



Gen. 2. 24

ASIA MINOR

PAMPHILISCHE ZEE.

ZEE.

De Iliche Zee

SIRISCHE ZEE.

MIDDELANTSCH E ZEE in den Bybel de GROOTE ZEE genaamt.

EGYPTISCHE ZEE.

Jonas vliet voor den Heere

Tapho ofte Loppo van waer Jonas ter zee afroer

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16.

ASIA SECVNDA PARS TERRÆ INFORMA PEGASI.
SEPTENTRIO.

17.



From Bunting's "Itinerarium Sacrae Scripturae" first published in 1581,
the Asian Continent is shown as a winged horse, Pegasus.



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International Map Collectors' Society

Spring 1987 Volume 7 No. 1

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COPY DATE FOR NEXT ISSUE 9 MAY 1987

NOTICE OF COMMITTEE MEETINGS

Oak Room
The Farmers Club
3 Whitehall Court
London SW1A 2EL

5.30 pm

(Embankment Underground)

Committee Meetings are held monthly and overseas representatives visiting London are welcome to attend.

1987:

Tue. 12 May A.G.M.
Wed. 10 June
Tue. 14 July
August : no meeting

Wed. 9 September
Tue. 13 October
Wed. 11 November
Tue. 8 December

IMCoS List of Officers

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Helen Wallis: President
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Dr. Mireille Pastoureau, Paris; Dr. Gunter Schilder,
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SW1W 0EN.

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Themis Strongilos
Kjartan Gunnarsson

*Secretary &
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Road, Streatham, London
SW16 1NQ. Tel: 01-769 5041
(Answerphone service)

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Surrey KT22 0LG.

*International
Secretary:* Alan Bartlett, St. Raphael, 2B
Fontmell Park, Ashford, Middlesex
TW15 2NW.

Editor: Stephen Luck, 83 Marylebone High
Street, London W1M 4AL.

*Publicity
Officer:* Yasha Beresiner, 1A Campden
Walk, Islington Green, London
N1 8DY. Tel: (h) 01-349 2207
(w) 01-354 2599
Telex 896462 Inform G.

Appointed Officers

Librarian: Tony Burgess, Weston House,
Eltham Green, London SE9 5LB.

*Photographer &
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*Advertising
Manager:* Warwick Leadlay, Gallery, 5 Nelson
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*America,
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Guatemala.

*America,
South:* Dr. Lorenzo Güller Frers, Paseo
Colon 315, 1063 Buenos Aires,
Argentina.

Australia: David G.L. Worland, 33 Wolseley
Road, Point Piper, N.S.W. 2027.

Canada: Edward H. Dahl, National Map
Collection, Public Archives of
Canada, 395 Wellington Street,
Ottawa, K1A 0N3.

Cyprus: Andreas J. Hadjipaschalis, P.O.
Box 4506, Nicosia.

Finland: Jan Strang, Antiikki – Kirja,
Kalevankatu 25, SF-00100 Helsinki.

France: (Resident in London) Jacques
Reutemann, 108 Iverna Court,
London W8 6TX.

Germany: Prof. Dr. D. Novak, Adenauerallee
23, D-5300 Bonn I, Federal
Republic of Germany.

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2216, Koningsplein 1, Amsterdam.

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Timaru.

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69, Madrid 6.

Sweden: Gunnar Skoog, Lundvagen 142
Box 6, S-201 21 Malmö.

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Bridge Street, Chester.
(N.E.) Clifford Stephenson.
(Midlands) Paul Sabin

U.S.A.: (Central) Kenneth Nebenzahl, 333
North Michigan Ave., Chicago,
Illinois 60601.
(East) Ralph E. Ehrenberg,
Geography and Map Division, The
Library of Congress, Washington,
D.C. 20540.

Notes from the Chairman

The theme for the London Symposium on June 20th will be "The Sciences of the World of Maps" the Symposium takes place at the Science Museum entrance Exhibition Road, South Kensington, London SW7.

Caroline and Peter Batchelor have kindly offered to look after the dinner arrangements which is being held at the Refectory, Sherfield Building, Imperial College, SW7, adjacent to the Science Museum. We look forward to seeing many members and their guests. Dinner 7pm for 8pm.

Tooley Adams & Co. have kindly asked Symposium delegates and map fair exhibitors to a reception at their premises on Friday 19th June 5.30 - 8.30pm.

The Spring meeting at the Royal Geographical Society on Thursday 26th Feb. was a great success. The Dutch Exhibition "The Art of Map Making" was supplemented by maps from the R.G.S.'s own map library. I would like to thank our hosts the R.G.S. and map room staff for making this meeting possible.

I have pleasure in welcoming Mr and Mrs Rooney of Bangkok as our representatives for Thailand.

The Memorial Service for Ronald Vere Tooley took place at the Grosvenor Chapel, South Audley Street, London W1, on February 23rd. Many members attended to pay their respects to this great man of cartography. The address was given by Dr Helen Wallis O.B.E., the President of the Society with readings by Clive Farahar and Stephanie Hoppen.

Eva Wajntraub our representative for Israel has plans well in hand for the Israel Symposium Oct. 25-28th. Details are available from Eva Wajntraub, or our International Secretary, Alan Bartlett

Would contributors please keep to the copy dates for the Journal in order for our Journal to be published on time, and also to ease the load of our busy editor Stephen Luck. I would like to use this occasion to thank Stephen for the time he gives to the Society affairs not only as editor but also as our designer and print buyer. I am sure you will have noticed the improvement in content and graphic design of our Journal since our earlier editions.

Geoffrey Ramsden our treasurer has now handed over to Harry Pearce. On your behalf I would like to thank Geoffrey for his help over the past 2½ years and for keeping our affairs in good order.

Our treasurer and Secretary Harry Pearce is now equipped with an Answerphone. This will help to make contact with the Society easier.

Stuart Jackson of Manchester has joined our Symposium and Map Fair committee, he requires volunteers to help man our stand at the Map Fair. If you can help please contact the Secretary either before or on the day of the Map Fair.

Our Annual General Meeting will be held on Tuesday May 12th at the Farmers Club 3, Whitehall Court, London SW1 at 6pm. We look forward to seeing members. (Embankment Underground)

MALCOLM YOUNG

INTERNATIONAL MAP COLLECTORS' SOCIETY

Future Copy Dates: 1st August
7th November
5th February 1988
6th May 1988

COPY DATE FOR NEXT ISSUE 9TH MAY

Letters to the Editor

Dear Sir

Enclosed is a translation of an article which appeared in one of Turkey's leading national papers. It might illustrate why we have practically no serious map collectors in Turkey, and why I find it extremely difficult to develop a market for antique maps.

Should you not see me at the next IMCoS meeting in London 1987, you can have a good guess as to where I may be!

