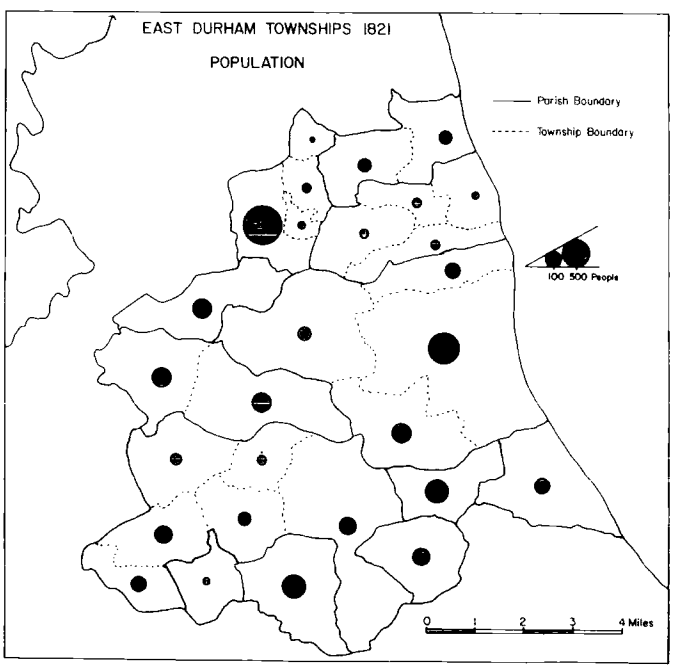
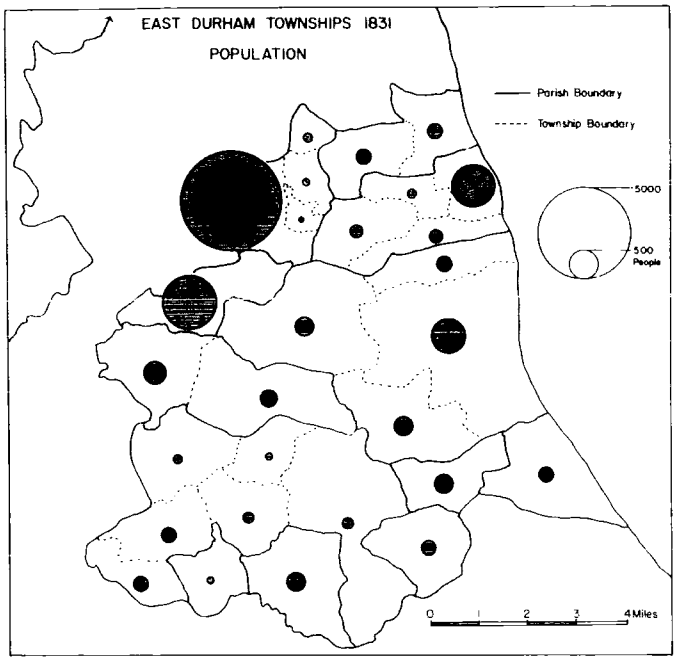

EAST DURHAM TOWNSHIPS 1821
POPULATION
Parish Boundary
Township Boundary
100 500 People
0 1 2 3 4 Miles

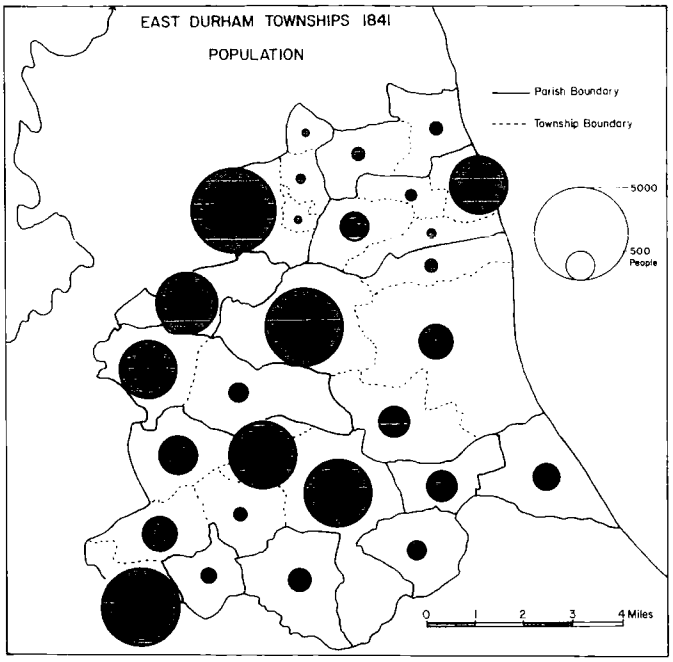
FIG. 4.2

EAST DURHAM TOWNSHIPS 1831-51, POPULATION GROWTH.

SOURCE.

PRINTED CENSUS TABLES 1831, 1841, 1851.
D.U.L.


EAST DURHAM TOWNSHIPS 1831
POPULATION
Parish Boundary
Township Boundary
5000
500
People
0 1 2 3 4 Miles


EAST DURHAM TOWNSHIPS 1841
POPULATION
Parish Boundary
Township Boundary
5000
500
People
0 1 2 3 4 Miles

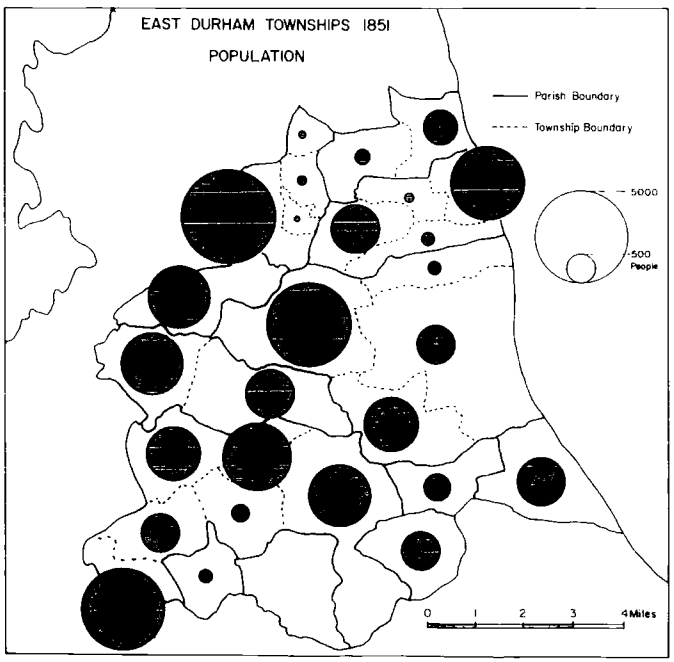

EAST DURHAM TOWNSHIPS 1851
POPULATION
Parish Boundary
Township Boundary
5000
500
People
0 1 2 3 4 Miles

FIG. 4.3

EAST DURHAM: OCCUPATION STRUCTURE 1801.

SOURCE.

PRINTED CENSUS TABLES, 1801

D.U.L.

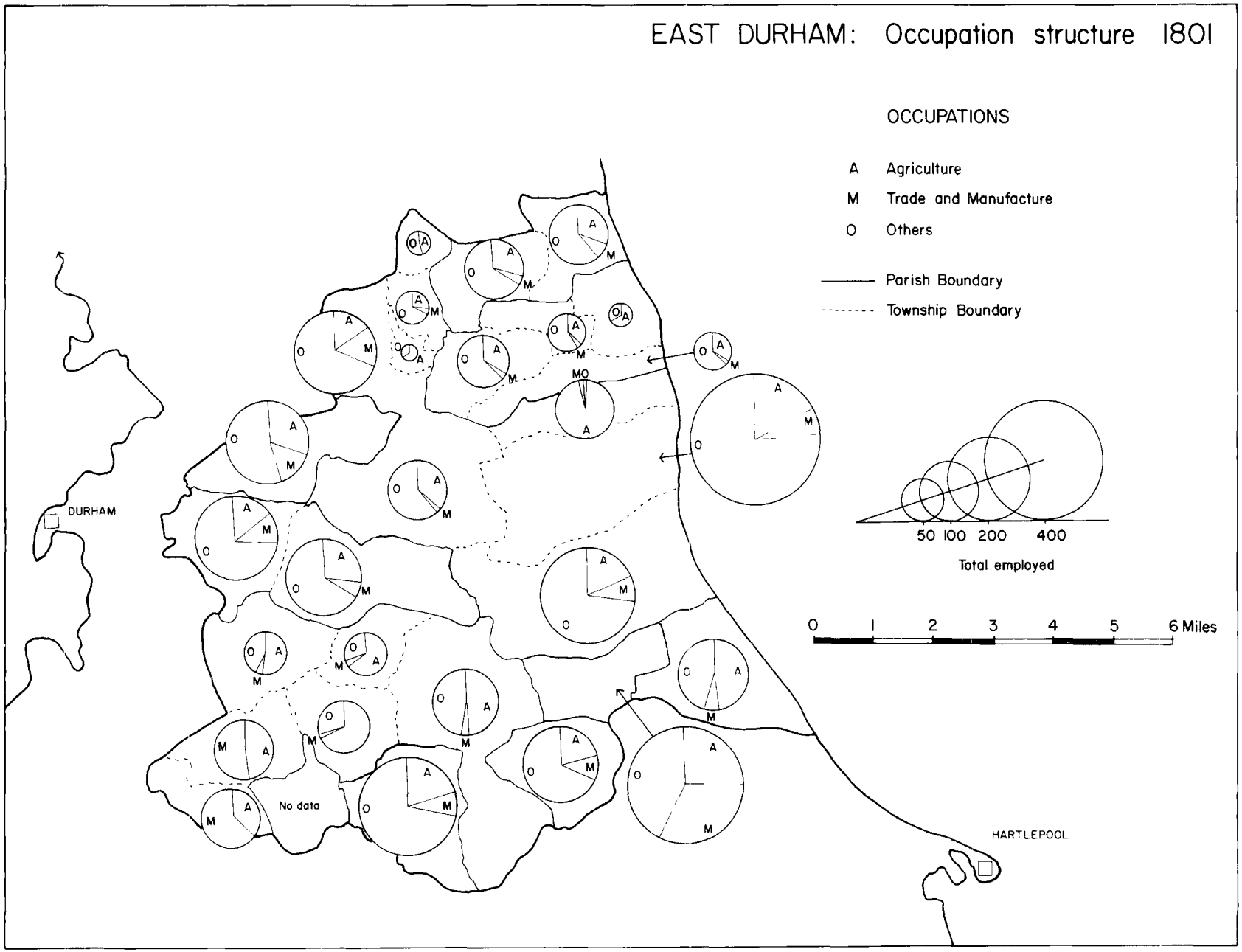

EAST DURHAM: Occupation structure 1801
OCCUPATIONS
A Agriculture
M Trade and Manufacture
O Others
Parish Boundary
Township Boundary
50 100 200 400
Total employed
0 1 2 3 4 5 6 Miles
DURHAM
HARTLEPOOL
No data

FIG. 4.4

EAST DURHAM: OCCUPATION STRUCTURE 1811.

SOURCE.

PRINTED CENSUS TABLES, 1811

D.U.L.

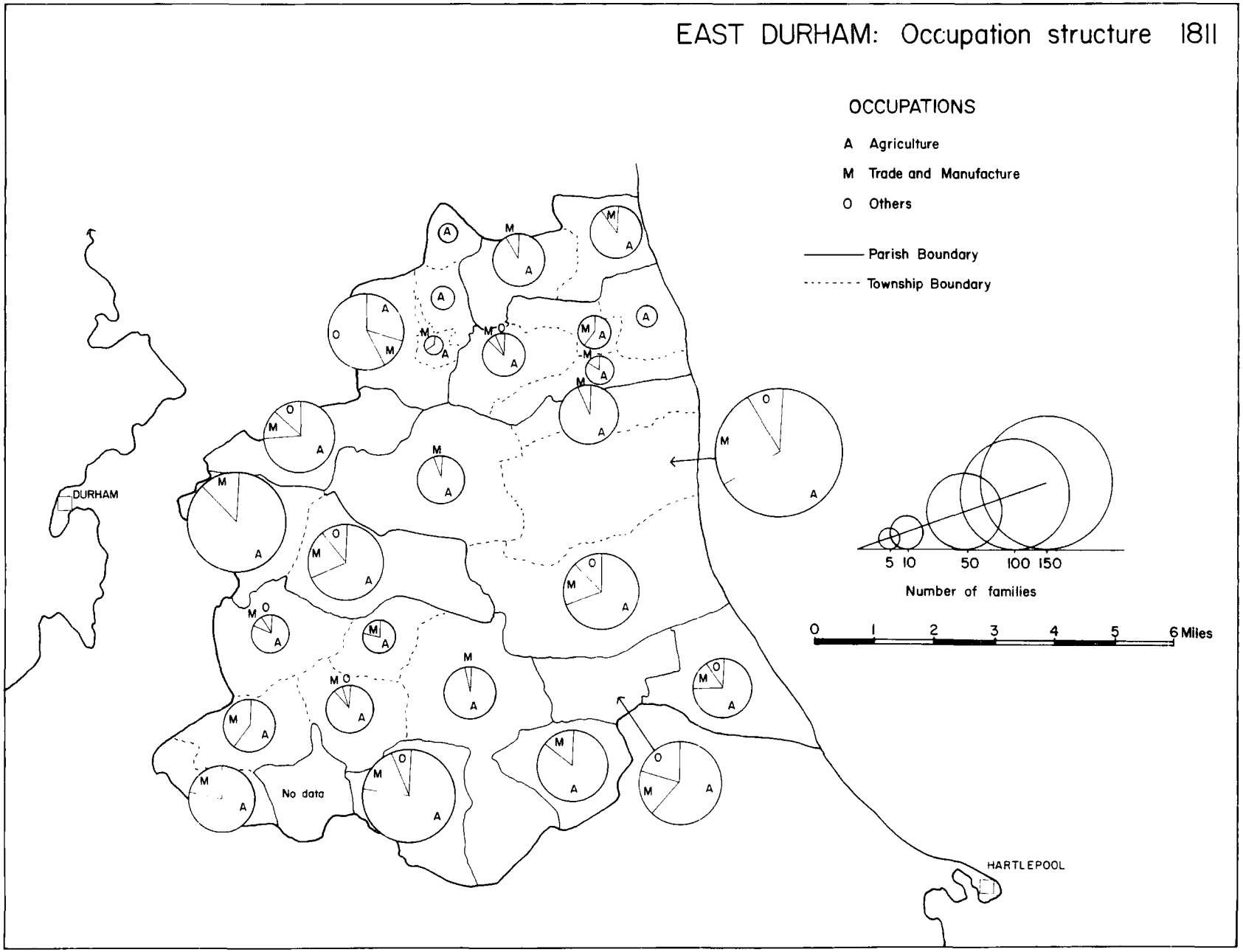

EAST DURHAM: Occupation structure 1811
OCCUPATIONS
A Agriculture
M Trade and Manufacture
O Others
Parish Boundary
Township Boundary
5 10 50 100 150
Number of families
0 1 2 3 4 5 6 Miles
DURHAM
HARTLEPOOL
No data

FIG. 4.5

EAST DURHAM: OCCUPATION STRUCTURE 1821.

SOURCE.

PRINTED CENSUS TABLES, 1821.
D.U.L.

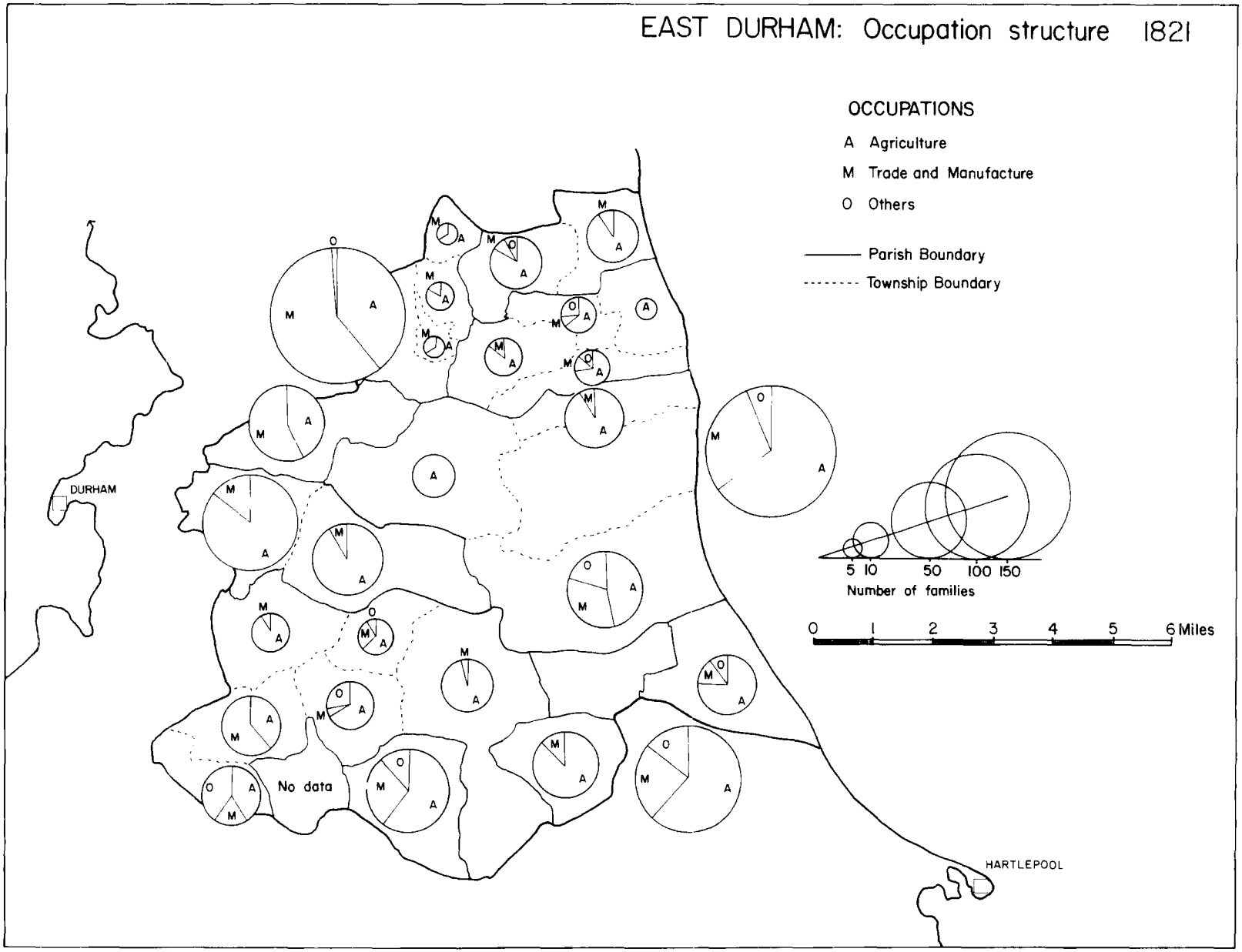

EAST DURHAM: Occupation structure 1821
OCCUPATIONS
A Agriculture
M Trade and Manufacture
O Others
Parish Boundary
Township Boundary
5 10 50 100 150
Number of families
0 1 2 3 4 5 6 Miles
DURHAM
HARTLEPOOL
No data

FIG. 4.6

EAST DURHAM: OCCUPATION STRUCTURE 1831.

SOURCE.

PRINTED CENSUS TABLES, 1831.

D.U.L.

EAST DURHAM: Occupation structure 1831

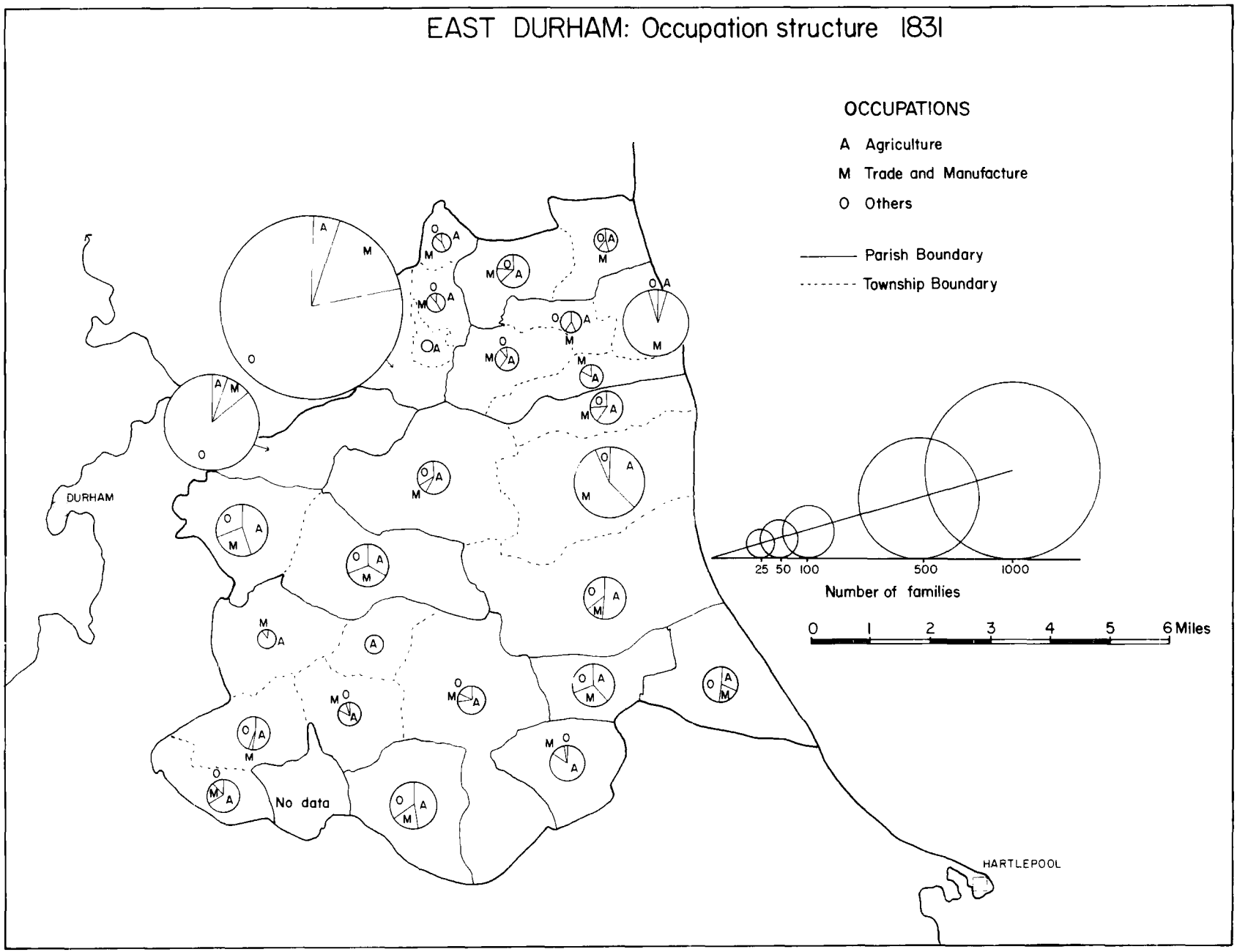


FIG. 4.7

EAST DURHAM: OCCUPATION STRUCTURE OF MALES AGED OVER 20 YEARS, 1831.

SOURCE.

PRINTED CENSUS TABLES, 1831.
D.U.L.

EAST DURHAM: Occupation structure of males aged over 20 years 1831

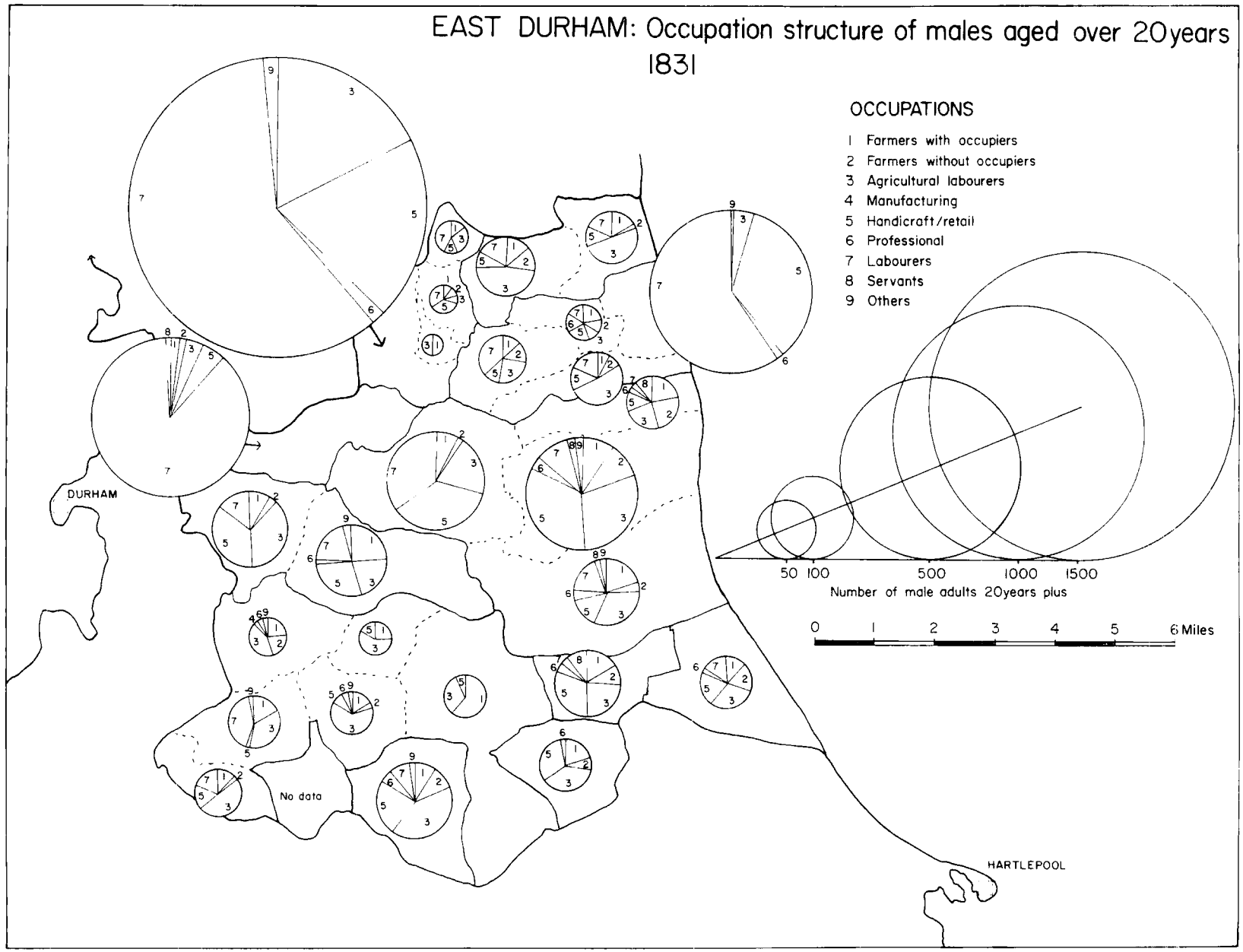


FIG. 4.8

EAST DURHAM SAMPLE VILLAGES; OCCUPATION STRUCTURE 1851.

SOURCES.

CENSUS ENUMERATORS' BOOKS 1851.

D.C.R.O. MURTON M3/21,22
HASWELL M3/21
QUARRINGTON M3/19
HUTTON HENRY M3/21
HETTON M3/23
SHOTTON M3/21
THRONLEY M3/20
TRIMDON M3/8.

EAST DURHAM SAMPLE VILLAGES: Occupation structure 1851

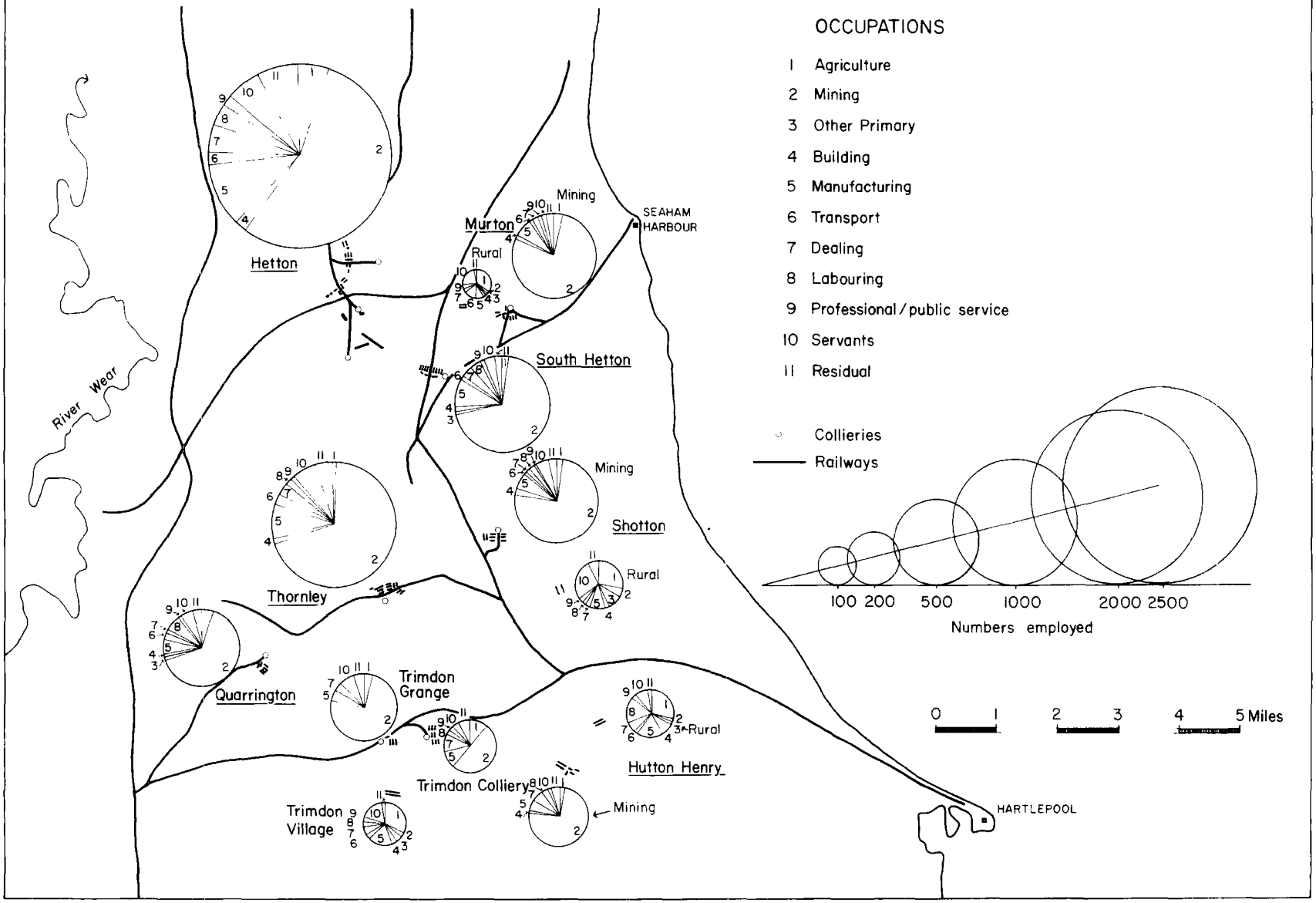


FIG. 4.9

HETTON-LE-HOLE: OCCUPATION STRUCTURE 1851.

SOURCE.

CENSUS ENUMERATORS' BOOKS 1851
HETTON TOWNSHIP, M3/23. D.C.R.O.

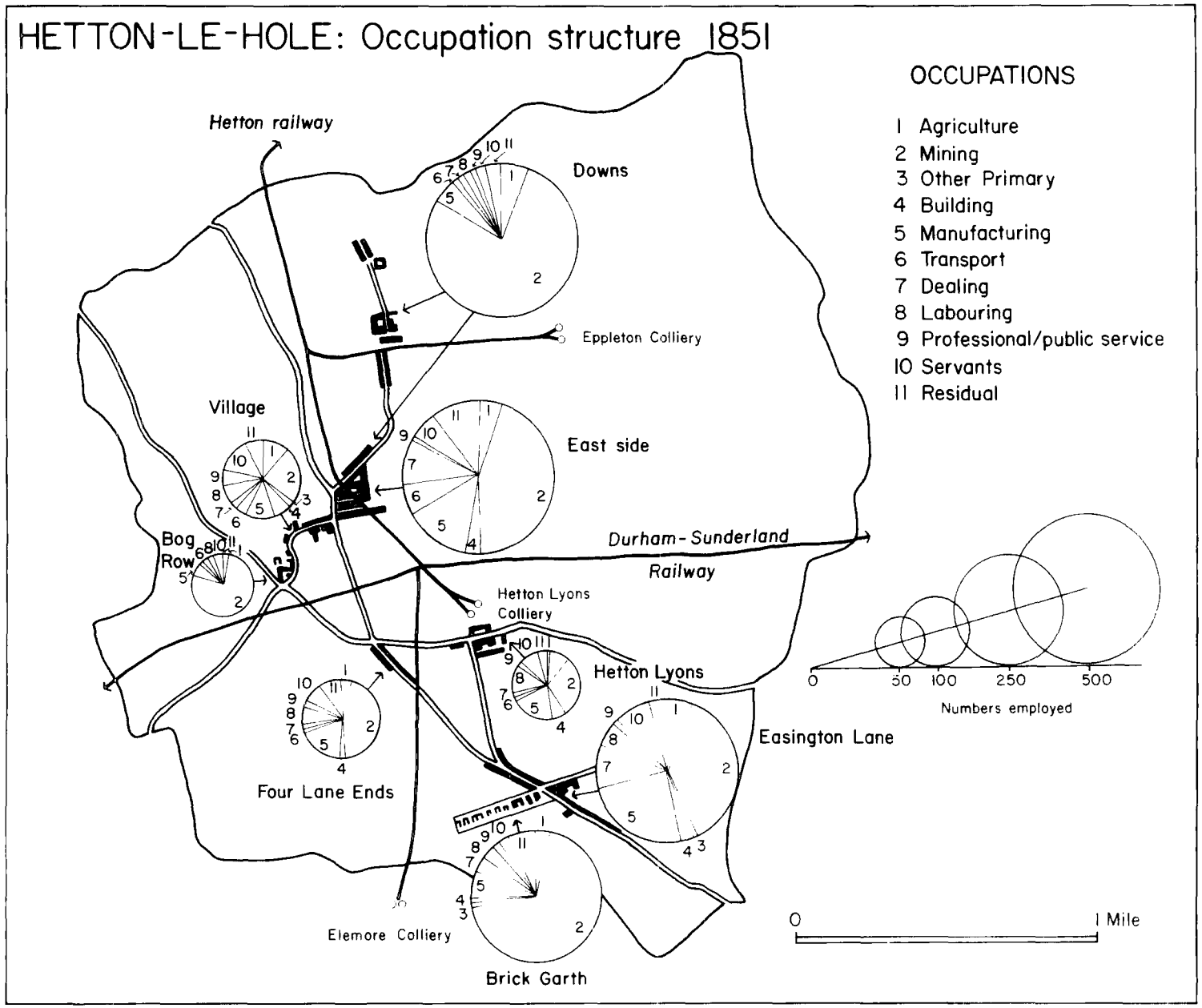

HETTON-LE-HOLE: Occupation structure 1851
OCCUPATIONS
1 Agriculture
2 Mining
3 Other Primary
4 Building
5 Manufacturing
6 Transport
7 Dealing
8 Labouring
9 Professional/public service
10 Servants
11 Residual
Hetton railway
Downs
Eppleton Colliery
Village
East side
Bog Row
Durham-Sunderland Railway
Hetton Lyons Colliery
Hetton Lyons
Easington Lane
Four Lane Ends
Elemore Colliery
Brick Garth
0 50 100 250 500
Numbers employed
0 1 Mile

FIG. 4.10

MURTON VILLAGE AND MURTON COLLIERY 1856.

SOURCE.

O.S. FIRST EDITION PLAN 1:2500 (1856).
COUNTY DURHAM SHEET 21 6.

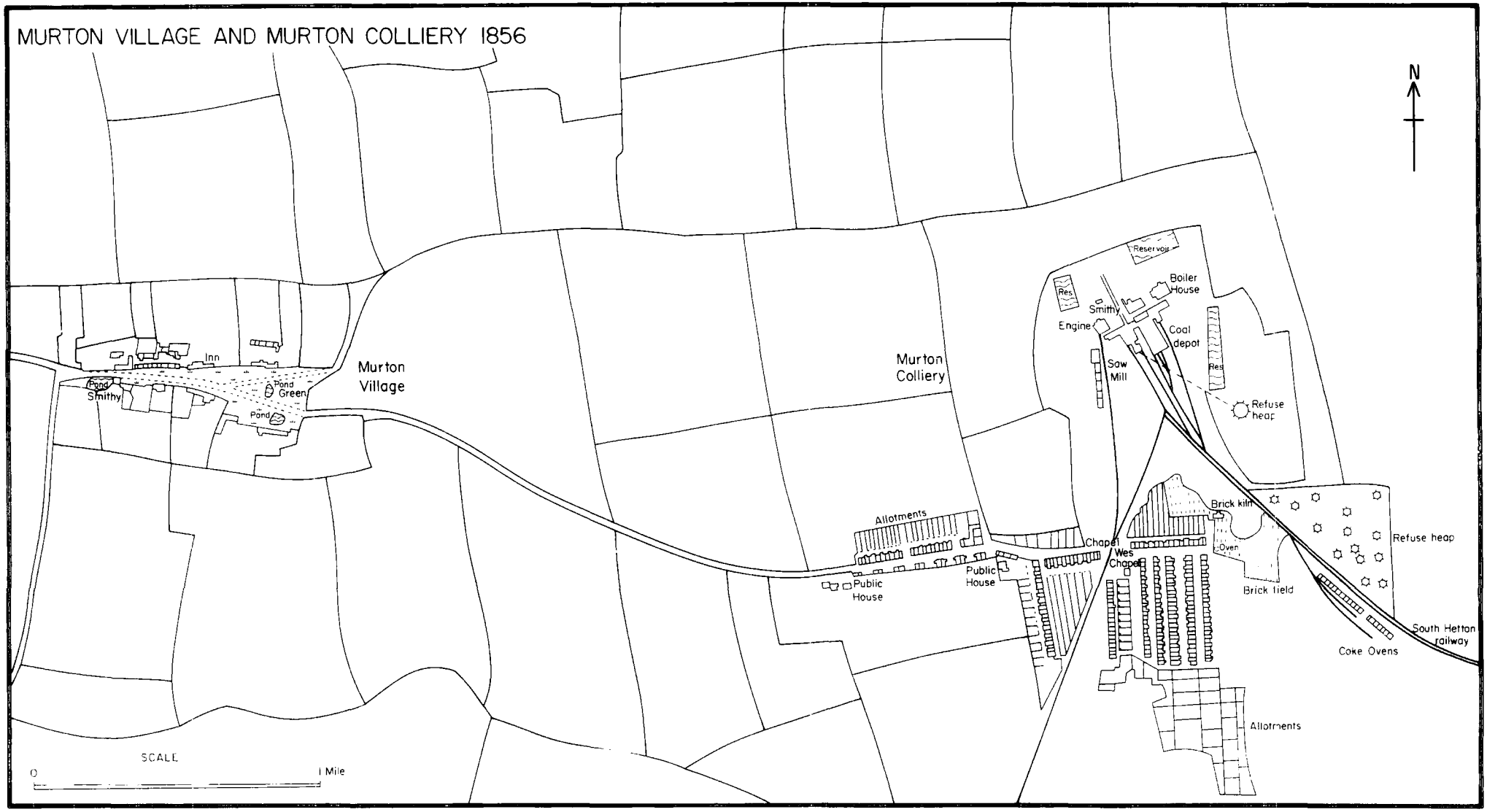

MURTON VILLAGE AND MURTON COLLIERY 1856
N
Inn
Pond
Smithy
Pond
Green
Pond
Murton
Village
Murton
Colliery
Reservoir
Res
Boiler
House
Smithy
Engine
Coal
depot
Saw
Mill
Res
Refuse
heap
Allotments
Public
House
Public
House
Chapel
Wes
Chapel
Brick kiln
Oven
Brick field
Refuse heap
South Hetton
railway
Coke Ovens
Allotments
SCALE
0
1 Mile

FIG. 4.11

THORNLEY: THE COLLIERY LANDSCAPE, 1856.

SOURCE.

O.S. FIRST EDITION PLAN 1:2500, (1856)
COUNTY DURHAM SHEET 34, 9.

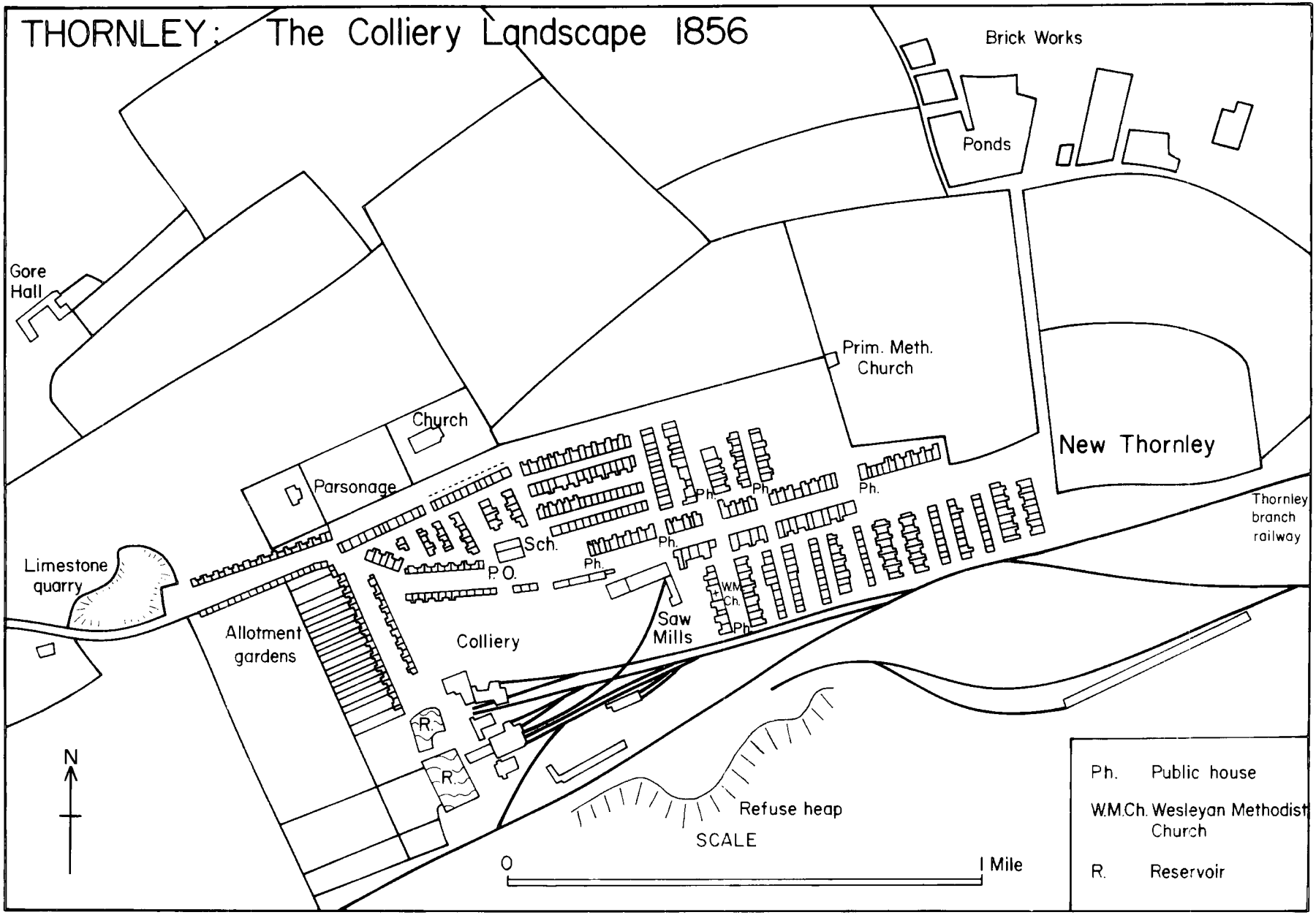

THORNLEY: The Colliery Landscape 1856
Brick Works
Ponds
Gore Hall
Prim. Meth. Church
Church
New Thornley
Parsonage
Ph.
Ph.
Ph.
Thornley branch railway
Sch.
Limestone quarry
P.O.
Ph.
W.M. Ch.
Ph.
Saw Mills
Allotment gardens
Colliery
R.
R.
N
Refuse heap
SCALE
0
1 Mile
Ph. Public house
W.M.Ch. Wesleyan Methodist Church
R. Reservoir

FIG. 4.12

WINGATE: THE COLLIERY LANDSCAPE 1856.

SOURCE.

O.S. FIRST EDITION PLAN 1:2500, (1856)
COUNTY DURHAM SHEET, 28, 14 & 36,2

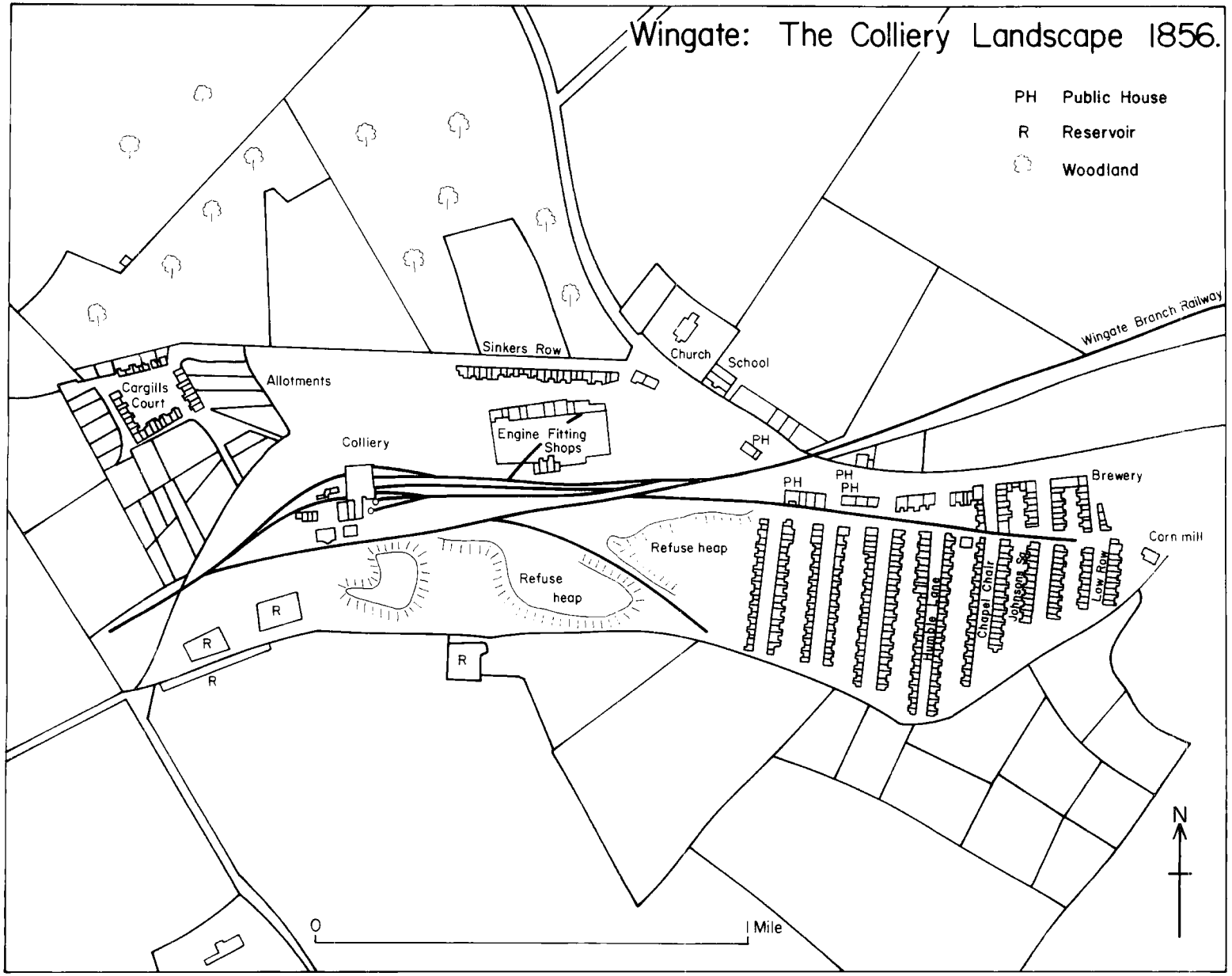

Wingate: The Colliery Landscape 1856.
PH Public House
R Reservoir
Woodland
Wingate Branch Railway
Sinkers Row
Church
School
Allotments
Cargills Court
Colliery
Engine Fitting Shops
PH
PH
PH
PH
Brewery
Corn mill
Refuse heap
Refuse heap
R
R
R
R
Humble Lane
Chapel Chair
Johnsons Sq.
Low Row
N
0
1 Mile

FIG. 4.13

HETTON-LE-HOLE: PLAN OF THE RURAL VILLAGE, c1825

SOURCE.