Yours faithfully

I. Muhtar Katircioglu
Karanfil Araligi No. 14
80620 Lenent Istanbul
Turkey

Translation of article in "CUMHURİYET" 10.9.1986., page 6, column 7.

The trial has started in Kusadasi (Scala Nova) of a tourist guide for possession of a map pertaining to the Ottoman period, on the grounds that the map was supporting "Regionalism", this being a means of spreading Communist propaganda.

The trial is being conducted in the State Security Tribunal, the prosecutor demanding a sentence of up to 15 years at a hard labour penitentiary.

The accused, a Mr Muzaffa Ersin Kanuk, a tourist guide, at the start of his trial yesterday, that during a search of his premises by the security forces, a map, printed in Germany prior to 1911, was discovered. The map showed Eastern Anatolia as "Ermenistan", North Eastern Anatolia as "Hayastan", and South Eastern Anatolia as "Kurdistan". The prosecutor claimed that the accused, through the possession of such a map was supporting "Regionalism", for which, as mentioned before he was demanding a prison sentence of up to 15 years hard labour.

Dear Sir,

Further to Alan Hulme's letter on page 26 of Vol 6 No. 4 edition of IMCoS Journal, I have inspected 16 different cartographer's Road Maps and can only find one other who used the unusual characteristic. This cartographer being GARDNER of 1719. Some of the others inspected did not in fact show the Road but I have included them in my list in case others know of other cartographers who ought to be inspected. I have not inspected the cartographers who from their titles obviously did not cover the route.

OGILBY 1675. Plate 57

MOLL 1718. Route not covered

GARDNER 1719. Plate 57

SENFEX 1719. Plate 57

OWEN & BOWEN 1720. Plate 146

DESNOS 1759. Plate 61

JEFFRY'S 1775. Plate 61 (Desnos Plates with titles)

GENT. MAG. 1765. Route not covered

HINTON 1765. Plate 23

KITCHIN 1767. Plate 63

LONDON MAG. 1768. Route not covered.

KITCHIN (small) 1771. Plate 58

BOWLES 1782. Plate 116 (Kitchin plates with additions and extra plate Nos)

PATERSON 1785. Vol. I 137

213 N.B. - (Ludlow had a power of trying and executing criminals distinct from the county)

FADEN 1786. Route not covered

SMITH 1826. Plate 52

KIRBYS Suffolk 1735

CARYs London 10 miles 1786.

The note in Paterson's referring to Ludlow while appearing to be the only clue may not be of any value at all seeing the unusual characteristic is approx. 3 miles from Ludlow.

It does however, show up that Gardner and Owen and Bowen copied Ogilby in much more detail than the others.

DAVID WEBB

IMCoS Photographer & Slide Librarian

IMCoS Tooley Award

Members are reminded that nominations for the IMCoS Tooley award should be sent to Dr Helen Wallis O.B.E. c/o Secretary, H. Pearce, 24 Mount Ephraim Rd, Streatham, London SW16 1NQ.

Past holders have been Valerie Scott of Map Collector Magazine, Kenneth Nebenzahl for his contribution to cartographic research and the Nebenzahl lectures in Chicago, Rodney Shirley for his many publications on maps in particular the magnificent book *The Mapping of the World* and Dr Helen Wallis O.B.E. for her outstanding contribution to cartography, worldwide.

Ronald Vere Tooley

1898-1986

A large congregation gathered for the Memorial Service for Ronald Vere Tooley at the Grosvenor Chapel, South Audley Street, on Monday February 23. Two short lessons were read by Clive Farahar and by Stephanie Hoppen, and in her address Helen Wallis spoke of "Mick" Tooley's long life his love of old maps, and the help and advice he unstintingly imparted to numerous collectors. As the Festschrift published in 1975 in honour of Tooley's 75th birthday appositely reminds us (in Fielding's words): "Map me no Maps, Sir, my Head is a Map, a Map of the whole world".

After the service many friends, dealers, collectors and members of the family gathered at Stephanie Hoppen's, who generously provided refreshments for everyone. Among the guests were Cass Broekema from Holland, Forbes Smiley from New York, Val Scott of the Map Collector Magazine Graham Powell of the Australian High Commission, Professor Fila Campbell, John Maggs, Senga Grant Olwin Caradoc Evans, Ralph Hyde of the Guildhall Library, Peter Barber of the British Library John Goss of Sotheby's and Malcolm Young and Rodney Shirley, Chairman and Past-President of IMCoS. Like all good parties, it was an occasion which Mick Tooley would have enjoyed greatly and there was the feeling that his spirit was not far from us.

R W S

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Contact:

Eva Wajntraub
4 Brenner Street
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Somerset: Mile Scale Error from Saxton to Ordnance Survey

By Keith Needell

When a plan or map shows a "scale" it could be assumed that the information shown is drawn to the stated scale for the purpose of interpolating distances or areas.

How accurate have cartographers been with our County maps?

Our **Statute mile** was fixed by Parliament in 1593 as 1760 yards (a yard or ulvia or ell, being established by King Henry I as the length of his arm). County maps from Saxton onward show a baffling mixture of Scale miles.

It seems that the length of a local mile differed from location to location. Some sources have tried to establish these e.g.

Baynton Williams (P60): Old British miles = 50 to a degree

Skelton (P197): Morden Somersetshire Great miles = 43 to a degree

Middle miles = 53 to a degree

Small miles = 61 to a degree

To avoid the problem of comparing differing lengths of "scale miles" only those Somerset maps that show, down the margins, a scale of degrees latitude have been compared.

A degree latitude is divided into 60 minutes or 60 nautical miles each of a mean 6080 feet. This results in appoxoimtely 69 1/3 Statute miles in a degree latitude.

It should be possible, therefore, where a map shows both a scale of miles and degrees latitude to establish the intended length of the scale mile for the map in question.

To compare the accuracy of some Somerset maps, which show degrees latitude, the distance "as the crow flies" around a triangle formed by the three towns Minehead, Bath and Crewkerne was used. The comparative distance was first calculated from the grid references of the three towns on the current metric version of the Ordnance Survey and established as 109 1/3 nautical miles.

The results are listed in Table 1 but show no conclusive pattern. There are some surprises. One might have expected a CARY map in 1787 to have been more accurate than a KITCHIN in 1749, or a BOWEN of 1750 more accurate than a MORDEN of 1701.

It is appreciated that the angles tended between the three towns should also have been established to make a true comparison as the dotted line in the sketch map, although of the same length puts the towns in different positions. This could mean that some of the maps listed as being reasonably accurate may not be so, whilst the more inaccurate maps will not become more accurate.

However, it has been assumed that the scale, or latitude scale is the accurate part of the map supposing the cartographer took more care of the map surface than of the supporting scale. What then would be the resulting accuracy?