PLAN OF THE HETTON ESTATE, (UNDATED).
HALMOTE COURT MISC. MAPS AND PLANS, No.70. U.D.D.P.D.

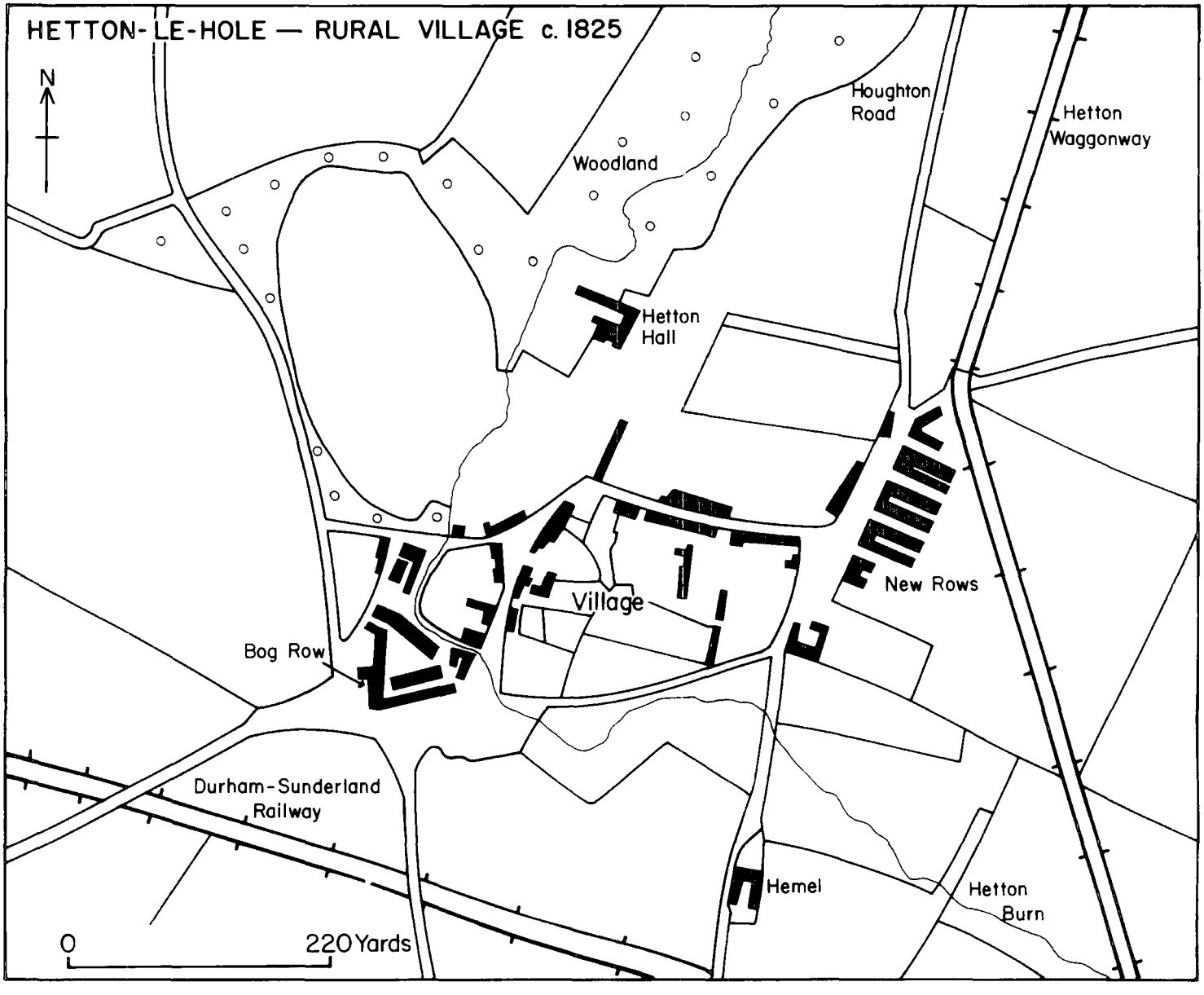

HETTON-LE-HOLE — RURAL VILLAGE c. 1825
N
Houghton Road
Hetton Waggonway
Woodland
Hetton Hall
New Rows
Village
Bog Row
Durham-Sunderland Railway
Hemel
Hetton Burn
0
220 Yards

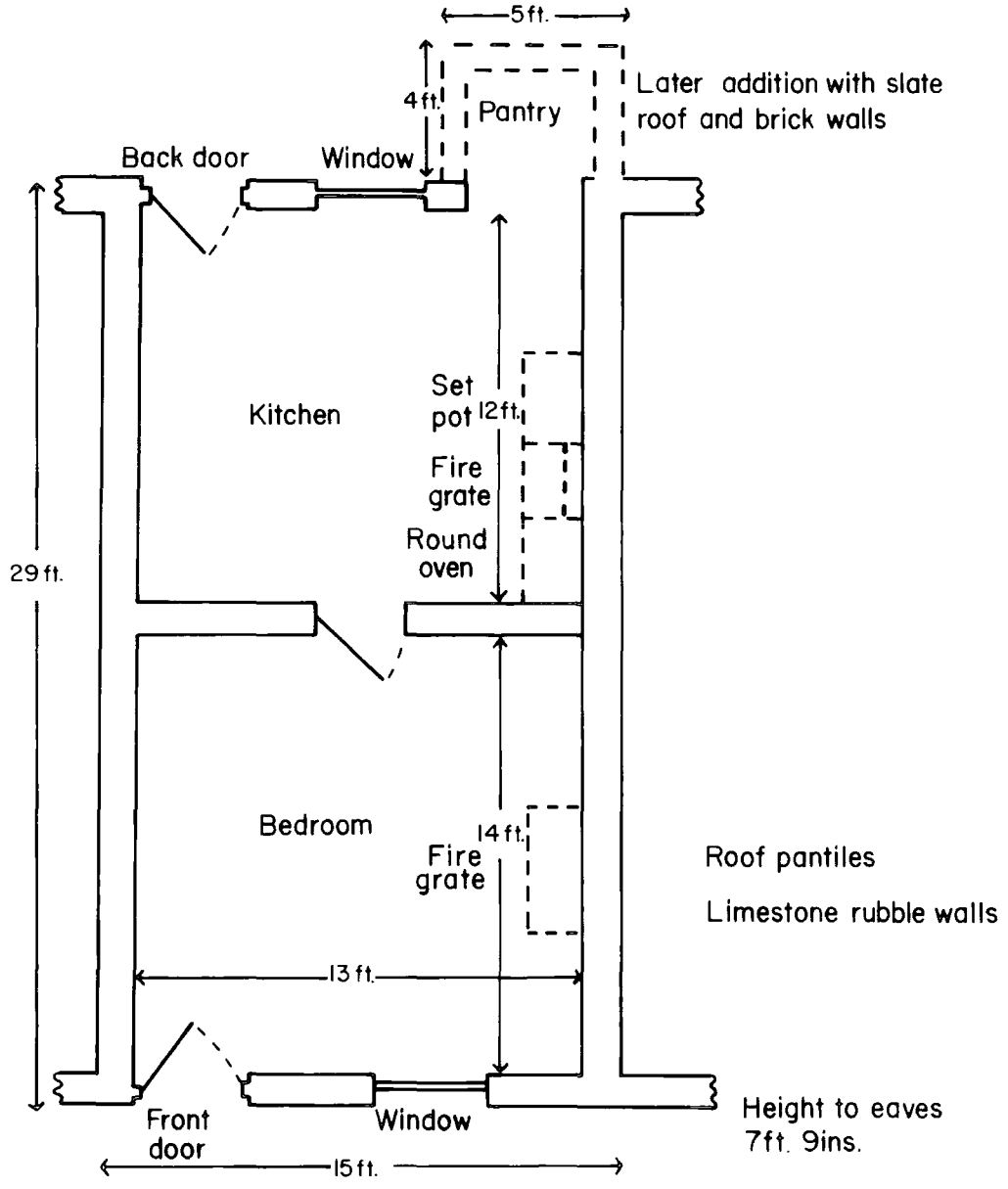
FIG. 4.14

PLAN OF A SINGLE COTTAGE AT EASINGTON LANE, HETTON-LE-HOLE

SOURCE.

FIELD MEASUREMENT 1975.

Single cottage Easington Lane, Hetton-le-Hole. Built by 1827.



Field measurement 1975

FIG. 4.15

PLAN OF A DOUBLE COTTAGE LYONS STREET, HETTON-LE-HOLE

SOURCE.

FIELD MEASUREMENT 1977.

Double cottage Lyons Street, Hetton-le-Hole. c.1850

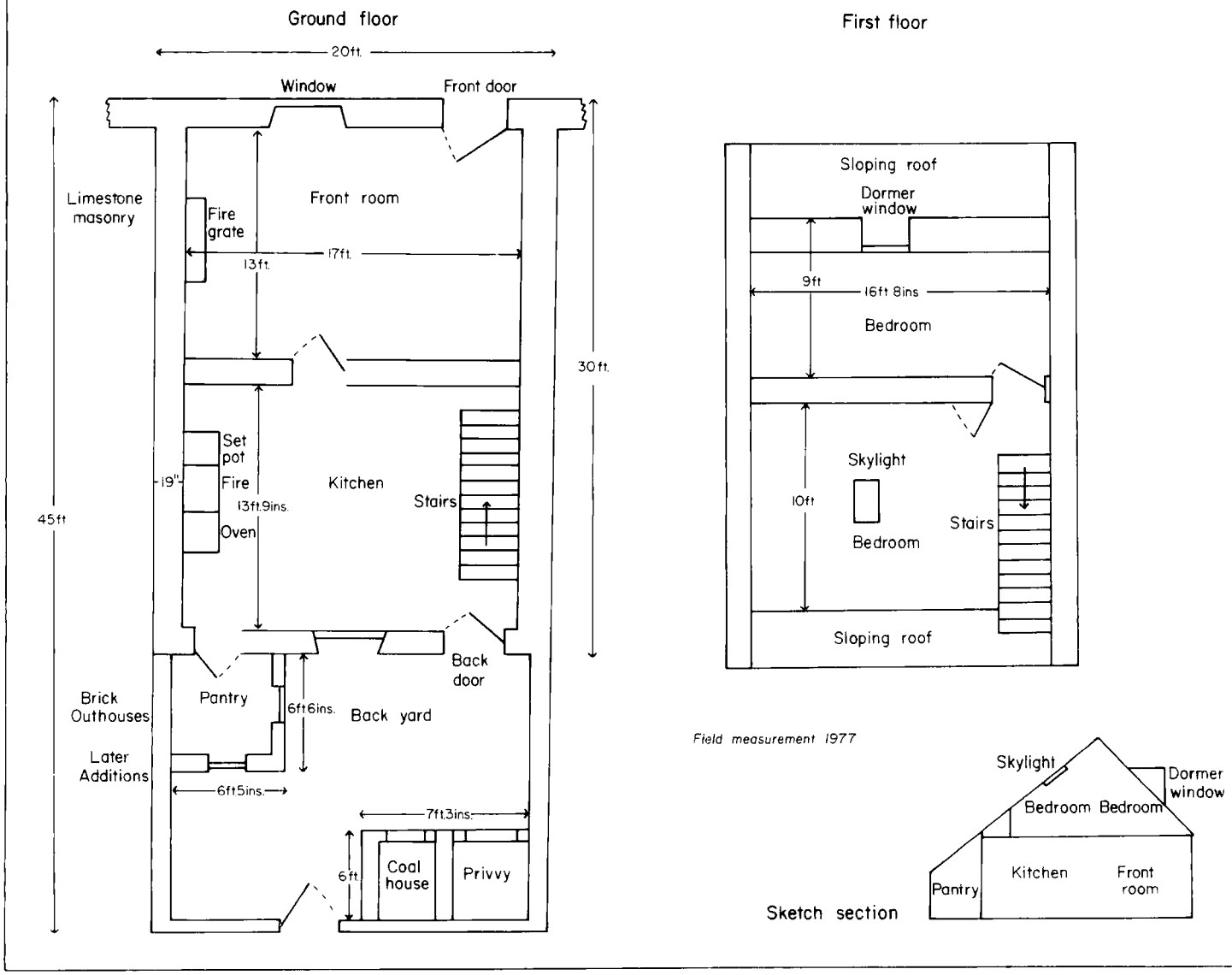


FIG. 5.1

EAST DURHAM: LAND OWNED AND LEASED BY COLLIERY COMPANIES c 1840.

SOURCES.

TITHE MAPS AND APPORTIONMENTS U.D.D.P.D.

BELL J.T.W. PLAN OF THE HARTLEPOOL COAL DISTRICT.

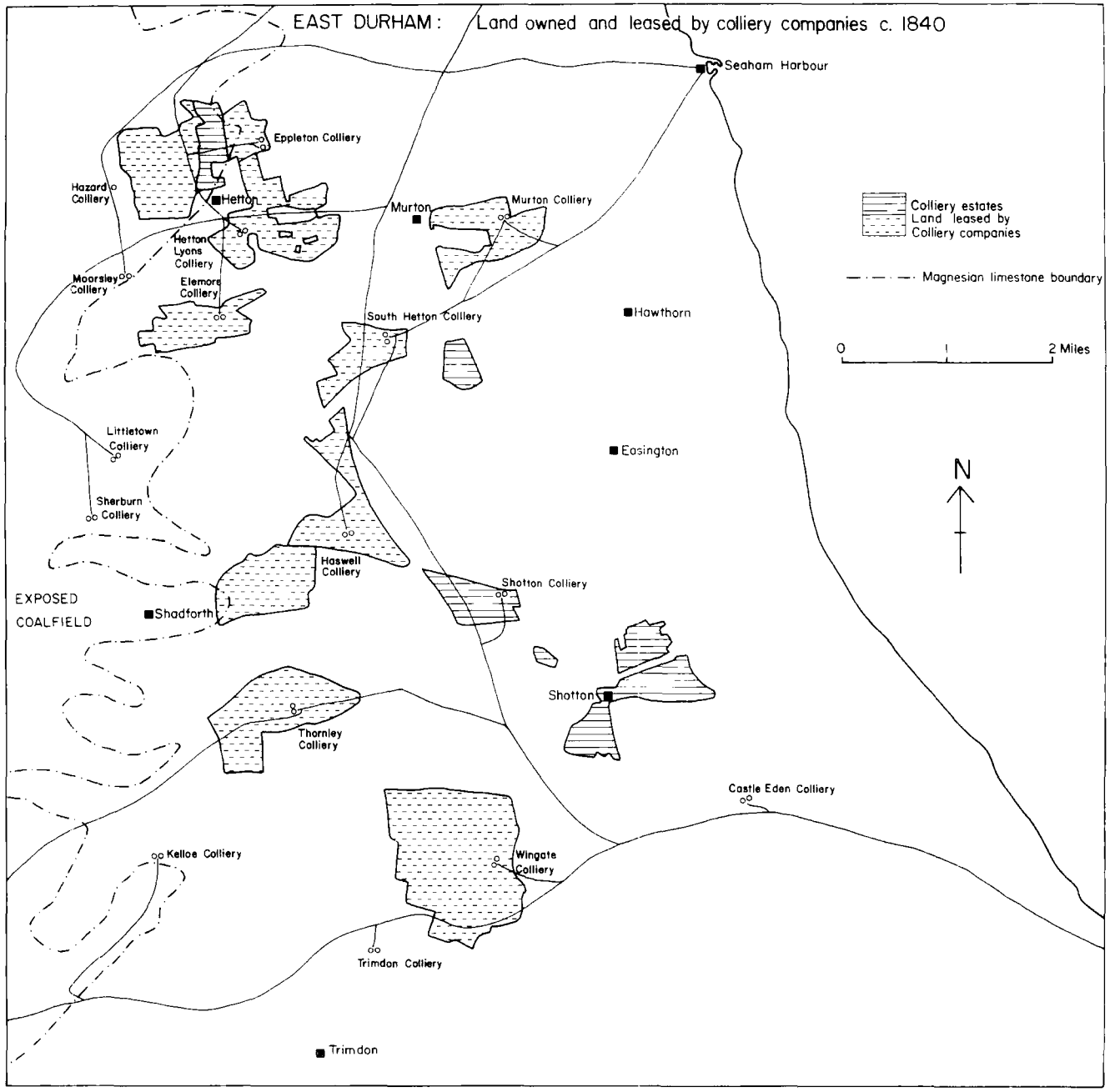

EAST DURHAM: Land owned and leased by colliery companies c. 1840
Seaham Harbour
Eppleton Colliery
Hazard Colliery
Hetton
Murton
Murton Colliery
Hetton Lyons Colliery
Moorsley Colliery
Elemore Colliery
South Hetton Colliery
Hawthorn
Colliery estates
Land leased by Colliery companies
Magnesian limestone boundary
0 1 2 Miles
N
Littletown Colliery
Easington
Sherburn Colliery
Haswell Colliery
Shotton Colliery
EXPOSED COALFIELD
Shadforth
Shotton
Thornley Colliery
Castle Eden Colliery
Kelloe Colliery
Wingate Colliery
Trimdon Colliery
Trimdon

FIG. 5.2

EAST DURHAM: COLLIERY CONCESSIONS MID 1840s.

SOURCES.

PLAN OF SEVERAL COALFIELDS IN THE WEAR DISTRICT. SCALE 32 CHAINS = 1".

WATSON COLL. PLANS SHELF 31,No.54 c.1840.

SEE CHAPTER 5 FOR REFERENCES TO INDIVIDUAL COAL LEASES BY LANDOWNERS TO COLLIERY COMPANIES.

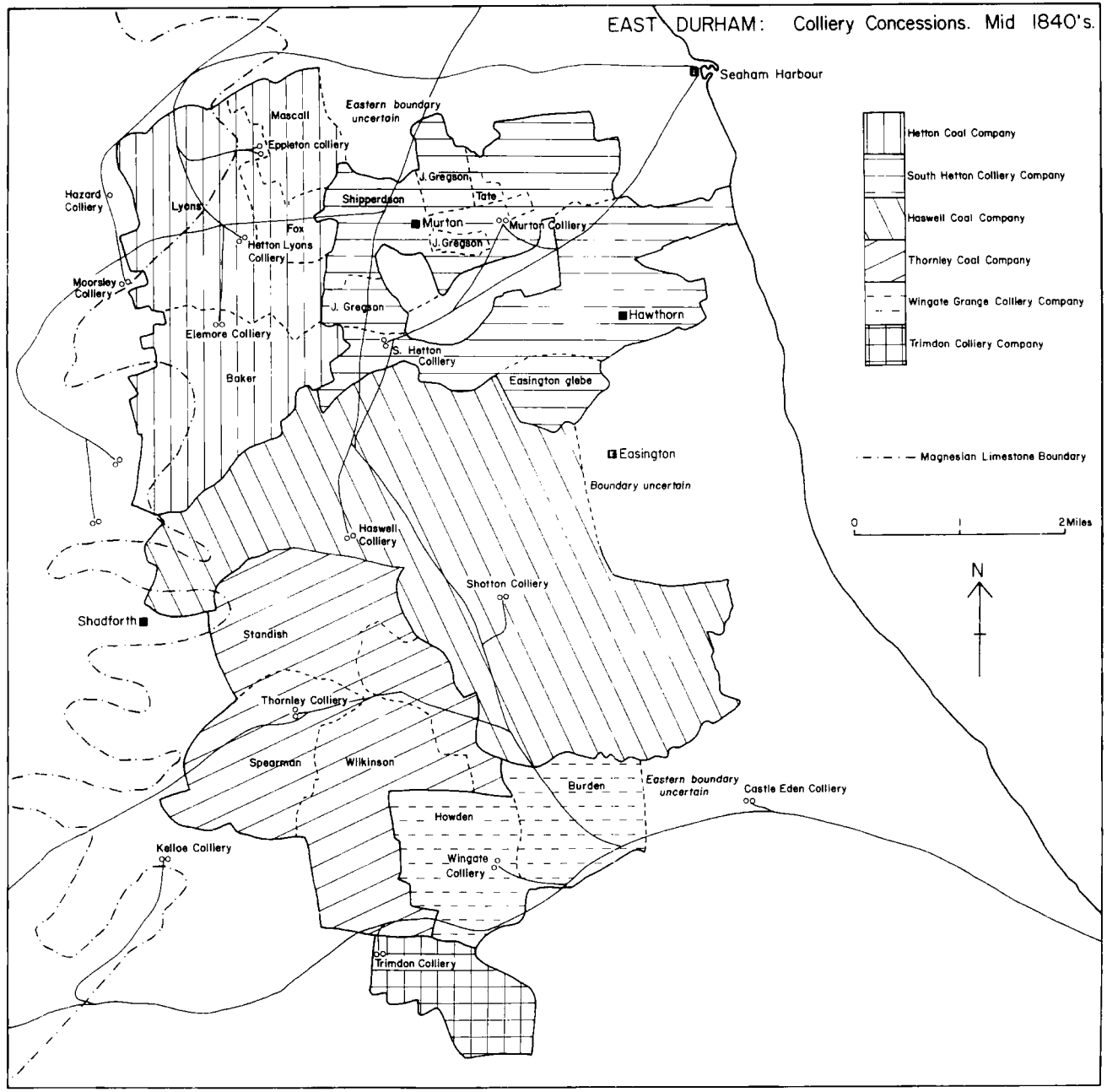

EAST DURHAM: Colliery Concessions. Mid 1840's.
Seaham Harbour
Eastern boundary uncertain
Mascall
Eppleton colliery
Hazard Colliery
Lyons
Fox
Hetton Lyons Colliery
Moorsley Colliery
Elemore Colliery
Baker
J. Gregson
Shipperdson
Tate
Murton
Murton Colliery
J. Gregson
Hawthorn
S. Hetton Colliery
Easington glebe
Easington
Boundary uncertain
Haswell Colliery
Shotton Colliery
Shadforth
Standish
Thornley Colliery
Spearman
Wilkinson
Burden
Eastern boundary uncertain
Castle Eden Colliery
Howden
Kelloe Colliery
Wingate Colliery
Trimdon Colliery
Hetton Coal Company
South Hetton Colliery Company
Haswell Coal Company
Thornley Coal Company
Wingate Grange Colliery Company
Trimdon Colliery Company
Magnesian Limestone Boundary
0
1
2 Miles
N

FIG. 5.3

WINGATE GRANGE SKETCH MAP OF THE SITE OF THE COLLIERY VILLAGE.

SOURCE.

N.C.B. COLL I/D/74/(6)
INCLUDED IN A LEGAL CONVEYANCE OF FOUR FIELDS FROM LORD HOWDEN TO GEORGE HORSINGTON, 1839.

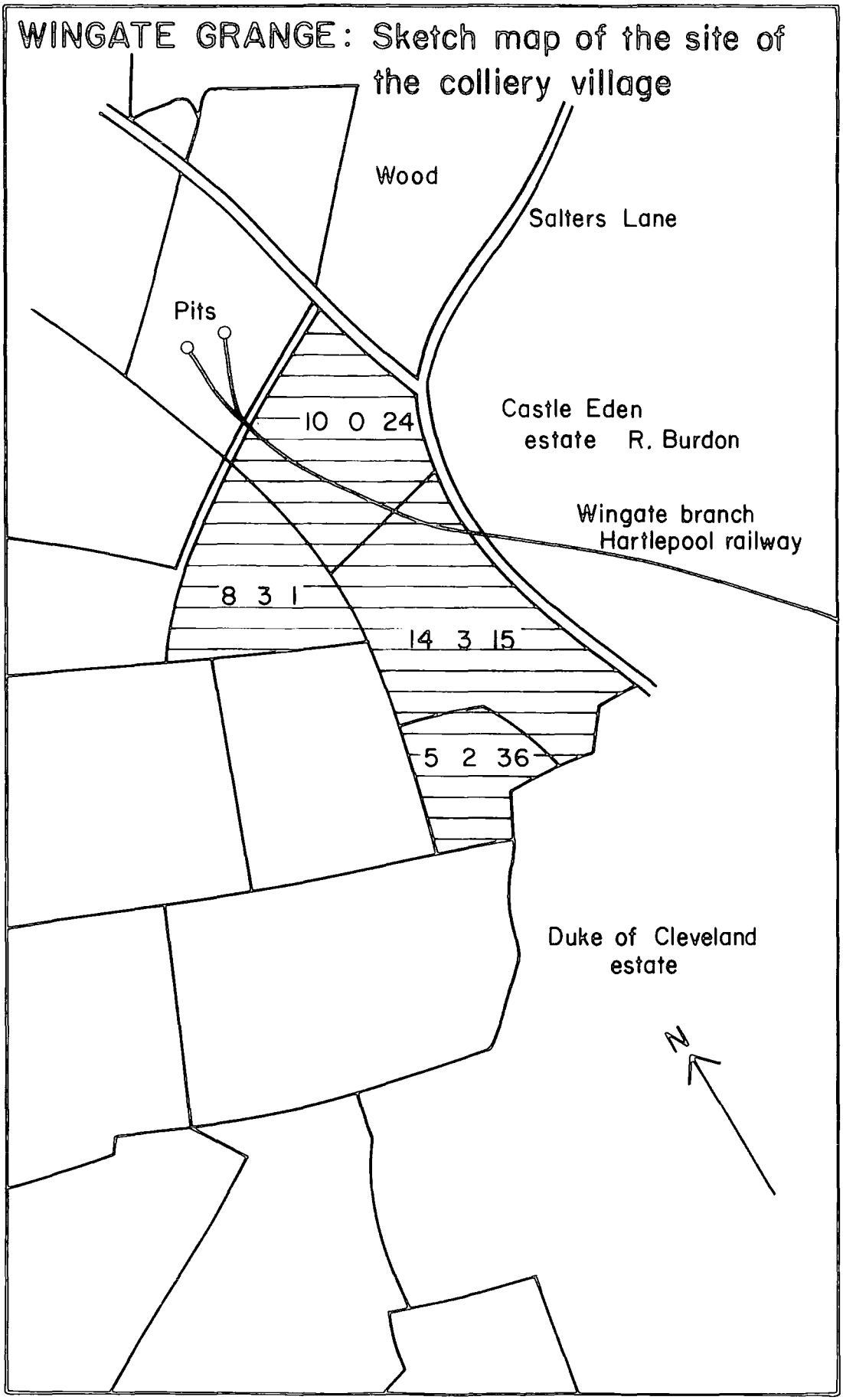

WINGATE GRANGE: Sketch map of the site of the colliery village
Wood
Salters Lane
Pits
10 0 24
Castle Eden estate R. Burdon
Wingate branch Hartlepool railway
8 3 1
14 3 15
5 2 36
Duke of Cleveland estate
N

FIG. 7.1

HETTON-LE-HOLE 1851
BIRTHPLACES OF COAL MINER HEADS OF HOUSEHOLDS.

NOTE: THE SAME SCALE FOR THE BIRTHPLACE NUMBERS HAS BEEN USED IN FIGS. 7.2 to 7.9 . ALSO THE SAME SYMBOLS HAVE BEEN EMPLOYED TO DISTINGUISH THE COAL MINER HEADS OF HOUSEHOLDS FROM THE OTHER HOUSEHOLD HEADS, I.E. COAL MINERS WITH BLANK CIRCLES, OTHERS WITH BLACK CIRCLES.

SOURCE.

CENSUS ENUMERATORS' BOOKS, 1851 HETTON-LE-HOLE, M3/23
D.C.R.O.

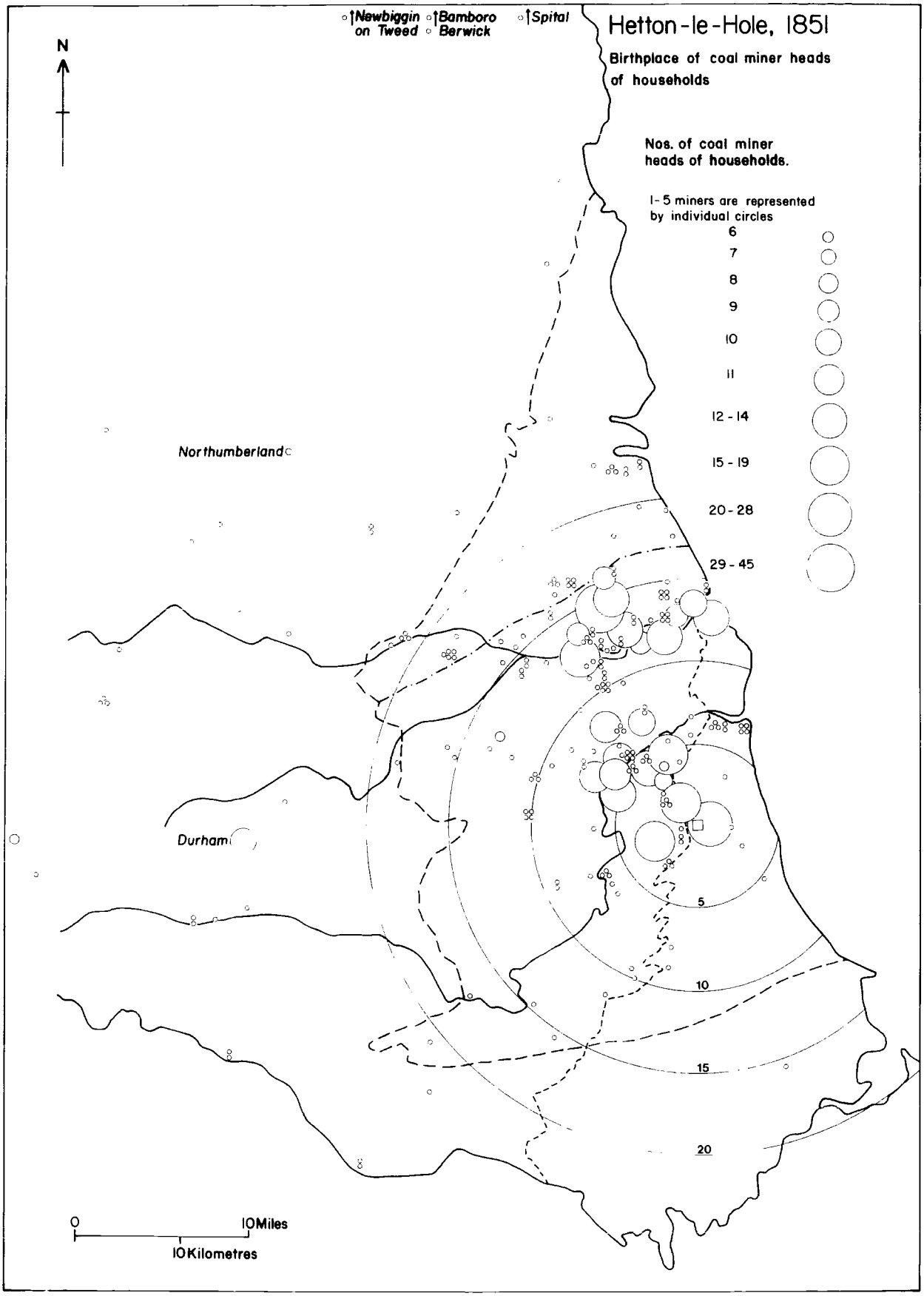

Newbiggin on Tweed
Bamboro Berwick
Spital
Hetton-le-Hole, 1851
Birthplace of coal miner heads of households
N
Nos. of coal miner heads of households.
1-5 miners are represented by individual circles
6
7
8
9
10
11
12 - 14
15 - 19
20 - 28
29 - 45
Northumberland
Durham
5
10
15
20
0
10 Miles
10 Kilometres

FIG. 7.2

HETTON-LE-HOLE 1851

BIRTHPLACES OF NON COAL MINER HEADS OF HOUSEHOLDS

SOURCE.

AS FOR FIG. 7.1

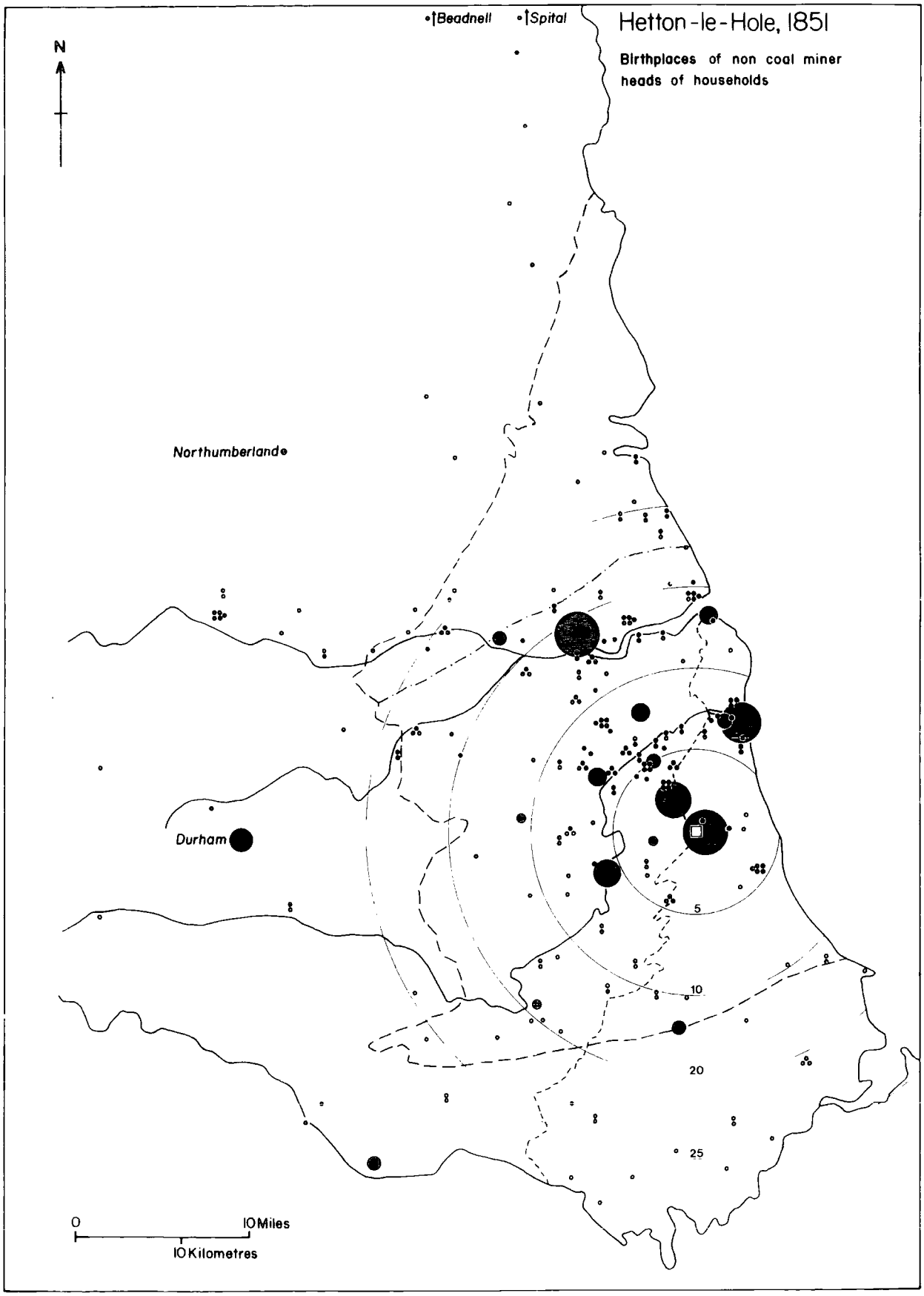

Hetton-le-Hole, 1851
Birthplaces of non coal miner heads of households
N
Beadnell
Spital
Northumberland
Durham
5
10
20
25
0
10 Miles
10 Kilometres

FIG. 7.3

EAST MURTON 1851

BIRTHPLACES OF HEADS OF HOUSEHOLDS.

SOURCE.

CENSUS ENUMERATORS' BOOKS 1851. EAST MURTON M3/21,22
D.C.R.O.

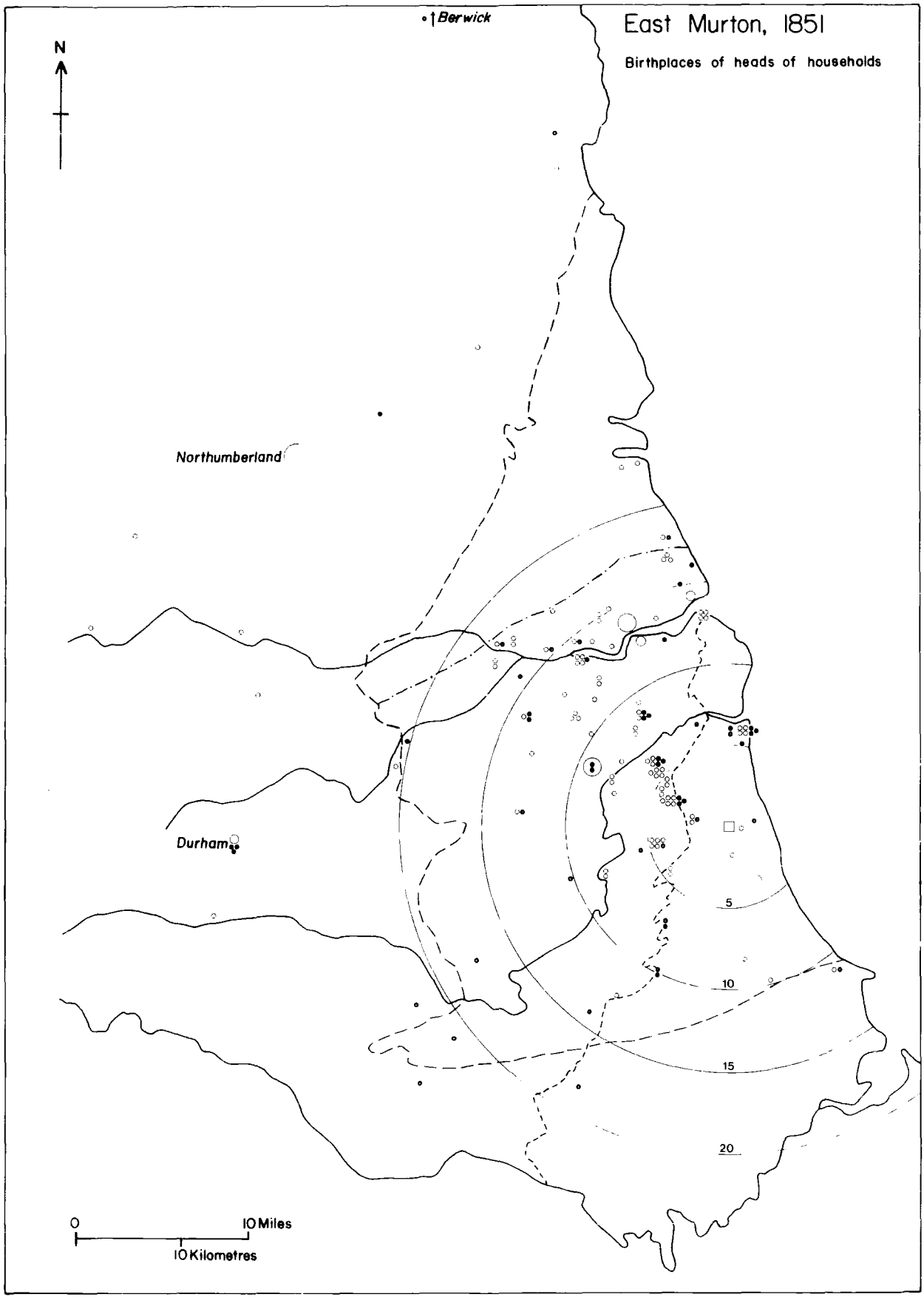

East Murton, 1851
Birthplaces of heads of households
N
Berwick
Northumberland
Durham
5
10
15
20
0
10 Miles
10 Kilometres

FIG. 7.4

SOUTH HETTON 1851

BIRTHPLACES OF HEADS OF HOUSEHOLDS.

SOURCE.

CENSUS ENUMERATORS' BOOKS 1851.

HASWELL TOWNSHIP (INCLUDING SOUTH HETTON), M3/21 D.C.R.O.

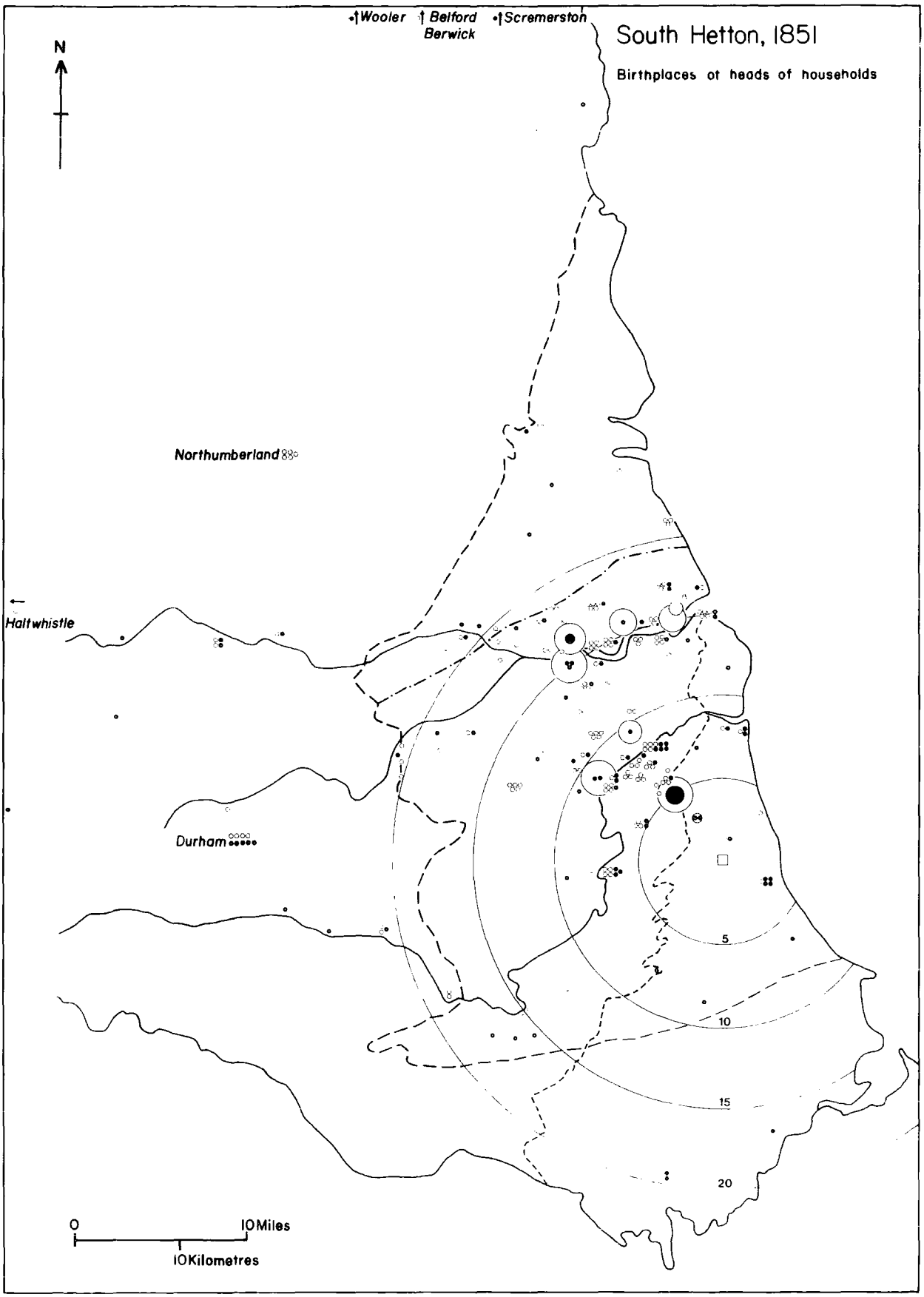

Wooler
Belford
Berwick
Scremerston
South Hetton, 1851
Birthplaces of heads of households
N
Northumberland
Haltwhistle
Durham
5
10
15
20
0
10 Miles
10 Kilometres

FIG. 7.5

SHOTTON 1851.

BIRTHPLACES OF HEADS OF HOUSEHOLDS.

SOURCE.

CENSUS ENUMERATORS' BOOKS 1851. SHOTTON M3/21 D.C.R.O.