For each map to be tested the distance between Minehead and Bath (the longest side of the triangle) is measured and converted to a length of 1000 units. The two remaining sides of the triangle are also measured and, using the same conversion factor as for the longest side, their pro rata lengths can be established. From the Ordnance Survey map the three sides are valued at:

Side 1:	Minehead – Bath	=	80.07 km converted to 1000 units
Side 2:	Bath – Crewkerne	=	62.60 km converted to 782 units
Side 3:	Crewkerne – Minehead	=	59.61 km converted to 745 units

Any other map measured should have the same converted values for Sides 2 and 3 if they are drawn to the same accuracy as the Ordnance Survey map (or nearly so taking into account some inaccuracy in measuring the distances – millimetres were used).

The results are listed in Table 2. To establish some order in the list, the percentage differences of each side from the O.S. has been calculated and added together (without regard to their negative or positive factors).

The results this time do show some pattern. As one might hope the 19th C maps are on the whole the more accurate except for the surprise of the apparently accurate VAN den KEERE of 1599 in amongst them and the more inaccurate (5-6%) GREENWOOD of 1822 not amongst them.

The 18th C and 17th C maps are more mixed, with the 17th C maps on the whole being the more accurate. Here again there are some surprises with the BOWEN of 1784 and LODGE of 1790 being at the bottom of the table.

In greater detail however the ELLIS (1766) which has a very great similarity to the KITCHIN (1764) may be presumed to have been copied from the KITCHIN. This suggestion is supported by the ELLIS being more inaccurate than the KITCHIN.

Again the SIMPSON (1746) is very similar to the ROQUE (1746) but has errors and omissions when compared with the ROQUE so that one might assume that the SIMPSON was copied from ROQUE. Yet, with their publishing dates being the same and the accuracy on the SIMPSON being greater than the ROQUE perhaps they were both prepared simultaneously but separately from the same source material.

Comparing the results of Table 2 with Table 1 at least one map, the COLLINSON (1792), shows a 3-4% error in Table 2 but a 19% error in Table 1. This difference is clearly explained in the use for Table 1 of the inaccurate scale shown on the map and not the inaccuracy of the map itself.

In conclusion it is pleasing to see the early SAXTON (1579) and SPEED (1611) maps with a 6-7% error appearing relatively high in the table of accuracy.