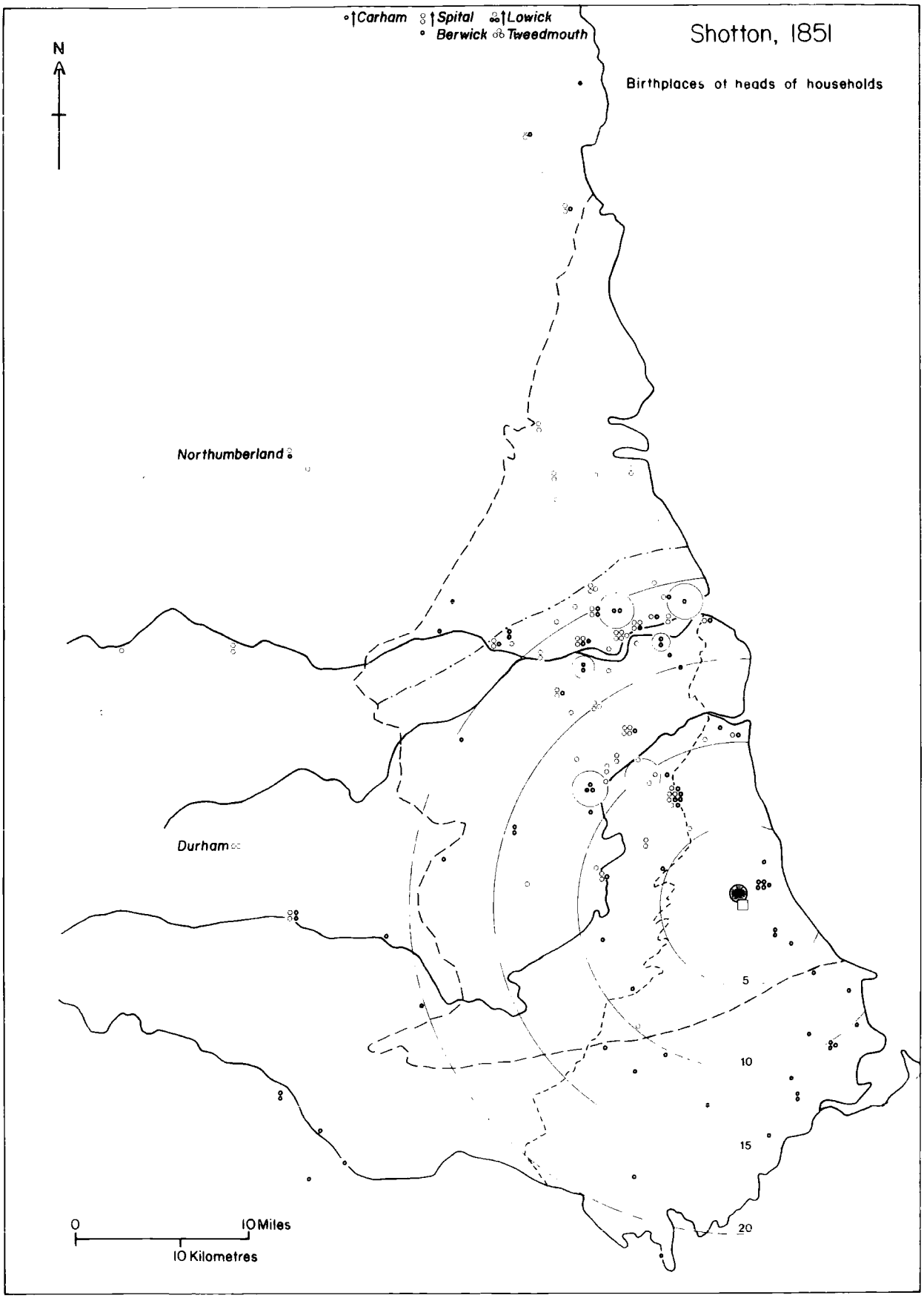

Carham
Spital
Lowick
Berwick
Tweedmouth
Shotton, 1851
Birthplaces of heads of households
N
Northumberland
Durham
5
10
15
20
0
10 Miles
10 Kilometres

FIG. 7.6

THORNLEY 1851.

BIRTHPLACES OF HEADS OF HOUSEHOLDS.

SOURCE.

CENSUS ENUMERATORS' BOOKS 1851 THORNLEY M3/20. D.C.R.O.

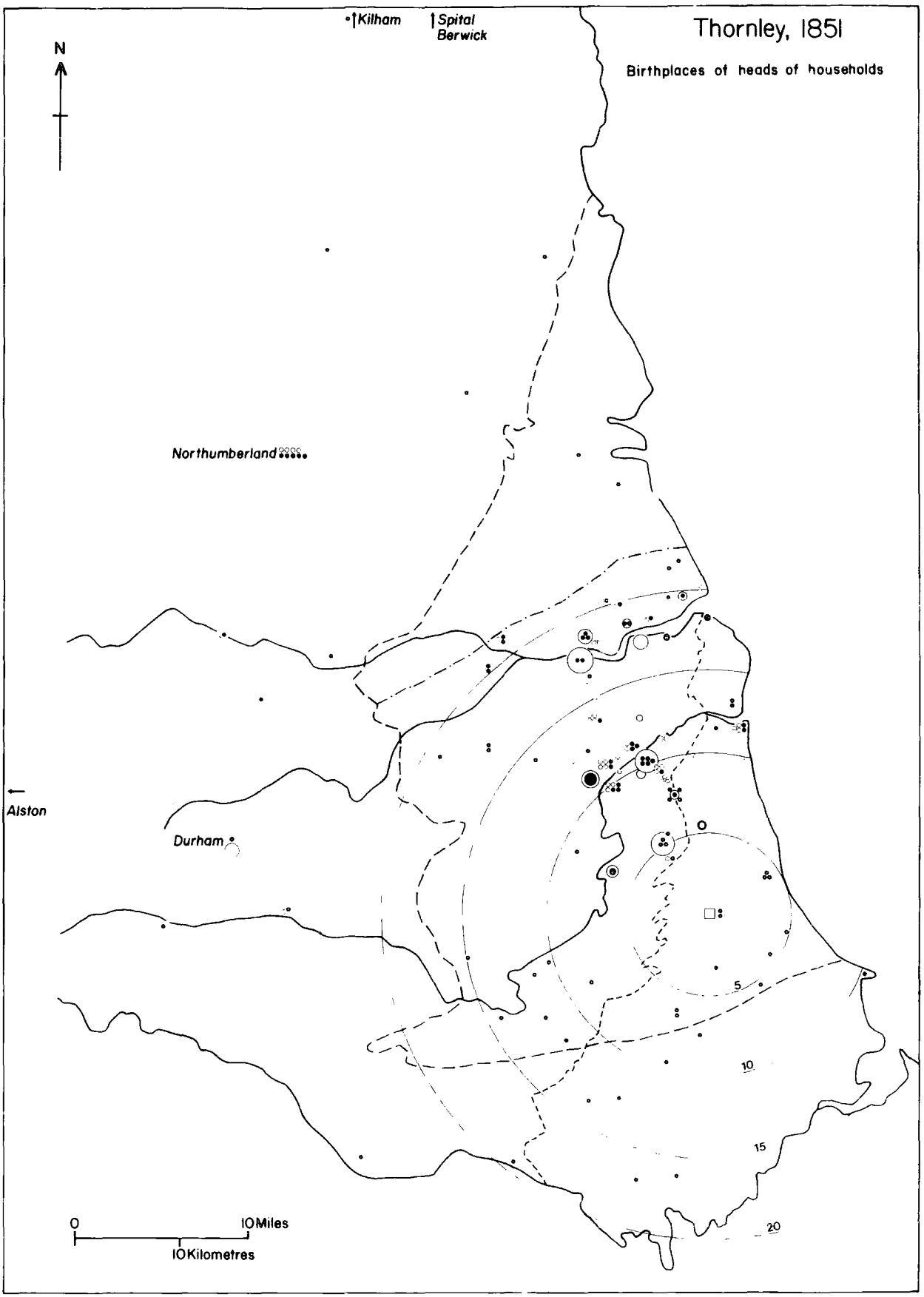

Thornley, 1851
Birthplaces of heads of households
N
Kilham
Spital
Berwick
Northumberland
Alston
Durham
5
10
15
20
0
10 Miles
10 Kilometres

FIG. 7.7

QUARRINGTON 1851.

BIRTHPLACES OF HEADS OF HOUSEHOLD.

SOURCE.

CENSUS ENUMERATORS' BOOKS 1851. QUARRINGTON M3/19 D.C.R.O.

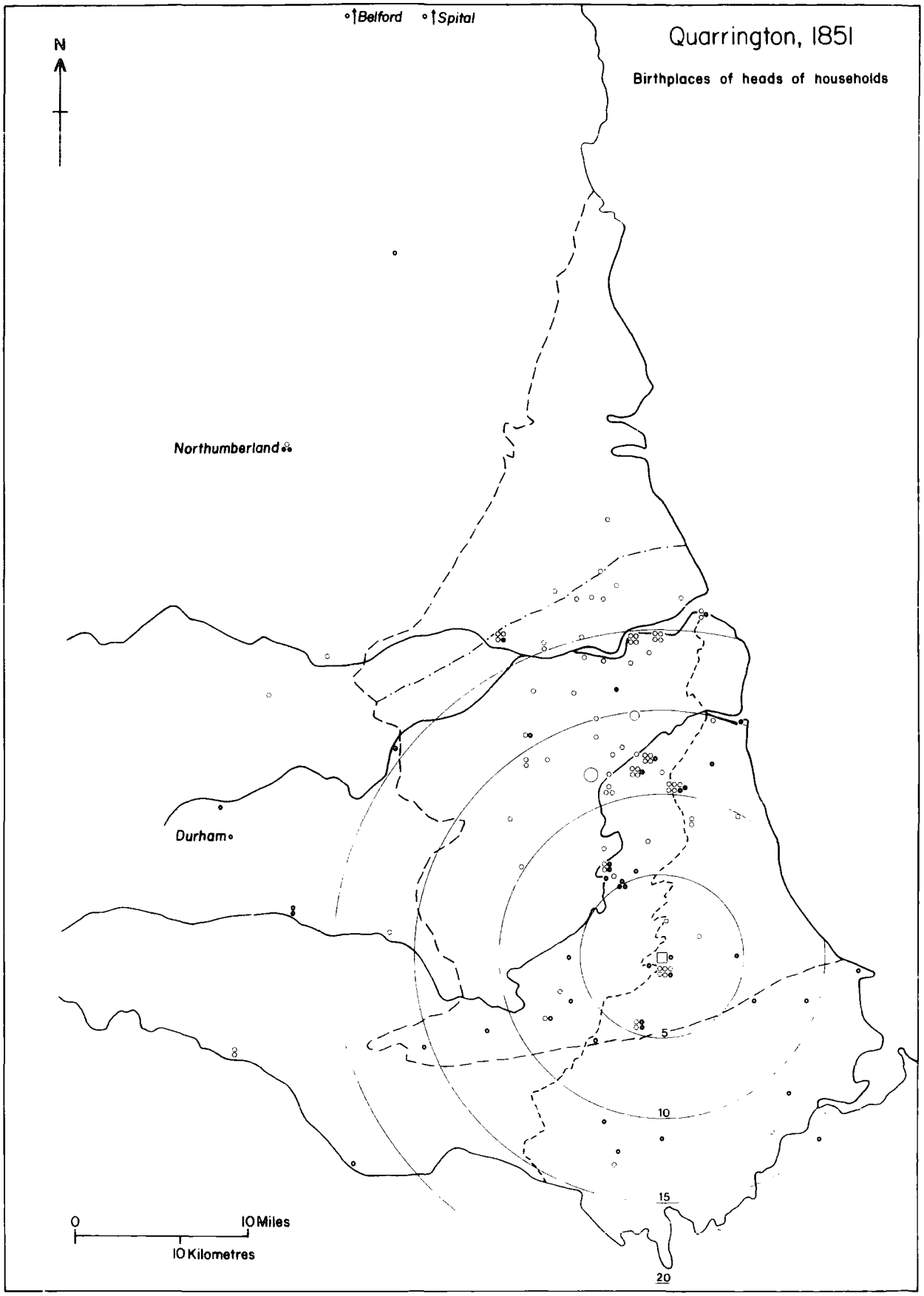

Belford
Spital
Quarrington, 1851
Birthplaces of heads of households
N
Northumberland
Durham
5
10
15
20
0
10 Miles
10 Kilometres

FIG. 7.8

HUTTON HENRY 1851
BIRTHPLACES OF HEADS OF HOUSEHOLDS.

SOURCE.

CENSUS ENUMERATORS' BOOKS 1851 HUTTON HENRY M3/21 D.C.R.O.

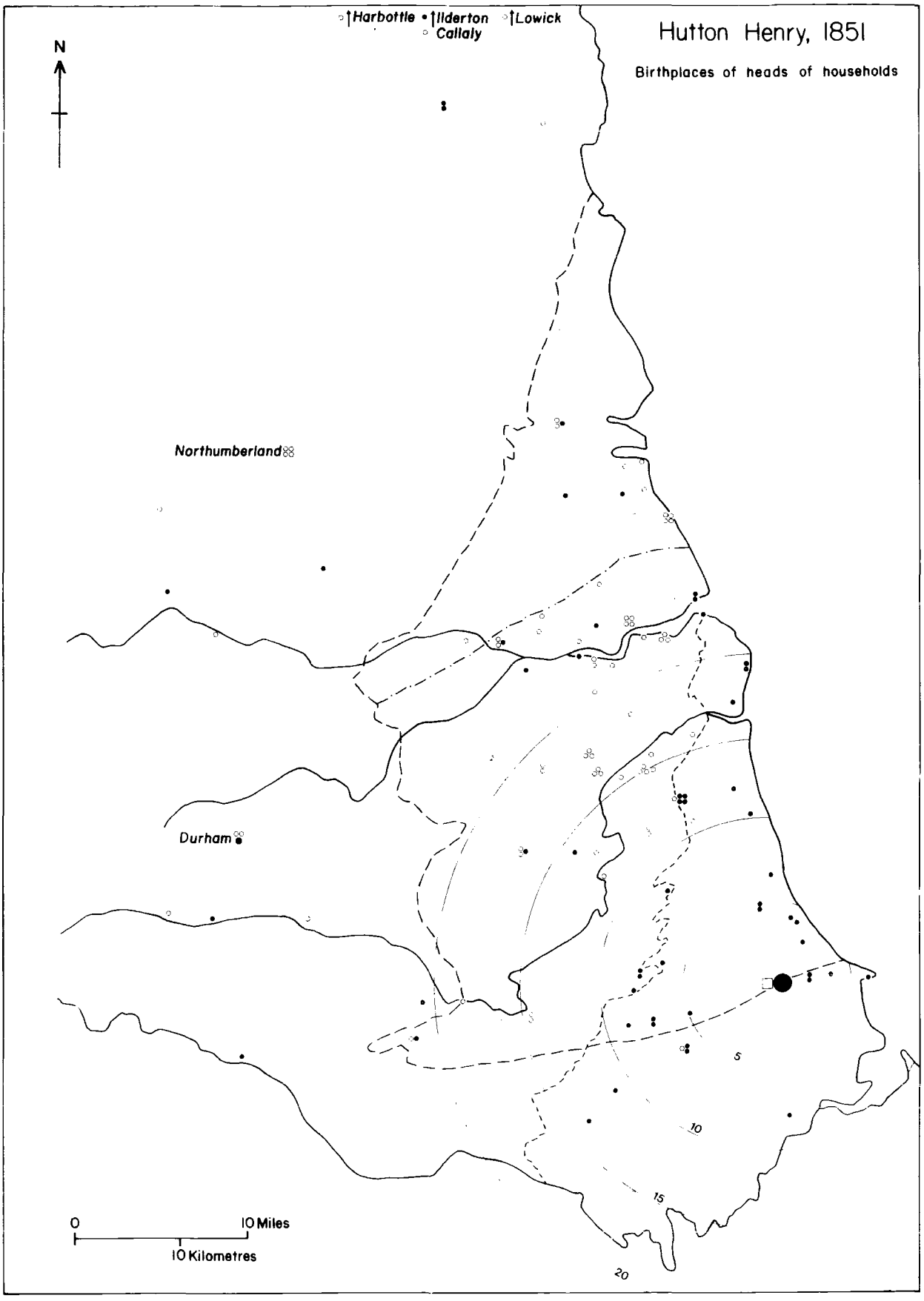

Harbottle
Ilderton
Callaly
Lowick
Hutton Henry, 1851
Birthplaces of heads of households
N
Northumberland
Durham
5
10
15
20
0
10 Miles
10 Kilometres

FIG. 7.9

TRIMDON 1851

BIRTHPLACES OF HEADS OF HOUSEHOLDS.

SOURCE.

CENSUS ENUMERATORS' BOOKS 1851 TRIMDON M3/8 D.C.R.O.

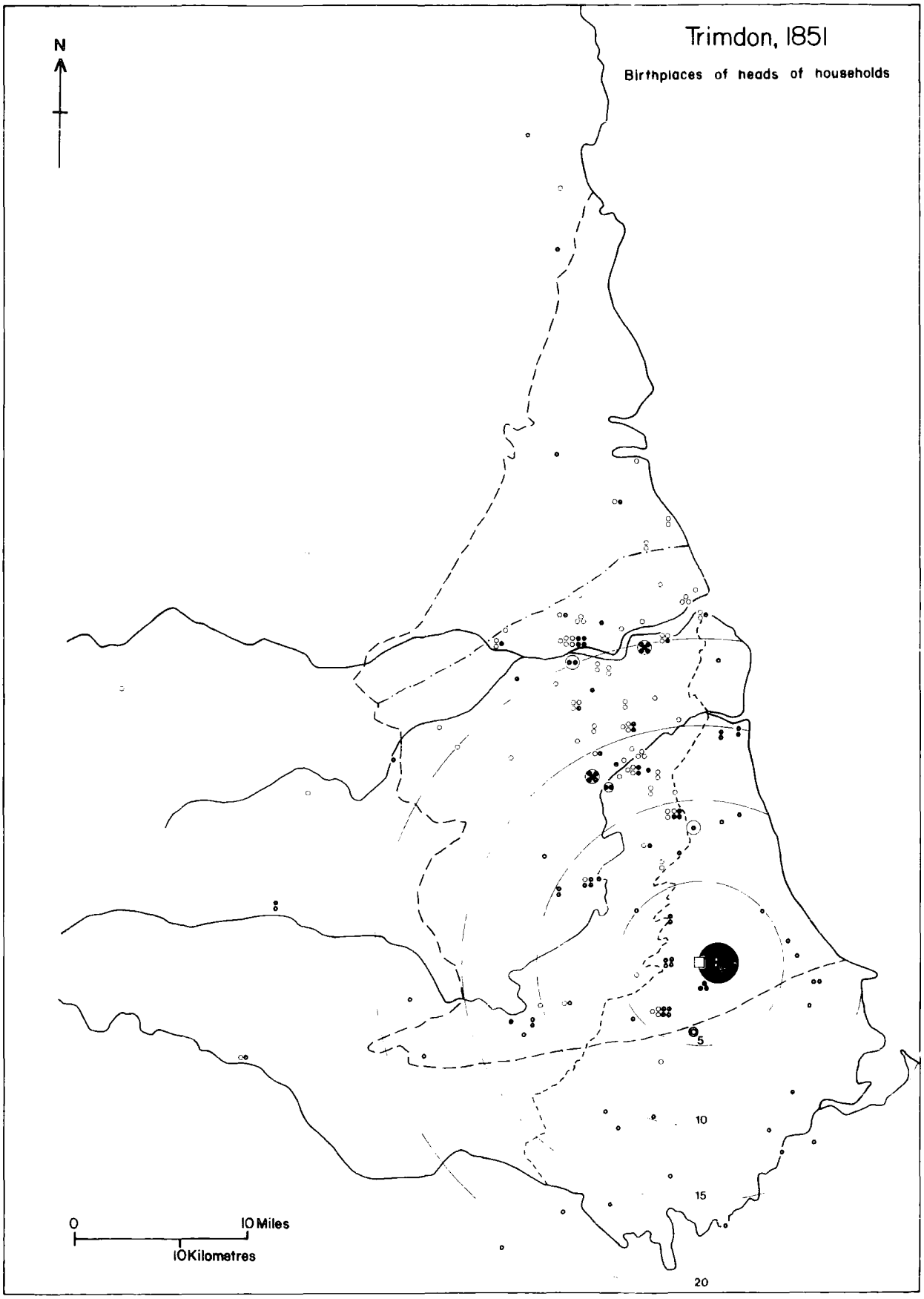

Trimdon, 1851
Birthplaces of heads of households
N
0
10 Miles
10 Kilometres
5
10
15
20

FIG. 7.10

HETTON-LE-HOLE 1851

BIRTHPLACES OF THE CHILDREN OF THE COAL MINERS.

SOURCE.

CENSUS ENUMERATORS' BOOKS 1851 HETTON M3/23 D.C.R.O.

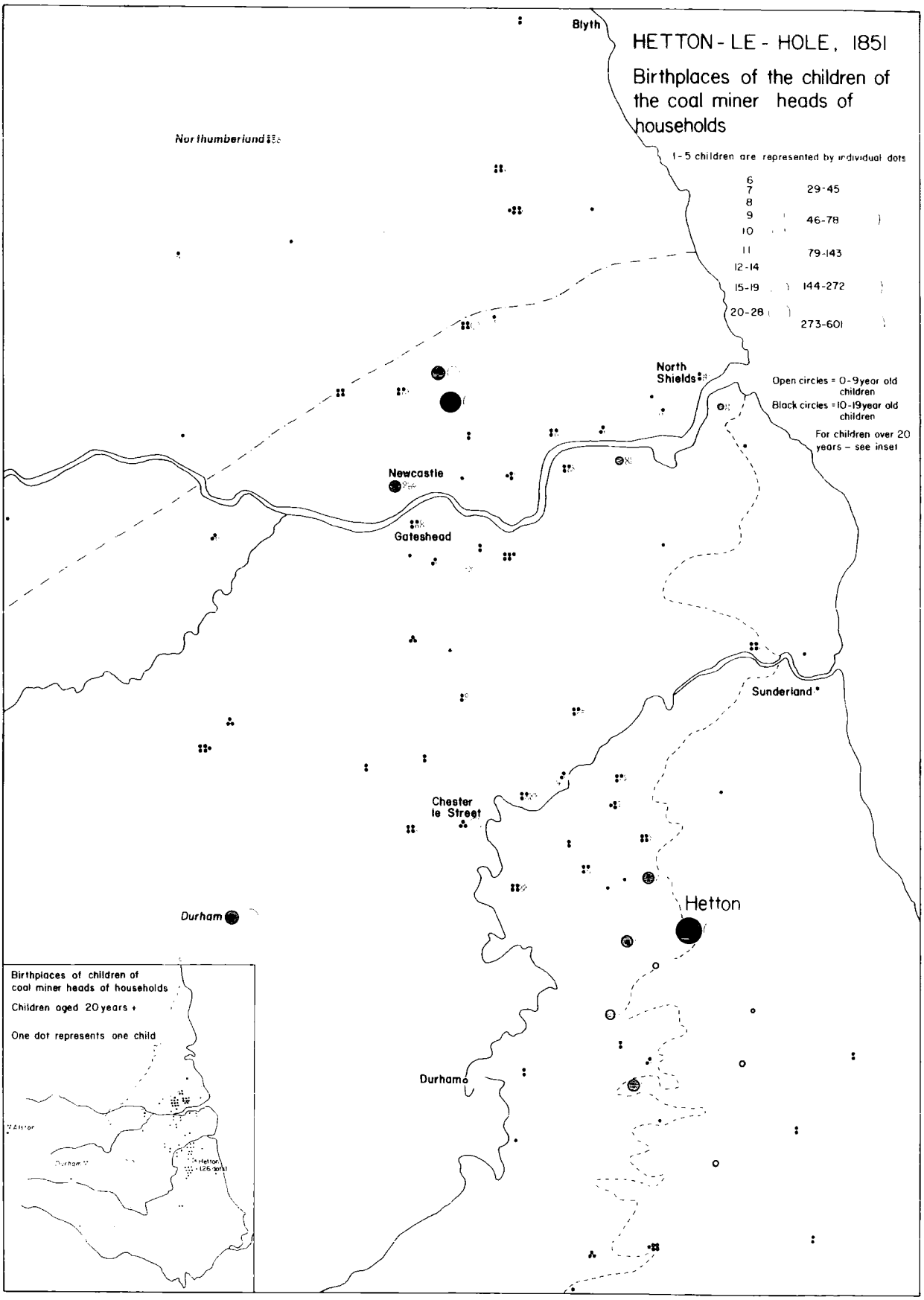

HETTON-LE-HOLE, 1851
Birthplaces of the children of the coal miner heads of households
1-5 children are represented by individual dots
6
7
8
9
10
11
12-14
15-19
20-28
29-45
46-78
79-143
144-272
273-601
Open circles = 0-9year old children
Black circles = 10-19year old children
For children over 20 years – see inset
Blyth
Northumberland
North Shields
Newcastle
Gateshead
Sunderland
Chester le Street
Hetton
Durham
Durham
Birthplaces of children of coal miner heads of households
Children aged 20 years +
One dot represents one child

FIG. 7.11

EAST MURTON 1851

BIRTHPLACES OF THE CHILDREN OF THE COAL MINERS

SOURCE.

CENSUS ENUMERATORS' BOOKS 1851 EAST MURTON M3/21,22 D.C.R.O

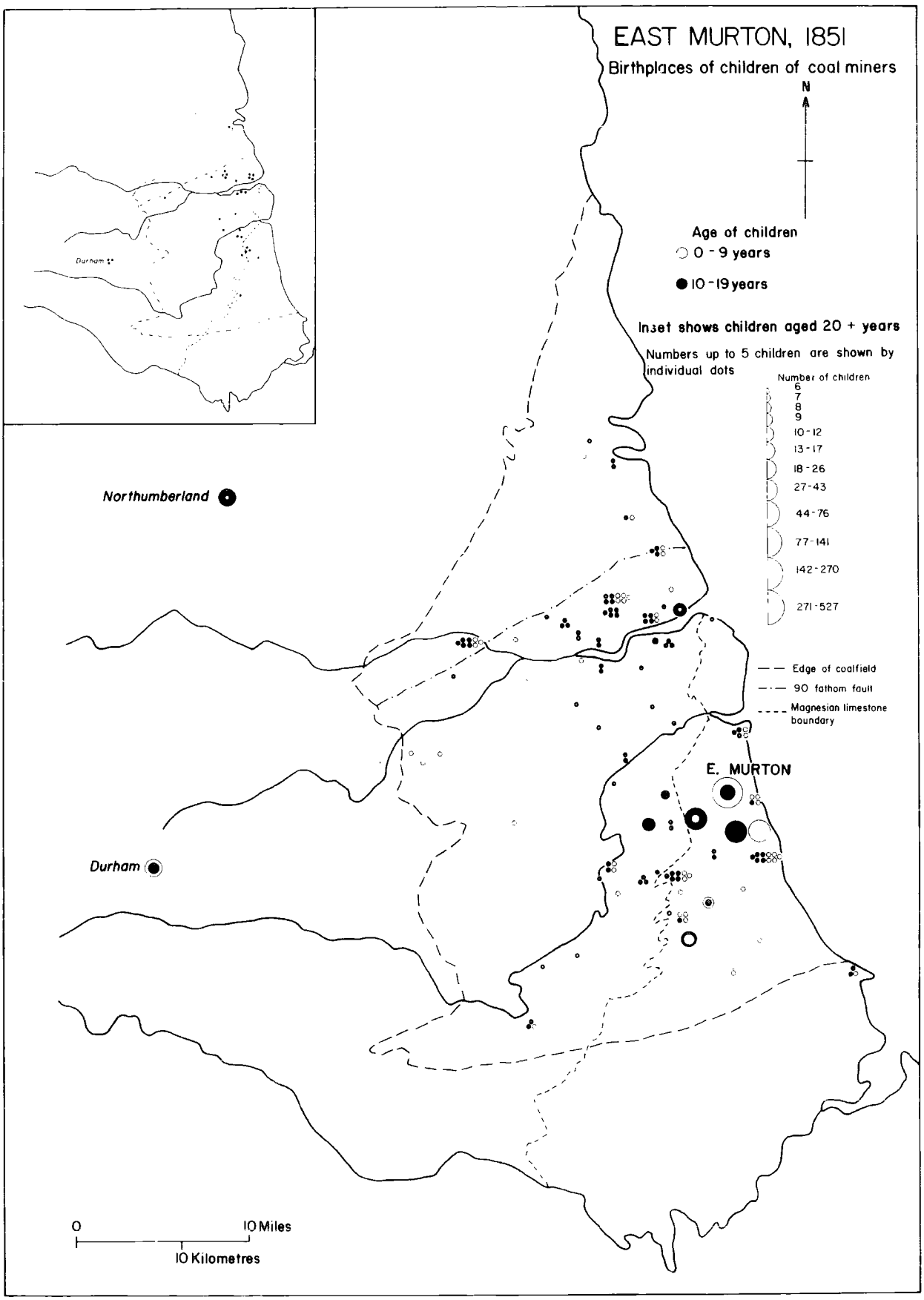

EAST MURTON, 1851
Birthplaces of children of coal miners
N
Age of children
0 - 9 years
10 - 19 years
Inset shows children aged 20 + years
Numbers up to 5 children are shown by individual dots
Number of children
6
7
8
9
10 - 12
13 - 17
18 - 26
27 - 43
44 - 76
77 - 141
142 - 270
271 - 527
Edge of coalfield
90 fathom fault
Magnesian limestone boundary
Northumberland
Durham
E. MURTON
0
10 Miles
10 Kilometres

FIG. 7.12

SOUTH HETTON 1851

BIRTHPLACES OF THE CHILDREN OF THE COAL MINERS

SOURCE.

CENSUS ENUMERATORS' BOOKS 1851 HASWELL M3/21. D.C.R.O.

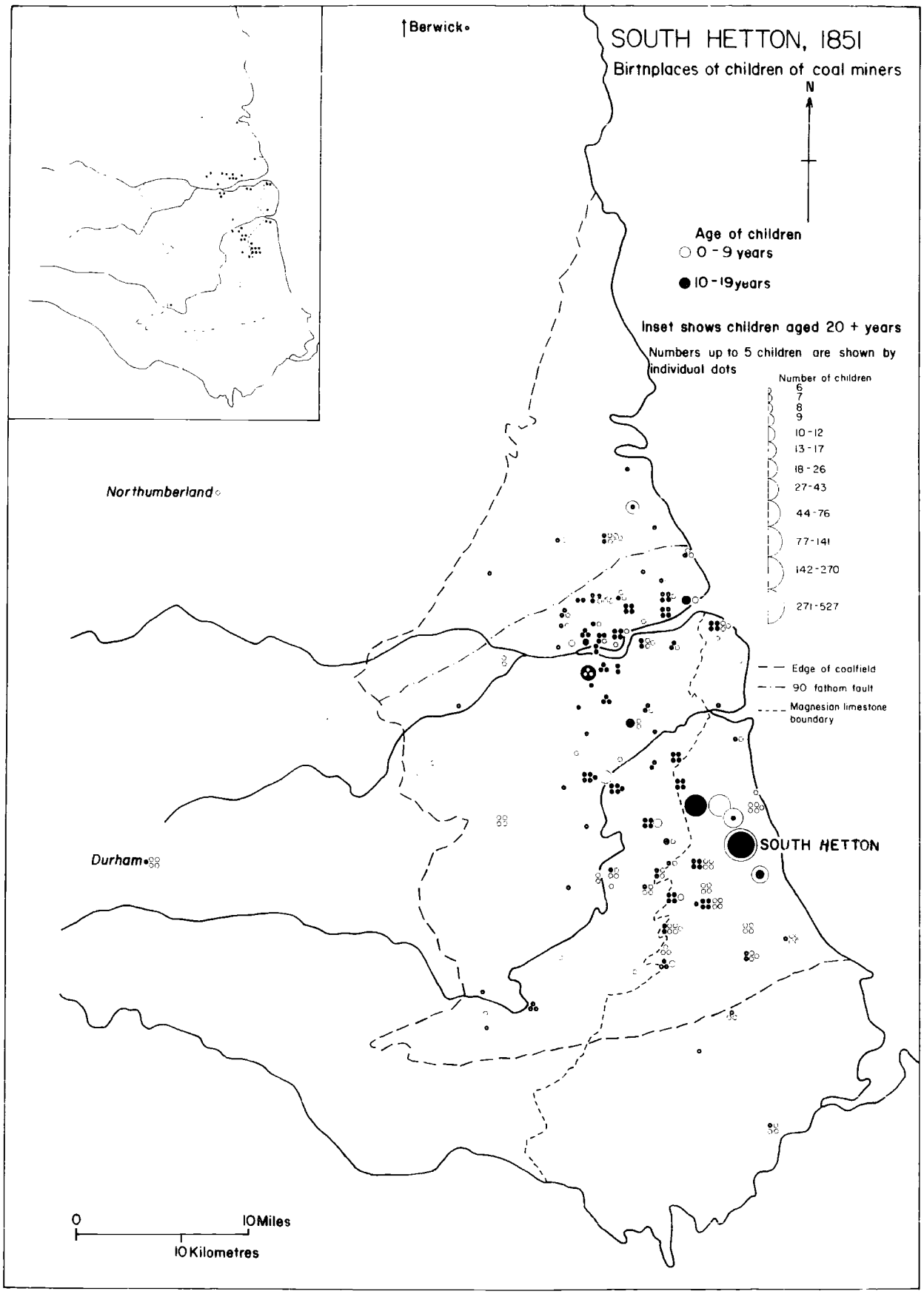

Berwick
SOUTH HETTON, 1851
Birthplaces of children of coal miners
N
Age of children
0 - 9 years
10 - 19 years
Inset shows children aged 20 + years
Numbers up to 5 children are shown by individual dots
Number of children
6
7
8
9
10 - 12
13 - 17
18 - 26
27 - 43
44 - 76
77 - 141
142 - 270
271 - 527
Edge of coalfield
90 fathom fault
Magnesian limestone boundary
Northumberland
Durham
SOUTH HETTON
0
10 Miles
10 Kilometres

FIG. 7.13

SHOTTON 1851

BIRTHPLACES OF THE CHILDREN OF THE COAL MINERS

SOURCE.

CENSUS ENUMERATORS' BOOKS 1851 SHOTTON M3/21 D.C.R.O.

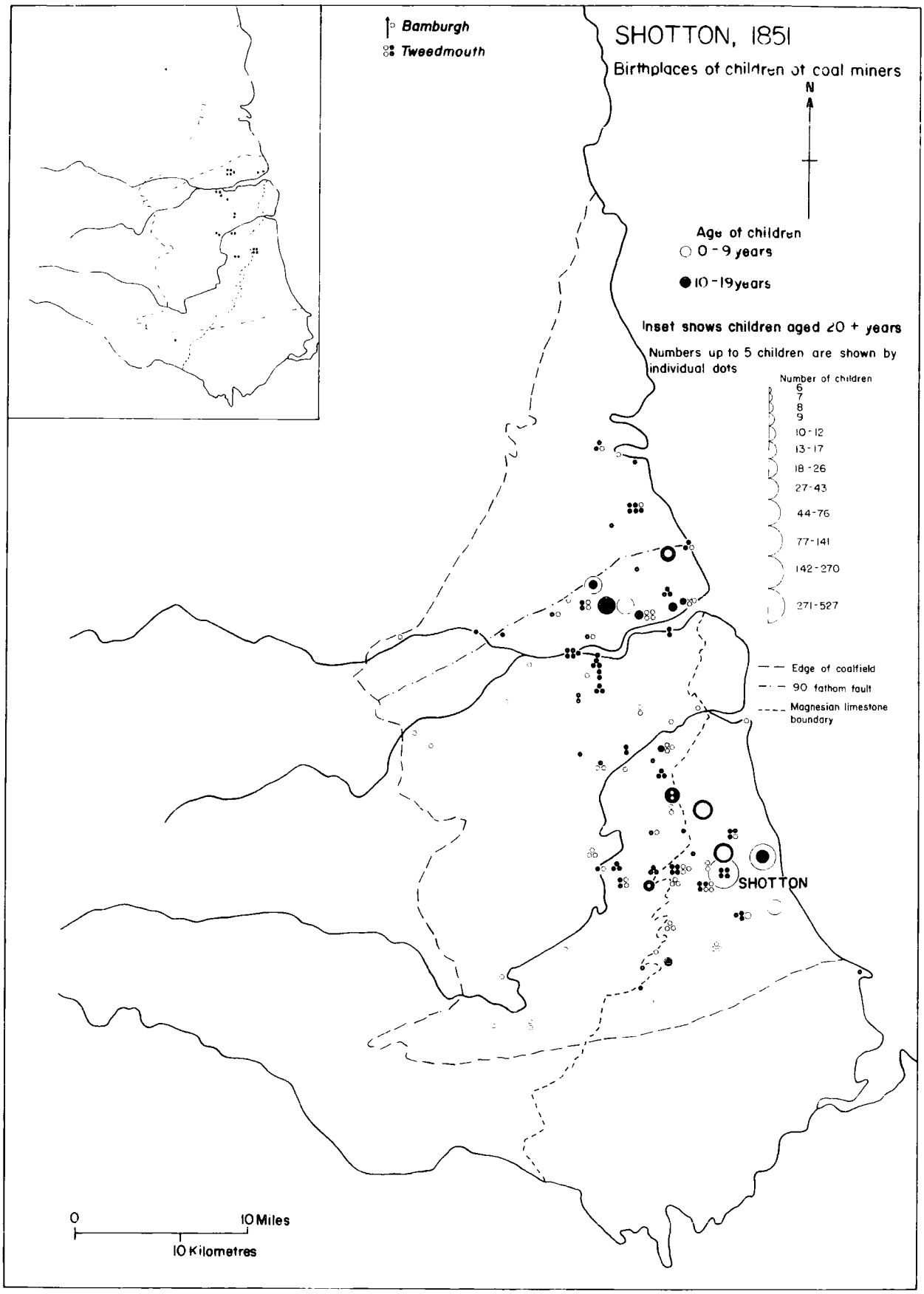

Bamburgh
Tweedmouth
SHOTTON, 1851
Birthplaces of children of coal miners
N
Age of children
○ 0 - 9 years
● 10 - 19 years
Inset shows children aged 20 + years
Numbers up to 5 children are shown by individual dots
Number of children
6
7
8
9
10 - 12
13 - 17
18 - 26
27 - 43
44 - 76
77 - 141
142 - 270
271 - 527
Edge of coalfield
90 fathom fault
Magnesian limestone boundary
SHOTTON
0
10 Miles
10 Kilometres

FIG. 7.14

THORNLEY 1851

BIRTHPLACES OF THE CHILDREN OF THE COAL MINERS

SOURCE.

CENSUS ENUMERATORS' BOOKS, 1851 THORNLEY M3/20 D.C.R.O.

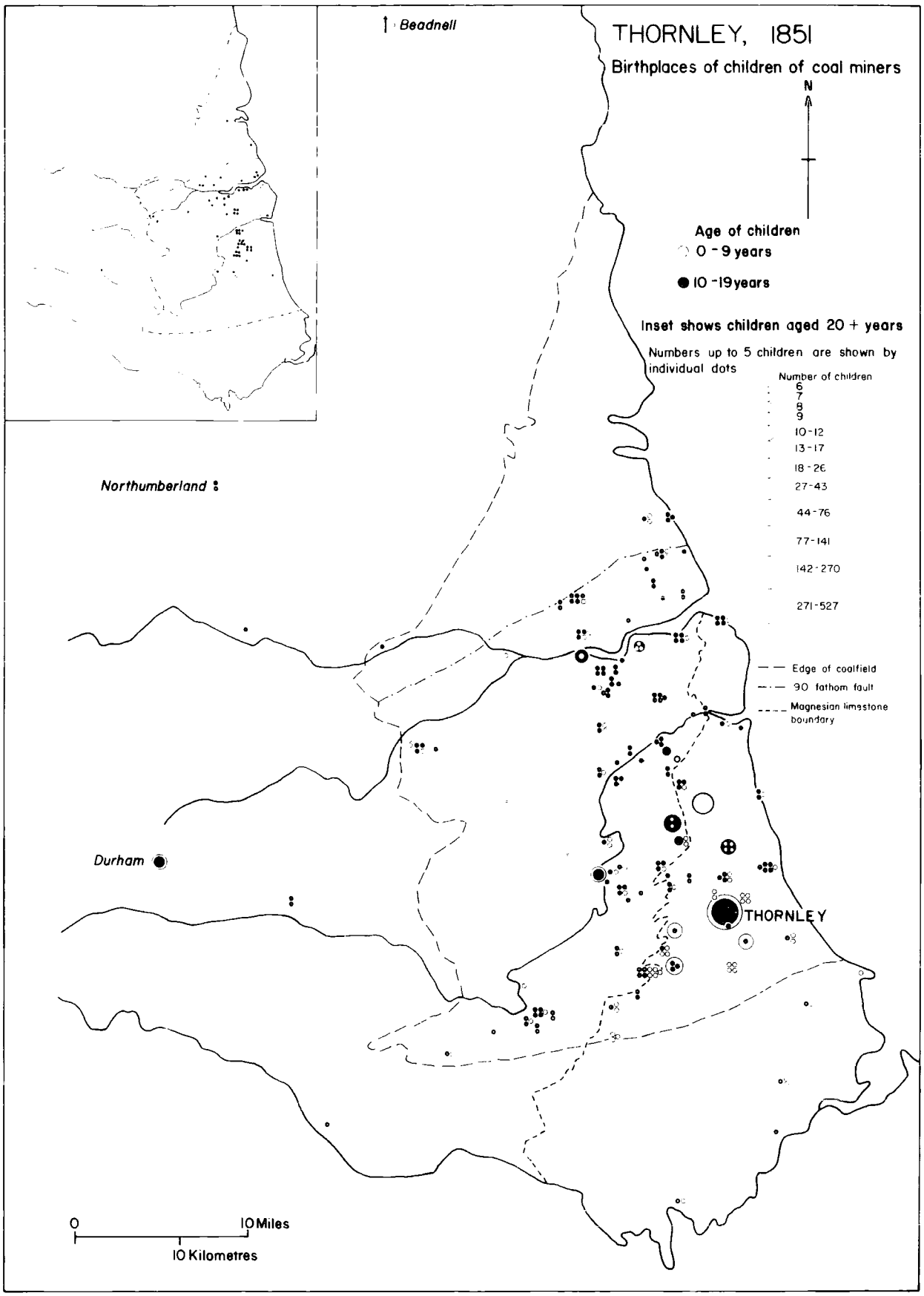

Beadnell
THORNLEY, 1851
Birthplaces of children of coal miners
N
Age of children
0 - 9 years
10 - 19 years
Inset shows children aged 20 + years
Numbers up to 5 children are shown by individual dots
Number of children
6
7
8
9
10-12
13-17
18-26
27-43
44-76
77-141
142-270
271-527
Edge of coalfield
90 fathom fault
Magnesian limestone boundary
Northumberland
Durham
THORNLEY
0
10 Miles
10 Kilometres

FIG. 7.15

QUARRINGTON 1851

BIRTHPLACES OF THE CHILDREN OF THE COAL MINERS

SOURCE

CENSUS ENUMERATORS' BOOKS 1851 QUARRINGTON M3/19 D.C.R.O.

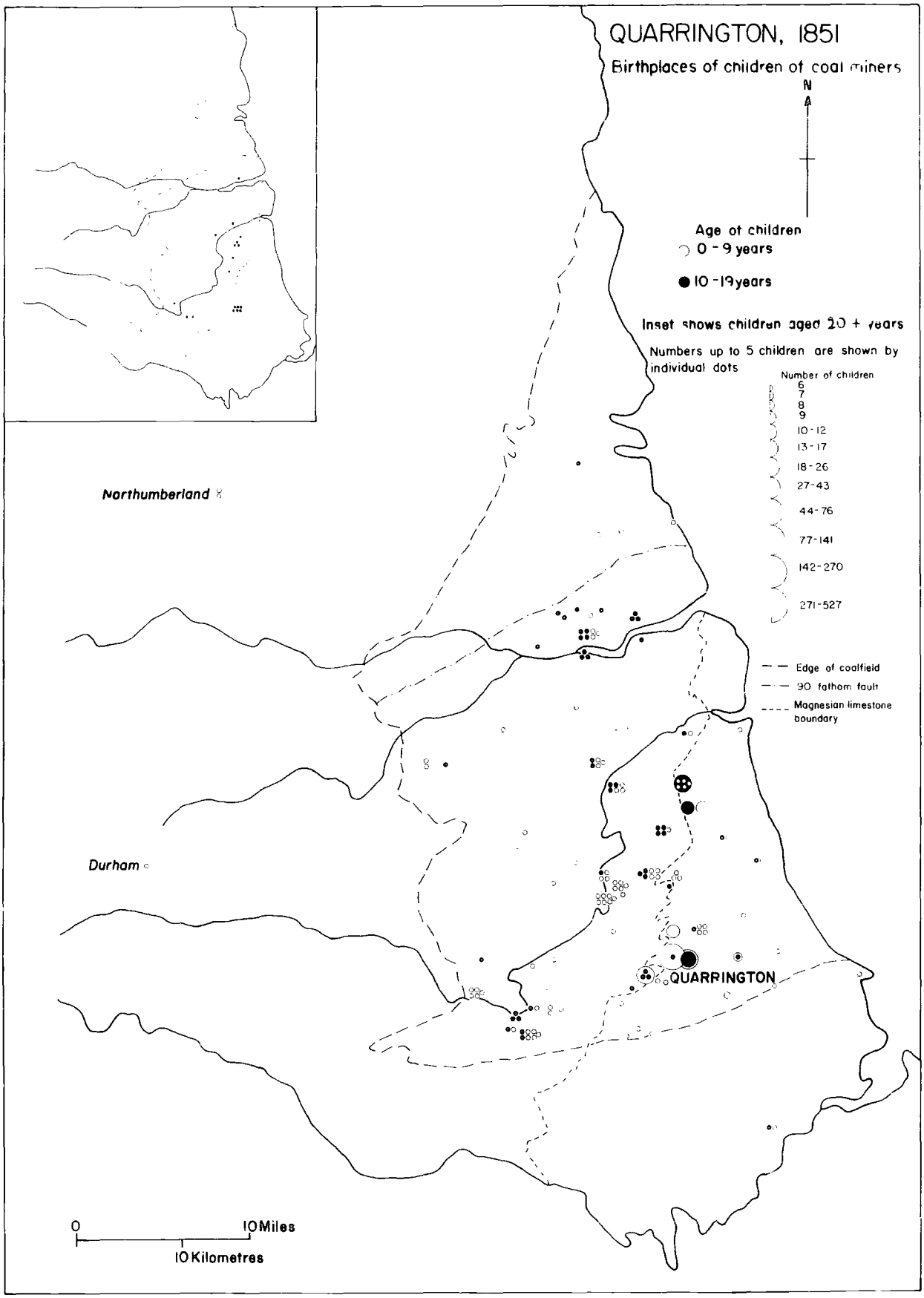

QUARRINGTON, 1851
Birthplaces of children of coal miners
N
Age of children
0 - 9 years
10 - 19 years
Inset shows children aged 20 + years
Numbers up to 5 children are shown by individual dots
Number of children
6
7
8
9
10 - 12
13 - 17
18 - 26
27 - 43
44 - 76
77 - 141
142 - 270
271 - 527
Edge of coalfield
90 fathom fault
Magnesian limestone boundary
Northumberland
Durham
QUARRINGTON
0
10 Miles
10 Kilometres

FIG. 7.16

HUTTON HENRY 1851

BIRTHPLACES OF THE CHILDREN OF THE COAL MINERS

SOURCE.

CENSUS ENUMERATORS' BOOKS 1851 HUTTON HENRY M3/21 D.C.R.O.

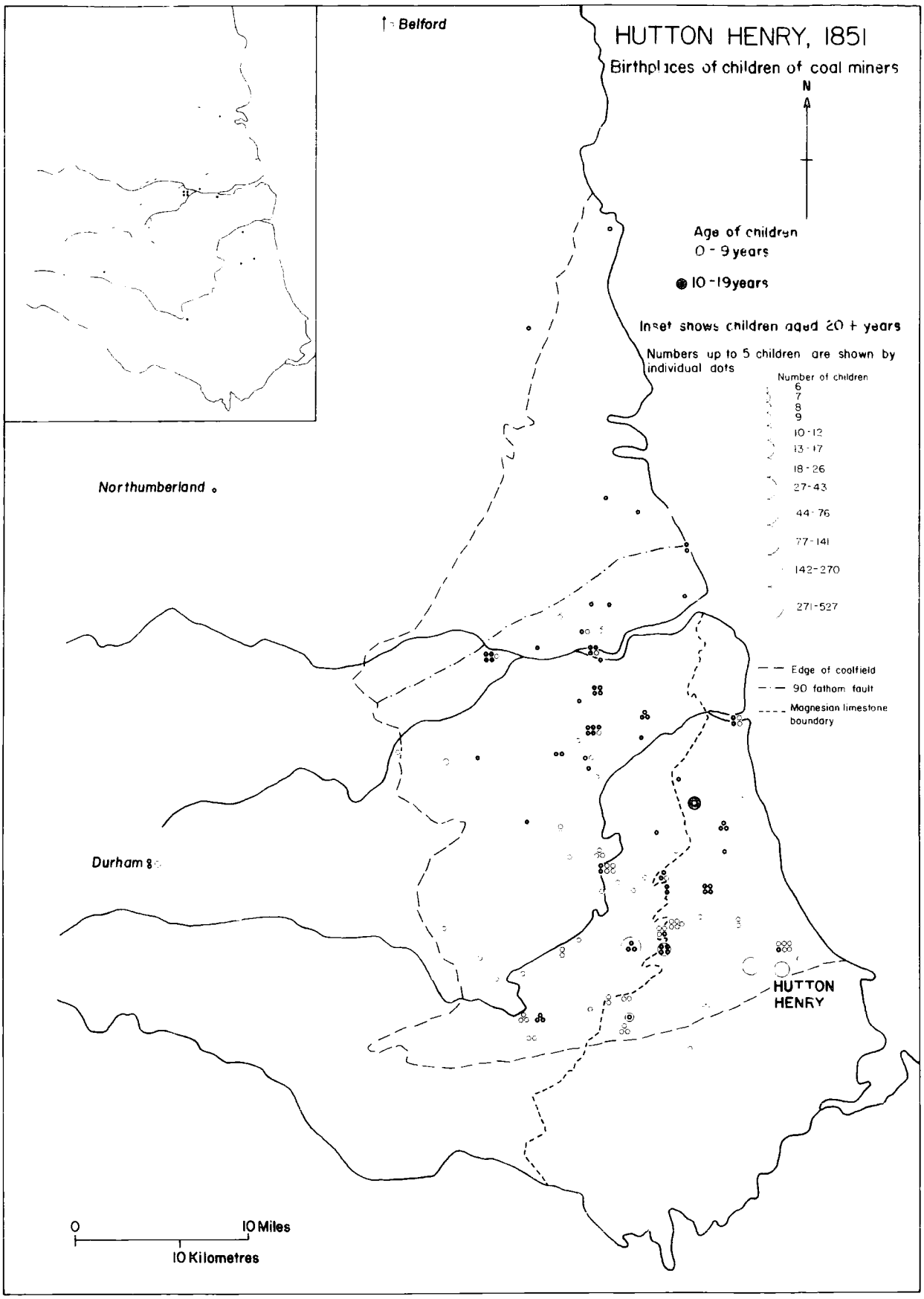

Belford
HUTTON HENRY, 1851
Birthplaces of children of coal miners
N
Age of children
0 - 9 years
10 - 19 years
Inset shows children aged 20 + years
Numbers up to 5 children are shown by individual dots
Number of children
6
7
8
9
10 - 12
13 - 17
18 - 26
27 - 43
44 - 76
77 - 141
142 - 270
271 - 527
Edge of coalfield
90 fathom fault
Magnesian limestone boundary
Northumberland
Durham
HUTTON HENRY
0
10 Miles
10 Kilometres

FIG. 7.17

TRIMDON 1851

BIRTHPLACES OF THE CHILDREN OF THE COAL MINERS

SOURCE.

CENSUS ENUMERATORS' BOOKS 1851 TRIMDON M3/8 D.C.R.O.

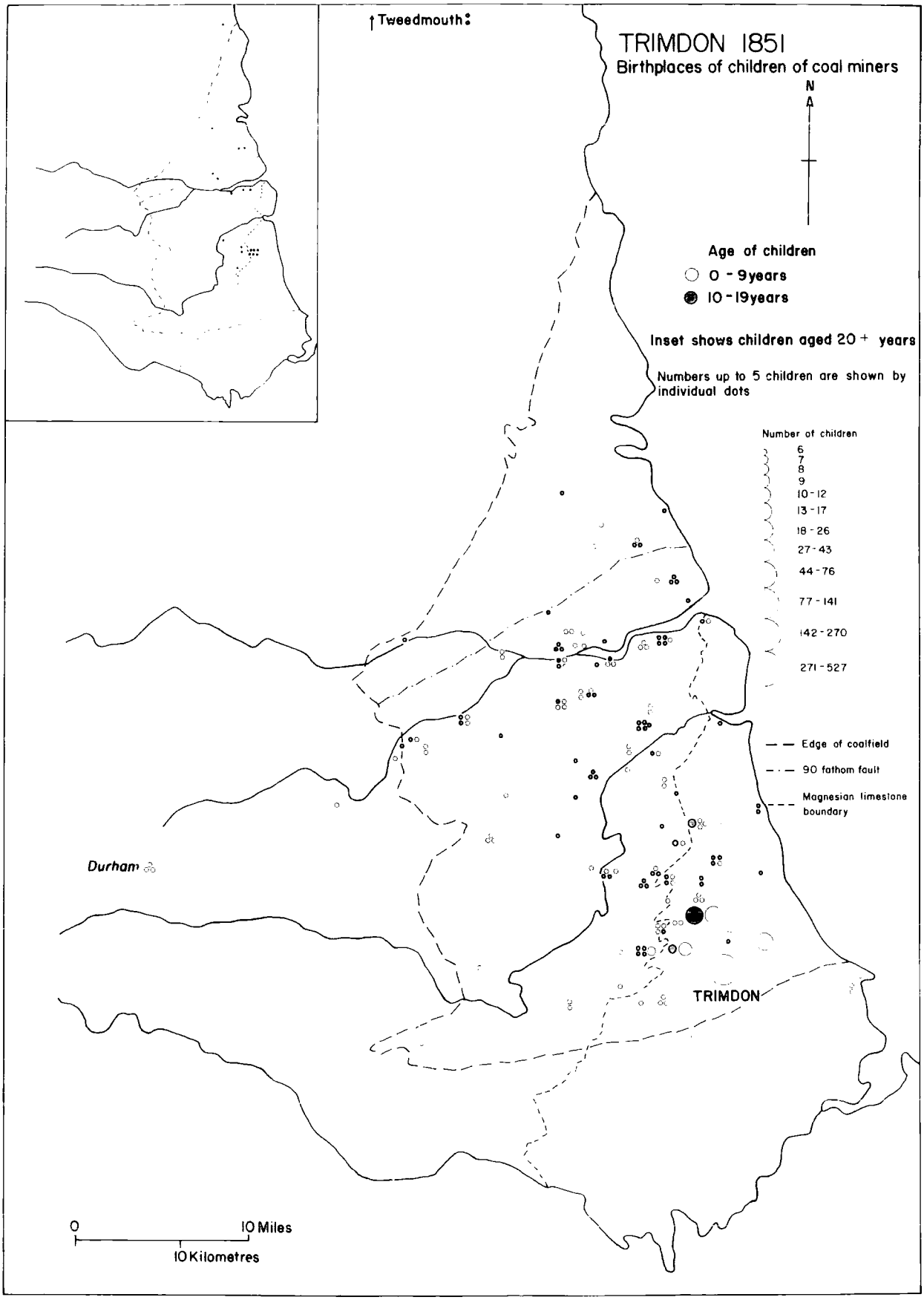

Tweedmouth
TRIMDON 1851
Birthplaces of children of coal miners
N
Age of children
0 - 9years
10 - 19years
Inset shows children aged 20 + years
Numbers up to 5 children are shown by individual dots
Number of children
6
7
8
9
10 - 12
13 - 17
18 - 26
27 - 43
44 - 76
77 - 141
142 - 270
271 - 527
Edge of coalfield
90 fathom fault
Magnesian limestone boundary
Durham
TRIMDON
0
10 Miles
10 Kilometres

FIG. 7.18

EAST MURTON 1851
MIGRATION TRACES

SOURCE.

CENSUS ENUMERATORS' BOOKS 1851 EAST MURTON M3/21,22 D.C.R.C

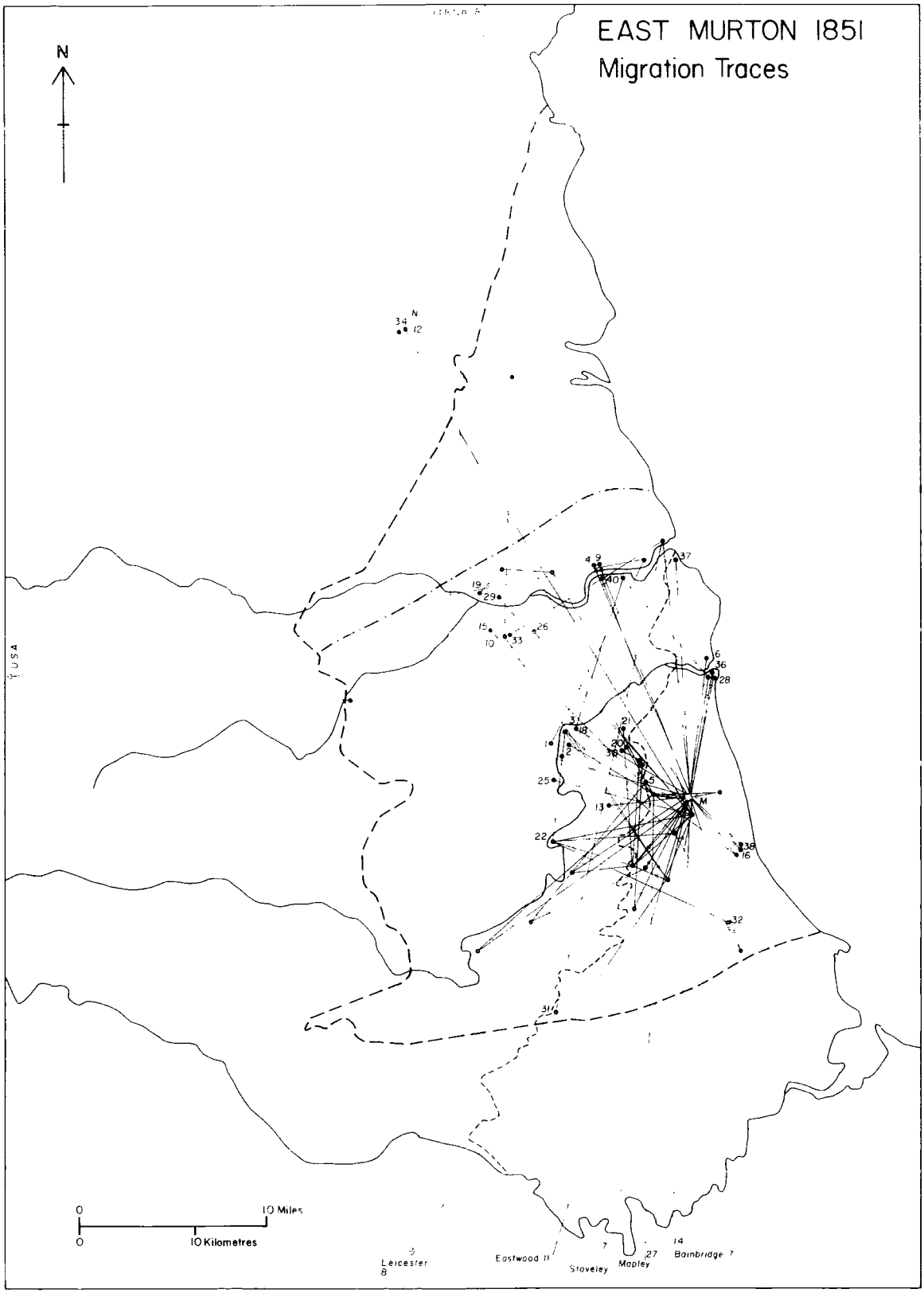

EAST MURTON 1851
Migration Traces
N
0
10 Miles
0
10 Kilometres
Leicester
8
Eastwood 11
Stoveley
7
Mapley
27
14
Bainbridge 7

FIG. 7.19

SHOTTON COLLIERY 1851
MIGRATION TRACES.

THE DOT FOR COAL MINER NO.28 HAS BEEN SHOWN ON THE MAP AT SOME DISTANCE FROM THE TRUE BIRTHPLACE BECAUSE OF THE DENSITY OF LINE.

SOURCE.

CENSUS ENUMERATORS' BOOKS 1851 SHOTTON M3/21 D.C.R.O.

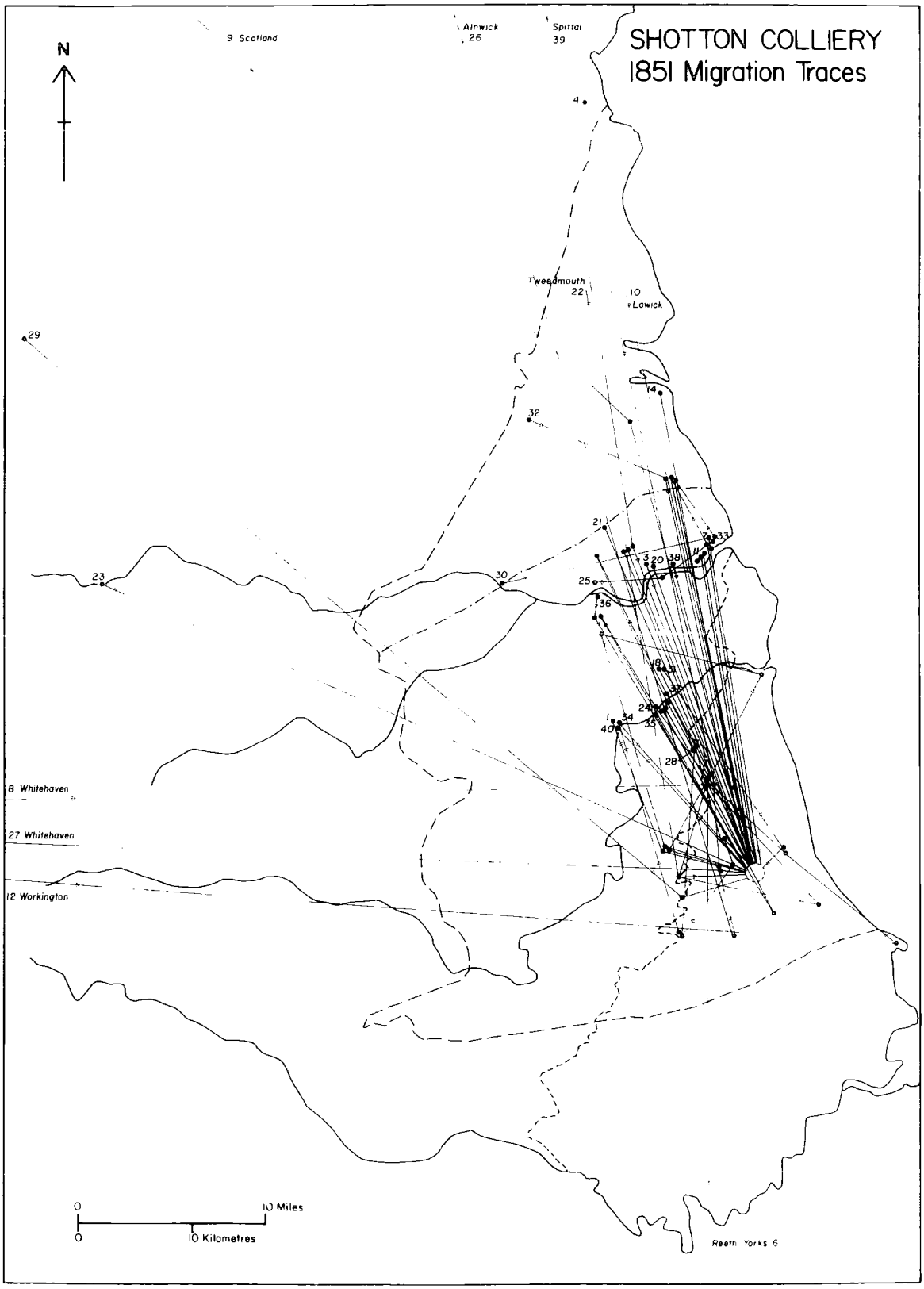

SHOTTON COLLIERY
1851 Migration Traces
N
9 Scotland
Alnwick
26
Spittal
39
4
Tweedmouth
22
10
Lowick
29
32
14
21
33
3
20
38
11
23
30
25
36
18
31
35
24
1
34
40
35
28
8 Whitehaven
27 Whitehaven
12 Workington
0
10 Miles
0
10 Kilometres
Reeth Yorks 6

FIG. 7.20

TRIMDON 1851

MIGRATION TRACES

SOURCE.

CENSUS ENUMERATORS' BOOKS 1851 TRIMDON M3/8 D.C.R.O.

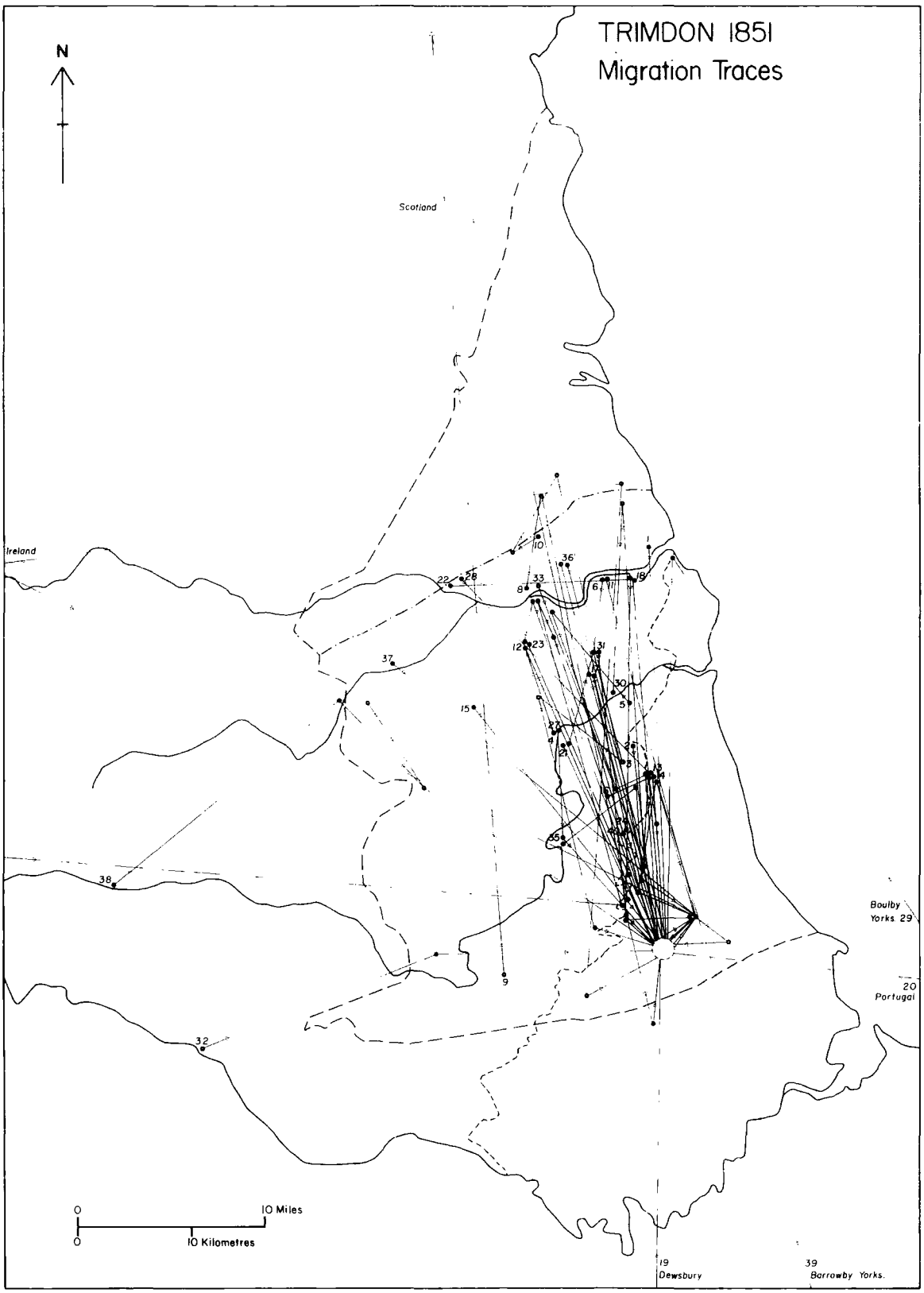

TRIMDON 1851
Migration Traces
N
Scotland
Ireland
Boulby
Yorks. 29
20
Portugal
19
Dewsbury
39
Barrowby Yorks.
0
10 Miles
0
10 Kilometres

TABLE 2.1 LANDOWNERSHIP AND TENANCY PATTERNS IN EAST DURHAM c.1840

Township	Estates 5 acres° No. of landowners	Holdings 5 acres° No. of occupiers	Acres Mean estate Size	Acres Mean farm Size	Total Acreage
Dalton	4	9	199	87	797
Dawdon	1	6	1080	180	1080
Cold Hesledon	1	8	994	124	994
E. Hurton	5	14	291	104	1455
Great Eppleton	3	3	229	229	688
Little Eppleton	1	1	335	335	335
Hotton	8	13	200	123	1598
Harden Law	2	2	259	259	518
Seaham Seaton	12	27	239	106	2871
Castle Eden	1	nd	1935	–	1935
Easington	49	67	83	61	4089
Hasuell	4	12	777	255	3108
Hawthorn	14	18	105	81	1466
Shotton	10	20	368	184	3680
Cassop	5	8	324	203	1622
Coxhoe	4	4	264	264	1056
Kelloe	2	8	685	171	1370
Quarrington	9	9	173	173	1557
Thornley	1	3	1107	365	1107
Wingate	8	13	519	317	4154
Hutton Henry	10	15	194	129	1942
Monk Hesleden	6	nd	409	–	2453
Pittington	11	14	168	130	1853
Shadforth	15	21	190	136	2852
Sherburn	11	14	118	93	1303
Trimdon	14	26	160	85	2236
Total	211	335	228	144	48119

Source: Tithe Apportionments.

TABLE 2.5 LAND USE PATTERNS IN EAST DURHAM C. 1840

	Land Use %			Arable Crops %						
Township	Arable	Meadow/ Pasture	Wood	Wheat	Oats	Fallow	Clover	Turnips	Barley	Beans
Dalton	75	24	1	25	25	25	25			
Dawdon	68	30	2	nd						
Cold Hesledon	41	44	11	33	16	33	17			
E. Murton	45	44	11	25	25	25	25			
Great Eppleton	44	53	3	23	36	20	20			
Little Eppleton	60	29	11	20	38	30	12			
Hetton	45	51	4	25	36	25	11			
Warden Law	nd									
Seaham) Seaton)	64	29	7	25	6	32	13	6	6	13
Castle Eden	21	58	19	25	25	25	25			
Easington) Haswell) Hawthorn) Shotton)	60	35	5	25	25	19	11			
Cassop	61	36	3	17	17	34	34			
Coxhoe	54	24	22	nd						
Kelloe	55	44	2	33	27	33	6			
Quarrington	65	32	2	33	17	33	17			
Thornley	66	28	6	nd						
Wingate	43	44	12	16	16	16	6	0.6		
Hutton Henry	42	52	6	nd						
Monk Hesledon	42	49	8	nd						
Pittington	53	38	9	13	14	11	10	8	12	5
Shadforth	52	47	1	25	31	20	17		7	
Sherburn	45	54.5	0.5	26	35	13	21	5		
Trimdon	53	43	4	33	20	33	14			
Mean	52	41.2	6.8							

Source: Tithe Files

TABLE 4.2 EAST DURHAM TOWNSHIPS. CENSUS TABLE 1801

Township	Houses	Families	Fam/ house	Persons M.	F.	T.	Mean House Size	Mean Fam. Size	Area Acres	Density/ sq. mile
Dalton	10	10	1.0	18	22	40	4.0	4.0	830	31
Dawdon	2	2	1.0	15	7	22	11.0	11.0	830	17
Cold Hesleden	7	7	1.0	23	25	48	6.9	6.9	820	37
E. Murton	16	16	1.0	43	32	75	4.7	4.7	1460	33
Great Eppleton	9	9	1.0	19	16	35	3.9	3.9	790	28
Little Eppleton	1	1	1.0	4	2	6	6.0	6.0	335	11
Hetton	43	49	1.14	106	106	212	4.9	4.3	1590	85
Warden Law	2	2	1.0	9	6	15	7.5	7.5	518	19
Seaham	17	21	1.24	57	58	115	6.8	5.5	1706	43
Seaton	19	24	1.26	47	49	96	5.1	4.0	1373	45
Castle Eden	60	74	1.23	188	174	362	6.0	4.9	1935	120
Easington	99	117	1.18	235	252	487	4.9	4.2	5217	60
Haswell	14	14	1.0	51	42	93	6.6	6.6	3108	19
Hawthorn	27	29	1.07	55	59	114	4.2	3.9	1552	47
Shotton	52	55	1.06	128	122	250	4.8	4.5	3853	42
Cassop	11	12	1.09	31	22	53	4.8	4.4	1622	21
Coxhoe	27	27	1.0	56	61	117	4.3	4.3	1055	71
Kelloe	18	18	1.0	45	35	80	4.4	4.4	1592	32
Quarrington	23	23	1.0	61	51	112	4.9	4.9	1589	45
Thornley	9	9	1.0	25	31	56	6.2	6.2	1107	32
Wingate	24	24	1.0	71	64	135	5.6	5.6	4154	21
Hutton Henry	35	35	1.0	85	71	156	4.5	4.5	1987	50
Monk Hesleden	34	36	1.06	77	73	150	4.4	4.2	2937	33
Pittington	40	42	1.05	102	118	220	5.5	5.2	2552	68
Shadforth	47	50	1.06	91	93	184	3.9	3.7	2872	41
Sherburn	59	70	1.19	119	133	252	4.3	3.6	1303	124
Trimdon	66	72	1.09	133	145	278	4.2	3.9	2280	78
Total	771	855	1.11	1894	1869	3763	4.9	4.3	50906	47.3

TABLE 4.3 EAST DURHAM TOWNSHIPS. CENSUS TABLES 1811.

Townships	Houses	Families	Fam./ house	Persons M.	Persons F.	Persons T.	Mean House Size	Mean Fam. Size	Area	Density
Dalton	10	10	1.0	28	24	52	5.2	5.2	830	40
Dawdon	3	3	1.0	16	11	27	9.0	9.0	830	21
Cold Hesledon	6	6	1.0	17	14	31	5.2	5.2	820	24
E. Murton	15	15	1.0	37	34	71	5.5	5.5	1460	31
Great Eppleton	4	4	1.0	20	8	28	7.0	7.0	790	23
Little Eppleton	2	3	1.5	14	16	30	15.0	10.0	335	57
Hetton	50	56	1.12	130	134	264	5.3	4.7	1590	106
Warden Law	2	2	1.0	8	4	12	6.0	6.0	518	15
Seaham	17	20	1.18	58	63	121	7.1	6.0	1706	45
Seaton	21	25	1.19	64	62	126	6.0	5.04	1373	59
Castle Eden	48	57	1.19	120	137	257	5.3	4.5	1935	85
Easington	110	138	1.26	256	286	542	4.9	3.9	5217	66
Haswell	17	18	1.06	64	50	114	6.7	6.3	3108	23
Hawthorn	25	27	1.08	73	45	118	4.7	4.4	1552	49
Shotton	51	52	1.02	138	148	286	5.6	5.5	3853	48
Cassop	11	11	1.0	32	27	59	5.4	5.4	1622	23
Coxhoe	28	36	1.29	83	88	171	6.1	4.8	1055	104
Kelloe	19	19	1.0	35	37	72	3.8	3.8	1592	29
Quarrington	16	25	1.56	73	70	143	8.9	5.7	1589	58
Thornley	9	9	1.0	33	25	58	6.4	6.4	1107	33
Wingate	25	25	1.0	79	72	151	6.0	6.0	4154	23
Hutton Henry	37	41	1.11	75	80	155	4.2	3.8	1987	50
Monk Hesleden	29	31	1.07	74	74	148	5.1	4.8	2937	32
Pittington	46	51	1.11	138	139	277	6.0	5.4	2552	69
Shadforth	47	47	1.0	108	118	226	4.8	4.81	2872	50
Sherburn	53	76	1.43	119	140	259	4.9	3.4	1303	127
Trimdon	69	70	1.01	125	149	274	4.0	3.9	2280	77
Total	770	875	1.12	2017	2055	4072	5.3	4.7	50906	51.2

TABLE 4.4 EAST DURHAM TOWNSHIPS CENSUS TABLES 1821.

Townships	Houses	Families	Fam./ House	Persons M.	F.	T.	Mean House Size	Mean Fam. Size	Area	Density
Dalton	11	11	1.0	28	21	49	4.5	4.5	830	38
Dawdon	3	3	1.0	21	14	35	11.7	11.7	830	27
Cold Hesledon	7	11	1.57	31	24	55	7.9	5.0	820	43
E. Murton	13	14	1.08	36	36	72	5.5	5.1	1460	32
Great Eppleton	5	6	1.2	22	21	43	8.6	7.2	790	35
Little Eppleton	2	3	1.5	13	19	32	16.0	10.7	335	61
Hetton	107	145	1.36	546	373	919	8.6	6.3	1590	370
Warden Law	3	3	1.0	7	7	14	4.7	4.7	518	17
Seaham	20	20	1.0	55	48	103	5.2	5.2	1706	39
Seaton	20	24	1.2	51	44	98	4.9	4.1	1373	46
Castle Eden	55	58	1.05	123	158	281	5.1	4.8	1935	93
Easington	114	139	1.22	303	290	593	5.2	4.3	5217	73
Haswell	17	17	1.0	56	59	115	6.8	6.8	3108	24
Hawthorn	25	30	1.2	77	63	140	5.6	4.7	1552	58
Shotton	55	55	1.0	127	137	264	4.8	4.8	3853	44
Cassop	11	11	1.0	44	34	78	7.1	7.1	1622	31
Coxhoe	27	27	1.0	78	54	132	4.9	4.9	1055	53
Kelloe	18	19	1.06	50	51	101	5.6	5.3	1592	41
Quarrington	33	33	1.0	93	84	177	5.4	5.4	1589	71
Thornley	9	11	1.22	29	31	60	6.7	5.5	1107	35
Wingate	25	25	1.0	67	64	131	5.2	5.2	4154	20
Hutton Henry	39	42	1.08	84	90	174	4.5	4.1	1987	56
Monk Hesleden	29	33	1.14	87	79	164	5.7	5.0	2937	36
Pittington	56	60	1.07	165	139	304	5.4	5.1	2552	76
Shadforth	49	49	1.0	108	115	223	4.6	4.6	2872	50
Sherburn	72	72	1.0	131	150	281	3.9	3.9	1303	138
Trimdon	61	67	1.1	154	148	302	5.0	4.5	2280	85
TOTAL	886	988	1.11	2586	2354	4940	5.6	5.0	50906	62

TABLE 4.5 EAST DURHAM TOWNSHIPS CENSUS TABLES 1831

Township	Houses	Families	Fam./ House	Persons M.	Persons F.	Persons T.	Males 20+ % popn.	Mean House Size	Mean Fam. Size	Area	Density
Dalton	12	14	1.17	41	32	73	25	6.1	5.4	830	56
Dawdon	96	138	1.44	620	402	1022	41	10.6	7.4	830	788
Cold Hesledon	11	18	1.64	66	46	112	33	10.2	6.2	820	87
E. Hurton	15	15	1.0	59	39	98	36	6.5	6.5	1460	43
Great Eppleton	7	7	1.0	23	24	47	23	6.7	6.7	790	38
Little Eppleton	3	4	1.33	10	7	17	35	5.7	4.3	335	32
Hetton	1052	1092	1.04	3121	2766	5887	24	5.6	5.4	1590	2370
Warden Law	11	11	1.0	24	30	54	26	4.9	4.9	518	67
Seaham	17	17	1.0	76	54	130	34	7.6	7.6	1706	49
Seaton	21	32	1.52	69	65	134	34	6.4	4.2	1373	62
Castle Eden	46	51	1.11	125	135	260	26	5.7	5.1	1935	86
Easington	119	155	1.30	343	350	693	28	5.8	4.5	5217	85
Haswell	31	33	1.06	176	87	263	54	8.5	8.0	3108	54
Hawthorn	30	35	1.17	82	80	162	26	5.4	4.6	1522	67
Shotton	54	59	1.09	132	140	272	24	5.0	4.6	3853	45
Cassop	11	11	1.0	37	32	69	32	6.3	6.3	1622	27
Coxhoe	29	29	1.0	79	75	154	23	5.3	5.3	1055	93
Kelloe	18	18	1.0	57	45	102	27	5.7	5.7	1592	41
Quarrington	31	32	1.03	97	76	173	24	5.6	5.4	1589	70
Thornley	8	10	1.25	29	21	50	24	6.3	5.0	1107	29
Wingate	22	22	1.0	61	54	115	23	5.2	5.2	4154	18
Hutton Henry	40	40	1.0	73	89	162	25	4.1	4.1	1987	52
Monk Hesleden	28	33	1.18	92	84	176	24	6.3	5.3	2937	38
Pittington	296	296	1.0	925	707	1632	25	5.5	5.5	2552	409
Shadforth	55	55	1.0	111	125	236	28	4.3	4.3	2872	53
Sherburn	78	78	1.0	158	179	337	25	4.3	4.3	1303	166
Trimdon	59	62	1.05	146	130	276	32	4.7	4.5	2280	77
TOTAL	2200	2365	1.13	6832	5874	12706	Av. 27	5.8	5.4	50906	160

TABLE 4.6 EAST DURHAM TOWNSHIPS CENSUS TABLES 1841.

Township	Houses	Families	Fam./ House	M.	F.	T.	Mean House Size	Mean Fam. Size	Area	Density	Age U.20%	Age 20.%
Dalton	16			49	39	88	5.5		830	68	47	53
Dawdon	402	420	1.04	1096	921	2017	5.0	4.8	830	1555	50	50
Cold Hesledon	15			43	40	83	5.5		820	65	52	48
E. Murton	89	90	1.01	291	230	521	5.9	5.8	1460	228	49	51
Great Eppleton	11			41	33	74	6.7		790	60	62	38
Little Eppleton	8			16	22	38	4.8		335	73	50	50
Hetton	917	917	1.0	2127	2031	4158	4.5	4.5	1590	1674	51	49
Warden Law	11			34	26	60	5.5		518	74	52	48
Seaham	29			88	65	153	5.3		1706	57	48	52
Seaton	32			93	82	175	5.5		1373	82	51	49
Castle Eden	104			277	281	558	5.4		1935	185	47	53
Easington	176			404	408	812	4.6		5217	100	46	54
Haswell	797	804	1.01	2122	1859	3981	5.0	4.9	3108	820	53	47
Hawthorn	35			87	90	177	5.1		1552	73	42	58
Shotton	118	118	1.0	316	287	603	5.1	5.1	3853	100	47	53
Cassop	195	199	1.02	611	465	1076	5.5	5.4	1622	425	51	49
Coxhoe	758	771	1.02	2090	1814	3904	5.2	5.1	1055	2368	53	47
Kellee	26			76	80	156	6.0		1592	63	47	53
Quarrington	145	145	1.0	395	337	732	5.0	5.0	1589	295	54	46
Thornley	519	543	1.05	1443	1287	2730	5.3	5.0	1107	1578	54	46
Wingate	489	501	1.02	1434	1191	2625	5.4	5.2	4154	404	51	49
Hutton Henry	58			161	126	287	4.9		1987	92	42	58
Monk Hesleden	94	96	1.02	256	234	490	5.2	5.1	2937	107	45	55
Pittington	432	432	1.0	1208	1087	2295	5.3	5.3	2552	576	54	46
Shadforth	66			172	164	336	5.1		2872	75	44	56
Sherburn	399	399	1.0	1009	937	1946	4.9	4.9	1303	956	51	49
Trimdon	84			194	188	382	4.5		2280	107	42	58
TOTAL	6025		1.01	15939	14518	30457	5.1	5.1	50906	383	51.1	48.9

N.B. The 1841 census tables provide no evidence of the number of families in the townships. The family data in Table 4.6 has been drawn from the census enumerators' books for the thirteen townships influenced by industrialization by 1841.

TABLE 4.7 EAST DURHAM TOWNSHIPS CENSUS TABLES 1851

Township	Houses	M	F	T	Mean House Size	Area	Density
Dalton	18	43	40	83	4.6	830	64
Dawdon	586	1750	1788	3538	6.0	830	2728
Cold Hesledon	19	62	55	117	6.2	820	91
E. Murton	235	754	633	1387	5.9	1460	608
Great Eppleton	10	36	27	63	6.3	790	51
Little Eppleton	5	13	11	24	4.8	335	46
Hetton	1129	2907	2757	5664	5.0	1590	2280
Warden Law	11	25	29	54	4.9	518	67
Seaham	81	498	231	729	9.0	1706	273
Seaton	38	105	95	200	5.3	1373	93
Castle Eden	96	247	244	491	5.1	1935	162
Easington	156	475	441	916	5.9	5217	112
Haswell	856	2326	2030	4356	5.1	3108	897
Hawthorn	39	86	97	183	4.7	1552	75
Shotton	284	822	785	1607	5.7	3853	267
Cassop	333	974	795	1769	5.3	1622	698
Coxhoe	781	2244	1857	4101	5.3	1055	2488
Kelloe	28	79	70	149	5.3	1592	60
Quarrington	213	570	493	1063	5.0	1589	41
Thornley	531	1423	1317	2740	5.2	1107	1584
Wingate	485	1304	1152	2456	5.1	4154	378
Hutton Henry	225	582	485	1067	4.7	1987	344
Monk Hesleden	303	775	720	1495	4.9	2937	326
Pittington	468	1326	1204	2530	5.4	2552	634
Shadforth	244	733	615	1348	5.5	2872	300
Sherburn	465	1234	1129	2363	5.1	1303	1161
Trimdon	324	836	762	1598	4.9	2280	449
TOTAL	7876	22229	19862	42091	5.3	50906	529

TABLE 4.9 EASINGTON WARD AGE STRUCTURE 1821

AGE GROUP	MALE		FEMALE		TOTAL	%	CUM. %
	NO.	%	No.	%			
0 – 4	1657	51.6	1553	48.4	3210	14.3	14.3
5 – 9	1439	50.5	1409	49.5	2848	12.7	27.0
10 – 14	1378	53.4	1204	46.6	2582	11.5	38.5
15 – 19	1078	52.4	978	47.6	2056	9.2	47.7
20 – 29	1657	51.7	1551	48.3	3208	14.3	62.0
30 – 39	2842	70.1	1211	29.9	4053	18.1	80.1
40 – 49	923	52.9	822	47.1	1745	7.8	87.9
50 – 59	600	51.0	577	49.0	1177	5.3	93.2
60 – 69	465	50.5	45	49.5	920	4.1	97.3
70 – 79	202	47.3	225	52.7	427	1.9	99.2
80 ◦	84	48.3	90	51.7	174	0.8	100
TOTAL	12325		10075		22400		
	55.0%		45%				

TABLE 4.15 EAST DURHAM TOWNSHIPS OCCUPATION STRUCTURES 1801.

% ages to nearest whole number.

Township	No. employed	Agric. No.	Agric. %	Trade/Man/ M'craft No.	Trade/Man/ M'craft %	Other No.	Other %
Dalton	40	15	37	1	2	24	60
Dawdon	22	15	68	0	0	7	32
Cold Heslodon	48	16	33	2	4	30	63
E. Murton	75	25	33	1	1	49	65
Great Eppleton	35	9	26	2	6	24	69
Little Eppleton	6	4	67	0	0	2	33
Hetton	212	39	18	34	1	139	66
Warden Law	15	7	47	0	0	8	53
Seaham	115	35	30	9	8	71	62
Seaton	96	28	29	4	4	64	67
Castle Eden	362	89	25	118	33	155	32
Easington	487	83	17	34	7	370	76
Haswell	93	34	37	1	1	58	62
Hawthorn	114	109	96	4	4	1	1
Shotton	250	52	21	22	9	176	70
Cassop	53	29	55	2	4	22	42
Coxhoe	117	44	38	73	62	0	0
Kelloe	80	56	70	1	1	23	29
Quarrington	112	55	49	57	51	0	0
Thornley	56	38	68	2	4	16	29
Wingate	135	67	50	4	3	64	47
Hutton Henry	156	34	22	16	10	106	68
Monk Hesleden	150	36	24	9	6	105	70
Pittington	220	66	30	35	16	111	54
Shadforth	184	52	28	11	6	121	66
Sherburn	252	44	17	27	11	181	72
Trimdon	278	56	20	22	8	200	72
TOTAL	3763	1137	30.2	491	13.0	2135	56.7

TABLE 4.16 EAST DURHAM TOWNSHIPS OCCUPATION STRUCTURES 1811

Township	Families employed	Agriculture No.	Agriculture %	Trade/Man/ H'craft. No.	Trade/Man/ H'craft. %	Other No.	Other %
Dalton	10	6	60	4	40	0	0
Dawdon	3	3	100	0	0	0	0
Cold Hesledon	6	5	83	1	17	0	0
E. Murton	15	13	87	1	7	1	7
Great Eppleton	4	4	100	0	0	0	0
Little Eppleton	3	2	67	0	0	1	33
Hetton	56	16	29	7	13	33	58
Warden Law	2	2	100	0	0	0	0
Seaham	20	18	90	2	10	0	0
Seaton	25	23	92	2	8	0	0
Castle Eden	57	35	61	10	18	12	21
Easington	138	92	66	35	25	12	9
Haswell	18	17	94	1	6	0	0
Hawthorn	27	25	93	2	7	0	0
Shotton	52	36	69	10	19	6	12
Cassop	11	9	82	1	9	1	9
Coxhoe	36	28	78	8	22	0	0
Kelloe	19	17	89	1	6	1	6
Quarrington	25	15	60	10	40	0	0
Thornley	9	7	78	2	22	0	0
Wingate	25	24	96	1	4	0	0
Hutton Henry	41	35	85	6	15	0	0
Monk Hesleden	32	23	74	5	16	3	10
Pittington	51	37	73	7	14	7	14
Shadforth	47	32	68	10	21	5	11
Sherburn	76	66	87	10	13	0	0
Trimdon	70	54	77	11	16	5	7
TOTAL	875	644	73.6	147	16.8	84	9.6

TABLE 4.17 EAST DURHAM TOWNSHIPS OCCUPATION STRUCTURES 1821.

Township	Families employed	Agriculture		Trade/Man/ H'craft.		Other	
		No.	%	No.	%	No.	%
Dalton	11	7	64	1	9	3	27
Dawdon	3	3	100	0	0	0	0
Cold Hesledon	11	10	91	1	9	0	0
E. Murton	14	12	86	2	14	0	0
Great Eppleton	6	5	83	1	17	0	0
Little Eppleton	3	2	67	0	0	1	33
Hetton	145	57	39	86	59	2	1
Warden Law	3	2	67	1	33	0	0
Seaham	20	18	90	2	10	0	0
Seaton	24	20	83	2	9	2	9
Castle Eden	93	36	62	14	24	8	14
Easington	139	91	65	40	29	8	6
Haswell	17	17	100	0	0	0	0
Hawthorn	30	22	73	4	14	4	14
Shotton	55	24	44	18	33	13	23
Cassop	11	10	91	1	9	0	0
Coxhoe	27	11	41	5	18	11	41
Kelloe	19	13	68	1	5	5	27
Quarrington	33	13	39	20	61	0	0
Thornley	11	7	64	3	27	1	9
Wingate	25	24	96	1	4	0	0
Hutton Henry	42	37	88	5	12	0	0
Monk Hesleden	33	25	76	5	15	3	9
Pittington	60	25	42	35	58	0	0
Shadforth	49	45	92	4	8	0	0
Sherburn	72	62	86	10	14	0	0
Trimdon	67	41	61	19	28	7	10
TOTAL	988	639	64.7	281	28.4	68	6.9

TABLE 4.18 EAST DURHAM TOWNSHIPS OCCUPATION STRUCTURES OF ALL FAMILIES 1831.

Township	Families employed	Agriculture		Trade/Man/ H'craft		Others	
		No.	%	No.	%	No.	%
Dalton	14	6	43	2	14	6	43
Dawdon	138	5	4	126	91	7	5
Cold Hesledon	18	15	83	3	17	0	0
E. Murton	15	9	60	4	27	2	13
Great Eppleton	7	3	43	3	43	1	14
Little Eppleton	4	4	100	0	0	0	0
Hetton	1092	52	5	186	17	854	78
Warden Law	11	3	27	1	9	7	64
Seaham	17	8	47	2	12	7	41
Seaton	32	20	63	4	13	8	25
Castle Eden	51	19	37	16	31	16	31
Easington	155	62	40	84	54	9	6
Haswell	33	19	58	2	6	12	36
Hawthorn	35	21	60	5	14	9	26
Shotton	59	30	51	8	14	21	36
Cassop	11	10	91	1	9	0	0
Coxhoe	29	19	66	6	21	4	13
Kelloe	18	15	83	2	11	1	6
Quarrington	32	17	53	1	3	14	44
Thornley	10	7	70	2	20	1	10
Wingate	22	16	73	2	9	4	18
Hutton Henry	40	34	85	5	13	1	2
Monk Hesleden	33	10	30	7	21	16	49
Pittington	296	15	5	23	8	258	87
Shadforth	55	18	33	20	36	17	31
Sherburn	78	35	45	19	24	24	31
Trimdon	62	29	47	11	18	22	35
TOTAL	2365	501	21.2%	543	23.0%	1321	55.8%

TABLE 4.19 EAST DURHAM TOWNSHIPS OCCUPATION STRUCTURES OF MALES OVER 20 YEARS 1831.

Township	Farmers with occupiers		Farmers no occupiers		Agric. lab.		Manuf.		H'craft retail		Prof.		Labs.		Servants		Others	
		%		%		%		%		%		%		%		%		%
Dalton	4	22	2	11	2	11	0	0	4	22	3	17	3	17	0	0	0	0
Dawdon	0	0	0	0	18	4	0	0	146	35	6	1.3	247	59	0	0	2	0.5
Cold Hesledon	3	8	3	8	19	51	0	0	5	14	0	0	7	19	0	0	0	0
E. Murton	4	11	5	14	9	26	0	0	4	11	0	0	13	37	0	0	0	0
Great Eppleton	1	9	1	9	1	9	0	0	4	36	0	0	4	36	0	0	0	0
Little Eppleton	3	50	0	0	3	50	0	0	0	0	0	0	0	0	0	0	0	0
Hetton	4	0.3	2	0.15	66	5	0	0	273	20	21	2	1004	72	0	0	22	2
Warden Law	2	14	0	0	4	28	0	0	2	14	0	0	6	43	0	0	0	0
Seaham	7	16	1	2	22	50	0	0	4	9	1	2	7	16	0	0	0	0
Seaton	6	13	6	13	22	48	0	0	4	9	1	2	7	15	0	0	0	0
Castle Eden	11	16	7	10	16	24	0	0	21	31	3	4	3	4	7	10	0	0
Easington	18	9	20	10	56	29	0	0	64	33	7	4	19	10	4	2	8	4
Haswell	10	7	2	1	29	20	0	0	51	36	0	0	50	35	0	0	0	0
Hawthorn	9	21	10	24	10	24	0	0	5	12	3	7	2	5	6	14	0	0
Shotton	12	19	3	5	21	33	0	0	10	16	3	5	11	17	3	5	4	6
Cassop	5	23	5	23	9	41	1	5	0	0	1	5	0	0	0	0	1	5
Coxhoe	4	11	1	3	18	50	0	0	6	17	1	3	6	17	0	0	0	0
Kelloe	5	18	1	4	18	64	0	0	2	7	1	4	0	0	0	0	1	4
Quarrington	7	17	0	0	15	36	0	0	1	2	0	0	17	40	0	0	2	5
Thornley	3	25	0	0	7	58	0	0	2	17	0	0	0	0	0	0	0	0
Wingate	16	62	0	0	8	31	0	0	2	8	0	0	0	0	0	0	0	0
Hutton Henry	8	20	3	8	15	38	0	0	13	33	1	3	0	0	0	0	0	0
Monk Hesleden	5	12	8	19	13	30	0	0	9	21	1	2	6	14	1	2	0	0
Pittington	7	1.7	6	2	16	4	0	0	19	5	1	0.2	354	88	3	0.7	0	0
Shadforth	16	24	0	0	14	21	0	0	19	29	1	2	14	21	0	0	2	3
Sherburn	7	8	3	4	31	37	0	0	30	36	0	0	12	14	0	0	0	0
Trimdon	7	8	9	10	37	42	0	0	20	33	4	5	7	8	0	0	4	5
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
TOTAL	184	5.4	98	2.9	499	14.5	1	0.03	720	21.0	59	1.7	1799	52.4	24	0.7	46	1.3

TABLE 4.20 EAST DURHAM TOWNSHIPS. OCCUPATION STRUCTURES OF EIGHT MINING TOWNSHIPS 1851.