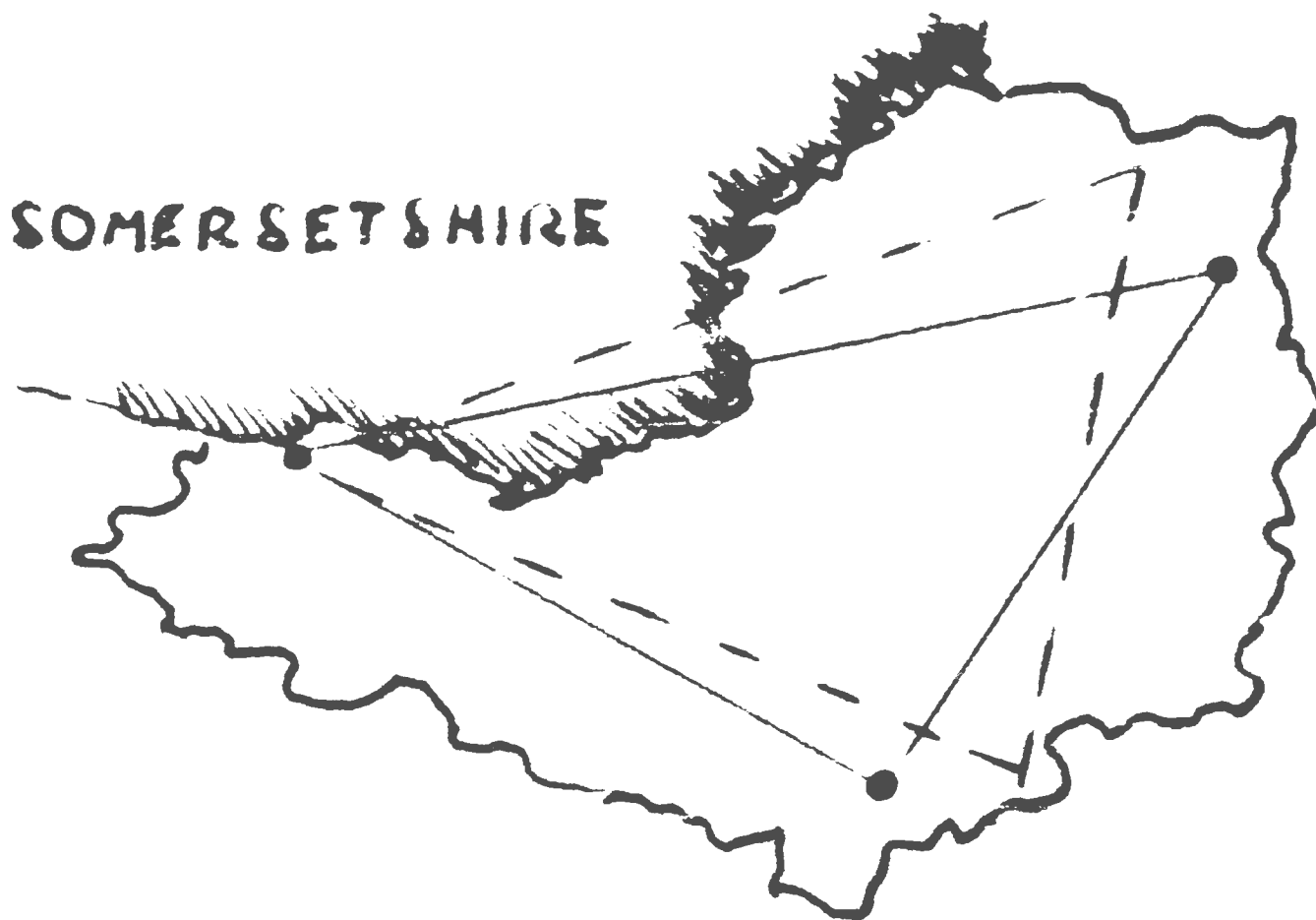


Table 1 — Minehead — Bath — Crewkerne

Date	Cartographer	Measured Distance in nautical miles	% Error	Map Scale	Scale Miles in a degree
1792	Collinson	88	19	A Scale of Miles	90
1787	Cary	103 $\frac{3}{4}$	} 5-6	Statute miles	69 1/3
1795	Baker	103 $\frac{3}{4}$		Scale of miles	69 1/3
1810	Wallis	104	4-5	Scale of miles	60
1805	Cary	105 $\frac{1}{2}$	} 3-4	Scale	69 $\frac{1}{2}$
1759	Gibson	106		English miles	75
1784	Bowen T.	106 $\frac{1}{4}$	} 2-3	British Statute miles	70
1834	Pinnock	106 $\frac{1}{2}$		English miles	69
1848	Archer	106 $\frac{1}{2}$		Scale	75
1766	Ellis	106 $\frac{3}{4}$		British Statute miles	69 $\frac{3}{4}$
1790	Lodge	107		British Statute miles	73 $\frac{1}{2}$
1822	Darton, Dix	107		Scale of miles	69 $\frac{1}{2}$
1749	Kitchin	107 1/3		English miles	69 1/3
1764	Kitchin	107 1/3		British Statute miles	69 $\frac{1}{2}$
1810	Cole, Roper	107 $\frac{1}{2}$		Scale	69 $\frac{1}{4}$
1789	Cary, Stockdale	108		1-2	Statute miles
1810	Miller	108	} 1-2	Statute miles	66
1827	Wilkes	108		British Statute miles	75
1837	Walker	108		English miles	69 $\frac{3}{4}$
1842	Pigot	109		Scale of miles	69 1/3
1831	Pigot	109	0-1	Scale	69
1831	Lewis	109	} 0-1	Scale of miles	70
	Ordnance Survey	109 1/3			
1780	Bowen, Kitchin	109 $\frac{1}{2}$	0-1	British Statute miles	69
1748	Osborne	113 $\frac{1}{4}$	3-4	Miles	60
1701	Morden	115 $\frac{1}{2}$	} 5-6	Scale of 10 miles	47:56:60
1763	Bowen, Martin	115 $\frac{3}{4}$		British Statute miles	65
1744	Cowley	117	7-8	English miles	60
1695	Morden	119	} 8-9	A scale of miles	47 $\frac{1}{2}$:52:60
1724	Moll	119		English miles	60
1758	Bowen E	123 $\frac{1}{2}$	} 12-13	British Statute miles	65
1750	Bowen E	123 $\frac{1}{2}$		British Statute miles	69
1767	Bowen E & T	126	} 15	British Statute miles	69
1749	Kitchin, Jeffrys	126		English miles	60

TABLE 2

Date	Cartographer	CONVERTED		COMBINED % Error
		Side 2	Side 3	
	Ordnance Survey	782	745	} 0-1
1810	Cole, Roper	782	750	
1836	Moule	782	751	
1835	Pigot (A Pocket Topography)	780	750	
1833	Pinnock	787	742	} 1-2
1837	Walker	788	741	
1808	Capper	793	746	
1842	Archer	797	745	

TABLE 2 (cont.)

Date	Cartographer	CONVERTED		COMBINED % Error
		Side 2	Side 3	
1832	Dawson	796	748	2-3
1827	Wilkes	794	739	
1805	Cary (New English Atlas)	800	744	
1829	Pigot (British Atlas)	796	751	
1599	Van den Keere	795	738	
1810	Wallis	794	753	
1831	Lewis	794	755	
1749	Kitchin (The London Magazine)	795	774	
1822	Darton, Dix	796	754	
1803	Luffman	783	767	
1701	Morden (The New Description.....)	781	722	
1834	Tymms	770	732	
1792	Collinson	801	754	
1789	Cary, Stockdale	801	734	4-5
1787	Cary (New and Correct English Atlas)	805	756	
1810	Miller	745	745	
1681	Blome (Speed's Maps Epitomized)	799	722	5-6
1741	Badeslade	796	719	
1758	Bowen E (The Universal Magazine)	742	743	
1673	Blome (Britannia)	790	712	
1744	Cowley	746	737	
1822	Greenwood	808	763	
1607	Camden, Kip	769	702	
1748	Osborne	793	778	
1636	Jansoon	803	721	
1611	Speed	803	720	
1668	Overton	810	726	
1645	Blaeu	804	720	
1790	Cary (Cary's traveller's companion)	808	767	
1720	Owen, Bowen	783	699	
1643	Langeren, Jenner	821	755	
1579	Saxton	802	716	
1762	Bowen, Kitchin (The Royal English Atlas)	732	747	
1795	Baker	819	761	
1695	Morden (Camden's Britannia)	809	718	7-8
1759	Gibson	759	777	
1749	Kitchin, Jeffreys	833	756	8-9
1694	Seller	828	724	
1763	Bowen, Martin	724	752	
1767	Bowen, F & T (Atlas Anglicannus)	713	745	
1746	Simpson	843	739	
1764	Kitchin (England Illustrated)	808	787	9-10
1750	Bowen E. (The Large English Atlas)	718	737	
1790	Aiken	825	775	
1746	Roque	841	725	10-11
1766	Ellis	814	792	
1724	Moll	861	748	
1784	Bowen T (The New British Traveller)	827	791	11-12
1790	Lodge	819	806	

IMCoS Library as at February 18th 1987

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LATEST ADDITIONS

Havaldur Sigurdsson's 'Icelandic Cartography' 1986. 2 Volumes. Donated by Kjartan Gunnarsson for which he has our grateful thanks.

I can only describe these as Tomes, huge, and beautifully illustrated with both black and white and coloured photographic reproductions of the maps referred to in the text.

Our only problems are, who will carry out the reviews to enable members to anticipate the undoubted pleasure of reading these books, and who will translate the text to complete our enjoyment of them.

Both books contain 'English Summaries' each of some nine pages. To be mildly critical of these summaries, it would have been helpful, if they could have been referenced back to the actual maps or page numbers. To follow the comments, comparisons and probabilities mentioned such referencing would have eased our understanding considerably, however if these summaries accurately reflect the original, they can only serve to whet the appetite, and cause us to lament the limitation placed upon those of us who cannot read the original text.

continued on page 13

Reiss & Auermann

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Caixa de Barcelona. 'Col-Leccio Cartografica' 1986.

Catalan Cartographic Institute. 'Cartografia de Cataluna' 1986.

Both the above are Exhibition Catalogues from the Barcelona Symposium.

Chasseaud P. Mapbooks. 'Trench Maps, 1915-1918'. 1986.

Hellwig F. 'Mittelrhein und Moselland im Bild alter Karten' 1985.

Rohr H.P. Meier Verlag. 'Schaffhauser im Bild alter Karten' 1986.

Tomkins E. 'Newfoundland's Interior Explored' Exhibition Catalogue 1986.

For the less serious map 'freaks' amongst us.

Seigfried Feller's 'Cartomania' Newsletter of The Association of Map Memorabilia Collectors. Issues I & II.

There are other additions to this list that are at present in the hands of Committee/Council members, these will be listed when handed in.

Note to Dealers

The Society is always pleased to have your latest Catalogues, space permitting these will be held until your following issue is received.

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Dr. Helen Wallis, former British Library Map Librarian pictured outside Buckingham Palace after receiving the OBE, December 1986

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Writings about Maps

by Cosimo

Obviously references to maps in private correspondence have been innumerable, but a letter contributing background for a notable early map, or rather a plan in this instance, is an unusual survival.

The writer was William Soone, who was Regius Professor of Law at Cambridge University, but was forced to resign when his papist views were discovered. He went abroad, became Professor of Civil Law at Lorraine, and apparently died in Cologne sometime after 1575.

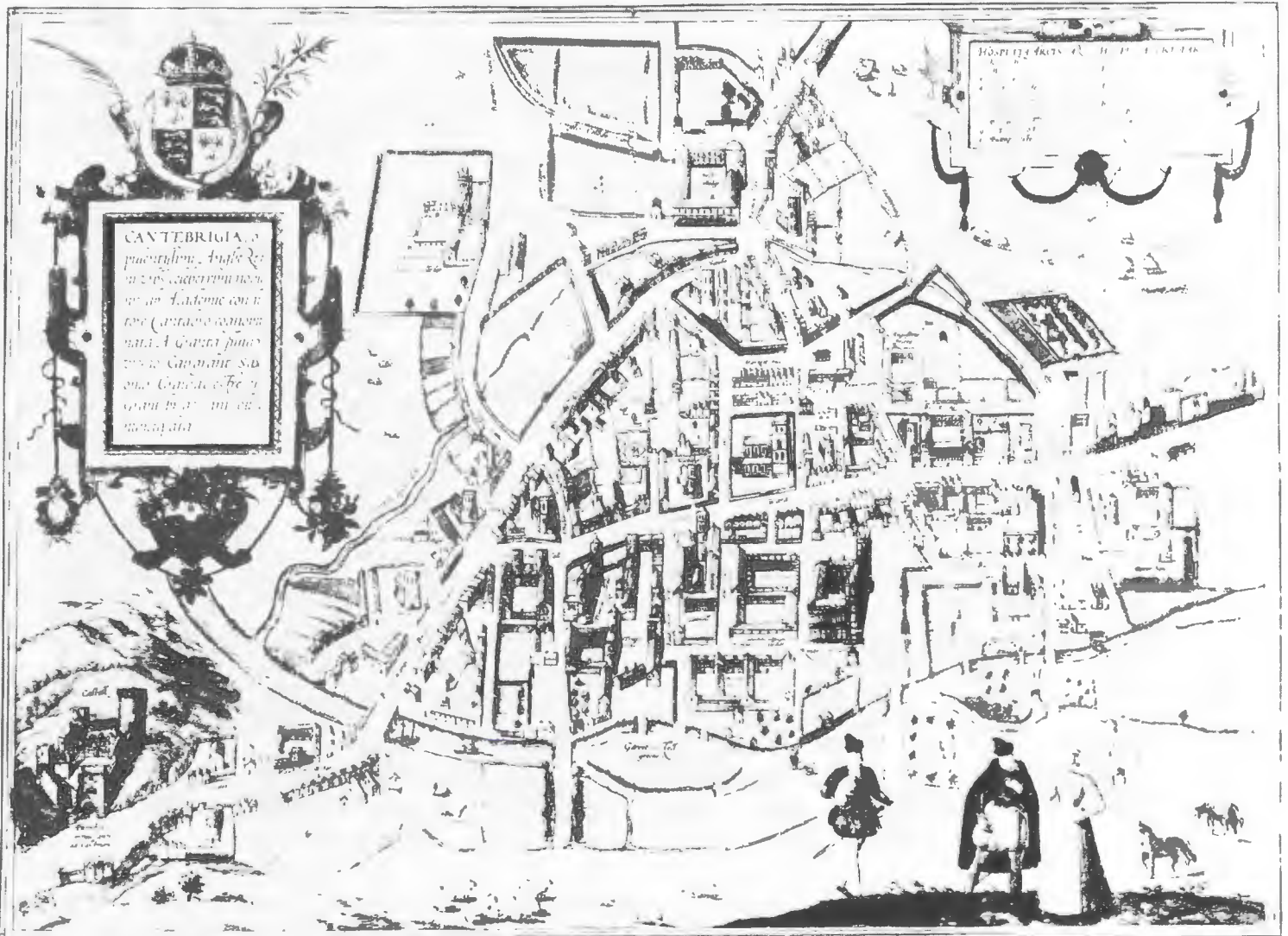
His letter was to Georg Braun and the plan in question was that of Cambridge in the *Civitates Orbis Terrarum*. Soone quaintly addresses it to Geo. Bruin, rather apposite, since he begins by acknowledging a gift of a map of Muscovy from Braun:

“William Soone, to Geo. Bruin, Greeting. I cannot, most polite Bruin, conceal how acceptable your present from your valuable collections was to me: it is a very accurate, elegant, and new description of Muscovy and ancient Scythia; and I shall make use of it, not merely as you advise to amuse, but to inform myself; and not only give it a place in my library as a memorial to your kindness but imprint it deep in my mind. In answer to your request, that I would give you what account I can of Cambridge, though my engagements at home in what I have already undertaken, or intend, keep me fully employed, and I have not the necessary books at hand, I cannot refuse your very laudable curiosity.”

He continues with some bitter, allegorical references to the religious persecution from which he had suffered:

“I do this the more readily, as a small return to the place of my education, to conduct her now fearing in her old age to pass from the island to the continent, across the sea infested with protestant pirates, and blushing to appear in public in a dishabille; and, after I have rescued her from the hands of persons polluted by a new superstition, to obtain for her that place which she deserves among famous cities, by commending her to the care of a person so attacht to our most holy religion as yourself.”

continued on page 17



Cambridge. Braun & Hogenberg [1575].



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continued from page 15

He then adds some dubious historical “facts” about the founding of Cambridge University:

“The University of Cambridge bears the name of its founder, Cantaber, a Spanish duke who, when Gurguntius, son of K. Belinus, was K. of Britain, first invited philosophers from Athens by the offer of handsome appointments, and established a school here, A.D. 1095. Thus was this seat of the polite arts founded 394 years before Christ, according to Bede and Alfred,....”

He completes this history and then discourses on students, their dress and behaviour, which only goes to show that there have been “student problems” around for quite a few hundred years:

“(They are) perpetually quarrelling and fighting with the townsmen. Hence the proverb, that a Royston horse, (Royston – a nearby country town) and a Cambridge Master of Arts, are a couple of creatures that will give way to nobody.”

He writes more of events, officers and the government of the University, then finishes on a nostalgic note:

“To conclude, the way of life in these colleges is the most pleasant and liberal: and if I might have my chance, and my principles would permit, I should prefer it to a kingdom. Farewell.

Cologne, the day before Whitsunday, 1575.”