Townships	Total empl.	Agric		Mining officials		Mining		Primary		Building		Manuf/ craft		Transport		Dealing		Labs.		Prof. & pub. ser.		Servants		Residual	
		No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Hutton Henry	392	47	12	4	1	188	48	3	1	12	3	32	8	2	1	19	5	27	7	5	1	38	10	15	4
Rural	141	42	31	1	1	2	1	2	1	10	7	18	13	2	1	7	5	17	12	3	2	31	22	6	4
Mining	251	5	2	3	1	186	74	1	0.4	2	1	14	6	0	0	12	5	10	4	2	1	7	3	9	4
Thornley	1052	12	1	7	1	726	69	4	0.4	11	1	89	9	30	3	34	3	21	2	14	1	64	6	40	4
South Hetton	602	9	2	3	1	419	70	3	0.5	13	2	52	9	5	1	23	4	24	4	8	1	26	4	17	3
Shotton	595	45	8	6	1	349	59	13	2	10	2	40	7	3	1	13	2	12	2	5	1	64	11	35	6
Rural	139	37	27	0	0	8	6	12	9	3	2	14	10	0	0	5	4	1	1	2	1	39	28	18	13
Mining	456	8	2	6	1	341	75	1	0.25	7	2	26	6	3	1	8	2	11	2	3	1	25	5	17	4
Murton	527	30	6	5	1	379	76	3	1	5	1	37	7	11	2	7	1	0	0	4	1	28	5	18	4
Rural	50	17	34	0	0	1	2	1	2	1	2	5	10	8	16	1	2	0	0	1	2	12	24	3	6
Mining	477	13	3	5	1	378	79	2	0.4	4	1	32	7	3	1	6	1	0	0	3	1	16	3	15	3
Trimdon	579	67	12	2	0.3	298	54	9	2	8	2	52	9	12	2	37	7	9	2	11	2	46	4	23	4
Rural	126	39	32	0	0	2	2	6	5	4	3	24	20	4	3	8	6	4	3	4	3	21	17	8	7
Colliery	167	18	11	0	0	83	50	2	1	2	1	15	9	2	1	19	12	3	2	3	2	6	4	13	8
Grange	286	10	4	2	1	213	75	1	0.6	2	1	13	5	6	2	10	4	2	1	4	1	19	6	2	1
Quarrington	370	17	5	13	4	232	63	5	1.4	3	1	22	6	7	2	2	1	22	6	3	1	30	8	14	3
Hetton	2125	82	4	31	2	1133	53	7	0.3	52	2	269	13	39	2	108	5	76	4	32	2	132	6	170	8
Easington Lane	427	11	3	3	1	157	37	4	1	13	3	106	25	1	0.2	44	10	22	5	5	1	36	8	24	6
Brick Garth	358	7	2	0	0	249	70	2	0.6	5	1	24	7	0	0	14	4	14	4	3	1	8	2	31	9
Eastside	402	19	5	2	1	179	45	0	0	11	3	56	14	22	6	38	10	0	0	3	1	27	6	45	10
Hetton Lyons	109	1	1	11	10	32	29	0	0	7	6	23	21	1	1	2	2	14	13	1	1	10	9	7	6
Four Lane Ends	141	6	4	1	1	64	45	0	0	3	2	26	18	1	1	3	2	10	7	4	3	10	7	13	9
Hetton Downs	476	16	3	8	2	362	76	0	0	1	0.2	22	5	6	1	3	1	8	2	6	1	13	3	30	6
Village	139	15	11	6	4	29	21	1	0.7	9	7	18	13	5	4	4	3	9	7	8	6	19	13	16	11
Bog Row	73	1	1	0	0	61	84	0	0	0	0	2	3	1	1	0	0	1	1	0	0	3	4	4	5
Total	6274	309	4.9	97	1.6	3724	59.7	47	0.8	119	1.9	593	9.5	109	1.7	243	3.9	191	3.1	82	1.3	428	6.9	332	5.3

TABLE 4.22 EAST DURHAM TOWNSHIPS. EMPLOYMENT RATES OF WIVES OF HEADS OF HOUSEHOLDS 1851

Township	No. of wives employed		No. of wives not employed.	
Hutton Henry	1		221	
Rural	0		67	
Mining	1		154	
Thornley	10		522	
South Hetton	0		435	
Shotton	1		301	
Rural	1		63	
Mining	0		238	
Murton	1		236	
Rural	0		23	
Mining	1		213	
Trimdon	4		323	
Rural	2		71	
Colliery	0		99	
Grange	2		153	
Quarrington	0		213	
Hetton	11		1183	
Easington Lane	3		237	
Brick Garth	4		203	
East side	0		241	
Hetton Lyons	0		52	
Four Lane Ends	2		76	
Hetton Downs	2		254	
Village	0		83	
Bog Row	0		37	
Total	28	0.8%	3434	99.2%

TABLE 6.2 EAST DURHAM TOWNSHIPS. PERSONS PER HOUSEHOLD 1851

Township	Relative Frequency																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	T
Hutton Henry	2.7	10.8	18.0	20.7	13.5	13.1	9.9	5.4	2.7	1.8	1.4	0	0	0	0	0	222
South Hetton	1.1	12.9	16.1	19.8	13.1	11.5	9.9	7.4	5.1	2.1	0.2	0.9	0	0	0	0	435
East Murton	0.8	7.2	9.3	13.1	12.7	19.8	14.3	9.3	6.3	4.6	1.3	1.3	0	0	0	0	237
Shotton	2.0	9.9	13.5	15.3	14.9	14.9	11.3	7.7	4.6	4.3	1.0	0.3	0.3	0	0	0	303
Thornley	0.9	9.6	16.2	19.0	14.8	13.2	10.5	6.6	4.1	3.6	0.9	0.2	0.2	0	0	0.2	532
Trimdon	3.1	10.7	14.1	17.7	20.2	14.1	8.0	4.6	4.3	2.4	0.6	0.3	0	0	0	0	327
Hetton	3.5	13.4	18.2	15.0	14.7	14.6	9.7	4.7	2.2	1.8	1.2	0.4	0.2	0	0.4	0	1205
Quarrington	1.9	11.3	13.1	13.6	22.5	16.0	9.4	7.5	1.9	1.9	0.5	0.5	0	0	0	0	213
Mean	2.0	10.7	14.8	16.5	16.1	14.7	10.3	6.7	3.9	2.8	0.9	0.4	0.1	0	0.1	0.1	3474

	Cumulative Frequency																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	T
Hutton Henry	2.7	13.5	31.5	52.3	65.8	78.8	88.7	94.1	96.8	98.6	100						222
South Hetton	1.1	14.0	30.1	49.9	63.0	74.5	84.4	91.7	96.8	98.9	99.1	100					435
East Murton	0.8	8.0	17.3	30.4	43.0	62.9	77.2	86.5	92.8	97.5	98.7	100					237
Shotton	2.0	11.9	25.4	40.7	55.6	70.5	81.8	89.5	94.1	98.4	99.4	99.7	100				303
Thornley	0.9	10.5	26.7	45.7	60.5	73.7	84.2	90.8	94.9	98.5	99.4	99.6	99.8	99.8	99.8	100	532
Trimdon	3.1	13.8	27.8	45.6	65.7	79.8	87.8	92.4	96.6	99.1	99.7	100					327
Hetton	3.5	16.9	35.1	50.1	64.8	79.4	89.1	93.8	96.0	97.8	99.0	99.4	99.6	99.6	100	100	1205
Quarrington	1.9	13.1	26.3	39.9	62.4	78.4	87.8	95.3	97.2	99.1	99.5	100					213
Mean	2.0	12.7	27.5	44	60.1	74.8	85.1	91.8	95.7	98.5	99.4	99.8	99.9	99.9	99.9	100	3474

Kolmogorov–Smirnov test: max. d. $22.8 - 0.228$ @ Hutton Henry & East Murton 5 persons/House

@ s.l. 0.05 $1.36\sqrt{\frac{n_1 + n_2}{n_1 n_2}} = 1.36\sqrt{\frac{459}{5264}}$

$= 0.127$

∴ there is a significant difference in the number of persons per household.

TABLE 6.3 EAST DURHAM TOWNSHIPS. PERSONS PER FAMILY 1851.

Relative Frequency

Township	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	T
Hutton Henry	6.3	13.1	21.6	18.9	15.3	10.8	5.9	4.1	1.8	1.8	0.5	0	0	0	0	0	222
South Hetton	2.8	18.6	19.5	16.1	12.2	10.6	9.7	5.5	3.0	1.4	0.5	0.2	0	0	0	0	435
East Murton	2.1	9.3	14.3	17.3	14.3	13.9	11.8	7.6	6.8	1.3	0.8	0.4	0	0	0	0	237
Shotton	5.0	12.9	17.9	13.3	14.3	14.9	9.2	6.3	4.0	2.0	0.3	0	0	0	0	0	303
Thornley	3.2	16.5	20.3	18.0	13.0	10.9	6.6	5.8	3.6	1.5	0.2	0.2	0	0	0	0.2	532
Trimdon	5.2	15.6	18.7	19.0	16.8	12.5	4.6	2.4	4.0	1.2	0	0	0	0	0	0	327
Hetton	8.0	19.7	19.0	15.3	12.9	11.2	6.8	3.8	1.7	0.7	0.5	0.2	0	0	0	0	1205
Quarrington	4.2	16.0	15.5	16.9	19.2	13.6	7.0	4.7	1.4	0.9	0.5	0	0	0	0	0	213
Mean	4.6	15.2	18.4	16.9	14.8	12.3	7.7	5.0	3.3	1.4	0.3	0.1	0	0	0	0	3474

Cumulative Frequency

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	T
Hutton Henry	6.3	19.4	40.1	59.9	75.2	86.0	91.9	96.0	97.8	99.6	100						222
South Hetton	2.8	21.4	40.9	57.0	69.2	79.8	89.4	94.9	97.9	99.3	99.8	100					435
East Murton	2.1	11.4	25.7	43.0	57.4	71.3	83.1	90.7	97.5	98.7	99.6	100					237
Shotton	5.0	17.9	35.8	49.1	63.4	78.3	87.5	93.8	97.8	99.8	100						303
Thornley	3.2	19.7	40.0	58.1	71.1	82.0	88.5	94.4	97.9	99.4	99.6	99.8	99.8	99.8	99.8	100	532
Trimdon	5.2	20.8	39.4	58.4	75.2	87.8	92.4	94.8	98.8	100							327
Hetton	8.0	27.7	46.7	62.0	74.9	86.1	92.9	96.7	98.4	99.1	99.6	99.8					1205
Quarrington	4.2	20.2	35.7	52.6	71.8	85.4	92.5	97.2	98.6	99.5	100						213
Mean	4.6	19.8	38.2	55.1	69.9	82.2	89.9	94.9	98.2	99.6	99.9	100	100	100	100	100	3474

K–S testing proved significant differences of family size @ s.l. 0.05 between

East Murton & Hetton family size 3
East Murton & Hutton Henry family size 5
East Murton & Trimdon family size 5
East Murton & Quarrington family size 5
East Murton & Thornley family size 4
East Murton & South Hetton family size 3
Shotton & Hetton family size 4

TABLE 6.4 EAST DURHAM TOWNSHIPS. CHILDREN PER HOUSEHOLD 1851.

Relative Frequency

Township	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	T
Hutton Henry	16.7	23.4	17.1	16.7	11.3	6.3	4.5	1.4	2.3	0.5	0	0	0	0	0	222
South Hetton	19.5	17.7	18.2	12.2	11.5	9.9	5.7	3.0	1.6	0.5	0.2	0	0	0	0	435
East Murton	9.7	14.3	18.6	13.1	13.9	13.1	8.0	6.3	1.7	0.8	0.4	0	0	0	0	237
Shotton	15.5	17.8	14.2	13.5	16.2	9.9	6.6	4.0	2.0	0.3	0	0	0	0	0	303
Thornley	18.6	19.0	18.2	14.5	10.7	7.3	5.5	4.1	1.5	0.2	0.2	0	0	0	0.2	532
Trimdon	17.7	18.7	21.1	15.3	14.1	4.9	3.1	4.0	1.2	0	0	0	0	0	0	327
Hetton	23.6	20.6	15.6	14.2	11.6	7.2	4.1	1.7	0.7	0.5	0.5	0.2	0	0	0	1205
Quarrington	18.8	15.5	16.4	19.7	15.0	6.1	5.2	1.9	0.9	0.5	0	0	0	0	0	213
																3474

Cumulative Frequency

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	T
Hutton Henry	16.7	40.1	57.2	73.9	85.1	91.4	96.0	97.3	99.6	100						222
South Hetton	19.5	37.2	55.4	67.6	79.1	89.0	94.7	97.7	99.3	99.8	100					435
East Murton	9.7	24.0	42.6	55.7	69.6	82.7	90.7	97.0	98.7	99.5	100					237
Shotton	15.5	33.3	47.5	61.1	77.2	87.1	93.7	97.7	99.7	100						303
Thornley	18.6	37.6	55.8	70.3	81.0	88.3	93.8	97.9	99.4	99.8	99.8	99.8	99.8	99.8	100	532
Trimdon	17.7	36.4	57.5	72.8	86.9	91.8	94.9	98.9	100							327
Hetton	23.6	44.2	59.8	74.0	85.6	92.8	96.9	98.6	99.3	99.8	100					1205
Quarrington	18.8	34.3	50.7	70.4	85.4	91.5	96.7	98.6	99.5	100						213
																3474

K–S testing proved significant differences of nos. of children per household @ s.l. 0.05 between: –

E. Murton & Hetton(3), Thornley(3), Trimdon(3), Quarrington(3), Hutton Henry(3) & South Hetton (3)

Shotton & Hetton (3)
Shotton & Hutton Henry (3)
Shotton & Trimdon (3)

TABLE 6.5 CHI-SQUARE TEST OF THE FREQUENCY OF LODGERS IN THE EAST DURHAM TOWNSHIPS 1851

Township	Households with lodgers		χ^2	Households without lodgers		χ^2	T
	O	18	0.2	O	204	0.02	
Hutton Henry	E	20		E	202		222
South Hetton	O	32	0.95	O	403	0.09	435
	E	38		E	397		
East Murton	O	26	1.19	O	211	0.12	237
	E	21		E	216		
Shotton	O	15	- 5.33	O	288	0.52	303
	E	27		E	276		
Thornley	O	63	+ 5.45	O	469	0.53	532
	E	47		E	485		
Trimdon	O	33	0.55	O	294	0.05	327
	E	29		E	298		
Hetton	O	99	0.46	O	1106	0.05	1205
	E	106		E	999		
Quarrington	O	20	0.05	O	193	0.005	213
	E	19		E	194		
T.		306			3168		3474

$\sum \chi^2 = 15.57$

With 7 degrees of freedom @ s.l. 0.05 χ^2 = 14.07

∴ there is a significant difference in the frequency of lodgers amongst the townships, but this result is due to the deviations from the expected values in Shotton and Thornley. In the other six townships there is very little deviation from the expected frequencies.

TABLE 6.6 CHI-SQUARE TEST OF THE FREQUENCY OF SERVANTS IN THE EAST DURHAM TOWNSHIPS 1851.

Township	Households with servants		χ^2	Households without servants		χ^2	T
Hutton Henry	O	16	0.47	O	206	0.04	222
	E	19		E	203		
South Hetton	O	23	- 5.92	O	412	0.57	435
	E	38		E	397		
East Murton	O	19	0.05	O	218	0.005	237
	E	20		E	217		
Shotton	O	38	+ 5.54	O	265	0.52	303
	E	26		E	277		
Thornley	O	49	0.20	O	483	0.02	532
	E	46		E	486		
Trimdon	O	34	1.29	O	293	0.12	327
	E	28		E	299		
Hetton	O	102	0.04	O	1103	0.004	1205
	E	104		E	1101		
Quarrington	O	19	0.06	O	194	0.005	213
	E	18		E	195		
T		300			3174		3474

$\Sigma \chi^2 = 14.85$

With 7 degrees of freedom @ s.l. 0.05 $\chi^2 = 14.07$

$\therefore$ there is a significant difference in the frequency of servants amongst the townships in overall terms, but this result is due to the deviations from the expected values in South Hetton and Shotton townships. In the six other townships there is very little deviation from the expected values.

TABLE 6.7 CHI-SQUARE TEST OF THE FREQUENCY OF RESIDENT RELATIONS IN THE EAST DURHAM TOWNSHIPS 1851.

Township	Households with relations		χ^2	Households without relations		χ^2	T
Hutton Henry	O	24	- 6.4	O	198	1.41	222
	E	40		E	182		
South Hetton	O	59	- 5.06	O	376	1.12	435
	E	79		E	356		
East Murton	O	39	0.37	O	198	0.08	237
	E	43		E	194		
Shotton	O	54	0.02	O	249	0.004	303
	E	55		E	248		
Thornley	O	120	+ 6.0	O	412	1.32	532
	E	96		E	436		
Trimdon	O	59	0	O	268	0	327
	E	59		E	268		
Hetton	O	241	2.43	O	964	0.54	1205
	E	218		E	987		
Quarrington	O	33	0.92	O	180	0.21	213
	E	39		E	174		
T.		629			2845		3474

$\Sigma \chi^2 = 25.88$

With 7 degrees of freedom @ s.l. 0.001 $\chi^2 = 24.32$

∴ there is a highly significant difference in the frequency of resident relations amongst the townships.

TABLE 6.8 EAST DURHAM TOWNSHIPS. STRUCTURE OF FAMILIES OF HEADS OF HOUSEHOLDS 1851

NUCLEAR — RELATIVE FREQUENCY % — EXTENDED

FAMILY STRUCTURE:

Township	1	2	3	4	5	6	7	T
Hutton Henry	3.6	9.9	75.7	2.3	0	0.5	8.1	222
South Hetton	2.5	13.1	71.3	2.3	0.2	0.2	10.3	435
East Murton	1.3	7.6	75.5	5.1	0	0.4	10.1	237
Shotton	3.0	7.6	71.3	2.3	0	0.7	14.9	303
Thornley	1.5	10.0	66.0	2.1	0.2	0.6	19.7	532
Trimdon	3.7	10.1	68.1	2.5	0.3	0.6	14.7	327
Hetton	5.1	11.2	63.6	3.1	0.2	0.6	16.2	1205
Quarrington	2.8	11.3	70.4	2.3	0	0	13.1	213
Mean	2.4	10.1	70.2	2.8	0.9	0.5	13.1	3474

CUMULATIVE FREQUENCY %

	1	2	3	4	5	6	7	T
Hutton Henry	3.6	13.5	89.2	91.4	91.4	91.9	100	222
South Hetton	2.5	15.6	86.9	89.2	89.4	89.7	100	435
East Murton	1.3	8.9	84.4	89.5	89.5	89.9	100	237
Shotton	3.0	10.9	82.2	84.5	84.5	85.1	100	303
Thornley	1.5	11.5	77.4	79.5	79.7	80.3	100	532
Trimdon	3.7	13.8	81.9	84.4	84.7	85.3	100	327
Hetton	5.1	16.3	79.9	83.0	83.2	83.8	100	1205
Quarrington	2.8	14.1	84.5	86.8	86.8	86.8	100	213
Mean	2.4	12.5	82.7	85.5	86.4	86.9	100	3474

See note 21 chapter 6 for the categories of family structure.

TABLE 6.9 CHI-SQUARE TEST OF THE STRUCTURE OF THE FAMILIES OF THE HEADS OF HOUSEHOLDS 1851.

Township	Nuclear Family		χ^2	Extended Family		χ^2	T
Hutton Henry	O	198	1.41	O	24	- 6.4	222
	E	182		E	40		
South Hetton	O	378	1.24	O	57	- 5.65	435
	E	357		E	78		
East Murton	O	200	0.19	O	37	0.84	237
	E	194		E	43		
Shotton	O	249	0.004	O	54	0.12	303
	E	248		E	55		
Thornley	O	412	1.32	O	120	+ 6.0	532
	E	436		E	96		
Trimdon	O	268	0	O	59	0	327
	E	268		E	59		
Hetton	O	963	0.63	O	242	2.9	1205
	E	988		E	217		
Quarrington	O	180	0.14	O	33	0.7	213
	E	175		E	38		
T		2848			626		3474

$$\sum \chi^2 = 27.48$$

With 7 degrees of freedom @ s.l. 0.001 χ^2 = 24.32

∴ there is a highly significant difference in the structure of the families of household heads amongst the townships.

TABLE 6.10 EAST DURHAM TOWNSHIPS. FREQUENCY OF SHARED HOUSEHOLDS 1851.

Relative Frequency %

Township	Household Shared	Household not Shared	T
Hutton Henry	2.7	97.3	222
South Hetton	3.4	96.6	435
East Murton	5.5	94.5	237
Shotton	3.3	96.7	303
Thornley	4.9	95.1	532
Trimdon	4.6	95.4	327
Hetton	6.2	93.8	1205
Quarrington	5.2	94.8	213
Mean	4.5	95.5	3474

TABLE 6.11 CHI-SQUARE TEST OF SHARED HOUSEHOLDS IN THE EAST DURHAM TOWNSHIPS 1851

Township	Household Shared		χ^2	Household not Shared		χ^2	T
Hutton Henry	O	6	2.27	O	216	0.12	222
	E	11		E	211		
South Hetton	O	15	1.71	O	420	0.09	435
	E	21		E	414		
East Murton	O	13	0.08	O	224	0.004	237
	E	12		E	225		
Shotton	O	10	1.67	O	293	0.09	303
	E	15		E	288		
Thornley	O	26	0	O	506	0	532
	E	26		E	506		
Trimdon	O	15	0.06	O	312	0.003	327
	E	16		E	311		
Hetton	O	75	4.34	O	1130	0.22	1205
	E	59		E	1146		
Quarrington	O	11	0.01	O	202	0.005	213
	E	10		E	203		
T		171			3303		3474

$\Sigma \chi^2 = 10.76$

With 7 degrees of freedom @ s.l. 0.05 $\chi^2 = 14.07$

$\therefore$ there is no significant difference in the proportion of shared households amongst the townships.

TABLE 6.12 EAST DURHAM TOWNSHIPS. MARITAL STATUS OF HEADS OF HOUSEHOLDS 1851.

Relative Frequency %

Township	Marital Status Group					
	1	2	3	4	5	6
Hutton Henry	87.8	4.1	3.6	1.8	0.5	2.3
South Hetton	86.4	1.4	4.1	0.5	0.5	7.1
East Murton	87.8	0.4	3.4	0.8	0.4	7.2
Shotton	85.3	1.7	4.0	0	2.3	6.7
Thornley	86.4	2.1	4.5	0.8	0.2	6.0
Trimdon	84.0	2.8	1.8	0.9	0.3	10.1
Hetton	81.3	2.0	3.9	1.3	0.9	10.5
Quarrington	89.7	0	4.7	0	0.5	5.2
Mean	86.1	1.8	3.8	0.8	0.7	6.8

Marital status group
1 Married male
2 Single male
3 Widowed male
4 Married female
5 Single female
6 Widowed female

TABLE 6.13 CHI-SQUARE TEST OF THE MARITAL STATUS OF THE HEADS OF HOUSEHOLDS IN THE TOWNSHIPS.

Township	Households headed by married males.		χ^2	Households headed by others.		χ^2	T
Hutton Henry	O	195	0.26	O	27	1.44	222
	E	188		E	34		
South Hetton	O	376	0.13	O	59	0.74	435
	E	369		E	66		
East Murton	O	208	0.24	O	29	1.36	237
	E	201		E	36		
Shotton	O	258	0.004	O	45	0.02	303
	E	257		E	46		
Thornley	O	460	0.18	O	122	0.62	532
	E	451		E	131		
Trimdon	O	275	0.01	O	52	0.08	327
	E	277		E	50		
Hetton	O	980	1.65	O	225	9.14	1205
	E	1021		E	184		
Quarrington	O	191	0.45	O	22	2.61	213
	E	180		E	31		
T		2943			581		3474

$\Sigma \chi^2 = 18.94$

With 7 degrees of freedom @ s.l. 0.05 χ^2 = 14.07

∴ there is a significant difference in the proportion of households headed by married males amongst the townships, due largely to the deviation from the expected value in Hetton township.

TABLE 6.14 EAST DURHAM TOWNSHIPS. LIFE CYCLE STAGE OF HEADS OF HOUSEHOLDS 1851

Relative Frequency %

Township	Life Cycle Stage						
	1	2	3	4	5	6	T
Hutton Henry	5.4	1.8	50.0	8.9	14.3	19.6	222
South Hetton	13.1	3.2	55.5	13.7	7.5	7.0	435
East Murton	5.7	1.4	42.4	27.6	17.1	5.7	237
Shotton	7.5	2.4	50.6	18.2	15.4	5.9	303
Thornley	9.7	2.6	46.9	17.7	14.0	9.1	532
Trimdon	9.4	2.5	55.1	13.4	9.1	10.5	327
Hetton	8.4	3.4	49.3	13.1	12.9	12.9	1205
Quarrington	10.0	3.2	59.5	11.6	8.4	7.4	213
Mean	8.7	2.6	51.2	15.5	12.3	9.8	3474

See note 23, chapter 6 for the categories of Life Cycle Stage.

TABLE 6.15 EAST DURHAM TOWNSHIPS. AGE STRUCTURE OF TOTAL POPULATIONS 1851.

	%	Cum %	%	Cum %	%	Cum %	%	Cum %	%	Cum %	%	Cum %	%	Cum %	%	Cum %
	Hutton	Henry	South	Hetton	East	Murton	Shotton		Thornley		Trimdon		Hetton		Quarrington	
80+	0.59	100	0.35	100	0.16	100	0.67	100	0.44	100	0.74	100	0.74	100	0.10	100
75 – 79	0.59	99.39	0.30	99.66	0.08	99.82	0.40	99.33	0.52	99.56	0.47	99.25	0.68	99.25	0.30	99.90
70 – 74	0.79	98.80	0.45	99.36	0.39	99.74	0.47	98.93	0.79	99.04	1.14	98.78	1.13	98.57	0.10	99.60
65 – 69	0.59	98.01	0.55	98.91	0.62	99.35	0.93	98.46	0.95	98.25	1.48	97.64	1.73	97.44	1.70	99.50
60 – 64	1.49	97.42	1.00	98.36	0.76	98.73	1.34	97.53	1.47	97.30	1.61	96.16	2.63	95.71	1.40	97.80
55 – 59	2.48	95.93	1.65	97.36	1.78	97.97	1.67	96.19	2.54	95.83	2.28	94.55	2.82	93.08	1.60	96.40
50 – 54	4.16	93.45	3.49	95.71	2.40	96.19	2.94	94.52	3.09	93.29	2.62	92.27	3.27	90.26	2.91	94.80
45 – 49	3.85	89.29	4.79	92.22	5.12	93.79	4.07	91.58	5.19	90.20	4.77	89.65	3.90	86.99	2.81	91.89
40 – 44	5.95	85.42	6.43	87.43	5.50	88.67	5.87	87.51	5.31	85.01	5.31	84.88	4.30	83.09	5.41	89.08
35 – 39	5.05	79.47	5.33	81.00	6.82	83.17	5.34	81.64	4.88	79.70	5.04	79.57	5.90	78.79	5.21	83.67
30 – 34	7.23	74.42	5.43	75.67	5.58	76.35	5.27	76.30	5.79	74.82	5.98	74.53	6.15	72.89	7.92	78.46
25 – 29	9.42	67.19	8.08	70.24	6.74	70.77	7.61	71.03	8.76	69.03	9.88	68.55	8.92	66.74	11.22	70.54
20 – 24	8.42	57.77	9.02	62.16	6.36	64.03	8.34	63.42	9.48	60.27	8.87	58.67	8.47	57.82	6.71	59.32
15 – 19	6.64	49.35	9.92	53.14	11.71	57.67	9.55	55.08	11.02	50.79	8.33	49.80	9.61	49.35	8.52	52.61
10 – 14	12.09	42.71	12.81	43.22	15.19	45.96	13.02	45.53	12.33	39.77	9.61	41.47	11.10	39.74	10.02	44.09
5 – 9	14.07	30.62	14.21	30.41	15.81	30.77	14.82	32.51	12.29	27.44	14.05	31.86	13.01	28.64	14.93	34.07
0 – 4	16.55	16.55	16.20	16.20	14.96	14.96	17.69	17.69	15.15	15.15	17.81	17.81	15.63	15.63	19.14	19.14

TABLE 6.16 KOLMOGOROV-SMIRNOV TESTS OF THE AGE STRUCTURES OF THE EAST DURHAM TOWNSHIPS. 1851

Decreasing mean age

Increasing mean age	Hetton	Trimdon	Hutton Henry	Thornley	Quarrington	S. Hetton	Shotton	E. Murton
Hetton	–	x	x	x	∫	∫	∫	∫
Trimdon	x	–	x	x	x	x	∫	∫
Hutton Henry	x	x	–	x	x	x	∫	∫
Thornley	x	x	x	–	x	x	∫	∫
Quarrington	∫	x	x	x	–	x	x	∫
South Hetton	∫	x	x	x	x	–	x	x
Shotton	∫	∫	∫	x	x	x	–	x
East Murton	∫	∫	∫	∫	∫	x	x	–

∫ = significant difference in age structure s.l. 0.05

x = no significant difference s.l. 0.05

TABLE 6.17 EAST DURHAM TOWNSHIPS. SEX RATIOS 1851

Township	Male		Female		Total
	No	%	No	%	
Hutton Henry	582	54.5	485	45.5	1067
South Hetton	1124	52.0	1038	48.0	2162
East Murton	751	54.1	636	45.9	1387
Shotton	1044	53.9	893	46.1	1937
Thornley	1423	52.0	1318	48.0	2741
Trimdon	836	52.3	762	47.7	1598
Hetton	2973	51.7	2778	48.3	5751
Quarrington	570	53.6	493	46.4	1063
Total	9303	52.6	8403	47.4	17706

TABLE 6.18 INTRA-TOWNSHIP ANALYSIS OF SOCIAL STRUCTURES.

RURAL-MINING COMMUNITIES 1851 SUMMARY TABLE

Variable	Hutton Henry	East Murton	Shotton	Grange-Village	Trimdon Colliery-Village	Grange-Colliery
Persons per household	x	x	x	x	∫	x
Persons per family	x	x	∫	x	x	x
Children per household	x	x	∫	x	∫	x
% of households with lodgers	x	x	x	x	x	x
% of households with servants	∫ (s.l. 0.001)	–	∫ (s.l. 0.001)	∫	∫	x
% of households with relations	∫	x	∫	x	x	x
Structure of family of head of household. Nuclear-extended.	∫	x	∫	x	x	x
Proportion of shared households.	–	–	x	x	x	∫
Life Cycle Stage of family of head of household.	∫	–	x	∫	∫	x
Age-structure – age groups	∫ (s.l. 0.001)	x	∫ (s.l. 0.001)	∫ (s.l. 0.001)	∫ (s.l. 0.001)	∫
Birthplace distribution	∫ (s.l. 0.001)	∫	∫ (s.l. 0.001)	∫ (s.l. 0.001)	∫ (s.l. 0.001)	∫

∫ = significant difference s.l. 0.05

x = no significant difference

– = test not possible.

TABLE 6.19 INTRA-TOWNSHIP ANALYSIS OF SOCIAL STRUCTURE 1851

SUMMARY TABLE

Variable	Easington Lane	Brick Garth	Eastside	Hetton Lyons	Four Lane Ends	Hetton Downs	Village	Bog Row	Test
Persons per household			x	x					Kolmogorov-Smirnov
Persons per family	x							x	Kolmogorov-Smirnov
Children per household			∫			∫			Kolmogorov-Smirnov s.l. 0.05
% households with lodgers	x	x	x	x	x	x	x	x	Chi-Square
% households with servants	∫	∫	∫	∫	∫	∫	∫	∫	Chi-Squared s.l. 0.001
% households with relations	∫	∫	∫	∫	∫	∫	∫	∫	Chi-Square s.l. 0.05
Structure of family of head of household.	∫	∫	∫	∫	∫	∫	∫	∫	Chi-Square s.l. 0.05
Proportion of shared households	∫	∫	∫	∫	∫	∫	∫	∫	Chi-Square s.l. 0.05
Life Cycle Stage of family of head of household	∫	∫	∫	∫	∫	∫	∫	∫	Chi-Square s.l. 0.001
Age-structure - overall		∫		∫					Kolmogorov-Smirnov s.l. 0.05
Age-structure - age groups	∫	∫	∫	∫	∫	∫	∫	∫	Chi-Square s.l. 0.001
Birthplace region	∫	∫	∫	∫	∫	∫	∫	∫	Chi-Square s.l. 0.001

∫ = significant difference
x = no significant difference

TABLE 6.20 CHI-SQUARE TESTS OF THE FREQUENCY OF LODGERS IN HUTTON HENRY, SHOTTON, TRIMDON AND EAST MURTON TOWNSHIPS 1851.

Hutton Henry

	Rural		Mining		Total
Households with lodgers	O 7	χ^2	O 11	χ^2	18
	E 5	0.8	E 13	0.31	
Households without lodgers	O 61	χ^2	O 143	χ^2	204
	E 63	0.06	E 141	0.03	
T	68		154		222

$\Sigma \chi^2 = 1.2$

1 d.f @ s.l. 0.05 $\chi^2 = 3.84$

∴ no significant difference

Shotton

	Rural		Mining		Total
Households with lodgers	O 4	χ^2	O 11	χ^2	15
	E 3	0.33	E 12	0.08	
Households without lodgers	O 61	χ^2	O 227	χ^2	288
	E 62	0.02	E 226	0.004	
T	65		238		303

$\Sigma \chi^2 = 0.434$

∴ no significant difference @ s.l. 0.05

Trimdon

	Rural		Trimdon Colliery		Total
Households with lodgers	O 9	χ^2	O 7	χ^2	16
	E 7	0.57	E 9	0.44	
Households without lodgers	O 66	χ^2	O 92	χ^2	156
	E 66	0.06	E 90	0.04	
T	73		99		172

$\Sigma \chi^2 = 1.11$

∴ no significant difference @ s.l. 0.05

East Murton

	Rural		Mining		Total
Households with lodgers	O 4	χ^2	O 22	χ^2	26
	E 3	0.33	E 23	0.04	
Households without lodgers	O 19	χ^2	O 192	χ^2	211
	E 20	0.05	E 191	0.005	
T	23		214		237

$\Sigma \chi^2 = 0.425$

∴ no significant difference @ s.l. 0.05

Testing also demonstrated that there was no significant difference in the proportion of households with lodgers between Trimdon Village and Trimdon Grange.

TABLE 6.21 CHI-SQUARE TEST OF THE FREQUENCY OF LODGERS WITHIN THE EIGHT ZONES OF HETTON 1851

	Households with lodgers			Households without lodgers			Total
Easington Lane	O	23	χ^2	O	217	χ^2	240
	E	20	0.45	E	220	0.04	
Brick Garth	O	18	χ^2	O	189	χ^2	207
	E	17	0.06	E	190	0.005	
East side	O	15	χ^2	O	226	χ^2	241
	E	20	1.25	E	221	0.11	
Hetton Lyons	O	4	χ^2	O	48	χ^2	52
	E	4	0	E	48	0	
Four Lane Ends	O	5	χ^2	O	73	χ^2	78
	E	6	0.17	E	27	0.01	
Hetton Downs	O	21	χ^2	O	235	χ^2	256
	E	21	0	E	235	0	
Village	O	9	χ^2	O	74	χ^2	83
	E	7	0.57	E	76	0.05	
Bog Row	O	3	χ^2	O	34	χ^2	37
	E	3	0	E	34	0	
Total		98			1096		1194

$$\Sigma \chi^2 = 2.719$$

7 dfs @ s.l. 0.05 χ^2 = 14.07

∴ there is no significant difference in the proportion of households with lodgers amongst the zones within Hetton.

TABLE 6.22 CHI-SQUARE TEST OF THE FREQUENCY OF SERVANTS IN THE FOUR SAMPLE TOWNSHIPS 1851.

Hutton Henry

	Rural		Mining		Total
Households with servants	O 14	χ^2	O 2	χ^2	16
	E 5	16.2	E 11	7.36	
Households without servants	O 54	χ^2	O 152	χ^2	206
	E 63	1.29	E 143	0.56	
Total	68		154		222

$\Sigma \chi^2$ = 25.41

1df @ s.l. 0.001 χ^2 = 10.83

∴ highly significant difference

Shotton

	Rural		Mining		Total
Households with servants	O 18	χ^2	O 20	χ^2	38
	E 8	12.5	E 30	3.33	
Households without servants	O 47	χ^2	O 218	χ^2	265
	E 57	1.75	E208	0.48	
T	65		238		303

$\Sigma \chi^2$ = 18.06

∴ highly significant difference.

Trimdon

	Rural		Trimdon Colliery		Total
Households with servants	O 14	χ^2	O 5	χ^2	19
	E 8	4.5	E 11	3.27	
Households without servants	O 59	χ^2	O 94	χ^2	153
	E 65	0.5	E 88	0.41	
T	73		99		172

$\Sigma \chi^2$ = 8.73

1 df @ s.l. 0.01 χ^2 = 6.64

∴ highly significant difference

A significant difference was also found between Trimdon village and Trimdon Grange.

East Murton

	Rural		Mining		Total
Households with servants	O 3	χ^2	O 14	χ^2	17
	E 2	0.05	E 15	0.07	
Households without servants	O 20	χ^2	O 200	χ^2	220
	E 21	0.05	E 199	0.005	
T	23		214		237

$\Sigma \chi^2$ = 0.622

∴ no significant difference s.l. 0.05

TABLE 6.23 CHI-SQUARE TEST OF THE FREQUENCY OF SERVANTS WITHIN THE EIGHT ZONES OF HETTON 1851

	Households with servants			Households without servants			Total
Easington Lane	O	27	χ^2	O	213	χ^2	240
	E	20	2.45	E	220	0.22	
Brick Garth	O	7	χ^2	O	200	χ^2	207
	E	17	= 5.88	E	190	0.53	
East Side	O	22	χ^2	O	219	χ^2	241
	E	20	0.2	E	221	0.02	
Hetton Lyons	O	9	χ^2	O	43	χ^2	52
	E	4	∘ 6.25	E	48	0.52	
Four Lane Ends	O	7	χ^2	O	71	χ^2	78
	E	7	0	E	71	0	
Hetton Downs	O	10	χ^2	O	246	χ^2	266
	E	21	= 5.76	E	235	0.51	
Village	O	17	χ^2	O	66	χ^2	83
	E	7	∘ 14.29	E	76	1.32	
Bog Row	O	1	χ^2	O	36	χ^2	37
	E	3	1.33	E	34	0.12	
Total		100			1094		1194

$\Sigma\chi^2$ ∘ 39.4

7 dfs @ s.l. 0.001 χ^2 ∘ 24.32

∴ there is a highly significant difference in the proportion of households with servants amongst the zones within Hetton.

TABLE 6.24 CHI-SQUARE TEST OF THE FREQUENCY OF RESIDENT RELATIONS IN THE FOUR SAMPLE TOWNSHIPS 1851

Hutton Henry

	Rural		Mining		Total
Households with relations	O 12	χ^2	O 12	χ^2	24
	E 7	3.57	E 17	1.47	
Households without relations	O 56	χ^2	O 142	χ^2	198
	E 61	0.41	E 137	0.18	
Total	68		154		222

$\Sigma \chi^2 = 5.63$

∴ significant difference @ s.l. 0.05

Shotton

	Rural		Mining		Total
Households with relations	O 19	χ^2	O 35	χ^2	54
	E 12	4.08	E 42	1.17	
Households without relations	O 46	χ^2	O 203	χ^2	249
	E 53	0.92	E 196	0.25	
Total	65		238		303

$\Sigma \chi^2 = 6.42$

∴ significant difference @ sl. 0.05

Trimdon

	Rural		Trimdon Colliery		Total
Households with relations	O 13	χ^2	O 21	χ^2	34
	E 14	0.07	E 20	0.05	
Households without relations	O 60	χ^2	O 78	χ^2	138
	E 59	0.02	E 79	0.01	
Total	73		99		172

$\Sigma \chi^2 = 0.15$

∴ no significant difference @ s.l. 0.05

Trimdon Village & Trimdon Grange – no significant difference @ s.l. 0.05

East Murton

	Rural		Mining		Total
Households with with relations	O 3	χ^2	O 36	χ^2	39
	E 4	0.25	E 35	0.03	
Households without relations	O 20	χ^2	O 178	χ^2	198
	E 19	0.05	E 179	0.006	
Total	23		214		237

$\Sigma \chi^2 = 0.336$

∴ no significant difference @ s.l. 0.05

TABLE 6.25 CHI-SQUARE TEST OF THE FREQUENCY OF RESIDENT RELATIONS WITHIN HETTON 1851.

	Households with relations		Households without relations		Total
Easington Lane	O 47 E 48	χ^2 0.02	O 193 E 192	χ^2 0.005	240
Brick Garth	O 36 E 41	χ^2 0.61	O 171 E 166	χ^2 0.15	207
East Side	O 54 E 48	χ^2 0.75	O 187 E 193	χ^2 0.19	241
Hetton Lyons	O 18 E 10	χ^2 6.4	O 34 E 42	χ^2 1.52	52
Four Lane Ends	O 20 E 16	χ^2 1.0	O 58 E 62	χ^2 0.26	78
Hetton Downs	O 40 E 51	χ^2 2.37	O 216 E 205	χ^2 1.69	256
Village	O 14 E 17	χ^2 0.53	O 69 E 66	χ^2 0.14	83
Beg Row	O 9 E 7	χ^2 0.57	O 28 E 30	χ^2 0.13	37
Total	238		956		1194

$\Sigma\chi^2$ = 16.34

7 dfs @ s.l. 0.05 χ^2 = 14.07

∴ there is a significant difference in the proportion of households with resident relations amongst the zones within Hetton.

TABLE 6.26 CHI-SQUARE TEST OF THE STRUCTURES OF THE FAMILIES OF THE HEADS OF HOUSEHOLDS IN THE FOUR SAMPLE VILLAGES 1851.

Hutton Henry

		Rural			Mining		Total
Nuclear	O	55	χ^2	O	143	χ^2	198
	E	60	0.42	E	138	0.18	
Extended	O	12	χ^2	O	12	χ^2	24
	E	7	3.57	E	17	1.47	
Total		67			155		222

$\Sigma\chi^2 = 5.64$

1 df @ s.l. 0.05 $\chi^2 = 3.84$

∴ a significant difference

Shotton

		Rural			Mining		Total
Nuclear	O	46	χ^2	O	203	χ^2	249
	E	53	0.92	E	196	0.25	
Extended	O	19	χ^2	O	35	χ^2	54
	E	12	4.08	E	42	1.17	
Total		65			238		303

$\Sigma\chi^2 = 6.42$

∴ a significant difference @ s.l. 0.05

Trimdon

		Village			Colliery		Total
Nuclear	O	60	χ^2	O	78	χ^2	138
	E	59	0.02	E	79	0.01	
Extended	O	13	χ^2	O	21	χ^2	34
	E	14	0.07	E	20	0.05	
Total		73			99		172

$\Sigma\chi^2 = 0.15$

∴ there is no significant difference

Also there is no significant difference in the family structures of Trimdon Grange and Trimdon Village.

East Hurton

		Rural			Mining		Total
Nuclear	O	20	χ^2	O	180	χ^2	200
	E	19	0.05	E	181	0.006	
Extended	O	3	χ^2	O	34	χ^2	37
	E	4	0.25	E	33	0.03	
Total		23			214		237

$\Sigma\chi^2 = 0.336$

∴ there is no significant difference

TABLE 6.27 CHI-SQUARE TEST OF THE STRUCTURE OF THE FAMILIES OF THE HEADS OF HOUSEHOLDS WITHIN HETTON 1851

	Nuclear		Extended		Total
Easington Lane	O 191	χ^2	O 49	χ^2	240
	E 192	0.005	E 48	0.02	
Brick Garth	O 171	χ^2	O 36	χ^2	207
	E 165	0.22	E 42	0.86	
East Side	O 187	χ^2	O 54	χ^2	241
	E 192	0.13	E 49	0.51	
Hetton Lyons	O 34	χ^2	O 18	χ^2	52
	E 42	1.52	E 10	6.4	
Four Lane Ends	O 58	χ^2	O 20	χ^2	78
	E 62	0.26	E 16	1.0	
Hetton Downs	O 216	χ^2	O 40	χ^2	256
	E 204	0.71	E 52	2.77	
Village	O 68	χ^2	O 15	χ^2	83
	E 66	0.06	E 17	0.24	
Bog Row	O 28	χ^2	O 9	χ^2	37
	E 30	0.13	E 7	0.57	
Total	953		241		1194

$\Sigma \chi^2 = 15.405$

with 7dfs @ s.l. 0.05 $\chi^2 = 14.07$

∴ there is a significant difference.

TABLE 6.28 CHI-SQUARE TEST OF THE FREQUENCY OF SHARED HOUSEHOLDS IN THE FOUR SAMPLE TOWNSHIPS 1851

Hutton Henry

	Rural			Mining			Total
Household shared	O	2	χ^2	O	4	χ^2	6
	E	2	0	E	4	0	
Not shared	O	64	χ^2	O	152	χ^2	216
	E	64	0	E	152	0	
Total		66			156		222

χ^2 test not valid
as 50% E. values lessthan 5

Shotton

	Rural			Mining			Total
Shared	O	5	χ^2	O	60	χ^2	65
	E	2	4.5	E	63	0.14	
Not shared	O	5	χ^2	O	233	χ^2	238
	E	8	1.13	E	230	0.04	
Total		10			293		303

$\therefore \Sigma\chi^2 = 5.81$
.. there is a significant difference @ s.l. 0.05

Trimdon

	Village			Colliery			Total
Shared	O	2	χ^2	O	9	χ^2	11
	E	5	1.8	E	6	1.5	
Not shared	O	71	χ^2	O	90	χ^2	161
	E	68	0.13	E	93	0.10	
Total		73			99		172

$\therefore \Sigma\chi^2 = 3.53$
.. there is no significant difference

East Murton

χ^2 test not possible as a 0 value recorded.

Also there is no significant difference in the frequency of shared households in Trimdon Grange and Trimdon Village.