Thus ends a minor 16c travelogue, tinged with more than a little nostalgia. I wonder if all those who have owned or studied the Braun & Hogenburg of Cambridge have been aware of this source of contemporary background?

Measuring the Earth – 250th Anniversary

Report by Malcolm Young

A Symposium jointly organised by the Royal Geographical Society and Royal Institution of Chartered Surveyors under the auspices of the International Federation of Surveyors (FIG) took place on November 20th at the Royal Geographical Society.

In 1735 and 1736 the French Academy of Sciences sent two major expeditions to Peru (now Ecuador) and Lapland respectively, (now Sweden and Finland) to prove whether the earth was flattened at the poles or the equator. These expeditions were said to have finally flattened the earth. Papers at the Symposium were given of the controversy between Sir Isaac Newton and J.D. Cassini of France and in the Maupertius expedition to the Arctic circle – The ‘Spanish participation in the measurement of the meridian (1735-1744)’ a talk was given by Captain Ricardo Cerezo Martinez of the Naval Museum Madrid.

Dr Anita McConnell of the Science Museum gave a talk with slides on the ‘Geodetic Surveyor at Work’. She explained how a surveyor’s instruments had to be portable, yet accurate and be constructed so that they could be transported under the most unfavourable conditions. In Peru and in Lapland the strange hostile environment and extremes of climate imposed additional hardships.

An interesting exhibition including surveying instruments was organised by Dr McConnell at the Science Museum, this exhibition is open until the end of December and then goes to Madrid. Members in London are recommended to visit the Exhibition. The IMCoS Membership Secretary and the Chairman attended the Symposium, and finally the 250th anniversary of measuring the earth was celebrated by a reception at the Science Museum.

List of Papers given at the Symposium

Paper 1 – “The Newton/Cassini Controversy” Mr Jim Bennett

Paper 2 – “The Arc Measurement in Peru 1735-45” Mr Jim Smith

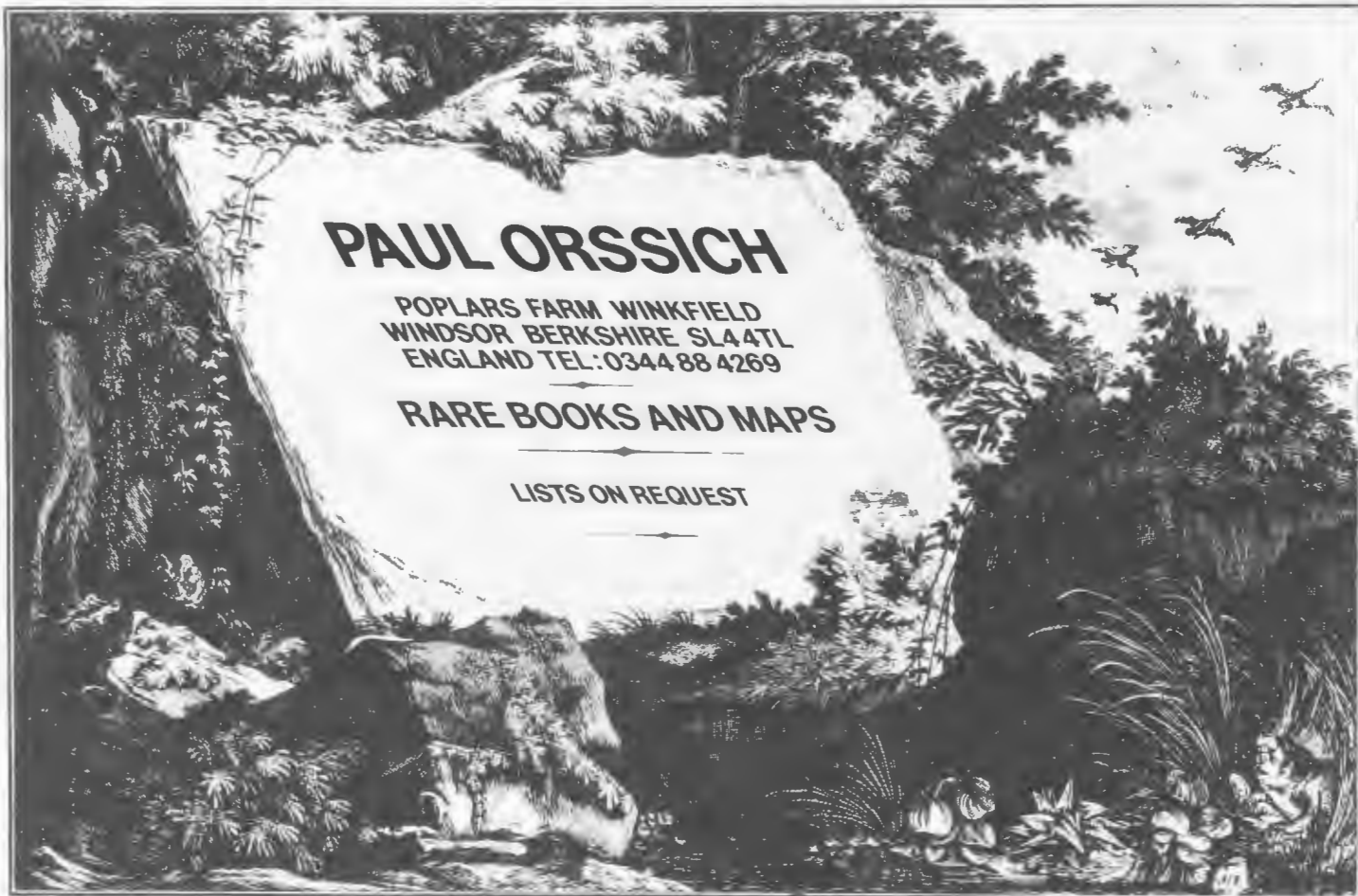
Paper 3 – “Maupertius’ Expedition to the Arctic Circle: The Swedish Context” Mr Sven Widmalm.

Paper 4 – “The Meter” M. Giacomo

Paper 5 – “The Spanish Participation in the Measurement of the Meridian (1735-1744)” Captain Ricardo Cerezo Martinez.

Paper 6 – “The Geodetic Surveyor at Work” Dr Anita McConnell.

Paper 7 – “The Figure of the Earth” Dr Arthur Allan and Miss Christine Hudson.



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Notice of Annual General Meeting on Tuesday 12th May 1987 at 6 pm

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AGENDA

1. President's Welcome
2. Apologies for Absence
3. Minutes of AGM on 13th May 1986
4. Chairman's Report
5. Executive Officers' Reports:
Secretary, Membership Secretary
International Secretary, Treasurer,
Journal Editor, Publicity Officer
6. Approval of Audited Accounts for 1985
7. Election of Directors, Treasurer, Editor, Publicity Officer
8. Any Other Business.