TABLE 6.29 CHI-SQUARE TEST OF THE FREQUENCY OF SHARED HOUSEHOLDS

WITHIN HETTON 1851

	Shared households		Not shared		Total
Easington Lane	O 27	χ^2	O 213	χ^2	240
	E 15	9.6	E 225	0.64	
Brick Garth	O 12	χ^2	O 195	χ^2	207
	E 13	0.077	E 194	0.005	
East Side	O 16	χ^2	O 225	χ^2	241
	E 15	0.067	E 226	0.04	
Hetton Lyons	O 2	χ^2	O 50	χ^2	52
	E 3	0.33	E 49	0.02	
Four Lane Ends	O 4	χ^2	O 74	χ^2	78
	E 5	0.2	E 73	0.14	
Hetton Downs	O 10	χ^2	O 246	χ^2	256
	E 16	2.25	E 240	0.15	
Village	O 3	χ^2	O 80	χ^2	83
	E 5	0.8	E 78	0.05	
Bog Row	O 1	χ^2	O 36	χ^2	37
	E 2	0.5	E 35	0.03	
Total	75		1119		1194

$\Sigma \chi^2 = 14.737$

7 dfs @ s.l. 0.05 $\chi^2 = 14.07$

∴ there is a significant difference.

TABLE 6.30 CHI-SQUARE OF THE LIFE CYCLE STAGE OF THE FAMILIES OF THE HEADS OF HOUSEHOLDS IN THE FOUR SAMPLE VILLAGES 1851.

Hutton Henry

Stage		Village			Colliery		Total
1 & 2	O	4	χ^2	O	17	χ^2	21
	E	6	0.67	E	15	0.27	
3	O	28	χ^2	O	82	χ^2	110
	E	31	0.29	E	79	0.11	
4	O	5	χ^2	O	18	χ^2	23
	E	7	0.57	E	16	0.25	
5	O	8	χ^2	O	17	χ^2	25
	E	7	0.14	E	16	0.06	
6	O	11	χ^2	O	7	χ^2	18
	E	5	7.2	E	13	2.77	
Total		56			141		197

$\Sigma\chi^2$ = 12.33

4 dfs s.l. 0.05 χ^2 = 9.49

∴ significant diff.

Shotton

Stage		Village			Colliery		Total
1 & 2	O	2	χ^2	O	23	χ^2	25
	E	4	1.0	E	21	0.19	
3	O	25	χ^2	O	103	χ^2	128
	E	22	0.41	E	106	0.08	
4	O	5	χ^2	O	41	χ^2	46
	E	8	1.13	E	38	0.24	
5	O	5	χ^2	O	34	χ^2	39
	E	7	0.57	E	32	0.13	
6	O	6	χ^2	O	9	χ^2	15
	E	3	3.00	E	12	0.75	
Total		43			210		253

$\Sigma\chi^2$ = 7.50

∴ no significant difference.

Trimdon

Stage		Village			Colliery		Total
1 & 2	O	2	χ^2	O	10	χ^2	12
	E	5	1.8	E	7	1.3	
3	O	28	χ^2	O	49	χ^2	77
	E	29	0.03	E	48	0.02	
4	O	2	χ^2	O	13	χ^2	15
	E	6	2.67	E	9	1.78	
5	O	6	χ^2	O	7	χ^2	13
	E	5	0.2	E	8	0.13	
6	O	15	χ^2	O	7	χ^2	22
	E	8	6.13	E	14	3.5	
Total		53			86		139

$\Sigma\chi^2$ = 17.56 4 dfs s.l. 0.05 χ^2 = 9.49

∴ a significant difference.

East Burton

χ^2 test not possible.

TABLE 6.31 CHI-SQUARE TEST OF THE LIFE CYCLE STAGE OF THE FAMILIES OF THE HEADS OF HOUSEHOLDS WITHIN HETTON 1851.

	Stages 1 & 2			3			4			5			6			T
Easington Lane	O	24	χ^2	O	108	χ^2	O	16	χ^2	O	17	χ^2	O	29	χ^2	194
	E	28	0.57	E	93	2.42	E	25	3.24	E	24	2.04	E	24	1.04	
Brick Garth	O	23	χ^2	O	95	χ^2	O	22	χ^2	O	23	χ^2	O	13	χ^2	176
	E	25	0.16	E	84	1.44	E	22	0	E	22	0.05	E	22	3.68	
East Side	O	27	χ^2	O	105	χ^2	O	19	χ^2	O	31	χ^2	O	35	χ^2	216
	E	31	0.52	E	103	0.04	E	27	2.37	E	27	0.59	E	27	2.37	
Hetton Lyons	O	1	χ^2	O	13	χ^2	O	6	χ^2	O	7	χ^2	O	13	χ^2	40
	E	6	4.17	E	19	1.89	E	5	0.2	E	5	0.8	E	5	12.8	
Four Lane Ends	O	2	χ^2	O	28	χ^2	O	9	χ^2	O	10	χ^2	O	15	χ^2	64
	E	9	5.44	E	30	0.13	E	8	0.125	E	8	0.5	E	8	1.125	
Hetton Downs	O	33	χ^2	O	96	χ^2	O	46	χ^2	O	30	χ^2	O	15	χ^2	220
	E	32	0.03	E	105	0.77	E	28	11.57	E	28	0.14	E	28	6.04	
Village	O	3	χ^2	O	37	χ^2	O	6	χ^2	O	6	χ^2	O	9	χ^2	61
	E	9	4.0	E	29	2.21	E	8	0.5	E	8	0.5	E	8	0.125	
Bog Row	O	5	χ^2	O	11	χ^2	O	6	χ^2	O	6	χ^2	O	1	χ^2	28
	E	4	0.25	E	13	0.31	E	6	0	E	4	1.0	E	4	2.25	
Total	144			478			127			126			125			1000

$\Sigma \chi^2 = 77.405$

28 dfs s.l. 0.001 $\chi^2 = 56.89$

∴ there is a highly significant difference

N B Life cycle stages 1 & 2 have been aggregated because of the small numbers recorded in stage 1.

TABLE 6.32 KOLMOGOROV-SMIRNOV TESTS OF OVERALL AGE STRUCTURES OF THE FOUR SAMPLE TOWNSHIPS 1851.

Hutton Henry — max.d = 15.05%

Rural-Mining — = 0.1505

KS value @ s.l. 0.001 = 0.1301

∴ there is a significant difference between the age structures of the rural and mining communities.

Shotton — max.d = 10.25%

Rural-Mining — = 0.1025

KS value @ 0.05 s.l. = 0.0846

∴ there is a significant difference

Trimdon — Trimdon Colliery & Trimdon Village — max.d = 14.84%

= 0.1484

KS value @ s.l. 0.05 = 0.09835

∴ there is a significant difference

Trimdon Grange & Trimdon Village — max.d = 17.79%

= 0.1779

KS value @ s.l. 0.001 = 0.1432

∴ there is a significant difference.

East Hurton — max.d = 6.38%

= 0.0638

KS value @ s.l. 0.05 = .122957

∴ there is no significant difference.

TABLE 6.33 CHI-SQUARE TESTS OF THE AGE STRUCTURES OF THE FOUR SAMPLE TOWNSHIPS. 1851.

Hutton Henry

Age Groups	Village	χ^2	Colliery	χ^2	Total
0 – 14	O 105		O 340		445
	E 135	– 6.67	E 310	2.9	
15 – 29	O 82		O 173		255
	E 77	0.32	E 178	0.14	
30 – 49	O 60		O 166		226
	E 68	0.94	E 158	0.41	
50 – 64	O 44		O 41		85
	E 26	+ 12.46	E 59	– 5.49	
65+	O 24		O 7		31
	E 9	+ 25	E 22	– 10.23	
Total	315		727		1042

$\Sigma \chi^2$ = 64.56 2
4 dfs s.l. 0.001 χ = 18.46
∴ highly significant difference

Shotton

Age Group	Village	χ^2	Colliery	χ^2	Total
0 – 14	O 128		O 596		724
	E 149	2.96	E 575	0.77	
15 – 29	O 87		O 316		403
	E 83	0.19	E 320	0.05	
30 – 49	O 58		O 262		320
	E 66	0.97	E 254	0.25	
50 – 64	O 26		O 70		96
	E 20	1.8	E 76	0.47	
65+	O 27		O 15		42
	E 9	+ 36	E 33	9.82	
Total	326		1259		1585

$\Sigma \chi^2$ = 52.28 2
4 dfs s.l. 0.001 χ = 18.46
∴ highly significant difference.

Trimdon

Age Group	Village	χ^2	Colliery	χ^2	Total
0 – 14	O 94		O 235		329
	E 122	– 6.43	E 207	3.79	
15 – 29	O 79		O 116		195
	E 72	0.68	E 123	0.40	
30 – 49	O 58		O 115		173
	E 64	0.56	E 109	0.33	
50 – 64	O 35		O 25		60
	E 22	+ 7.68	E 38	– 4.45	
65+	O 32		O 16		48
	E 18	+ 10.89	E 30	– 6.53	
Total	298		507		805

$\Sigma \chi^2$ = 41.74
∴ highly significant difference

East Murton

Age Group	Village	χ^2	Colliery	χ^2	Total
0 – 14	O 49		O 570		619
	E 55	0.65	E 564	0.06	
15 – 29	O 33		O 319		352
	E 31	0.13	E 321	0.01	
30 – 49	O 24		O 277		301
	E 27	0.33	E 274	0.03	
50 – 64	O 11		O 55		66
	E 6	+ 4.17	E 60	0.42	
65+	O 4		O 20		24
	E 2	2.0	E 22	0.18	
Total	121		1241		1362

$\Sigma \chi^2$ = 7.98 2
4 dfs s.l. 0.05 χ = 9.49
∴ no significant difference.

Testing also proved a highly significant difference of age structure between Trimdon Grange and Trimdon Village.

TABLE 6.34 AGE STRUCTURE OF THE EIGHT ZONES WITHIN HETTON 1851.

	Easington Lane		Brick Garth		East Side		Hetton Lyons		Four Lane Ends		Hetton Down		Village		Bog Row	
	%	cum %	%	cum %	%	cum %	%	cum %	%	cum %	%	cum %	%	cum %	%	cum %
80+	1.40	100	0.52	100	1.10	100	0.41	100	0.56	100	0.24	100	1.06	100	0	100
75 – 79	0.88	98.63	0.41	99.48	1.10	99.02	1.64	99.62	1.68	99.42	0.24	99.77	0.27	99.00	0	100
70 – 74	0.79	97.75	0.93	99.07	1.29	97.92	2.05	97.98	2.52	97.74	0.88	99.53	1.86	98.73	0	100
65 – 69	1.67	96.96	1.55	98.14	1.20	96.63	3.69	95.93	3.36	95.22	1.20	98.65	2.65	96.87	1.18	100
60 – 64	3.77	95.29	2.47	96.59	2.89	95.43	3.69	92.24	3.36	91.86	1.36	97.45	2.12	94.22	1.76	98.84
55 – 59	3.42	91.52	2.16	94.12	2.99	92.54	4.10	88.55	3.08	88.5	2.39	96.09	3.18	92.10	2.35	97.08
50 – 54	3.86	88.10	2.58	91.96	3.69	89.55	4.10	84.45	1.96	85.42	2.55	93.70	5.04	88.92	3.53	94.73
45 – 49	3.86	84.24	2.89	89.38	3.49	85.86	6.15	80.35	5.88	83.46	4.23	91.15	3.48	83.88	4.71	91.20
40 – 44	4.65	80.38	2.78	86.49	5.48	82.37	3.69	74.20	2.52	77.58	4.86	86.92	3.48	80.40	7.06	86.49
35 – 39	5.26	75.73	7.53	83.71	5.68	76.89	6.56	70.51	7.00	75.06	4.78	82.06	6.63	76.92	5.29	79.43
30 – 34	5.70	70.47	7.73	76.18	4.98	71.21	2.05	63.95	7.28	68.06	6.54	77.28	7.16	70.29	4.71	74.14
25 – 29	7.98	64.77	8.66	68.45	11.25	66.23	11.89	61.90	5.88	60.78	8.85	70.74	6.37	63.13	8.24	69.43
20 – 24	8.59	56.79	8.04	59.79	8.27	54.98	8.61	50.01	5.88	54.9	8.85	61.89	10.08	56.76	11.18	61.19
15 – 19	10.08	48.20	7.94	51.75	9.56	46.71	9.43	41.40	9.80	49.02	10.69	53.04	10.08	46.68	7.65	50.01
10 – 14	11.31	38.12	10.82	43.81	9.16	37.15	12.70	31.97	10.36	39.22	12.84	42.35	9.55	36.60	12.94	42.36
5 – 9	13.23	26.81	14.12	32.99	12.25	27.99	10.66	19.27	12.89	28.86	13.16	29.51	12.20	27.05	14.71	29.42
0 – 4	13.58	13.58	18.87	18.87	15.74	15.74	8.61	8.61	15.97	15.97	16.35	16.35	14.85	14.85	14.71	14.71

TABLE 6.35 CHI-SQUARE TEST OF THE AGE STRUCTURES WITHIN HETTON 1851.

	Age Groups																	
	0 – 14			15 – 29			30 – 49			50 – 65			65+			Total		
Eastington Lane	O	435	χ^2	O	304	χ^2	O	222	χ^2	O	126	χ^2	O	54	χ^2			1141
	E	453	0.72	E	308	0.05	E	231	0.35	E	100	+ 6.76	E	49	0.51			
Brick Garth	O	425	χ^2	O	239	χ^2	O	203	χ^2	O	70	χ^2	O	33	χ^2			970
	E	385	+ 4.16	E	261	1.85	E	197	0.18	E	85	2.65	E	42	1.93			
East Side	O	373	χ^2	O	292	χ^2	O	197	χ^2	O	96	χ^2	O	46	χ^2			1004
	E	399	1.69	E	271	1.63	E	204	0.24	E	88	0.73	E	43	0.21			
Hetton Lyons	O	78	χ^2	O	73	χ^2	O	45	χ^2	O	29	χ^2	O	19	χ^2			244
	E	97	– 3.72	E	66	0.74	E	49	0.33	E	21	+ 3.05	E	10	+ 8.1			
Four Lane Ends	O	140	χ^2	O	7 7	χ^2	O	81	χ^2	O	30	χ^2	O	29	χ^2			357
	E	142	0.03	E	96	– 3.76	E	72	1.13	E	31	0.03	E	15	+ 13.07			
Hetton Downs	O	531	χ^2	O	356	χ^2	O	256	χ^2	O	79	χ^2	O	32	χ^2			1254
	E	498	2.19	E	338	0.96	E	254	0.02	E	110	– 8.74	E	54	– 8.96			
Village	O	138	χ^2	O	100	χ^2	O	78	χ^2	O	39	χ^2	O	22	χ^2			377
	E	150	0.96	E	102	0.04	E	76	0.05	E	33	1.09	E	16	2.25			
Bog Row	O	72	χ^2	O	46	χ^2	O	37	χ^2	O	13	χ^2	O	2	χ^2			170
	E	68	0.24	E	46	0	E	34	0.26	E	15	0.27	E	7	– 3.57			
Total	2192			1487			1119			482			237					5517

$$\Sigma \chi^2 = 87.22$$

28 dfs s.l. 0.001 χ^2 = 56.89

$\therefore$ there is a highly significant difference.

TABLE 6.36 CHI-SQUARE TABULATION TO TEST THE AGE STRUCTURES OF THE EIGHT ZONES WITHIN HETTON, 1851

	Easington Lane	Brick Garth	East Side	Hetton Lyons	Four Lane Ends	Hetton Downs	Village	Bog Row
Easington Lane	x							
Brick Garth	16.33 ∫	x						
East Side	2.81	14.75 ∫	x					
Hetton Lyons	6.50	24.28 ∫	6.35	x				
Four Lane Ends	11.47 ∫	14.90	12.93 ∫	9.22	x			
Hetton Downs	26.72 ∫	6.61	18.17 ∫	31.86 ∫	18.46 ∫	x		
Village	1.07	11.29 ∫	1.61	3.04	4.79	20.37 ∫	x	
Bog Row	6.63	2.74	6.53	14.61 ∫	11.27 ∫	1.76	7.0	x

with 4 dfs @ s.l. 0.05 χ^2 = 9.45

∫ indicates a significant difference of age structure between two of the zones

TABLE 6.37 SPEARMAN RANK CORRELATION COEFFICIENT TEST BETWEEN THE AGE STRUCTURE AND THE PROPORTION OF COAL MINERS WITHIN THE EIGHT ZONES OF HETTON, 1851.

	Rank			
	Age structure	Proportion of coal miners	d	d^2
Easington Lane	5	6	1	1
Brick Garth	3	3	0	0
East Side	4	5	1	1
Hetton Lyons	8	7	1	1
Four Lane Ends	7	4	3	9
Hetton Downs	2	2	0	0
Village	6	8	2	4
Bog Row	1	1	1	1

$$\Sigma d^2 = 17$$

$$r_s = 1 - \frac{(6 \times 17)}{504}$$

$$= 1 - \frac{102}{504}$$

$$= 1 - 0.202$$

$$r_s = \underline{\underline{0.798}}$$

TABLE 6.38 CROSS-TABULATIONS FOR THE INTRA-TOWNSHIP ANALYSES

CROSS-TAB	HETTON	THORNLEY	SHOTTON	TRIMDON	EAST MURTON	SOUTH HETTON	HUTTON HENRY	QUARRINGTON
OHHxPH	∫	X	X	X	X	X	X	X
OHHxPF	∫	∫	∫	∫	∫	X	X	X
OHHxSFH	∫	X	∫	X	X	X	X	X
OHHxLC	∫	X	X	X	X	X	X	X
OHHxShare	∫	X	∫	X	X	X	X	X
OHHxCH	∫	∫	X	X	X	X	X	X
OHHxNL	∫	X	∫	X	X	∫	X	X
OHHxNS	∫	∫	∫	∫	∫	∫	∫	∫
OHHxNR	∫	X	∫	X	X	X	X	X
OHHxBHH	∫	∫	∫	∫	X	∫	∫	∫
OHHxAHH	∫	∫	∫	∫	∫	∫	∫	∫
OHHxSHH	∫	∫	∫	∫	∫	∫	∫	∫
OHHxMSH	∫	∫	∫	∫	∫	∫	∫	∫
AHHxPH	∫	∫	∫	∫	∫	∫	∫	–
AHHxPF	∫	∫	∫	∫	∫	∫	∫	∫
AHHxSFH	∫	∫	∫	X	∫	∫	∫	X
AHHxLC	∫	∫	∫	∫	∫	∫	∫	∫
AHHxShare	∫	∫	–	X	–	X	–	–
AHHxCH	∫	–	–	–	–	–	–	–
AHHxNL	∫	X	–	X	X	X	–	X
AHHxNS	∫	X	∫	∫	X	X	–	–
AHHxNR	∫	∫	∫	X	∫	∫	∫	X
AHHxBHH	∫	∫	–	–	–	–	–	–
AHHxSHH	∫	–	∫	∫	–	∫	∫	–
AHHxMSH	∫	∫	∫	∫	∫	∫	∫	∫
BHHxPH	X	X	–	X	–	–	–	–
BHHxPF	X	X	–	∫	–	–	X	–
BHHxSFH	X	X	∫	X	–	–	–	–
BHHxLC	∫	X	∫	X	X	X	X	–
BHHxShare	X	–	–	–	–	–	–	–
BHHxCH	–	X	–	–	–	–	–	–
BHHxNL	∫	X	–	–	–	–	–	–
BHHxNS	∫	X	–	–	–	–	–	–
BHHxNR	X	X	–	X	X	–	–	–
BHHxSHH	∫	–	–	–	–	–	–	–

∫ = sign. assocn s.l. 0.05 or greater

X = no sig. assocn.

– = chi sq. test not possible.

TABLE 7.1 DISTRIBUTION OF BIRTHPLACES OF THE TOTAL POPULATION 1851.

	Hutton Henry	South Hetton	East Murton	Shotton	Thornley	Trimdon	Hetton	Quarrington	Mean
Village	8.72	19.01	19.4	14.44	19.3	17.77	26.88	10.18	16.96
East Durham	18.12	16.06	20.57	20.88	10.74	15.54	5.92	17.98	15.73
Sunderland	1.63	1.09	1.69	1.31	1.22	1.14	2.57	0.19	1.36
Mid Wear Valley	15.72	19.25	17.93	17.44	22.19	17.89	20.56	23.79	19.34
Lower Tyneside – Durham	3.64	7.27	4.56	4.56	7.04	7.80	5.08	3.43	5.42
N.West Durham	2.88	2.04	2.13	1.13	1.33	2.79	1.95	2.19	2.01
S.West Durham	2.59	1.47	1.25	1.38	1.78	1.59	1.05	4.57	1.96
Pennine Durham	2.88	1.05	0.88	3.00	1.04	1.21	1.66	1.81	1.69
Upper Tyneside	0.29	0.24	1.40	0.31	0.59	0.63	0.76	0.19	0.55
South Durham	6.71	1.33	1.40	2.75	3.04	6.79	1.52	5.99	3.69
Durham – not known	3.45(66.63)	1.14(69.95)	2.57(73.78)	0.81(68.01)	2.63(70.9)	1.59(74.74)	2.04(69.99)	1.33(71.65)	(70.71)
Lower Tyneside – N'land	2.49	8.41	8.52	15.31	3.85	4.82	8.98	1.33	6.71
N'land Coalfield	1.92	2.61	1.69	2.19	1.48	0.70	2.13	0.76	1.69
Newcastle	2.78	5.80	1.69	2.25	2.33	2.66	3.22	2.38	2.89
Upper Tyneside N'land	0.38	0.95	0.66	0.88	0.63	0.38	0.81	0.86	0.69
N'land – rural	4.12	2.57(21.05)	1.40(19.18)	4.76	1.44	2.28	2.78	2.09	2.68
Northumberland –not known	1.34(13.03)	0.71	5.22	0.50(25.89)	1.44(11.17)	0.57(11.41)	0.76(18.68)	0.76(8.18)	1.41(16.07)
North Riding	4.70	1.14	1.40	2.06	2.93	3.24	2.06	4.0	2.69
Cumberland	2.21	1.33	0.96	0.75	2.41	1.46	1.54	6.37	2.13
Westmorland	0.10	0.10	0.37	0.19	0.26	0.19	0.61	1.24	0.38
Yorks E.Riding	1.73	0.33	0.22	0.38	2.59	0.76	0.29	0.57	0.86
Yorks.W.Riding	0.58	0.24	0.51	0.50	1.52	0.63	0.61	0.57	0.65
Lancs.	1.05(10.37)	0.52 (3.66)	0.73(4.19)	0.06(3.94)	0.85(10.56)	0.70(6.98)	0.22(5.33)	1.62(14.37)	0.72(7.43)
Eng & Wales	3.16	1.95	1.25	1.00	2.15	2.41	1.64	2.95	2.06
Scotland	1.25	0.81	0.22	0.50	1.44	1.01	0.96	0.86	0.98
Ireland	4.22	2.47	0.81	0.31	3.37	2.47	2.93	1.43	2.06
Foreign	0.19	0	0.29	0.06	0.15	0.19	0.10	0.19	0.15
Not Known	1.15(9.97)	0.10(5.34)	0.29(2.85)	0.31(2.18)	0.22(7.33)	0.63(6.71)	0.38(6.01)	0.38(5.81)	0.44(5.79)
Total	1043	2104	1361	1600	2699	1576	5536	1051	16970

TABLE 7.2 CHI-SQUARE TEST OF BIRTHPLACES IN THE EIGHT SAMPLE TOWNSHIPS.

PROPORTION BORN IN THE TOWNSHIP OF RESIDENCE 1851.

	Born in township			Born elsewhere			Total
Hutton Henry	O	91	χ^2	O	952	χ^2	1043
	E	208	– 65.8	E	835	16.39	
South Hetton	O	400	χ^2	O	1704	χ^2	2104
	E	419	0.86	E	1685	0.21	
East Murton	O	264	χ^2	O	1097	χ^2	1361
	E	271	0.18	E	1090	0.04	
Shotton	O	231	χ^2	O	1369	χ^2	1600
	E	319	– 24.28	E	1281	6.05	
Thornley	O	521	χ^2	O	2178	χ^2	2699
	E	538	0.54	E	2161	0.13	
Trimdon	O	280	χ^2	O	1296	χ^2	1576
	E	314	3.68	E	1262	0.92	
Hetton	O	1488	χ^2	O	4048	χ^2	5536
	E	1103	+ 134.38	E	4433	33.44	
Quarrington	O	107	χ^2	O	944	χ^2	1051
	E	209	– 49.78	E	842	12.36	
Total		3382			13585		16970

From the χ^2 calculations for the frequency of births in the township of residence in 1851, it can be seen that highly significant differences occurred amongst the sample townships.

7 dfs @ s.l. 0.001 χ^2 = 24.32

TABLE 7.3 CHI-SQUARE TEST OF BIRTHPLACES IN THE EIGHT SAMPLE TOWNSHIPS

PROPORTION BORN IN EAST DURHAM 1851.

		East Durham			Born Elsewhere			Total
Hutton Henry	O	189	χ^2		O	854	χ^2	1043
	E	135	◇	21.6	E	908	3.21	
South Hetton	O	338	χ^2		O	1766	χ^2	2104
	E	272	◇	16.01	E	1832	2.38	
East Murton	O	280	χ^2		O	1081	χ^2	1361
	E	176	◇	61.45	E	1186	8.53	
Shotton	O	334	χ^2		O	1266	χ^2	1600
	E	207	◇	77.9	E	1393	11.58	
Thornley	O	290	χ^2		O	2409	χ^2	2699
	E	349		9.97	E	2350	1.48	
Trimdon	O	245	χ^2		O	1331	χ^2	1576
	E	204		8.24	E	1372	1.23	
Hetton	O	328	χ^2		O	5208	χ^2	5536
	E	715	−	209.5	E	4821	31.07	
Quarrington	O	189	χ^2		O	862	χ^2	1051
	E	136		20.7	E	915	3.07	
Total		2193				14777		16970

From the χ^2 calculations for the frequency of birthplaces in East Durham in 1851, it can be seen that highly significant differences occurred amongst the sample townships

7 dfs @ s.l. 0.001 χ^2 = 24.32

TABLE 7.4 CHI-SQUARE TEST OF BIRTHPLACES IN THE EIGHT SAMPLE TOWNSHIPS POPULATION BORN IN NORTHUMBERLAND AND DURHAM 1851.

	N'land & Durham		Born Elsewhere		Total
Hutton Henry	O 831	χ^2	O 212	χ^2	1043
	E 912	- 7.19	E 131	◇ 50.08	
South Hetton	O 1915	χ^2	O 189	χ^2	2104
	E 1839	3.14	E 265	- 21.80	
East Murton	O 1265	χ^2	O 96	χ^2	1361
	E 1192	4.47	E 171	- 32.90	
Shotton	O 1502	χ^2	O 98	χ^2	1600
	E 1399	◇ 7.58	E 201	- 52.78	
Thornley	O 2215	χ^2	O 484	χ^2	2699
	E 2359	- 8.79	E 340	◇ 61.0	
Trimdon	O 1358	χ^2	O 218	χ^2	1576
	E 1378	0.29	E 198	2.02	
Hetton	O 4909	χ^2	O 627	χ^2	5536
	E 4839	1.01	E 697	7.03	
Quarrington	O 839	χ^2	O 212	χ^2	1051
	E 919	- 6.96	E 132	◇ 48.48	
Total	14834		2136		16970

From the calculations for the frequency of birthplaces in Northumberland and Durham in 1851, it can be seen that highly significant differences occurred amongst the sample townships. See Table 7.1 for a relative birthplace frequency.

7 dfs @ s.l. 0.001 χ^2 . 24.32

TABLE 7.5 CHI-SQUARE TEST OF BIRTHPLACES IN THE EIGHT SAMPLE TOWNSHIPS.
POPULATION BORN IN DISTANT LOCATIONS (OUTSIDE THE NORTH OF ENGLAND) 1851.

	Distant location			Born elsewhere			Total
Hutton Henry	O	104	χ^2	O	939	χ^2	1043
	E	61	+ 30.3	E	982	1.88	
South Hetton	O	112	χ^2	O	1992	χ^2	2104
	E	122	0.82	E	1982	0.05	
East Murton	O	39	χ^2	O	1322	χ^2	1361
	E	79	− 20.25	E	1282	1.25	
Shotton	O	35	χ^2	O	1565	χ^2	1600
	E	93	− 36.17	E	1507	2.23	
Thornley	O	198	χ^2	O	2501	χ^2	2699
	E	157	10.71	E	2542	0.66	
Trimdon	O	106	χ^2	O	1470	χ^2	1576
	E	92	2.13	E	1484	0.13	
Hetton	O	333	χ^2	O	5203	χ^2	5536
	E	322	0.38	E	5214	0.02	
Quarrington	O	61	χ^2	O	990	χ^2	1051
	E	61	0.0	E	990	0.0	
Total		988			15982		16970

From the calculations for the frequency of birthplaces in distant locations in 1851, it can be seen that highly significant differences occurred amongst the sample townships. See Table 7.1 for the relative birthplace frequencies.
7 dfs @ s.l. 0.001 χ^2 = 24.32

TABLE 7.6 CHI-SQUARE TEST OF BIRTHPLACES. SHOTTON TOWNSHIP 1851

	Rural		Mining		Total
Shotton	O 88	χ^2	O 144	χ^2	232
	E 48	+ 33.33	E 184	- 8.70	
East Durham	O 59	χ^2	O 274	χ^2	333
	E 68	1.19	E 263	0.46	
Durham Coalfield	O 76	χ^2	O 342	χ^2	418
	E 86	1.16	E 331	0.37	
Durham- rest	O 41	χ^2	O 45	χ^2	86
	E 18	+ 29.39	E 68	- 7.78	
Northumberland Coalfield	O 19	χ^2	O 311	χ^2	330
	E 68	- 35.30	E 261	+ 9.58	
Northumberland - rest	O 14	χ^2	O 72	χ^2	86
	E 18	0.89	E 68	0.24	
North	O 22	χ^2	O 41	χ^2	63
	E 13	6.23	E 50	1.62	
Rest of British Isles	O 7	χ^2	O 30	χ^2	37
	E 8	0.13	E 29	0.03	
Total	326		1259		1585

$\Sigma \chi^2 = 136.4$

7 dfs @ s.l. 0.001 $\chi^2 = 24.32$

$\therefore$ there is a highly significant difference in the birthplace distribution of the population of the rural and mining communities.

TABLE 7.7 CHI-SQUARE TEST OF BIRTHPLACES. EAST MURTON TOWNSHIP 1851.

	Rural	χ^2	Mining	χ^2	Total
East Murton	O 48		O 216		264
	E 24	24.0	E 240	2.4	
East Durham	O 25		O 255		280
	E 25	0	E 255	0	
Durham Coalfield	O 27		O 367		394
	E 35	1.83	E 359	0.18	
Durham - rest	O 12		O 54		66
	E 6	6.0	E 60	0.6	
Northumberland Coalfield	O 2		O 249		251
Northumberland - rest	E 22	18.18	E 229	1.75	
North	O 7		O 89		96
Elsewhere	E 9	0.44	E 87	0.05	
Total	121		1230		1351

$\Sigma \chi^2 = 55.43$

5 dfs @ s.l. 0.001 $\chi^2 = 20.52$

∴ there is a highly significant difference in the birthplace distribution of the population of the rural and mining communities. Because of the small numbers in the rural village, the birthplaces in the last four rows have been aggregated into 1 Northumberland 2 Elsewhere.

TABLE 7.8 CHI-SQUARE TEST OF BIRTHPLACES. TRIMDON PARISH 1851

	Trimdon Colliery		Trimdon Village		Total
Trimdon	O 75	χ^2	O 92	χ^2	167
	E 105	− 8.57	E 62	◇ 14.52	
East Durham	O 85	χ^2	O 29	χ^2	114
	E 72	2.35	E 42	4.02	
Durham Coalfield	O 157	χ^2	O 50	χ^2	207
	E 130	◇ 5.61	E 77	− 9.47	
Durham − rest	O 36	χ^2	O 73	χ^2	109
	E 69	− 15.78	E 40	◇ 27.22	
Northumberland Coalfield	O 48	χ^2	O 4	χ^2	52
	E 33	◇ 6.82	E 19	− 11.84	
Northumberland − rest	O 14	χ^2	O 7	χ^2	21
	E 13	0.08	E 8	0.12	
North	O 33	χ^2	O 25	χ^2	58
	E 37	0.43	E 21	0.76	
Elsewhere	O 59	χ^2	O 16	χ^2	75
	E 47	3.06	E 28	5.14	
Total	507		298		805

$\Sigma\chi^2$ ∘ 115.79

7 df @ s.l. 0.001 χ^2 ∘ 24.32

∘ ∘ there is a highly significant difference in the birthplace distribution of the population of the rural and mining communities.

TABLE 7.8 CHI-SQUARE TEST OF BIRTHPLACES. TRIMDON PARISH 1851.

	Trimdon Grange Colliery			Trimdon Village			Total
Trimdon	O 113	χ^2		O 92	χ^2		205
	E 148	− 8.28		E 57	+ 21.49		
East Durham	O 130	χ^2		O 29	χ^2		159
	E 115	1.96		E 44	5.11		
Durham Coalfield	O 295	χ^2		O 50	χ^2		345
	E 249	+ 8.50		E 96	− 22.04		
Durham – rest	O 42	χ^2		O 73	χ^2		115
	E 83	− 20.25		E 32	+ 52.53		
Northumberland Coalfield	O 83	χ^2		O 4	χ^2		87
	E 63	6.35		E 24	− 16.67		
Northumberland – rest	O 24	χ^2		O 7	χ^2		31
	E 22	0.18		E 9	0.44		
North	O 54	χ^2		O 25	χ^2		79
	E 57	0.16		E 22	0.41		
Elsewhere	O 29	χ^2		O 16	χ^2		45
	E 32	0.28		E 13	0.69		
Total	771			298			1069

$$\Sigma\chi^2 = 165.34$$

∴ there is a very highly significant difference in the birthplace distribution of the population of the rural and mining communities.

TABLE 7.9 CHI-SQUARE TEST OF BIRTHPLACES. HUTTON HENRY TOWNSHIP 1851

	Rural		Mining		Total
Hutton Henry	O 72	χ^2	O 19	χ^2	91
	E 28	+ 69.14	E 63	− 30.73	
East Durham	O 67	χ^2	O 122	χ^2	189
	E 57	1.75	E 132	0.76	
Durham Coalfield	O 33	χ^2	O 246	χ^2	279
	E 84	− 30.96	E 195	+ 13.34	
Durham − rest	O 61	χ^2	O 74	χ^2	135
	E 41	+ 9.76	E 94	4.26	
Northumberland Coalfield	O 6	χ^2	O 73	χ^2	79
	E 24	− 13.50	E 55	+ 5.89	
Northumberland − rest	O 21	χ^2	O 36	χ^2	57
	E 17	0.94	E 40	0.4	
North	O 38	χ^2	O 70	χ^2	108
	E 33	0.76	E 75	0.33	
Elsewhere	O 17	χ^2	O 87	χ^2	104
	E 31	− 6.32	E 73	2.68	
Total	315		727		1042

$\Sigma\chi^2$ = 161.49

7 df @ s.l. 0.001 χ^2 = 24.32

∴ there is a highly significant difference in the birthplace distribution of the population of the rural and mining communities.

TABLE 7.10 HETTON 1851. INTRA-TOWNSHIP BIRTHPLACE ANALYSIS.

		Easington Lane	χ^2	Brick Garth	χ^2	East Side	χ^2	Hetton Lyons	χ^2	Four Lane Ends	χ^2	Hetton Downs	χ^2	Village	χ^2	Bog Row	χ^2	Total
Hetton	O	295		233		283		62		110		323		139		28		1473
	E	305	0.33	259	2.61	268	0.84	65	0.14	95	2.37	335	0.43	101	+ 14.3	46	° 7.04	
East Durham	O	74		47		70		10		22		70		14		17		324
	E	67	0.73	60	2.52	59	2.05	14	1.14	21	0.05	74	0.22	22	2.91	10	4.9	
Durham Coalfield.	O	344		240		407		92		113		399		109		64		1768
	E	366	1.32	311	- 16.21	322	+ 22.44	78	2.51	114	0.01	402	0.22	121	1.19	55	2.2	
Durham rest	O	80		86		26		4		23		23		29		11		282
	E	58	+ 8.34	50	+ 25.92	51	- 12.25	12	5.33	18	1.39	64	- 26.27	19	5.26	9	0.44	
Northumberland Coalfield	O	128		117		101		46		62		327		35		20		836
	E	173	- 11.71	147	- 6.12	152	- 17.11	37	2.19	54	1.19	190	+ 98.78	57	- 8.49	26	1.38	
Northumberland Rest	O	42		29		37		7		13		46		19		5		198
	E	41	0.02	35	1.03	36	0.03	9	0.44	13	0	45	0.02	14	1.79	6	0.17	
North	O	63		119		38		12		5		30		18		9		294
	E	61	0.07	52	+ 86.32	53	4.25	13	0.08	19	- 10.32	67	- 20.43	20	0.2	9	0	
Rest of British Isles	O	115		99		42		11		9		36		14		17		343
	E	71	+ 27.27	60	+ 25.35	62	- 6.45	15	1.07	22	- 7.68	78	- 22.62	23	3.52	11	3.27	
Total		1141		970		1004		244		357		1254		377		171		5518

$\Sigma\chi^2$ = 543.35 49 df @ s.l. 0.001 = 23.96

∴ there is a highly significant difference in the birthplace distribution of the population of the zones within Hetton.

TABLE 7.11 CROSS-TABULATIONS OF OCCUPATIONS AND BIRTHPLACES 1851.

HETTON TOWNSHIP.

		East Durham	Durham C'field	Durham rest	N'land C'field	N'land rest	North	Elsewhere	Total
Miners	N	28	327	28	160	31	55	33	662
	%	4.2	49.4	4.2	24.2	4.7	8.3	5.0	100%
Others	N	40	219	50	71	35	55	69	539
	%	7.4	40.6	9.3	13.2	6.5	10.2	12.8	100%
Total		68	546	78	231	66	110	102	1201

$\Sigma \chi^2$ = 65.01 6 df sig = 0.0000

EAST MURTON TOWNSHIP.

		East Durham	Durham C'field	Durham rest	N'land C'field	N'land rest	North	Elsewhere	Total
Miners	N	7	82	8	31	21	9	10	168
	%	4.2	48.8	4.8	18.5	12.5	5.4	6.0	100%
Others	N	7	33	7	6	6	8	2	69
	%	10.1	47.8	10.1	8.7	8.7	11.6	2.9	100%
Total		14	115	15	37	27	17	12	237

$\Sigma \chi^2$ = 12.37 6 df sig = 0.0543

TABLE 7.12 CROSS-TABULATIONS OF OCCUPATIONS AND BIRTHPLACES 1851.

SOUTH HETTON TOWNSHIP

		East Durham	Durham C'field	Durham rest	N'land C'field	N'land rest	North	Elsewhere	Total
Miners	N	9	146	15	85	21	13	20	309
	%	2.9	47.2	4.9	27.5	6.8	4.2	6.5	100
Others	N	10	49	11	16	8	8	5	107
	%	9.3	45.8	10.3	15.0	7.5	7.5	4.7	100
Total		19	195	26	101	29	21	25	416

$\Sigma\chi^2$ = 18.31 6 df sig. = 0.0055

SHOTTON TOWNSHIP

		East Durham	Durham C'field	Durham rest	N'land C'field	N'land rest	North	Elsewhere	Total
Miners	N	1	77	8	63	22	13	8	192
	%	0.5	40.1	4.2	32.8	11.5	6.8	4.2	100
Others	N	15	28	24	15	10	7	5	104
	%	14.4	26.9	23.1	14.4	9.6	6.7	4.8	100
Total		16	105	32	78	32	20	13	296

$\Sigma\chi^2$ = 58.67 6 df sig. = 0.0000

TABLE 7.13 CROSS-TABULATIONS OF OCCUPATIONS AND BIRTHPLACES 1851

THORNLEY TOWNSHIP

		East Durham	Durham C'field	Durham rest	N'land C'field	N'land rest	North	Elsewhere	Total
Miners	N	11	156	27	63	21	53	45	376
	%	2.9	41.5	7.2	16.8	5.6	14.1	12.0	100
Others	N	14	62	18	14	15	24	9	156
	%	9.0	39.7	11.5	9.0	9.6	15.4	5.8	100
Total		25	218	45	77	36	77	54	532

$\Sigma\alpha^2$ = 22.89 6 df sig. = 0.0020

HUTTON HENRY TOWNSHIP

		East Durham	Durham C'field	Durham rest	N'land C'field	N'land rest	North	Elsewhere	Total
Miners	N	2	34	10	19	14	21	13	113
	%	1.8	30.1	8.8	16.8	12.4	18.6	11.5	100
Others	N	23	14	21	3	5	21	16	103
	%	22.3	13.6	20.4	2.9	4.9	20.4	15.5	100
Total		25	48	31	22	19	42	29	216

$\Sigma\chi^2$ = 45.71 6 df sig = 0.0000

TABLE 7.14 CROSS-TABULATIONS OF OCCUPATIONS AND BIRTHPLACES 1851

TRIMDON PARISH

		East Durham	Durham C'field	Durham rest	N'land C'field	N'land rest	North	Elsewhere	Total
Miners	N	10	75	11	31	6	12	17	162
	%	6.2	46.3	6.8	19.1	3.7	7.4	10.5	100
Others	N	27	54	29	8	8	20	15	161
	%	16.8	33.5	18.0	5.0	5.0	12.4	9.3	100
Total		37	129	40	39	14	32	32	323

$\Sigma \chi^2$ = 35.30 6 df sig. = 0.0000

QUARRINGTON TOWNSHIP

		East Durham	Durham C'field	Durham rest	N'land C'field	N'land rest	North	Elsewhere	Total
Miners	N	10	63	10	14	2	31	18	148
	%	6.8	42.6	6.8	9.5	1.4	20.9	12.2	100
Others	N	4	21	14	1	8	9	3	60
	%	6.7	35.0	23.3	1.7	13.3	15.0	5.0	100
Total		14	84	24	15	10	40	21	208

$\Sigma \chi^2$ = 30.07 6 df sig. = 0.0000

TABLE 7.15 CHI-SQUARE TESTS OF OCCUPATIONS AND BIRTHPLACE DISTANCES 1851. HEADS OF HOUSEHOLDS.

HETTON PARISH

	Miles 0 – 5		6 – 10		11 – 15		16 – 20		20+		TOTAL
Miners	O 110	χ^2	O 119	χ^2	O 193	χ^2	O 41	χ^2	O 55	χ^2	518
	E 107	0.08	E 131	1.10	E 167	= 4.05	E 50	1.02	E 63	1.02	
Others	O 77	χ^2	O 111	χ^2	O 100	χ^2	O 46	χ^2	O 55	χ^2	389
	E 80	0.11	E 99	1.45	E 126	= 5.37	E 37	2.19	E 47	1.36	
Total	187		230		293		87		110		907

$\Sigma\chi^2$ = 18.35

4 df s.l. 0.005 χ^2 = 14.86

∴ there is a significant difference.

EAST MURTON TOWNSHIP

	Miles 0 – 5		6 – 10		11 – 15		16 – 20		20+		TOTAL
Miners	O 22	χ^2	O 36	χ^2	O 44	χ^2	O 12	χ^2	O 11	χ^2	125
	E 20	0.2	E 40	0.4	E 38	0.95	E 14	0.29	E 13	0.31	
Others	O 6	χ^2	O 20	χ^2	O 9	χ^2	O 8	χ^2	O 8	χ^2	51
	E 8	0.5	E 16	1.0	E 15	2.4	E 6	0.67	E 6	0.67	
Total	28		56		53		20		19		176

$\Sigma\chi^2$ = 7.39

4 df s.l. 0.05 χ^2 = 9.49

∴ there is no significant difference.

TABLE 7.16 CHI-SQUARE TESTS OF OCCUPATIONS AND BIRTHPLACE DISTANCES

1851. HEADS OF HOUSEHOLDS

SOUTH HETTON TOWNSHIP

	Miles 0 – 5		6 – 10		11 – 15		16 – 20		20◦		TOTAL
Miners	O	11	O	78	O	45	O	88	O	28	250
	E	13	E	82	E	40	E	80	E	33	
	χ^2	0.31	χ^2	0.20	χ^2	1.6	χ^2	0.80	χ^2	0.76	
Others	O	8	O	38	O	9	O	25	O	19	99
	E	6	E	34	E	17	E	33	E	14	
	χ^2	0.67	χ^2	0.47	χ^2	3.76	χ^2	1.94	χ^2	1.79	
Total		19		116		54		113		47	349

$\Sigma\chi^2$ = 12.3 χ^2

4 d.f s.l. 0.005 χ^2 = 9.49

∴ there is a significant difference

SHOTTON TOWNSHIP

	Miles 0 – 5		6 – 10		11 – 15		16 – 20		20◦		TOTAL
Miners	O	0	O	16	O	38	O	72	O	35	161
	E	11	E	18	E	38	E	58	E	36	
	χ^2	– 11.0	χ^2	0.22	χ^2	0.0	χ^2	◦ 3.38	χ^2	0.03	
Others	O	17	O	13	O	23	O	21	O	23	97
	E	6	E	11	E	23	E	35	E	22	
	χ^2	◦20.17	χ^2	0.36	χ^2	0.0	χ^2	– 5.6	χ^2	0.05	
Total		17		29		61		93		58	258

$\Sigma\chi^2$ = 40.81

4 df s.l. 0.001 χ^2 = 18.46

∴ there is a highly significant difference.

TABLE 7.17 CHI-SQUARE TESTS OF OCCUPATIONS AND BIRTHPLACE DISTANCES 1851. HEADS OF HOUSEHOLDS.

THORNLEY TOWNSHIP

	Miles 0 – 5		6 – 10		11 – 15		16 – 20		20+		TOTAL
Miners	O	4	O	49	O	58	O	90	O	48	249
	E	9	E	56	E	63	E	75	E	45	
	χ^2	2.78	χ^2	0.88	χ^2	0.40	χ^2	3.0	χ^2	0.2	
Others	O	9	O	33	O	34	O	20	O	18	114
	E	4	E	26	E	29	E	35	E	21	
	χ^2	6.25	χ^2	1.88	χ^2	0.86	χ^2	6.43	χ^2	0.43	
Total		13		82		92		110		66	363

$\Sigma\chi^2 = 23.11$

4 df s.l. 0.001 $\chi^2 = 18.46$

∴ there is a highly significant difference.

HUTTON HENRY TOWNSHIP

	Miles 0 – 5		6 – 10		11 – 15		16 – 20		20+		TOTAL
Miners	O	1	O	1	O	10	O	20	O	43	75
	E	10	E	7	E	11	E	14	E	34	
	χ^2	8.1	χ^2	5.14	χ^2	0.09	χ^2	2.57	χ^2	2.38	
Others	O	17	O	11	O	9	O	5	O	18	60
	E	8	E	5	E	8	E	11	E	27	
	χ^2	10.13	χ^2	7.2	χ^2	0.13	χ^2	3.27	χ^2	3.0	
Total		18		12		19		25		61	135

$\Sigma\chi^2 = 42.01$

∴ there is a highly significant difference.

TABLE 7.18 CHI-SQUARE TESTS OF OCCUPATIONS AND BIRTHPLACE DISTANCES 1851. HEADS OF HOUSEHOLDS.

TRIMDON PARISH

Miles

	0 – 5		6 – 10		11– 15		16 – 20		20◦		TOTAL
Miners	O 7	χ^2	O 17	χ^2	O 27	χ^2	O 28	χ^2	O 44	χ^2	123
	E 21	– 9.33	E 20	0.45	E 29	0.14	E 21	2.33	E 32	◦ 4.5	
Others	O 36	χ^2	O 24	χ^2	O 31	χ^2	O 15	χ^2	O 21	χ^2	127
	E 22	◦ 8.91	E 21	0.43	E 29	0.14	E 22	2.23	E 33	– 4.36	
Total	43		41		58		43		65		250

$\Sigma\chi^2$ ◦ 32.82

4 df s.l. 0.001 χ^2 ◦ 18.46

∴ there is a highly significant difference.