Catalogues Received

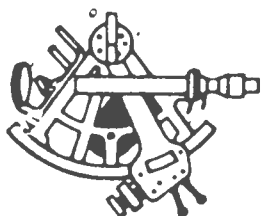
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Membership Subscriptions

A very big thank you to all members who paid for the renewal of subscriptions at the beginning of the year. Prompt payment is essential if it is to help the Society to provide a better Journal and an efficient Information line. New membership forms are always available for members to hand out to colleagues, friends or local libraries. The Society needs and always welcomes new members.

If any member is in doubt about membership status or requires new membership forms contact Caroline Batchelor: Pikes, The Ridgeway, Oxshott, Leatherhead, Surrey KT22 0LG.



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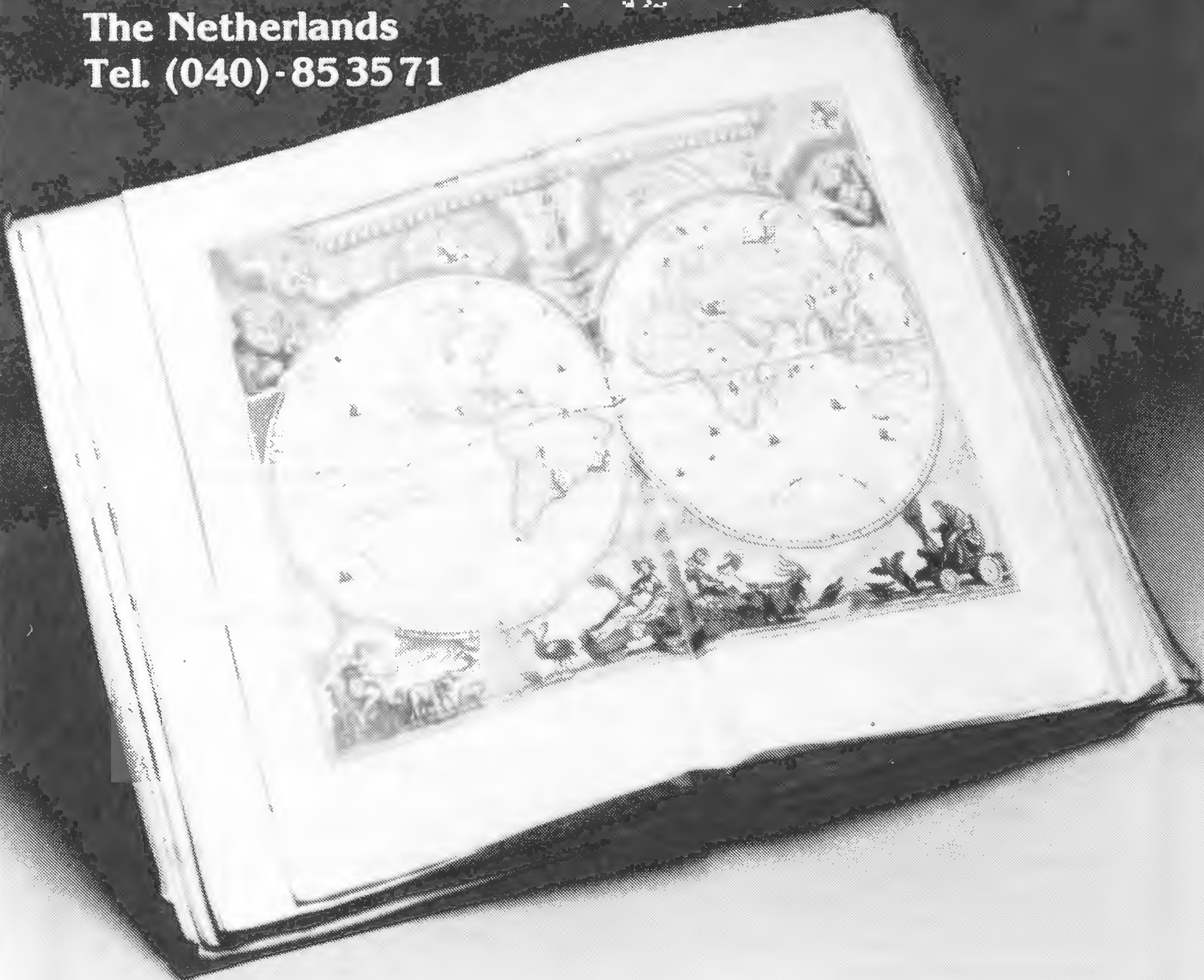
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IMCoS visit to 'The Art of Map-making' Exhibition at the R.G.S.

Some 20 members managed to attend this midweek afternoon gathering at the Royal Geographical Society. Our thanks to Peter Clarke and Francis Herbert for their usual hospitality.

The meeting was an informal visit to this Dutch Exhibition, which was produced by the Netherlands Information Service. The Exhibition aimed to illustrate the many different forms that combine to make up Dutch map-making, and included examples of Frontispieces, Cartouches, Estate and City Plans, Prints and Views, Navigational Charts, Military, Civil and Colonial Maps, Polder Maps, Soil Profile Maps and no doubt others I have missed noting. They illustrate the coming together of the Scholar, the Painter and the Surveyor, and how in the middle period we saw the demise of the Painter in favour of the Surveyor, and inevitably, later still, his replacement by the Engineer. The overall theme of the Exhibition serves to mark the achievements the Dutch Nation, in Exploration, Colonisation and its Commercial pre-eminence in World Trade. Whilst it would be petty to criticise this attempt to cover a period of over 250 yrs in such a restricted exhibition, I am sure we would have gained even more had there been greater depth to the printed material supplied. Nevertheless an enjoyable and interesting afternoon for all concerned.

Tony Burgess

N.B.

Peter Clarke reminded us that we do not have to be members to visit the Map Room, only if we wish to use the Library.



*Mr. Laurance Worms, London, Mrs. Valery Glavert, Norwich, Mr. Tony Hadjipanayi, Cyprus,
Mrs. R.. Olszewska, London, at IMCoS R.G.S. on 26-2-87*



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Mapping Great Britain's Industrial Revolution: Two Classic Maps of the 1830s

by Rodney W. Shirley

There has been relatively little study, so far, of individual maps from the early nineteenth century which record the great social and economic changes brought about by the industrial revolution. From the 1760s onwards there was a sweeping expansion in Britain's industrialisation led by far-reaching innovations in the production or manufacture of earthenware, iron, coal and other minerals, and textiles. To transport this greatly increased tonnage of output a nationwide network of canals was laboriously dug to link navigable rivers across the realm. The first general map showing the new canals was, I think, a small plate in the *Gentleman's Magazine* for 1773; later maps of greater significance such as Charles Smith's detailed map of 1806 on the scale of ten miles to the inch show a much more extensive network of canals and navigable rivers.