QUARRINGTON TOWNSHIP

	0 – 5		6 – 10		11 – 15		16 – 20		20◦		TOTAL
Miners	O 9	χ^2	O 10	χ^2	O 39	χ^2	O 17	χ^2	O 17	χ^2	92
	E 10	0.1	E 15	1.67	E 34	0.74	E 14	0.07	E 19	0.21	
Others	O 6	χ^2	O 13	χ^2	O 13	χ^2	O 4	χ^2	O 11	χ^2	47
	E 5	0.2	E 8	3.13	E 18	1.39	E 7	1.29	E 9	0.44	
Total	15		23		52		21		28		139

$\Sigma\chi^2$ ◦ 9.24

4 df s.l. 0.05 χ^2 ◦ 9.49

∴ there is no significant difference.

TABLE 7.19 BIRTHPLACES OF THE CHILDREN OF THE COALMINERS IN THE EIGHT SAMPLE TOWNSHIPS 1851

Relative Frequencies

	Hetton		Thornley		Shotton		Trimdon		E.Murton		S.Hetton		H.Henry		Quarrington		Regions	Mean
Township		44.19		33.93		21.37		24.37		29.64		31.07		4.27		17.80		22.78
East Durham		10.70		15.48		31.72		31.49		31.37		24.91		25.62		26. 44		24.72
Sunderland		0.73		0.69		0.50		0.23		0.87		0.88		1.07		0.26		0.65
Mid-Wear Valley		16.93		17.65		14.52		16.09		9.01		11.95		29.89		24.08		17.52
Lower Tyneside-Durham		3.85		6.21		3.34		7.13		2.77		5.79		3.56		1.57		4.28
North West Durham		1.04		1.28		0.50		4.60		0.69		0.75		6.41		1.57		2.11
South West Durham		0.61		1.97		0.83		0.69		0.52		1.01		4.63		7.07		2.17
Pennine Durham		0.37		0.59		0.17		0.23		0		0.38		1.07		0		0.35
Upper Tyneside		0.24		0.88		0.33		0.46		1.91		0		0		0		0.48
South Durham		0.24		1.08		0.17		1.38		0.52		0.63		0.71		1.05		0.72
Durham – not known	81.65	2.75	83.31	3.55	73.78	0.33	88.28	1.61	80.42	3.12	78.0	0.63	81.14	3.91	80.36	0.52	80.87	2.05
Lower Tyneisde – N'land		10.51		1.78		20.37		4.14		9.88		7.67		1.07		1.05		8.60
N'land C'field		2.69		0.99		2.67		1.15		1.56		3.52		3.20		0.79		2.07
Newcastle		1.28		1.68		0.50		1.84		0.69		4.78		4.63		2.62		2.25
Upper Tyneside		0.12		0		0.17		0.23		0.17		0		0		0		0.09
N'land rural		0.37		0.2		1.50		0.92		0		0.38		1.78		0.79		0.74
N'land not known	15.34	0.37	4.95	0.3	25.38	0.17	8.51	0.23	16.46	4.16	16.98	0.63	11.39	0.71	5.77	0.52	13.10	0.89
N.Riding		0.49		0.79		0		0.23		0		0.13		0.71		0.79		0.39
Cumberland		0.49		2.07		0.5		0.69		0		0.5		2.49		6.81		1.69
Westmorland		0.18		0.1		0		0		0		0		0.36		0.52		0.15
Yorks E.Riding		0		2.86		0		0.69		0		0		1.07		1.05		0.71
Yorks W.Riding		0.06		1.18		0		0.69		0.17		0		0		0.52		0.33
Lancs.	1.22	0	7.99	0.99	0.5	0	2.53	0.23	1.21	1.04	0.76	0	4.99	0.36	11.26	1.57	3.81	0.4
England & Wales		1.34		0.79		0.33		0.23		0.52		1.38		1.42		2.36		1.05
Scotland		0.24		1.58		0		0.69		0		0.38		1.07		0		0.50
Ireland		0		1.97		0		0.46		0.69		2.39		0		0		0.69
Foreign		0		0.1		0		0		0.69		0		0		0.26		0.13
Not Known	1.76	0.18	4.54	01	0.33	0	1.38	0	1.90	0	4.28	0.13	2.49	0	2.62	0	2.58	0.07
		1636		1014		599		437		577		795		281		382		5751

TABLE 7.20 CROSS TABULATIONS OF THE AGES AND BIRTHPLACES OF THE CHILDREN OF COAL MINERS 1851.

HETTON PARISH

Age Groups	East Durham	Mid-Wear	Durham Lower Tyne	Rest Durham C'field	N'land L.Tyne	N'land Rest C'field	Total
0 – 9	139	140	24	11	73	35	422
%	32.9%	33.2	5.7	2.6	17.3	8.3	100
10 – 19	46	105	31	17	80	30	309
%	14.9	34.0	10.0	5.5	25.9	9.7	100
TOTAL	185	245	55	28	153	65	731

$\Sigma\chi^2 = 37.41$

5 df s.l. 0.001 $\chi^2 = 20.52$

∴ there is a significant difference.

EAST MURTON TOWNSHIP

Age Groups	East Durham	Mid-Wear	Durham Lower Tyne	Rest Durham C'field	N'land L.Tyne	N'land Rest C'field	Total
0 – 9	89	9	1	9	11	3	122
%	72.9	7.4	0.8	7.4	9.0	2.5	100
10 – 19	93	33	11	9	35	8	188
	49.5	17.6	5.9	4.8	18.6	4.3	
TOTAL	182	42	12	18	46	11	310

$\Sigma\chi^2 = 23.71$

5 df s.l. 0.001 $\chi^2 = 20.52$

∴ there is a significant difference.

TABLE 7.21 CROSS TABULATIONS OF THE AGES AND BIRTHPLACES OF THE CHILDREN OF COAL MINERS. 1851.

SOUTH HETTON TOWNSHIP

Age Groups	East Durham	Mid Wear	Lower Tyne Durham	Rest Durham C'field	N'land L.Tyne	N'land rest C'field	Total
0 – 9	133	36	13	7	20	29	238
%	55.9	15.1	5.5	2.9	8.4	12.2	100
10 – 19	61	48	26	6	29	31	201
%	30.3	23.9	12.9	3.0	14.4	15.4	100
TOTAL	194	84	39	13	49	60	439

$\Sigma\alpha^2$ = 32.80

5 df s.l. 0.001 α^2 = 20.52

∴ there is a significant difference.

SHOTTON TOWNSHIP

Age Groups	East Durham	Mid Wear	Lower Tyne Durham	Rest Durham C'field	N'land L.Tyne	N'land Rest C'field	Total
0 – 9	121	26	1	8	50	7	213
%	56.8	12.2	0.5	3.8	23.5	3.3	100
10 – 19	66	49	14	1	60	13	203
%	32.5	24.1	6.9	0.5	29.6	6.4	100
TOTAL	187	75	15	9	110	20	416

$\Sigma\alpha^2$ = 39.31

5 df s.l. 0.001 α^2 = 20.52

∴ there is a significant difference

TABLE 7.22 CROSS TABULATIONS OF THE AGES AND BIRTHPLACES OF THE CHILDREN OF COAL MINERS 1851.

THORNLEY TOWNSHIP.

AGE GROUPS	EAST DURHAM	MID WEAR	LOWER TYNE DURHAM	REST DURHAM C'FIELD	N'LAND L.TYNE	N'LAND REST C'FIELD	TOTAL
0 – 9	79	47	14	14	3	7	164
%	48.2	28.7	8.5	8.5	1.8	4.3	100
10 – 19	79	104	38	16	10	16	263
%	30.0	39.5	14.4	6.1	3.8	6.1	100
TOTAL	158	151	52	30	13	23	427

$\Sigma \chi^2 = 17.55$

5 df s.l. $0.01 \chi^2 = 15.09$

∴ there is a significant difference.

HUTTON HENRY TOWNSHIP

AGE GROUPS	EAST DURHAM	MID WEAR	LOWER TYNE DURHAM	REST DURHAM C'FIELD	N'LAND L.TYNE	N'LAND REST C'FIELD	TOTAL
0 – 9	50	58	1	17	1	11	138
%	36.2	42.0	0.7	12.3	0.7	8.0	100
10 – 19	24	24	6	9	2	8	73
%	32.9	32.9	8.2	12.3	2.7	11.0	100
TOTAL	74	82	7	26	3	19	211

$\Sigma \chi^2 = 14.02$

5 d.f s.l. $0.05 \chi^2 = 11.07$

∴ there is a significant difference.

TABLE 7.23 CROSS TABULATIONS OF THE AGES AND BIRTHPLACES OF THE CHILDREN OF COAL MINERS 1851.

TRIMDON PARISH

Age Groups	East Durham	Mid Wear	Lower Tyne Durham	Rest Durham C'Field	N'land L.Tyne	N'land Rest C'field	Total
0 – 9	89	26	15	18	4	5	157
%	56.7	16.6	9.6	11.5	2.5	3.2	100
10 – 19	43	34	13	7	10	7	114
%	37.7	29.8	11.4	6.1	8.8	6.1	100
Total	132	60	28	25	14	12	271

$\Sigma\alpha^2$ = 19.56

5 df s.l. 0.01 α^2 = 15.09

∴ there is a significant difference.

QUARRINGTON TOWNSHIP

Age Groups	East Durham	Mid Wear	Lower Tyne Durham	Rest Durham C'field	N'land L.Tyne	N'land Rest C'field	Total
0 – 9	73	55	2	22	1	5	158
%	46.2	34.8	1.3	13.9	0.6	3.2	100
10 – 19	23	31	4	7	2	8	75
%	30.7	41.3	5.3	9.3	2.7	10.7	100
Total	96	86	6	29	3	13	233

$\Sigma\alpha^2$ = 14.44

5 df s.l. 0.05 α^2 = 11.07

∴ there is a significant difference.

TABLE 7.24 BIRTHPLACE DISTRIBUTION OF THE TOTAL POPULATION OF SHOTTON, TRIMDON AND EAST MURTON TOWNSHIPS 1871

	Shotton	%	Trimdon	%	East Murton	%
Township		15.88		27.37		24.57
East Durham		23.67		14.73		20.55
Sunderland		2.45		1.22		4.22
Mid-Wear		13.72		8.76		11.59
Lower Tyne		3.25		2.36		3.22
N.W. Durham		1.84		0.67		0.83
S.W. Durham		3.32		2.11		2.19
Pennine Durham		0.52		0.46		0.33
Upper Tyne		0.52		0.12		0.20
S. Durham		1.96		4.10		1.03
Durham - nk	67.55	0.42	65.36	3.46	72.25	3.52
N'land L. Tyne		2.80		1.26		3.82
S.E. N'land		2.83		0.55		1.93
Newcastle		1.00		0.86		1.53
U.Tyne N'land		0.45		0.03		0.43
Rural N'land		1.64		0.64		1.03
N'land - nk	9.14	0.42	4.6	1.26	10.03	1.29
N. Riding		1.32		1.68		0.73
Cumberland		1.29		1.29		1.16
Westmorland		0.19		0.09		0.17
Yorks E. Riding		1.10		0.55		0.43
Yorks W. Riding		0.64		1.44		0.73
Lancs.	6.28	1.74	11.08	6.03	3.62	0.40
England rest		7.70		3.55		9.93
Wales		0.71		4.72		0.13
Ireland		5.35		8.54		2.89
Scotland		2.96		1.38		0.66
Foreign		0.10		0.24		0.43
Not Known		0.03		0.06		0.03
Others	17.04	0.19	18.96	0.46	14.1	0.03
Total no.	3105		3266		3012	

TABLE 7.25 BIRTHPLACES OF 1) COAL MINER 11) OTHER HEADS OF HOUSEHOLDS IN SHOTTON, TRIMDON AND EAST MURTON TOWNSHIPS 1871

	Shotton				Trimdon				East Murton			
	C.Miners	%	Others	%	C.Miners	%	Others	%	C.Miners	%	Others	%
Township		1.32		7.52		2.63		11.16		2.44		6
East Durham		12.53		12.78		11.93		8.37		17.07		8
Sunderland		2.20		3.76		0.72		1.40		2.88		7
Mid Wear		16.70		9.77		12.65		14.42		15.08		14
Lower Tyne		5.71		2.26		4.53		4.19		6.87		4
N.W Durham		2.20		5.26		1.67		0.93		1.11		1
S.W. Durham		1.54		5.26		1.91		2.79		1.55		6
Pennine Durham		0.88		2.26		0		1.86		0.44		1
Upper Tyne		1.32		0		0.24		0.47		0.44		0
S.Durham		0.66		7.52		3.58		9.77		1.33		5
Durham Not known	46.38	1.32	57.14	0.75	43.2	3.34	58.15	2.79	54.09	4.88	56	4
N'land L.Tyne		5.71		4.51		2.86		3.72		7.54		2
S.E. N'land		5.71		2.26		0.24		0.47		4.21		1
Newcastle		1.54		0		1.19		0		3.10		1
U.Tyne N'land		1.32		0.75		0		0		0.89		0
Rural N'land		3.08		6.77		1.67		1.40		1.77		5
N'land Not known	17.58	0.22	15.04	0.75	8.11	2.15	10.24	4.65	20.61	3.10	13	4
N.Riding		1.54		3.01		2.86		5.12		1.55		7
Cumberland		2.20		1.50		1.43		2.79		1.77		3
Westmorland		0.22		0.75		0		0		0.44		2
Yorks E.Riding		1.98		3.01		0.24		0.93		0.67		2
Yorks W.Riding		1.32		2.26		2.39		6.05		1.11		1
Lancs.	11.44	4.18	12.03	1.50	18.38	11.46	15.82	0.93	5.98	0.44	16	1
England rest		12.31		3.76		6.68		2.79		12.42		3
Wales		1.32		0		9.31		0.47		0.44		0
Ireland		8.57		5.26		11.46		11.16		5.32		8
Scotland		1.98		6.77		1.91		0.93		0.67		3
Foreign		0		0		0		0		0.44		1
Not Known		0		0		0.24		0.47		0		0
Others	24.62	0.44	15.79	0	30.32	0.72	15.82	0	19.29	0	15	0
Total		455		133		419		147		451		100

TABLE 7.26 SHOTTON TOWNSHIP. CHI-SQUARE TESTS OF BIRTHPLACE ORIGINS 1851-1871.

TOTAL POPULATION.

	Shotton		E.Durham		Durham C'field		Durham Rest		N'land C'field		N'land Rest		North		Rest of British Isles		Total
		χ^2		χ^2		χ^2		χ^2		χ^2		χ^2		χ^2		χ^2	
1851	232		333		418		86		330		86		63		37		1585
	245	0.69	361	2.17	405	0.42	59	12.36	186	111.48	51	24.02	87	6.62	191	124.17	
1871	493		735		779		90		220		64		195		529		3105
	480	0.35	707	1.11	792	0.21	117	6.23	364	56.97	99	12.37	171	3.37	375	63.24	
Total	725		1068		1197		176		550		150		258		566		4690

$$\Sigma\chi^2 = 426.47$$

SHOTTON COLLIERY

1851	144		274		342		45		311		72		41		30		1259
	177	6.15	292	1.11	339	0.44	35	2.86	161	139.7	42	21.43	67	10.09	156	101.77	
1871	429		670		728		67		211		63		176		476		2818
	396	2.75	652	0.5	740	0.19	77	1.3	361	62.32	93	9.68	150	4.51	350	45.36	
Total	573		944		1070		112		522		135		217		506		4077

$$\Sigma\chi^2 = 410.21$$

SHOTTON VILLAGE

1851	88		59		76		41		19		14		22		7		326
	81	0.6	66	0.74	68	0.94	34	1.44	15	1.07	9	2.78	22	0	32	19.53	
1871	64		65		51		23		9		3		19		53		287
	71	0.69	58	0.84	59	1.08	30	1.63	13	1.23	8	3.13	19	0	28	22.32	
Total	152		124		127		64		28		17		41		60		613

$$\Sigma\chi^2 = 58.02$$

SHOTTON COAL MINERS

1851	0		1		77		8		63		22		13		8		192
	2	2.0	17	15.06	63	3.11	6	0.67	38	16.45	11	11.0	19	1.9	36	21.78	
1871	6		57		135		13		65		15		52		112		455
	4	1.0	41	6.24	149	1.32	15	0.27	90	6.94	26	4.65	46	0.78	84	9.33	
Total	6		58		212		21		128		37		65		120		647

$$\Sigma\chi^2 = 102.41$$

TABLE 7.27 EAST MURTON TOWNSHIP. CHI-SQUARE TESTS OF BIRTHPLACE ORIGINS

1851–1871

TOTAL POPULATION

	East Murton		E.Durham		Durham C'field		Durham Rest		N'land C'field		N'land Rest		North		Rest U.K.		Total
		χ^2		χ^2		χ^2		χ^2		χ^2		χ^2		χ^2		χ^2	
1851	264		280		394		66		161		90		57		39		1351
	311	7.1	278	0.01	329	12.84	66	0	122	12.47	50	32	51	0.71	144	76.5	
1871	740		619		670		147		232		70		109		425		3012
	693	3.19	621	0.06	735	5.75	147	0	271	5.61	110	14.55	115	0.31	320	34.5	
Total	1004		899		1064		213		393		160		166		464		4363

$$\Sigma\chi^2 = 205.56$$

MURTON COLLIERY

1851	216		255		367		54		159		90		50		39		1230
	273	11.9	255	0	299	15.46	57	0.16	116	15.94	46	42.09	46	0.35	138	71.02	
1871	696		598		632		137		228		62		105		424		2882
	639	5.08	598	0	700	6.61	134	0.07	271	6.82	107	18.93	109	0.15	325	30.16	
Total	912		853		999		191		387		152		155		463		4112

$$\Sigma\chi^2 = 224.74$$

	MURTON VILLAGE								Northumberland		Rest of North – rest of U.K.		
1851	48		25		27		12		2		7		121
	44	0.36	22	0.41	31	0.52	11	0.09	7	3.57	6	0.17	
1871	42		21		38		10		12		5		129
	46	0.35	24	0.38	34	0.47	11	0.09	7	3.57	6	0.17	
Total	91		46		65		22		14		12		250

$$\Sigma\chi^2 = 10.15$$ No sig. difference

EAST MURTON COAL MINERS

1851	0		7		82		8		31		21		9		10		168
	3	3.0	23	11.13	56	12.07	10	0.4	28	0.32	12	6.75	10	0.1	26	9.85	
1871	11		77		126		30		71		22		27		87		451
	8	1.13	61	4.2	152	4.48	28	0.14	74	0.12	31	2.61	26	0.04	71	3.61	
Total	11		84		208		38		102		43		36		97		619

$$\Sigma\chi^2 = 59.95$$

TABLE 7.28 TRIMDON PARISH. CHI-SQUARE TESTS OF BIRTHPLACE ORIGINS 1851–71.

TOTAL POPULATION

	Trimdon		East Durham		Durham C°field		Durham Rest		N°land C°field		N°land Rest		North		U.K.		Total
		α^2		α^2		α^2		α^2		α^2		χ^2		κ^2		α^2	
1851	280		245		503		151		132		44		114		107		1576
	382	27.24	236	0.34	326	96.1	134	2.16	72	50	35	3.46	155	10.8	236	70.5	
1871	894		481		498		262		88		62		362		619		3266
	792	13.14	490	0.17	675	46.41	279	1.04	148	24.32	51	2.37	321	5.24	490	33.96	
Total	1174		726		1001		413		220		106		476		726		4842

$\Sigma\alpha^2 = 387.31$

TRIMDON GRANGE

1851	114		130		295		42		83		24		54		29		771
	148	7.81	119	1.02	188	60.9	58	4.41	44	34.57	24	0	58	0.28	132	80.37	
1871	235		149		147		95		21		32		82		282		1043
	201	5.75	160	0.76	254	45.07	79	3.24	60	25.35	32	0	78	0.21	179	59.27	
Total	349		279		442		137		104		56		136		311		1814

$\Sigma\alpha^2 = 329.008$

TRIMDON COLLIERY

1851	75		85		157		36		48		14		33		59		507
	132	24.61	85	0	104	27.01	30	1.2	25	21.16	9	2.78	64	15.02	59	0	
1871	508		293		302		95		63		26		249		202		1738
	451	7.2	293	0	355	7.91	101	0.36	86	6.15	31	0.81	218	4.41	202	0	
Total	583		378		459		131		111		40		282		261		2245

$\Sigma\alpha^2 = 118.62$

TRIMDON VILLAGE

1851	94		29		50		73		4		7		25		16		298
	93	0.01	26	0.35	38	3.79	55	5.89	3	0.33	4	2.25	21	0.76	57	29.49	
1871	151		39		49		72		4		4		31		135		485
	152	0.007	42	0.21	61	2.36	90	3.6	5	0.2	7	1.29	35	0.46	94	17.88	
Total	245		68		99		145		8		11		56		151		783

$\Sigma\alpha^2 = 68.88$

TRIMDON COAL MINERS.

1851	2		8		75		11		31		6		12		17		162
	4	1.0	17	4.76	45	20.0	11	0	14	20.64	6	0	25	6.76	40	13.23	
1871	11		53		88		29		18		16		77		127		419
	9	0.44	44	1.84	118	7.63	29	0	35	8.26	16	0	64	2.64	104	5.09	
Total	13		61		163		40		49		22		89		144		581

$\Sigma\alpha^2 = 92.29$

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The Tithe Data

Township	Tithe Plan & Apportionment (U.D.D.P.D.)	Tithe File (P.R.O. Kew)	
Cassop	1840	1840	IR/18/1915
Castle Eden	1841	1838	IR/18/1916
Cold Hesledon	1838	1838	IR/18/2015
Coxhoe	1842	1841	IR/18/1943
Dalton-le-Dale	1839	1839	IR/18/1948
Dawdon	1842	1842	IR/18/1952
Easington	1838	1838	IR/18/1959
Eppleton Great	1839	1838	IR/18/1965
Eppleton Little	1839	1839	IR/18/1961
Hetton-le-Hole	1839	1838	IR/18/2017
Hutton Henry	1838	1837	IR/18/2032
Kelloe	1839	1839	IR/18/2037
Monk Hesleden	1837	1837	IR/18/2063
Murton	1839	1839	IR/18/2074
Pittington	1841	1840	IR/18/2096
Quarrington	1838	1839	IR/18/2101
Seaham & Seaton	1840	1840	IR/18/2115
Shadforth	1838	1838	IR/18/2118
Sherburn	1838	1838	IR/18/2121
Thornley	1844	1843	IR/18/2149
Trimdon	1840	1839	IR/18/2154
Warden Law	1841	1841	IR/18/2165
Wingate	1840	1839	IR/18/2179
Haswell	1840)		
Hawthorn	1840)	incorporated in Easington parish for Tithe File data.	
Shotton	1840)		

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North Division

Parishes and Townships

Dalton Parish

Township Dalton
Dawdon
Cold Hesledon
East Murton

Houghton Parish

Great Eppleton
Little Eppleton
Hetton-le-Hole
Warden Law

Seaham Parish

Seaham
Seaham with Slingley

Durham Ward

Pittington Parish

Pittington
Shadforth
Sherburn

South Division

Parishes and Townships

Easington Parish

Township Easington
Haswell
Hawthorn
Shotton

Castle Eden Parish

Kelloe Parish

Cassop
Coxhoe
Kelloe
Quarrington
Thornley
Wingate

Monk Hesleden Parish

Hutton Henry
Monk Hesleden

Trimdon Parish

CENSUS DATA

Census Enumerators' Books (D.C.R.O.)

Township

1841		1851		1871	
East Murton	M27/8	East Murton	M3/21,22	East Murton	M18/32
Hetton	M27/9	Hetton	M3/23	Shotton	M18/31
Haswell	M27/29	Haswell	M3/21	Trimdon	M18/11
Shotton	M27/29	Shotton	M3/21		
Pittington	M27/10	Pittington	M3/19		
Sherburn	M27/10	Sherburn	M3/19		
Cassop	M27/29	Cassop	M3/19		
Coxhoe	M27/29	Coxhoe	M3/19,20		
Quarrington	M27/29	Quarrington	M3/19		
Thornley	M27/9, 10	Thornley	M3/20		
Monk Hesleden	M27/10	Monk Hesleden	M3/21		
		Hutton Henry	M3/21		
		Trimdon	M3/8		
		Shadforth	M3/19		

UNPRINTED SOURCES

COLLECTIONS OF PAPERS.

Specific references to the documentary record are given at the end of each chapter.

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The Buddle Papers Vol.19	N.E.I.M.M.E.
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The Londonderry Papers	D.C.R.O.
The N.C.B. Coll.	D.C.R.O.
The Shipperdson Papers, Vol.2	U.D.D.P.D.
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Land Tax Returns 1760-1832

Hetton Township	LTA/E/N	D.C.R.O.
Great Eppleton Township	LTA/E/N	D.C.R.O.

APPENDIX 1

One of the major achievements of British historical geographers in the last decade has been the exploitation of the mid-nineteenth century census enumerators' books and the development of techniques to handle and analyse the mass of socio-economic data contained within them. Stimulated by the seminal work of Armstrong (1967), an increasing number of historical geographers and historians have used the census books as a basic source of information to analyse characteristics such as residential segregation, social change and population mobility both within the between British cities of the last century. Almost invariably the investigations of researchers such as Lawton and Pooley (1976), Dennis (1975), and Shaw (1977) have been sample-based large scale ecological studies of towns and conurbations, with a 10% or 20% systematic sample of households employed in order to reduce the volume of household data to a manageable size. However as Robb (1978) notes, one important quality of mid-nineteenth century material, its availability for almost every occupied households, is not exploited in studies using samples and he argues that a total collection small-area analysis of contrasting urban zones is a natural step from the increasingly repetitive sample-based large scale studies of recent years. Whilst urban historical geographers may debate this issue for some time, the work of the author is more concerned with research at the micro scale in the form of a group of coal mining villages in east Durham. It is the purpose of this appendix to suggest that there are methodological problems associated with the analysis of the censal data for small areas in general and colliery settlements in particular, the

ultimate solution of which might enable such micro analyses to complement the more commonly attempted macro-scale studies of large communities. The three problems discussed below are (i) the problem of sampling the households, (ii) the problems of the classification of the social and economic structures of the mining communities, (iii) problems concerned with the analysis of the censal material by computer.

(i) The Problem of Sampling the Census Enumerators' Books.

Unlike the nineteenth century town and cities recently studied, the mining population of east Durham in 1851 was not aggregated but was dispersed in settlement units in townships ranging in population from 1067 (224 households) to 5751 (1205 households). Therefore, because of the initial decision to conduct the analysis at the township (i.e. sub-division of parish) scale, the first methodological problem concerned the sampling of the households located in the mining settlements. Based on the assumption that some type of sampling was necessary to reduce the volume of censal data, the possibility of drawing systematic or random households from all fifteen townships was considered. However, the first problem arose immediately owing to the operation of the research at the township scale. It is obviously necessary to test the representativeness of samples drawn from total populations and this has been achieved in urban research by comparing the distributions of a series of variables such as occupation structure, birthplace distribution, age and sex characteristics of the sample population against the distribution of the same variables for the total population. The latter are available in the printed volume of the census, but unfortunately not at the township level, where the only

variables which can be identified are mean household size and sex-ratio. As it is intended to examine a much larger number of variables the aggregate data available at the township level represented an inadequate basis for testing the reliability of a sample of the households. Nevertheless, in order to experiment with the feasibility of employing sampling techniques in small settlements, three of the colliery villages were chosen at random and for each of them three variables were calculated for (i) the total population (ii) a sample of the population. In the case of the largest village, Thornley (population 2740 in 532 households), a 20% systematic sample of households was drawn; in the other settlements, Quarrington (population 1063 in 213 households) and East Murton (population 1387 in 237 households) a systematic 50% household sample was taken. The three variables chosen to test the reliability of the samples were birthplace distribution, age structure and sex ratio. Chi-square testing was used to demonstrate whether the observed frequencies in the samples differed significantly from those in the total populations of the villages. In Statistical tables (i) and(ix) the chi-square tabulations indicate that the samples were no more than partially reliable in their representation of the total population variables.

In the birthplaces test, places of origin were classed into eight regions, a rather coarse framework for analysis, but despite this, in all three settlements the observed samples frequency fell outside the chi-square limit, even in the two villages sampled at the 50% level. As one of the major elements of this study of colliery settlements is an examination of the mobility of the labour force, then it would appear that such sample unreliability must call into question the use of sampling techniques in the micro-

scale analyses. The tests to calculate the degree to which the age-structure of the sample population differed significantly from the total population indicated that whilst in Thornley and Quarrington Hill the sample was reliable, in East Murton the sample was very biased. Finally, in all three villages the sex-ratio of the sample population was a valid representation of the total population: this result is not unexpected when one remembers that the great majority of the households contained a man and wife the sample data therefore not being independently derived.

On the basis of this experiment with sample populations it was considered that for detailed research attempting to reconstruct the social, economic and migrational characteristics of population in small areas, sampling households was probably an unreliable technique. Confirmation of this conclusion is afforded by Schofield (1972) who demonstrates that for the type of censal analysis envisaged minimum sample sizes of the order of 300 are necessary. As six of the fifteen colliery townships in east Durham contained about 300 households or fewer, the total collection method was considered to be more appropriate. Furthermore, it was felt that by a process of sampling households, small-scale but potentially interesting socio-economic characteristics of colliery communities such as the residential segregation of officials from the bulk of the labour force, or the grouping in contiguous housing of migrants from the same locations, might be under-represented or even overlooked. It is considered therefore that the micro-scale total reconstruction approach can usefully complement the sample analysis of larger populations. In view of such considerations a cluster sample method has been adopted, with eight of the mining townships chosen for total-collection analysis, ranging in size from smallest

to largest, providing a good spatial spread and exemplifying older to more recent foundations. By the adoption of this procedure the study is based upon a population of just over 17,000 in 3,500 households.

(ii) The Classification of Occupational Data

In the second section discussion centres around the need for a classification of the occupational data derived from the census books and the problems of applying classifications to colliery settlements in the mid-nineteenth century. It is well known that mining settlements had a narrow occupational structure; analysis of the occupations listed in the 1851 census returns for the eight sample east Durham mining townships confirms this generalization as the percentages of all gainfully employed people engaged in coalmining ranged from 54.22% to 77.33% with only three of the townships recording less than 60%. Such findings might well prompt one to question the need to consider the matter of the socio-economic classification of the occupational data for what appear to be virtually monofunctional settlements. However it is maintained that a sufficiently wide range of occupations existed in these communities to justify attempts at classification. Firstly, within some of the townships pre-mining rural villages existed which contained a wider range of agrarian and craft occupations than was the case with the purely mining communities. Secondly, some of the larger mining settlements possessed groups of workers employed in manufacturing and craft activities either on a domestic basis or as employees of the coal company engaged in activities such as engineering, engine-building or construction. Because of these factors some classification of the occupational data is

necessary, both as a descriptive device and as a basis for measuring variations within and between mining communities. It is clearly necessary to group occupational titles into meaningful divisions in order to explore the relationships between such groups and a range of socio-economic and migrational characteristics. Because the emphasis of the work is upon the economic profile of the settlements, no attempt has been made to use social class as a basis for analysis. In the preliminary stages an attempt to distinguish social groups from the occupational data following Armstrong's use (1967 and 1972) of the 1950-51 General Register Office scheme for the classification of occupations into five socio-economic groups, was found to be impractical. The major obstacle was the subdivision of the colliery labour force in the 1950-51 attribution lists into skilled, Class III and semi-skilled, Class IV: in this classification a distinction is made between those underground workers who are engaged in coalcutting and power loading (Class III) and all other underground workers concerned with the conveying of coal to the shaft, with developing underground workings and with repairing roadways (Class IV), together with other workers above ground. When this classification system is applied to the 1851 census entries it proves impossible in many cases to apportion the colliery labour force as the usual occupation description is simple 'coal-miner'. Underground officials such as deputies and overmen are sometimes distinguished, although their frequency is probably under-recorded, but for the bulk of the colliery workers much ambiguity exists.

In order to achieve a classification of the occupational descriptions given in the census books which would permit measurement of the economic structure of the communities, use has been

made of the industrial classification developed by Charles Booth (1886) and discussed and modified by Armstrong (1972). Through the use of Booth's industrial classification of occupations and his allocation lists of nineteenth century occupational titles to industrial sectors, it has proved feasible to tabulate the economic structure of the east Durham mining settlements making only minor amendments to Booth's original scheme. Whilst Armstrong reduced the number of major industrial sectors from eleven to nine by combining agriculture and fishing and by dropping 'others' from the occupied population (Armstrong 1972), for the mining settlements the number of industrial categories has been kept at eleven by

(i) creating a distinction between colliery officials and coal miners

(ii) by creating another primary occupations category to be able to identify activities such as quarrying, and

(iii) by deleting the meaningless Industrial Service category.

Although the subdivision of the mining category into two is a departure from the principle of an industrial classification, it is felt that this amendment can be justified as it permits the search for comparisons between the two mining groups and a series of variables such as birthplaces, age-structures and household composition. Booth's Industrial Service category contained two elements, banking, insurance and accounts on the one hand and labourers on the other; the few isolated examples of the former have been located in the public service and professional group whilst the latter have been put in a separate labourer category in those cases which cannot be assigned to a particular industry.

Table I shows Booth's original major industrial categories, Armstrong's modification and the amendment for the mining villages.

TABLE I. THREE SYSTEMS OF CLASSIFYING MAJOR INDUSTRIAL CATEGORIES

C. BOOTH	A. ARMSTRONG	EAST DURHAM STUDY
Agriculture	Agriculture/fishing	Agriculture/fishing
Fishing	Mining	Mining: officials
Mining	Building	Mining: others
Building	Manufacture	Other extractive
Manufacture	Transport	Building
Transport	Dealing	Manufacture
Dealing	Industrial Service	Transport
Industrial Service	Public Service/ Professional	Dealing
Public Service/ Professional	Domestic Service	Labourers
Domestic Service		Public Service/ Professional
Others		Domestic Service

Using the modified classification the allocation of the occupational entries proved to be a relatively straight-forward matter with few ambiguities, partly the result of the dominant position of the coal industry as employer. Although it could be argued that the amendments made to the categories invalidate the possibility of comparing the economic profile of this study area with other research, it is unlikely that any meaningful comparisons are possible between a group of coal mining settlements on the one hand and large multi-functional mid-Victorian towns on the other.

(iii) Computer Analysis of the Census Material.

In order to prepare the manuscript material drawn from the census enumerators' books of the eight mining villages for analysis by computer, the data, originally recorded in verbal as well as numerical form, were coded and then punched onto computer cards using two for each household. Table A indicates the codes that were employed for all the variables incorporated in the analysis of the settlements. Using the Statistical Package for the Social Sciences (SPSS) frequencies procedure, a series of descriptive tables was produced for each colliery village which are listed in Table B and which are designed to measure the social, economic and birthplace characteristics of the total populations of the sample colliery settlements. Furthermore, by the use of the 'select if' procedure of the SPSS, whereby the computer will analyse only those households which are specified cases within the population of households, it proved to be an easy task to obtain frequency tables for particular sections of the mining townships. For example, in the cases where an ancient rural village still stood separate from a recently-created mining community, it was a simple matter for the computer to calculate the required frequencies for the run of households in both units of settlement, e.g. Shotton village and Shotton colliery. Similarly separate frequency tables could be constructed for spatially separate mining communities which had developed within the same township, e.g. Trimdon Grange and Trimdon Colliery. Furthermore, the 'select if' procedure could be used to distinguish particular occupation groups within the townships, thereby facilitating comparison between them as measured by a range of socio-economic and birthplace variables.

In addition to the speedy production of many frequency tables,

it was also intended to use the computer to assist in the testing of relationships between a series of variables drawn from the census material. For example, it was hoped to be able to test statistically the significance as well as the strength of the association between occupations of heads of households and a range of variables such as family size, age structure, frequency of lodgers and birthplaces. By using the SPSS cross-tabulation procedure, two way or 'n' way contingency tables can easily be produced but within this context a considerable methodological problem arose at an early stage connected with the significance testing of the cross-tabulations. The chi-square test was chosen as an appropriate test of the significance of the association between variables; it will accept data measured at the nominal scale and it makes no assumptions about the shape of the sample population (i.e. it is a non-parametric test). Both these attributes proved essential as some of the variables employed are categorical such as occupation groups, birthplace regions and household structures, whilst in the cases of many variables the distribution was clearly non-normal. However, in order to make reliable inferences about the significance of the association between variables, the chi-square test requires that (i) fewer than 20% of the cells of the contingency table have an expected frequency of less than five, and (ii) no cells record an expected frequency of less than one.

Because of the small number of households in the eight mining villages with the smallest containing only 222 households and the largest 1205 and because of the large number of categories into which some of the variables were divided, e.g. twelve occupation groups and twenty-eight birthplace regions, early attempts at

cross-tabulation produced large tables many of which contained cells which contravened the numerical requirements of the chi-square test. As this precluded the measurement of association between variables, the number of categories in each list of variables was reduced in order to decrease the size of the cross-tabulations and hence increase the likelihood of statistically reliable significance testing. In some cases the number of categories was reduced very considerably in order to produce contingency tables capable of statistical analysis. Birthplaces, for example, were collapsed to eight regions from the original twenty-eight, whilst occupations, because of small numbers recorded in many of the occupation categories were reduced from twelve to two groups (simply coal miners and others). After considerable experimentation an attempt was made to achieve a balance between the necessity of complying with the technical requirements of the statistical test on the one hand and the meaningfulness of an analysis based on severely reduced detail on the other hand. In Table C, the extent to which the cross-tabulation analyses for the eight mining villages proved possible is indicated by the symbols at the foot of the table. The left-hand column lists the cross-tabulations, and for each village the symbols demonstrate whether the chi-square test was feasible or not and whether there was an association with a significance level of 0.05 or greater. As Table C shows, despite the reduction of the size of the contingency tables, in many cases particularly in the smaller villages it proved impossible to conduct a chi-square test with any degree of reliability because of infringements of the limitations of the test referred to above. In these cases, the cross-tabulations have been used descriptively but no attempts have been made to test

them for significance or strength of association between the relevant variables.

EAST MURTON 1851 50% SAMPLE

AGE-STRUCTURE: CHI-SQUARE TEST

STATISTICAL TABLE i)

a age group	b total pop.	c expected freq.	d observed freq. (sample)	e diff.	f $diff.^2$	g $\frac{diff.^2}{expected\ freq.}$	h =(b-c) expected freq. in cases emitted from samples	i = (b-d) freq. which would have been encountered by exam all other cases	j diff.	k $diff.^2$	l $\frac{diff.^2}{expected\ freq.}$
0 – 4	211	105	94	11	121	1.15	106	117	11	121	1.14
5 – 9	211	105	99	6	36	0.34	106	112	6	36	0.34
10 – 14	206	102	96	6	36	0.35	104	110	6	36	0.35
15 – 19	158	78	87	9	81	1.04	80	71	9	81	1.01
20 – 24	109	54	54	0	0	0	55	55	0	0	0
25 – 29	91	45	55	10	100	2.22	46	36	10	100	2.17
30 – 34	79	39	38	1	1	0.03	40	41	1	1	0.03
35 – 39	92	46	45	1	1	0.02	46	47	1	1	0.02
40 – 44	74	37	43	6	36	0.97	37	31	6	36	0.97
45 – 49	68	34	23	11	121	3.56	34	45	11	121	3.56
50 – 54	32	16	17	1	1	0.06	16	15	1	1	0.06
55 – 59	23	11	15	4	16	1.45	12	8	4	16	1.33
60 – 64	11	5	9	4	16	3.20	6	2	4	16	2.67
65 – 69	9	4	8	4	16	4.00	5	1	4	16	3.20
70 +	13	6	5	1	1	0.17	7	8	1	1	0.14
						18.56					16.99
									T =		35.55
									s.l. 0.05 chi-square 14 df =		23.685

11)

EAST MURTON 1851: 50% SAMPLE

BIRTHPLACE DISTRIBUTION: CHI-SQUARE TEST.

a	b	c	d	e	f	g	h (b–c)	i (b–d)	j	k	l
Birthplace											
Murton	268	133	118	15	225	1.69	135	150	15	225	1.67
Durham	755	375	364	11	121	0.32	380	391	11	121	0.32
Northumberland	264	131	147	16	256	1.95	133	117	16	256	1.92
North	64	32	38	6	36	1.13	32	26	6	36	1.13
England and Wales	14	7	5	2	4	0.57	7	9	2	4	0.57
Ireland	11	5	10	5	25	5.00	6	1	5	25	4.17
Scotland	3	1	1	0	0	0	0	0	0	0	0
Others	5	2	4	2	4	2.00	3	1	2	4	1.33
						12.66					11.11
								T	=		23.77
						s.l. 0.05 chi-square with 7 df			=		14.067

EAST MURTON 1851 50% SAMPLE

SEX-RATIO: CHI-SQUARE TEST

iii)

a	b	c	d	e	f	g	h (b-c)	i (b-d)	j	k	l
Sex											
male	751	371	377	6	36	0.097	380	374	6	36	0.095
female	636	315	310	5	25	0.079	321	326	5	25	0.078
						0.176					0.173
								T		=	0.349
							s.l. 0.05 chi-square 1 df			=	3.841

iv)

THORNLEY 1851 20% SAMPLE

AGE-STRUCTURE: CHI-SQUARE TEST.

a age group	b total pop.	c expected freq.	d observed freq. (sample)	e diff.	f $diff.^2$	g $\frac{diff.^2}{expected\ freq.}$	h (b-c) expected freq. in cases omitted from samples	i (b-d) freq. which would have been encountered by exam all other cases	j diff.	k $diff.^2$	l $\frac{diff.^2}{expected\ freq.}$
0 – 4	411	86	79	7	49	0.57	325	332	7	49	0.15
5 – 9	344	72	61	11	121	1.68	272	283	11	121	0.44
10 – 14	361	75	84	9	81	1.08	286	277	9	81	0.28
15 – 19	305	64	83	19	361	5.64	241	222	19	361	1.50
20 – 24	263	55	61	6	36	0.65	208	202	6	36	0.17
25 – 29	223	46	49	3	9	0.20	177	174	3	9	0.05
30 – 34	164	34	27	7	49	1.44	130	137	7	49	0.38
35 – 39	140	29	30	1	1	0.03	111	110	1	1	0.01
40 – 44	137	29	25	4	16	0.55	108	112	4	16	0.15
45 – 49	132	28	24	4	16	0.57	104	108	4	16	0.15
50 – 54	81	17	16	1	1	0.06	64	65	1	1	0.02
55 – 59	66	14	8	6	36	2.57	52	58	6	36	0.69
60 – 64	42	9	9	0	0	0	33	33	0	0	0
65 – 69	28	6	6	0	0	0	22	22	0	0	0
70+	42	9	9	0	0	0	33	33	0	0	0
						15.04					3.99
								T =			19.03
								s.l. 0.05 chi-square 14 df =			23.685

THORNLEY 1851 20% SAMPLE

v) BIRTHPLACE DISTRIBUTION: CHI-SQUARE TEST

a	b	c	d	e	f	g	h (b-c)	i (b-d)	j	k	l
Birthplace											
Thornley	526	110	119	9	81	0.74	416	407	9	81	0.19
Durham	1408	293	325	32	1024	3.49	1115	1083	32	1024	0.92
Northumberland	308	64	50	14	196	3.06	244	258	14	196	0.80
North	290	60	42	18	324	5.40	230	248	18	324	1.41
England and Wales	58	12	7	5	25	2.08	46	51	5	25	0.54
Ireland	100	21	19	2	4	0.19	79	81	2	4	0.05
Scotland	39	8	8	0	0	0	31	31	0	0	0
Others	10	2	1	1	1	0.5	8	9	1	1	0.13
						15.46					4.04
								T	=		19.50
					s.l. 0.05	chi-square 7 df			=		14.067

THORNLEY 1851 20% SAMPLE

vi) SEX RATIO: CHI-SQUARE TEST

a	b	c	d	e	f	g	h	i	j	k	l
Sex ratio											
Male	1417	296	275	21	441	1.49	1121	1142	21	441	0.39
Female	1322	276	296	20	400	1.45	1046	1026	20	400	0.38
						2.94					0.77
							T =				3.71

s.l. 0.05 chi-square 1 df = 3.841

QUARRINGTON HILL 1851 50% SAMPLE

AGE-STRUCTURE: CHI-SQUARE TEST

vii)

a age group	b total pop.	c expected freq.	d observed fre. (sample)	e diff.	f $diff.^2$	g $\frac{diff.^2}{expected\ freq.}$	h =(b-c) expected freq. in cases omitted from samples	i =(b-d) freq. which would have been encountered by exam all other cases	j diff.	k $diff.^2$	l $\frac{diff.^2}{expected\ freq.}$
0 – 4	193	100	111	11	121	1.21	93	82	11	121	1.30
5 – 9	159	82	94	12	144	1.76	77	65	12	144	1.87
10 – 14	112	58	61	3	9	0.16	54	51	3	9	0.17
15 – 19	96	50	40	10	100	2.00	46	56	10	100	2.17
20 – 24	75	39	31	8	64	1.64	36	44	8	64	1.78
25 – 29	110	57	52	5	25	0.44	53	58	5	25	0.47
30 – 34	86	45	44	1	1	0.02	41	42	1	1	0.02
35 – 39	55	28	28	0	0	0	27	27	0	0	0
40 – 44	56	29	30	1	1	0.04	27	26	1	1	0.07
45 – 49	29	15	17	2	4	0.27	14	12	2	4	0.29
50 – 54	29	15	15	0	0	0	14	14	0	0	0
55 – 59	16	8	9	1	1	0.13	8	7	1	1	0.13
60 – 64	14	7	7	0	0	0	7	7	0	0	0
65 – 69	19	10	9	1	1	0.1	9	10	1	1	0.11
70+	12	6	2	4	16	2.67	6	10	4	16	2.67
						10.87					11.05

s.l. 0.05 chi-square 14 df = 23.685 T = 21.92

QUARRINGTON HILL 50% SAMPLE 1851

viii) BIRTHPLACE: CHI-SQUARE TEST

a	b	c	d	e	f	g	h (b-c)	i (b-d)	j	k	l
Birthplace											
Quarrington	103	53	56	3	9	0.17	50	47	3	9	0.18
Durham	659	341	332	9	81	0.24	318	327	9	81	0.26
Northumberland	86	44	37	7	49	1.11	42	49	7	49	1.17
North	152	79	98	19	361	4.57	73	54	19	361	4.95
England and Wales	31	16	11	5	25	1.56	15	20	5	25	1.67
Ireland	16	8	10	2	4	0.50	8	6	2	4	0.50
Scotland	10	5	3	2	4	0.80	5	7	2	4	0.80
Others	6	3	3	0	0	0	0	0	0	0	0
						8.95					9.53
								T =			18.48
								s.l. 0.05 chi-square at 7 df =			14.067

QUARRINGTON HILL 50% SAMPLE 1851

SEX RATIO: CHI-SQUARE TEST

ix)

a	b	c	d	e	f	g	h (b–c)	i (b–d)	j	k	l
Sex											
Male	570	296	295	1	1	0.003	274	275	1	1	0.003
Female	493	254	255	1	1	0.003	239	238	1	1	0.004
						0.006					0.007
								T =			0.013
							s.l. 0.05 chi-square 1 df			=	3.841

TABLE A.

GODES EMPLOYED FOR THE COMPUTER ANALYSIS.

Occupation Group

1 Agriculture and fishing
2 Coal mining: officials
3 Coal mining: others
4 Other primary
5 Building
6 Manufacture/craft
7 Transport
8 Dealing
9 Labourers
10 Public service and professional
11 Domestic service
12 Residual: not employed

Social Class

1 Professional
2 Intermediate
3 Skilled
4 Partly skilled
5 Unskilled
6 Residual

Age of children

1 0 - 4 years
2 5 - 9
3 10 - 14
4 15 - 19
5 20 - 24

Life Cycle Stage of Married Head of Household

1 Wife under 45 no children at home.
2 Wife under 45, 1 child under 1 year.
3 Children at home, none in employment.
4 Children at home, under half in employment.
5 Children at home, over half in employment.
6 Wife over 45, either no children at home or only 1 aged over 20.

Structure of Families of Heads of Households.

1 Head alone or only with unrelated persons.
2 Nuclear family, childless married couple.
3 Nuclear family, with children.
4 Stem families, two or more lineally-related ever-married persons and their nuclear families.
5 Stem families: ditto + other kin.
6 Composite family: unmarried siblings only.
7 Other combinations of kin.
8 Other family structures.

Birthplaces

1 Village of residence
2 East Durham plateau
3 Sunderland
4 Mid-Wear Valley
5 Lower Tyneside, Durham
6 North West Durham coalfield
7 South West Durham coalfield
8 West Durham extra coalfield
9 Upper Tyneside, Durham
10 South Durham extra coalfield
11 Durham general
12 Lower Tyneside, Northumberland
13 Northumberland coalfield north of 90 fathom dyke
14 Newcastle
15 Upper Tyneside, Northumberland
16 Northumberland, rural
17 Northumberland, general
18 North Riding
19 Cumberland
20 Westmorland
21 West and East Riding
22 Yorkshire general
23 Lancashire
24 Rest of England and Wales
25 Scotland
26 Ireland
27 Foreign
28 Others.

Sharing residence with another family unit

1 Yes
2 No

Type of Household: marital status of head of household

1 Married male
2 Single male
3 Widowed male
4 Married female
5 Single Female
6 Widowed female

TABLE B

DESCRIPTIVE TABLES PRODUCED BY THE SPSS PACKAGE.

Persons per household
Persons per family
Number of children
Number of lodgers
Number of servants
Number of relations
Number of visitors
Structure of family of heads of households
Shared households
Life cycle stage of married heads of households
Marital status of heads of households
Occupations of heads of households
Social class of heads of households
Occupations of wives of heads of households
Occupations of lodgers (max. number 6)
Occupations of children (max. number 6)
Birthplaces of heads of households
Birthplaces of wives of heads of households
Birthplaces of children (max. number 10)
Birthplaces of lodgers (max. number 6)
Birthplaces of servants (max. number 4)
Birthplaces of relations (max. number 4)
Ages of heads of households
Ages of wives of heads of households
Ages of children (max. number 10)
Ages of lodgers (max. number 6)
Ages of servants (max. number 4)

TABLE C CROSS-TABULATION ANALYSES FOR THE COLLIERY SETTLEMENT.

Number of Households		1205 Hetton	532 Thornley	303 Shotton	327 Trimdon	237 East Murton	435 South Hetton	224 Hutton Henry	213 Quarrington Hill
Occupation of head of house	x persons per house	∫	X	X	X	X	X	X	X
	x persons per family	∫	∫	∫	∫	X	X	X	X
	x structure family	∫	X	∫	X	X	X	X	X
	x life cycle	∫	X	X	X	X	X	X	X
	x shared houses	∫	X	∫	X	X	X	X	X
	x no. of children	∫	∫	X	X	X	X	X	X
	x no. of lodgers	∫	X	∫	X	X	∫	X	X
	x no. of servants	∫	∫	∫	∫	∫	∫	∫	∫
	x no. of relations	∫	X	∫	X	X	X	X	X
	x birthplace head	∫	∫	∫	∫	X	∫	∫	∫
	x age head	∫	∫	∫	∫	∫	∫	∫	∫
	x social class head	∫	∫	∫	∫	∫	∫	∫	∫
	x marital status head	∫	∫	∫	∫	∫	∫	∫	∫
Age of head of house	x persons per house	∫	∫	∫	∫	∫	∫	∫	0
	x persons per family	∫	∫	∫	∫	∫	∫	∫	∫
	x structure family	∫	∫	∫	X	∫	∫	∫	X
	x life cycle	∫	∫	∫	∫	∫	∫	∫	∫
	x shared house	∫	∫	0	X	0	X	0	0
	x no. of children	∫	0	0	0	0	0	0	0
	x no. of lodgers	∫	X	0	X	X	X	0	X
	x no. of servants	∫	X	∫	∫	X	X	0	0
	x no. of relations	∫	∫	∫	X	∫	∫	∫	X
	x birthplace head	∫	∫	0	0	0	0	0	0
	x social class head	∫	0	∫	∫	0	∫	∫	0
	x marital status head	∫	∫	∫	∫	∫	∫	∫	∫
Birthplace headof house	x persons per house	X	X	0	X	0	0	0	0
	x persons per family	X	X	0	∫	0	0	X	0
	x structure family	X	X	∫	X	0	0	0	0
	x life cycle	∫	X	∫	X	X	X	X	0
	x shared houses	X	0	0	0	0	0	0	0
	x no. of children	0	X	0	0	0	0	0	0
	x no. of lodgers	∫	X	0	0	0	0	0	0
	x no. of servants	∫	X	0	0	0	0	0	0
	x no. of relations	X	X	0	X	X	0	0	0
	x social class head	∫	0	0	0	0	0	0	0

∫ = Significant association s.l. 0.05 or greater

X = No. significant association.

0 = Chi-square test not possible.

APPENDIX 2.

PHOTOGRAPHIC RECORD OF EAST DURHAM.

HOUSING TYPES

Plate 1 Single Cottages, Easington Lane: Front view.

Plate 2 Single Cottages, Easington Lane: Rear view.

Plate 3 Double Houses: Brick Garth, Hetton-le-Hole.

Plate 4 Double Houses, Hetton-le-Hole.

Plate 5 Colliery Cottage, Hetton area.

Plate 6 Street Scene, Trimdon Colliery.

Plate 7 Hetton Lyons, Quality Row.

Plate 8 Shotton Colliery, General view.

COLLIERY INSTALLATIONS

Plate 9 Hetton Lyons Colliery, Sketch by T.H. Hair Late 1830s.

Plate 10 Haswell Colliery, 1864.

Plate 11 Trimdon Colliery.

Plate 12 Murton Colliery 1910-12.

Plate 13 Remains of Haswell Pumping Engine.

COAL TRANSPORT SYSTEMS.

Plate 14 Engine House, Warden Law.

Plate 15 Warden Law Incline.

Plate 16 Warden Law Railway Line.

Plate 17 Seaham Harbour: General View.

Plate 18 Seaham Harbour: Coal Drops.

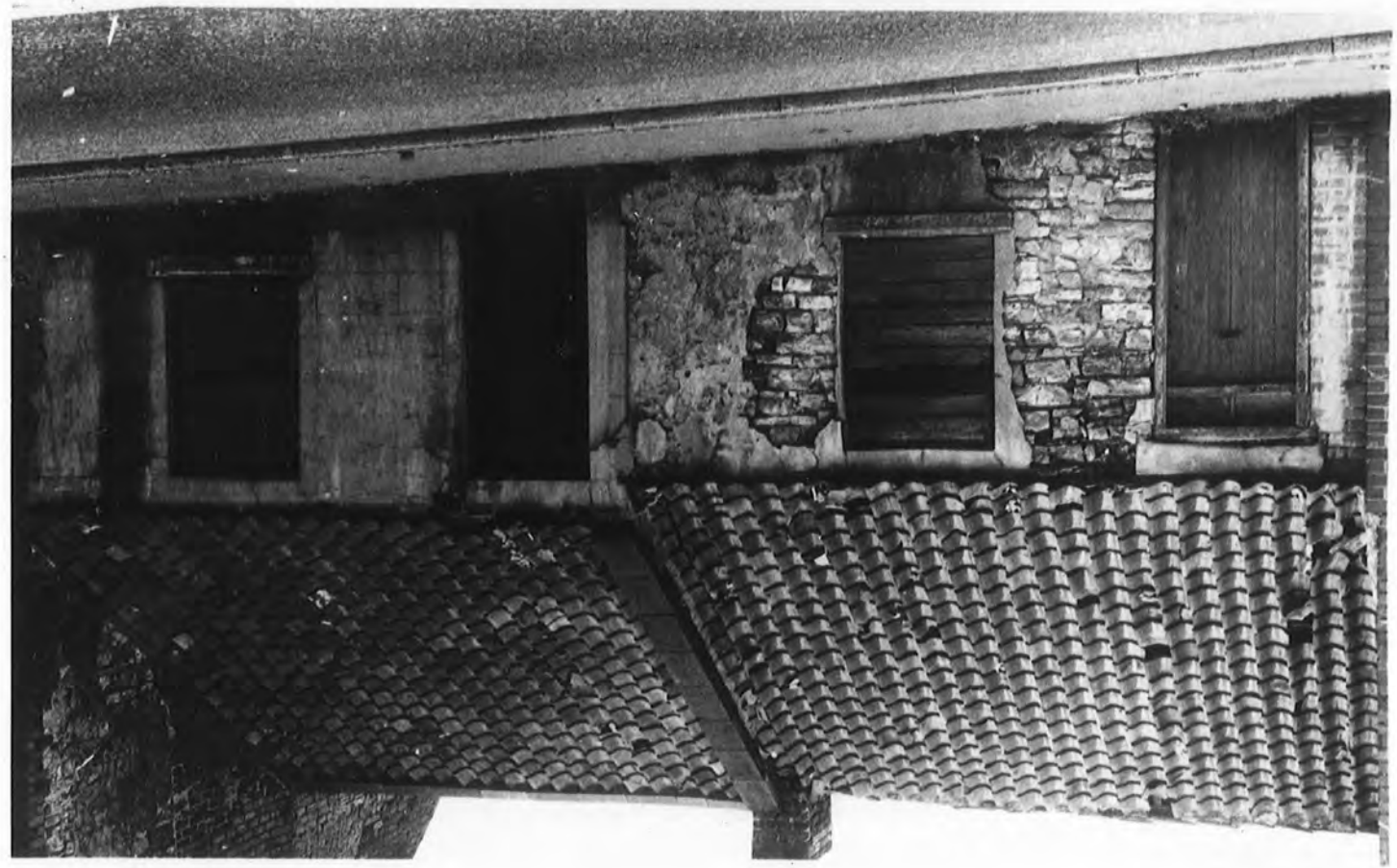


PLATE 1 SINGLE COTTAGES, EASINGTON LANE, HETTON-LE-HOLE.

Built in the 1820s with roughly coursed Magnesian Limestone walls, later rendered and roofed with pantiles, these cottages contained only two rooms on the ground floor. In terms of materials and style such examples of early colliery housing in east Durham represent a continuation in an industrial settlement of an earlier vernacular tradition of cottage construction.

See Fig 4.14 for a plan of one of these cottages.

Source. K. Richardson.

PLATE 2 SINGLE COTTAGES, EASINGTON LANE, HETTON-LE-HOLE. REAR VIEW.

A surviving fragment of early nineteenth century miners' cottages in Easington Lane showing the scullery extension with a cat-slide roof.

Source. Beamish Museum, Neg. No. 10594.

PLATE 3 DOUBLE HOUSES, BRICK GARTH, HETTON-LE-HOLE.

Two-storeyed miners' housing at Brick Garth in Easington Lane. Built from local Magnesian Limestone, roughly-dressed and with slate roofs which have probably replaced earlier pantile roofs. Photograph taken in the 1950s. Houses subsequently demolished.

Source. Beamish Museum Neg. No. 10609

PLATE 4 DOUBLE HOUSES, HETTON-LE-HOLE.

Built in the late 1850s of coursed Magnesian Limestone masonry with a front garden and a rear yard this type of housing represente a major improvement upon the earliest cottages built in the 1820s both in terms of internal living space and plot size.

Fig 4.15 shows the plan details of similar housing in an adjacent street in Hetton.

Source. Beamish Museum Neg. No. 2185

PLATE 5 COLLIERY COTTAGE, HETTON AREA.

Location not known. Photograph probably taken at the beginning of the twentieth century: an evocative glimpse at the domestic environment of this east Durham mining settlement.

Source. Beamish Museum Neg. No. 10536

FFEE POT STREET, TRIMDON COLLIERY.

PLATE 6 TRIMDON COLLIERY; STREET SCENE

View looking approximately north and photograph taken probably in the first decade of the twentieth century, shows both the original type of colliery row on the left built in the 1840s with the opening of Trimdon colliery in 1843 and later housing in the background.

Source. Beamish Museum Neg. No. 5868

PLATE 7 HETTON LYONS, "QUALITY ROW"

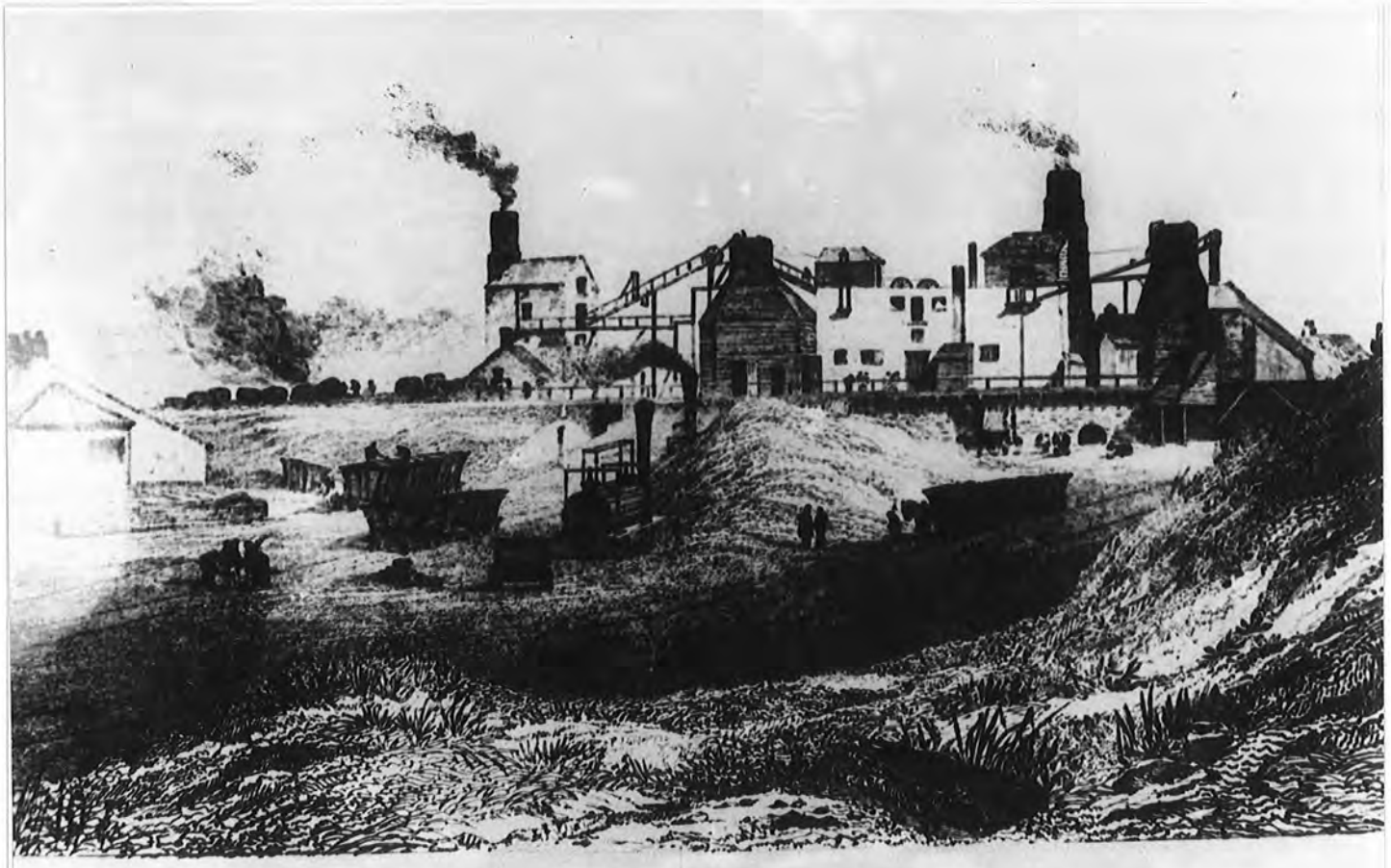
Part of the housing at Hetton Lyons in which colliery officials, engineers and skilled workers lived in the mid-nineteenth century. Spatially separate from the miners' rows in Hetton and Easington, these superior houses represented a true Quality Row within the socio-economic structure of the mining town.

Source. Author.

PLATE 8 SHOTTON COLLIERY: GENERAL VIEW

A general view of colliery installations, waste heap, rows of miners' housing and garden allotments.

Source. K. Richardson



HETTON COLLIERY.

PLATE 9 HETTON LYONS COLLIERY. SKETCH BY T.H.HAIR, LATE 1830s.

The colliery installations are here viewed from the north west. The two shafts sunk between 1820 and 1822 were worked by two winding engines the boiler houses for which can be seen in the sketch. The use of horses for shunting the coal waggons and Stephenson's early locomotives on the gentlest gradients of the Hetton waggonway can also be seen.

Source. Hair T.H. A Series of Views of the Collieries in the Counties of Northumberland and Durham, (1844), reprinted (1969).

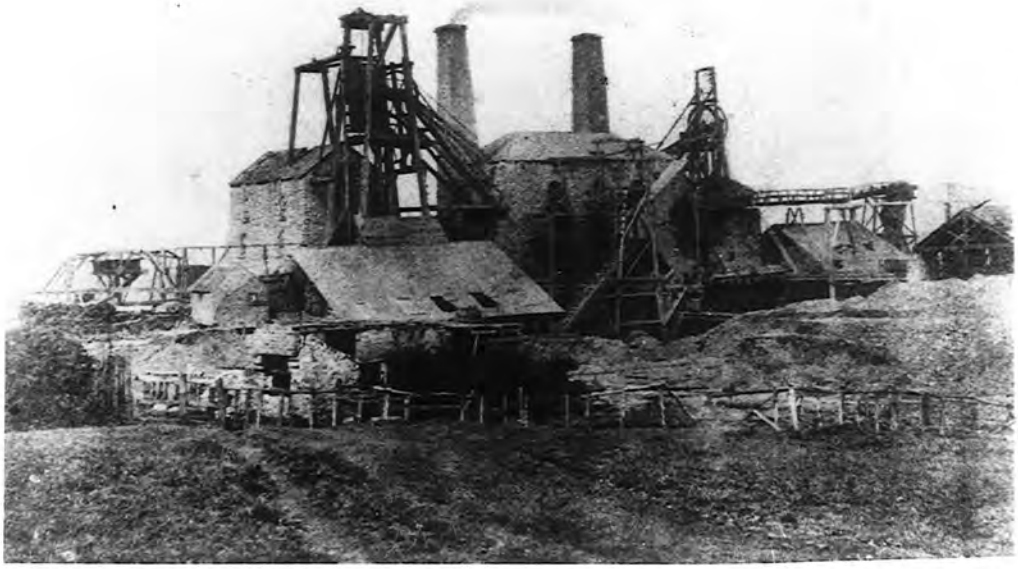


PLATE 10 HASWELL COLLIERY PHOTOGRAPHED 1864.

The earliest surviving photograph which has been found of an east Durham colliery sunk thirty years before the photograph was taken, Haswell Colliery, like all other mines on the concealed coalfield had twin shafts the winding gear of which can be seen. The chimneys of the engine houses which provided the power for the winding, pumping and ventilation systems can also be discerned.

Source. Beamish Museum Neg. No. 4603.

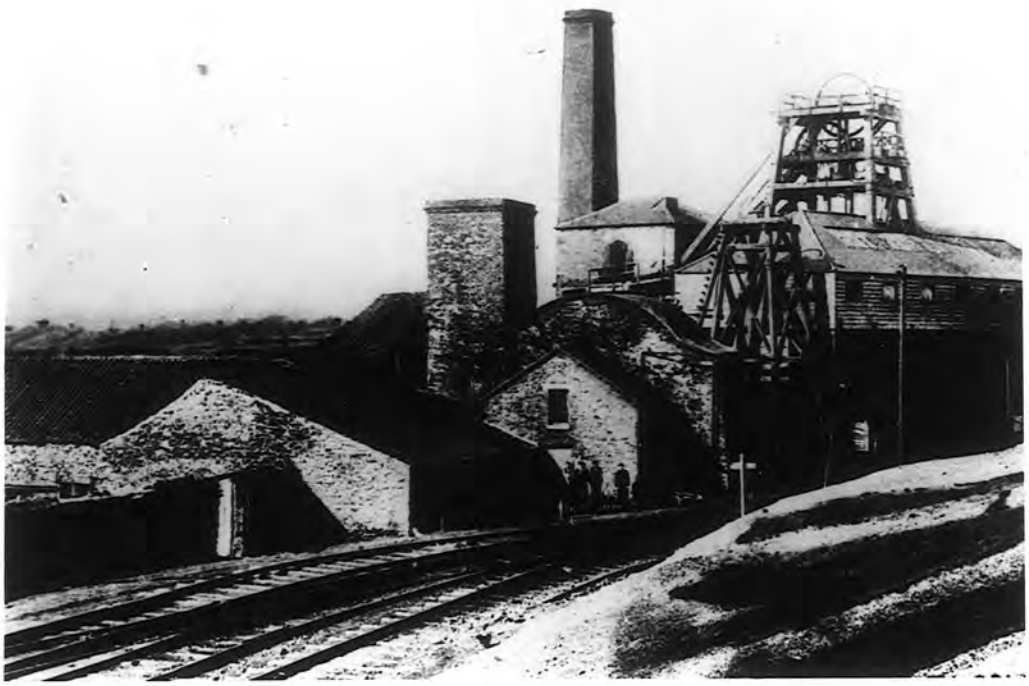


PLATE 11 OLD PIT, TRIMDON COLLIERY.

The photograph, probably taken early this century, shows one of the two winding engines and engine houses at this south Durham colliery.

Source. Beamish Museum Neg. No. 5858.

PLATE 12 MURTON COLLIERY 1910-12

This photograph was taken almost seventy years after the colliery first drew coal in 1843 and doubtless there had been major changes to the surface installations over this period.

Source. Beamish Museum Neg. No. 11027

PLATE 13 REMAINS OF HASWELL PUMPING ENGINE.

The sole physical remains of Haswell Colliery which opened in 1835 and closed in 1895.

Source. Beamish Museum Neg. No. 1835.

PLATE 14 WARDEN LAW ENGINE HOUSE.

The photograph shows the engine house and the revolving drum which was used to haul full coal waggons up to the engine house which was located close to the summit of Warden Law on the Hetton waggonway between Hetton and Bishopwearmouth. This stationary engine was one of three means of haulage originally employed on the line, the other two being locomotives where the gradient was less than 1:300 and self-acting incline planes.

Source. Beamish Museum Neg. No. 2889.

PLATE 15 WARDEN LAW INCLINE

Looking down the incline between the Warden Law engine and Hetton. The photograph shows another stationary engine to the right of the line, in the background, which was used to haul the waggons up Copt Hill. Also visible are the ropes used to haul the waggons and the rollers over which they ran.

Source. K. Richardson.

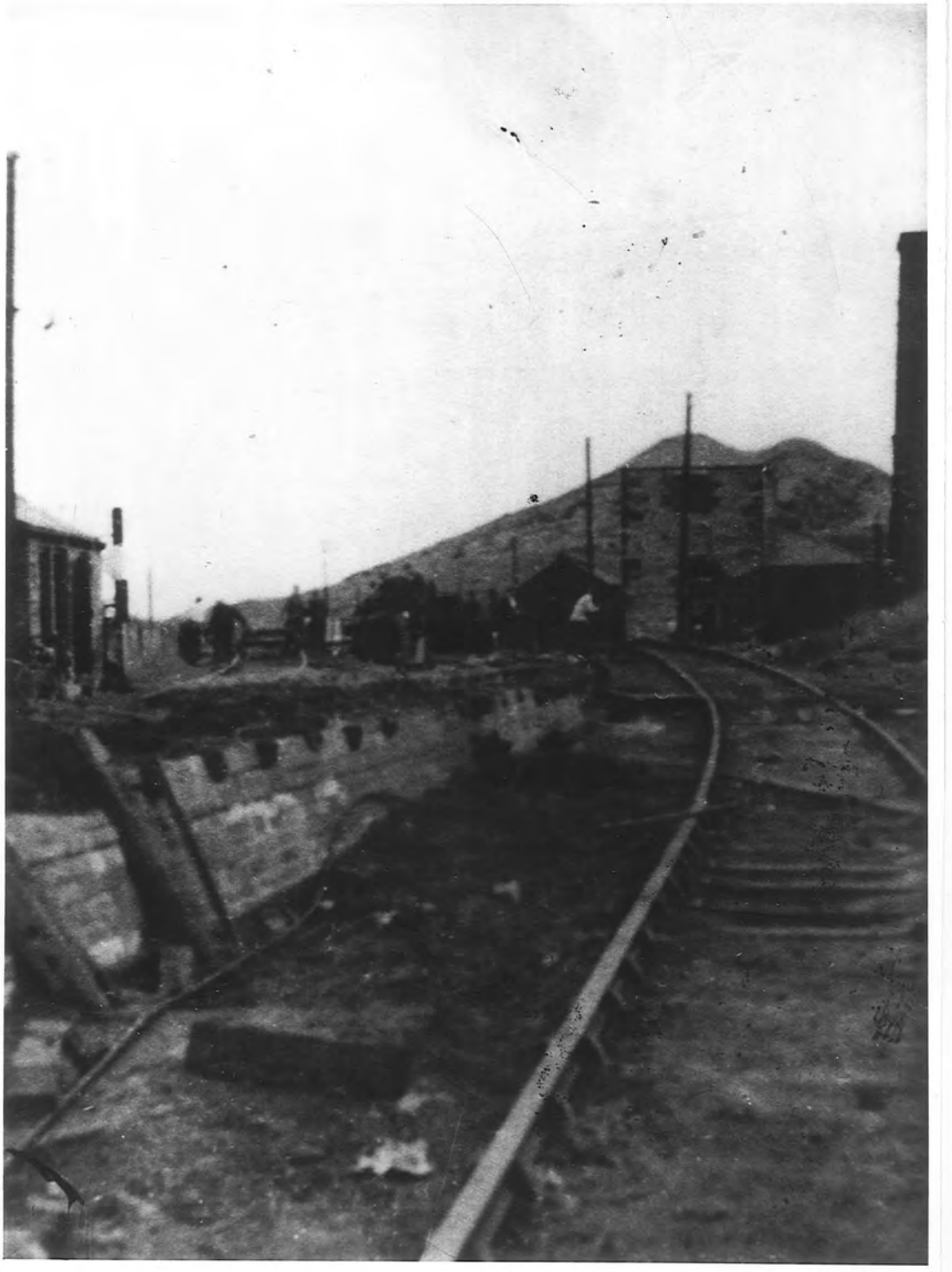


PLATE 16 WARDEN LAW SUMMIT.

Behind the Warden Law engine house the summit of the hill can be seen. The Hetton line curves past the engine house and proceeds towards Bishopwearmouth. Originally haulage from the summit was effected by a self-acting incline, the energy of the full tubs descending the gradient being used by means of an endless rope to haul a set of empty waggons up to the Warden Law engine house.

Source. K. Richardson.

PLATE 17. SEAHAM HARBOUR.

Photographed probably at the end of the nineteenth century, this view shows the North Harbour to the left with coal waggons passing to the wooden drops which were used to fill the coastal collier vessels. Built by the 3rd Marquis of Londonderry from 1828-35 the harbour was designed to export the coal from his Rainton and Pittington collieries. In addition, coal from South Hetton, Murton & Haswell collieries on the concealed coalfield as well as from the neighbouring Seaton and Seaham collieries, was exported via this outlet from its earliest years.

Source. Beamish Museum Neg. No. 3697.

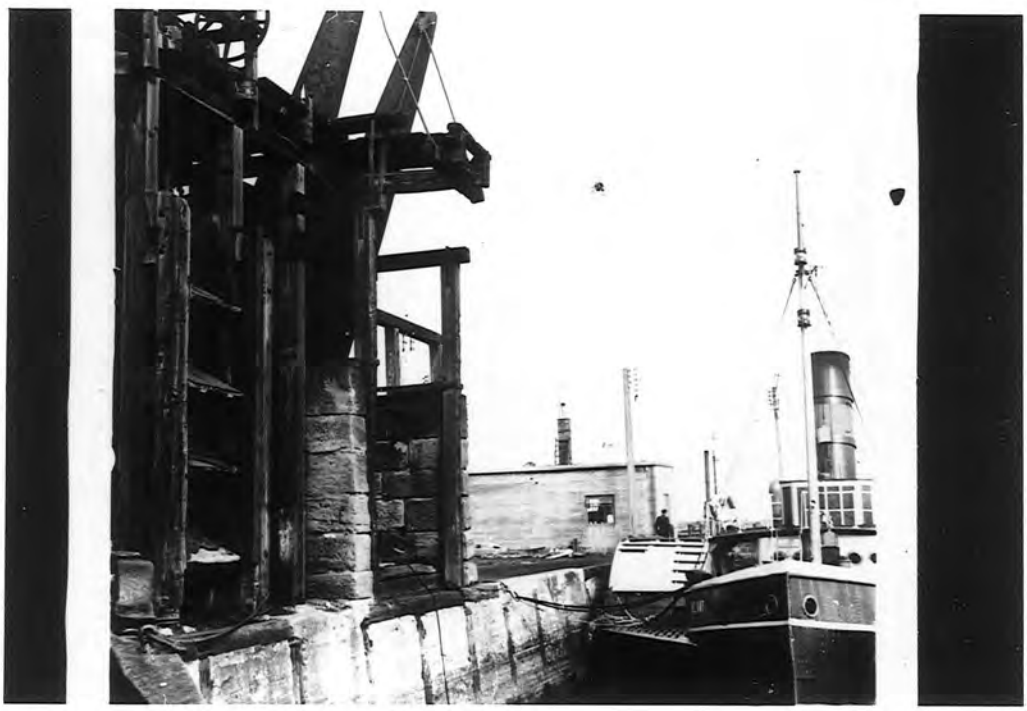


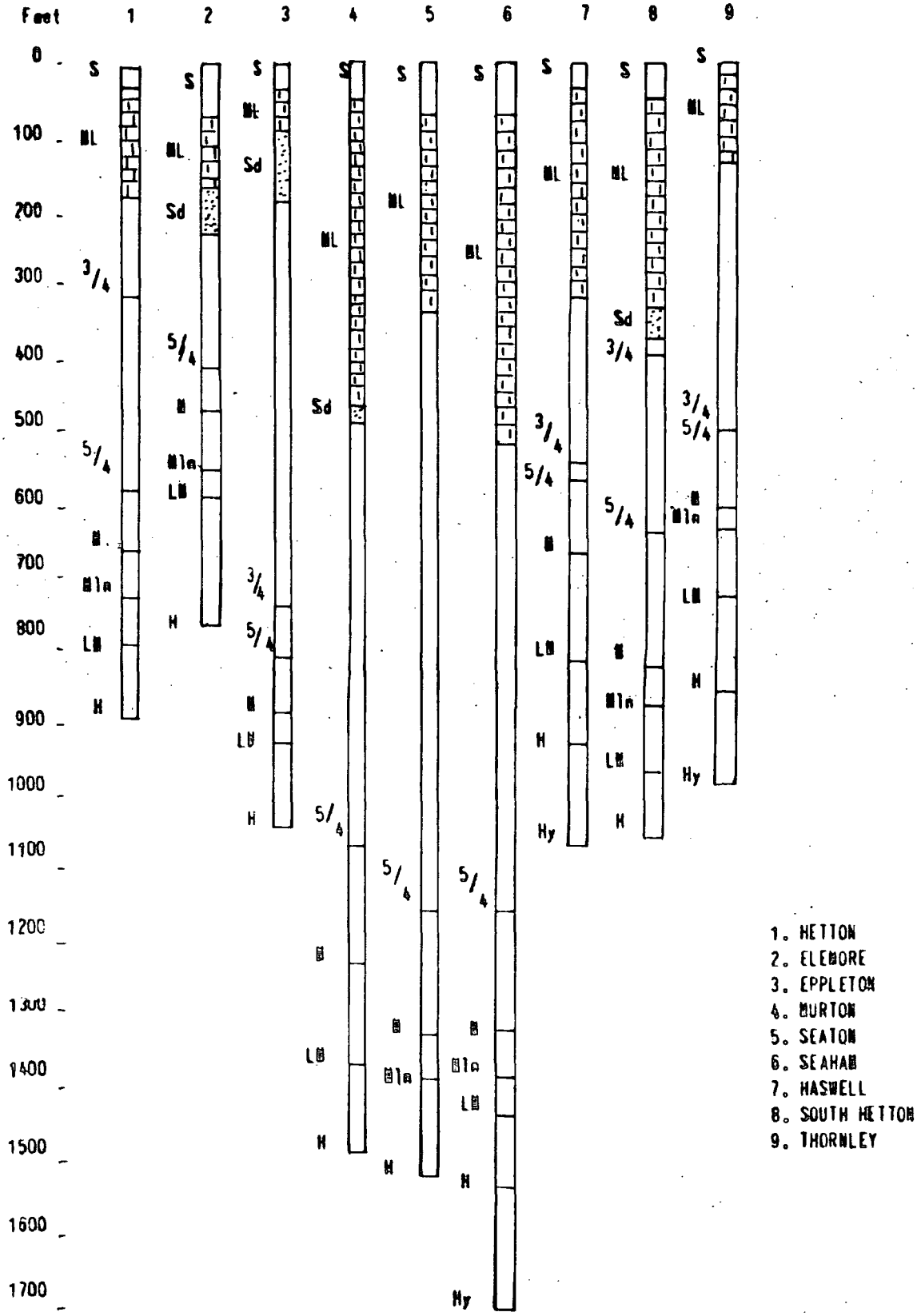
PLATE 18. SEAHAM HARBOUR. CLOSE-UP PHOTOGRAPH OF COAL DROPS

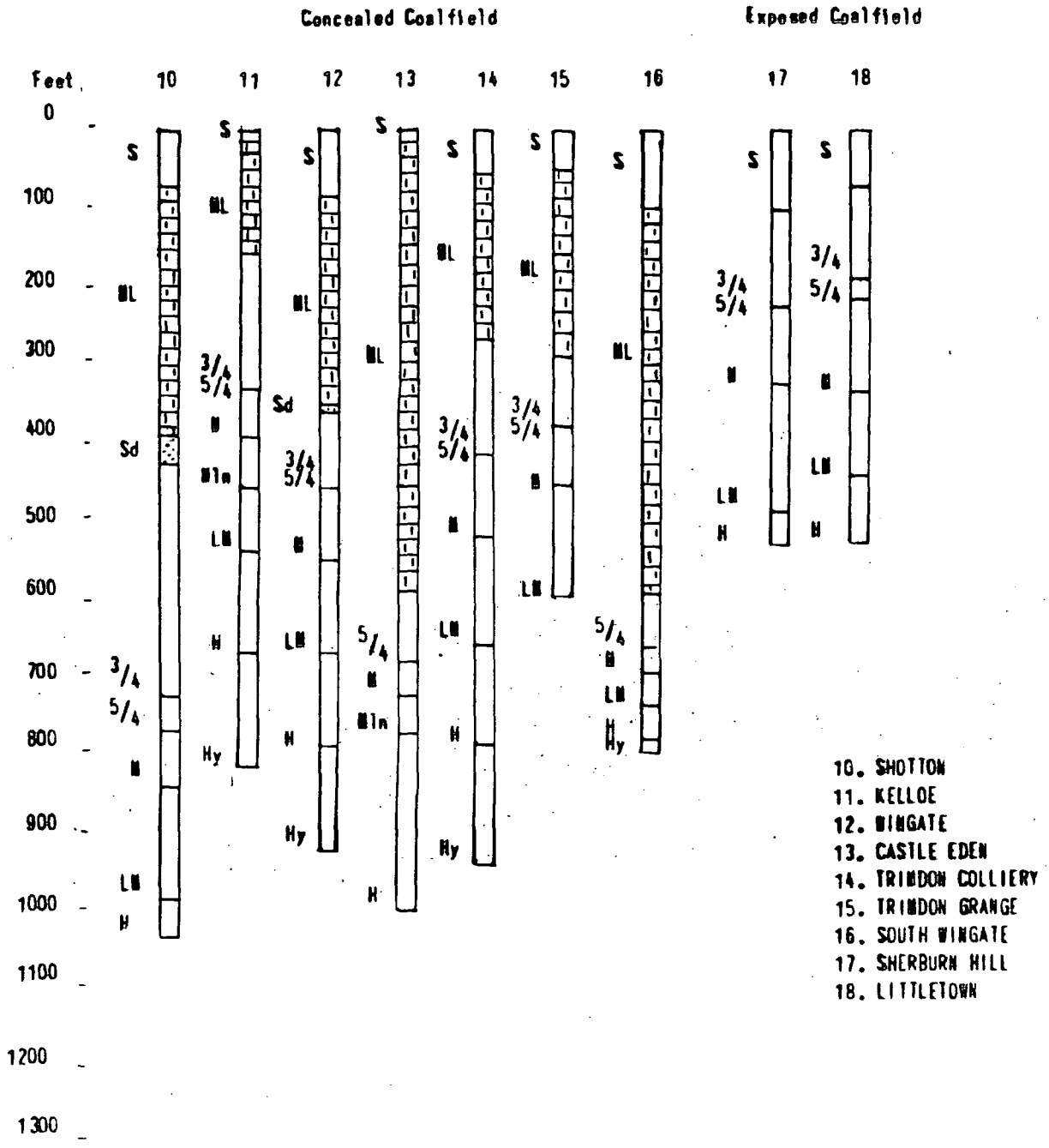
A detailed view of the machinery used to pour the coal from the waggons into the vessels.

Source. Beamish Museum Neg. No. 815

APPENDIX 3

THE RESOURCE: THE COAL SEAMS OF THE CONCEALED COALFIELD





S. Superficial
M.L. Magnesian Limestone
Sd. Basal Sands
3/4 3/4 Seam
5/4 5/4 Seam
M Main seam
Mln Maudlin Seam
LM Low Main seam
H Hutton seam
Hy Harvey seam

APPENDIX 4

HETTON COAL COMPANY: COAL PRODUCTION (SCORES).

Year	Colliery: Hetton	Elemere	Eppleton	Total
1827	51374	9698		61072
1828	47057	12762		59819
1829	49915	25692		75607
1830	51643	28769		80412
1831	39948	17666		67614
1832	nd	nd		nd
1833	nd	nd		nd
1834	41759	30699	2756	75214
1835	30827	21529	11602	63958
1836	34613	18718	17736	71067
1837	34162	25954	15626	75742
1838	42749	21164	10105	74018
1839	35817	22143	10009	67969
1840	17999	30802	11755	60556
1841	10279	36327	12414	59020
1842	n.k.	n.k.	n.k.	47674

SOUTH HETTON COLLIERY COMPANY: COAL PRODUCTION (SCORES)

Year	S. Hetton	Murton	Total
1836	30566		
1837	35026		
1838	33403		
1839	30900		
1840	31135		
1841	28884		
1842	26094		
1843	20408		
1844	17694	15286	32980
1845	13232	17112	30344
1846	9838	18125	27963
1847	10463	22681	33144
1848	6891	25635	32526
1849	3539	13638	17177
1850	11325	24822	36147
1851	nd	nd	nd
1852	nil	23543	23543
1853	24671	14746	39417
1854	25606	14563	40169
1855	24054	16850	40904
1856	20598	17604	38202
1857	27251	23248	50498
1858	27104	25956	53060
1859	27199	29525	56724
1860	25720	31417	57137
1861	25035	33134	58169

APPENDIX 4

HETTON COAL COMPANY: PRODUCTION BY COLLIERY AND BY SEAM.

Year	Colliery	Hetton	Colliery Elemore	Colliery Eppleton	Total
1827	Main	25010	4747		29757
	Hutton	26003	4951		30954
	Low Main	361			361
		51374	9698		61072
1828	Main	23195	337		23532
	Hutton	23757	12425		36182
	Low Main	105	-		105
		47057	12762		59819
1829	Main	23255	4414		27669
	Hutton	26616	21278		47894
	Low Main	44	-		44
		49915	25692		75607
1830	Main	25723	6308		32031
	Hutton	25920	22461		48381
		51643	28769		80412
1831	Main	20207	6875		27082
	Hutton	19741	20791		40532
		39948	27666		67614
1832	n.d.				
1833	n.d.				
1834	Main	16718	70	246	17034
	Hutton	25041	30629	2510	58180
		41759	30699	2756	75214
1835	Main	10094	-	-	10094
	Hutton	20733	21529	11602	53864
		30827	21529	11602	63958
1836	Main	12579	-	-	12579
	Hutton	22034	18718	17736	58488
		34613	18718	17736	71067

		Colliery Hetton		Colliery Elemore	Colliery Eppleton	Total
1837	Main	13099	+15	-	-	13114
	Hutton	18842		25954	15626	60422
	Low Main	2206		-	-	2206
		34162		25954	15626	75742
1838	Main	13766		-	-	13766
	Hutton	25598		21164	10105	56867
	Low Main	3385		-	-	3385
		42749		21164	10105	74018
1839	Main	11123		-	-	11123
	Hutton	20381		22143	10009	52533
	Low Main	4313		-	-	4313
		35817		22143	10009	67969
1840	Main	8427		-	-	8427
	Hutton	8504		30802	11755	51061
	Low Main	1068		-	-	1068
		17999		30802	11755	60556
1841	Main	971		-	-	971
	Hutton	6137		36327	12414	54878
	Low Main	3171		-	-	3171
		10279		36327	12414	59020

APPENDIX 4

SOUTH HETTON COLLIERY COMPANY.

PRODUCTION BY COLLIERY AND SEAM.

Year	Colliery S.Hetton	Colliery Murton	Total Scores
1836	Hutton 30506	-	30506
1837	Hutton 35026	-	35026
1838	Hutton 33403	-	33403
1839	Hutton 30900	-	30900
1840	Hutton 31135	-	31135
1841	Hutton 28884	-	28884
1842	Hutton 26094	-	26094
1843	Hutton 20408	-	20408
1844	Hutton 17694	Hutton 7432 Main 7854 15286	32980
1845	Hutton 13232	Hutton 12856 Main 4256 17112	30344
1846	Hutton 9838	Hutton 18125 Main - 18125	27963
1847	Hutton 10463	Hutton 22613 L.Main 68 22681	33144
1848	Hutton 6891	Hutton 25635	32526
1849	Hutton 3539	Hutton 13638	17177
1850	Hutton 11325	Hutton 24822	36147
1851	n.d.	n.d.	n.d.
1852	Hutton - nil	Hutton 23543	23543
1853	Hutton 24671	Hutton 14746	39417
1854	Hutton 25606	Hutton 14563	40169
1855	Hutton 23837 Main 217 24054	Hutton 16622 L.Main 228 16850	40904

Year	S.Hetton	Murton	Total Scores
1856	Hutton 20598	Hutton 17594 L.Main 10 17604	38202
1857	Hutton 27211	Hutton 23248	50498
1858	Hutton 27104	Hutton 25956	53060
1859	Hutton 27112 L.Main 21 Main 66 27199	Hutton 29525	56724
1860	Hutton 25065 Main 655 25720	Hutton 31417	57137
1861	Hutton 33048 L.Main 86 33134	Hutton 22437 Main 2598 25035	58169

Source: Shipperdson Papers
Vol.2 3417-3418,
3512-3638.

APPENDIX 4

HETTON COAL COMPANY. PROPORTION OF COAL SHIPPED FOR SEA SALE COAL TRADE, 1827-1841.

	%		%
1827	87.1	1835	90.3
1828	88.6	1836	88.6
1829	89.6	1837	89.9
1830	89.1	1838	87.9
1831	87.7	1839	85.3
1832	n.k.	1840	83.6
1833	n.k.	1841	80.7
1834	90.9	Mean	87.6

SOUTH HETTON COLLIERY COMPANY. PROPORTION OF COAL SHIPPED FOR SEA SALE COAL TRADE, 1836-61.

	South Hetton Colliery	Murton Colliery		South Hetton Colliery	Murton Colliery
1836	90.5		1851	n.k	n.k
1837	90.2		1852	no coal worked	99.98
1838	98.4		1853	n.k.	n.k.
1839	97.5		1854	99.93	99.98
1840	91.4		1855	99.84	99.96
1841	76.0		1856	99.8	100
1842	98.7		1857	99.9	99.99
1843	98.2		1858	99.9	86.6
1844	99.9	99.9	1859	99.9	n.k.
1845	98.4	99.9	1860	98.6	79.5
1846	98.7	99.9	1861	99.1	83.0
1847	99.8	99.9			
1848	99.5	99.95			
1849	99.8	99.95	Mean	97.3	96.6
1850	99.8	99.9			

APPENDIX 5

THE TITHE FILES

The Tithe Files contain documentary material relating to the commutation of the tithes for every tithe district. Included in the folders which are lodged at the P.R.O.'s Kew depository, are the reports of the Assistant Commissioner who conducted the local meetings, together with relevant correspondence and a questionnaire completed by the Assistant Tithe Commissioner. Not all the files contain a questionnaire but in the case of the east Durham townships there were sufficient completed questionnaires to permit the analysis of land-use, cropping systems and market factors which can be found in Chapter 2. Listed below are the questions, the answers to which, provide the data to assist the reconstruction of English agriculture c.1840.

Question 1. Date of notice of meeting with Assistant Commissioner; when and where affixed?

2. Date and place of first meeting?

3. When and in what newspapers was the meeting advertised?

4. Who was the Chairman of the meeting?

5. What was the total titheable assessment?

6. What was the interest of the parties who signed the notice? viz. Landowners or Titheowners?

7. State the number of landowners in the parish or township and how many signed the agreement?

8. State the acreages of the landowners who have signed the agreement and of those who have not.

9. State the total interest (i.e. acreages) of the Great Tithe owners and the Small Tithe owners.

10. State the quantity and value of the glebe.

11. Describe the parish or township, the quality of the lands, the system of farming and whether the quantity produced is affected by any extra-ordinary instances of high or low farming.

12. State the value of the tithes collected for each of the seven years preceding Christmas 1835 and give the average.

13. When the tithes have been compounded for give the annual amount and average as in question 12.

14. Deduct the average of the abatement made during the last seven years from the composition agreed for.

15. State whether the Titheowner has paid the rate set forth during the seven years.

16. Was the composition so paid an average as regards the neighbouring parishes or townships?

17. Give details of personal tithes; fish, minerals etc.

18. State average receipts for Easter offerings, mortuary fees etc.

19. State the accuracy of the schedule.

20. State your opinion as to the fairness of the agreement.

21. State whether the agreement should be confirmed.

22. Give a description and rough estimate of the amount of titheable produce and the value of the tithes after deducting the expenses of collection.

In this study the greatest use has been made of the answers to questions 11 and 22. The former provided useful detail of soil, climatic market and transport factors; the latter specified acreages of land-use, yields and prices, although recognition of the likely inaccuracies of the estimated acreages under different forms of land-use is recognised (See Chapter 2).