A complete 'soil or minerals' map of England had been called for at a meeting of the Royal Society as long ago as 1683. Over the next century theories of the formation of geological strata slowly emerged and the necessary regional observations collated. These researches were painstakingly brought to fruition in William Smith's large geological map of 1815 which permitted the more scientific location and winning of new mineral deposits. Soon to follow was the next revolution in communications – the steam passenger railway – which was inaugurated with the opening of the Shildon to Stockton Quay service in September 1825. It is however sometimes overlooked that railways (or railroads) had been operating for several decades prior to 1825; for instance the regular horse-drawn passenger service between Swansea and Mumbles (the Oystermouth Line) from 1807 and the many steam locomotive engines in use on colliery or industrial lines.

The splendid folding map of Great Britain by John Walker of Wakefield, dated 1830, not only brings together all these three elements of the new industrial scenario – canals, minerals production and emerging railways – but is also a masterpiece of engraving in its own right. The map is on the relatively large scale of just over six miles to the inch, with Scotland from Stirlingshire northwards inserted on the smaller scale of twelve and a half miles to the inch. The overall size is approximately six feet by five feet. The main towns, roads and estates of the country gentry are distinctively marked, and the hills are meticulously hachured. Some of the finest examples have the counties carefully wash-coloured by hand.

John Walker appears to be unrelated to several other cartographers or engravers of the same name, such as J A Walker and J W Walker (both of the late eighteenth century), or James Walker, president of the Institution of Civil Engineers, or the contemporary brothers John and Charles Walker who published the British Atlas in 1835. The John Walker in question was a land and minerals surveyor who lived in St. John's, one of the better-off parts of Wakefield. He started work in the 1820s and is known for a fine plan of Wakefield in 1823 as well as for plans of local estates and drafts of collieries, railways and canals. In 1837 he was in partnership with a Mr Lee and was described as a mining engineer. Neither the exact date of his birth or death seem to be recorded: Peter Eden's *Dictionary of Land Surveyors* (listing twelve J or John Walkers) notes that he was still in business in 1853. Henry Clarkson, writing in 1887, refers to 'the late Mr John Walker', implying that his death had occurred not long beforehand.

The title of Walker's map, in brilliantly elaborate steel-engraved cursive script is as follows: 'A Map of the Inland Navigation, Canals and Rail Roads with the situations of the various Mineral Productions Throughout Great Britain... by J Walker, Land and Mineral Surveyor Wakefield accompanied by a Book of Reference, compiled by Joseph Priestley Esq of the Aire and Calder Navigation'. Franks and Johnson of Wakefield are recorded as the engravers. At the bottom of the map is another highly florid dedication to William IV by the three principals: Nichols, Priestley and Walker; the publisher, book author and map compiler respectively.

The first of these, Richard Nichols, was a well-known figure in Wakefield and was postmaster, newspaper publisher and the leading bookseller in the town. His London publishers were Longmans whose collaboration (together with the firm of G and J Cary) is recorded as part of the dedication on the map. Nichols seems to have been a man of quick temper. He became involved in various lawsuits and later went bankrupt. Clarkson records the following diverting story:

‘Mr Nichols was a man of extremely obstinate temper, and I recollect an amusing thing happening to him, arising from this. Having occasion to go to London, he sent to the coach office at the corner of the Strafford Arms, to secure an inside place by the coach which left Leeds late in the evening, and passed through Wakefield about nine or ten o’clock at night. This could only be secured conditionally upon there being a seat at liberty; and on the arrival of the coach at Wakefield it was found that every inside place had been taken at Leeds. The passengers got out to stretch their legs for the few minutes the coach stayed. Nichols jumped in, and persisted in keeping his seat in spite of the entreaties and threats of both passengers and coachman, and curling himself up in a corner, went off into a sound sleep. The proprietor very quietly ordered the horses to be taken out, and put into a spare coach, into which the passengers got, and went on their way rejoicing, leaving Nichols to take the journey only in his dreams.’

Joseph Priestley - no relation as far as I am aware to the celebrated scientist of the same name - was the ‘agent’ or manager of the Aire and Calder Navigation Company. At that time the Aire and Calder was a powerful corporate body controlling the water communications from Wakefield and Leeds through to Hull and the eastern coast of England. It is Priestley’s work *Historical Account of the Navigable Rivers and Canals of Great Britain* that was prepared to accompany Walker’s map. The book is dedicated to Thomas Telford, then president of the Institution of Civil Engineers and publication took place in 1831, the year following the date on Walker’s map. In the preface it states that Walker’s map was the ‘uninterrupted labour of seven years to which this volume forms a reference’, and that publication of the map had been delayed (at great cost) in order that particulars could be furnished of every canal or railway Act up to the dissolution of the late parliament. Walker, so it is said, received the especial patronage of the late King George IV; the work is now gratefully dedicated to King William IV.

The body of Priestley’s work is a comprehensive reference guide describing the routes and tariffs of nearly 230 canals and navigable rivers, and sixty railways, which had been incorporated according to Acts of Parliament up to May 1830. In the case of railways between five and seven years was typically allowed for construction so by no means all of those listed may have been built. The great majority were however proceeded with, even though their operating life prior to bankruptcy or amalgamation may have been short. Each canal or railway is cross-referenced by a number relating to a small frontispiece index map in Priestley’s book and to a given sheet, numbered I-IV, on Walker’s accompanying map. The large scale of the latter allows easy identification of each railway or canal.

In addition, not dealt with in Priestley’s book, the map marks mineral deposits of all kinds. These are usually named –clay, gravel, chalk, coal, copper, ironstone etc– but for more frequent deposits the common chemical signs are used as follows:

copper	♀	tin	♁
salt	⊖	managanese	⚗
coal	•	ironstone	♂
lead	♁	slate	≠
limestone	□	cobalt	♁
gypsum	♀	zinc	

The prevalence of coal workings is, as expected, concentrated in the main industrial areas of South Yorkshire, Derbyshire, Durham and Northumberland, the Scottish Lowlands, Flint, South Wales, Shropshire and the Mendips. Tin, lead and copper mines in Cornwall are prominently marked. More surprising is the recording of less common minerals in remoter areas: strontium in Mull, silver around Ben Nevis, asbestos in Lanark, cobalt in Cheshire and septaria near Colchester. In the more populated areas the actual mills or factories are marked; for instance within thirty miles of London we find the following manufactures:

Print works
Silk works
Gunpowder mills
Iron mills
Brick kilns

Snuff mills
Glass manufactures
Oil mills
Paper mills
Lime works

In addition widespread deposits of chalk, gravel, clay, stone, fullers earth, fire clay, flint and sand are located around the capital.

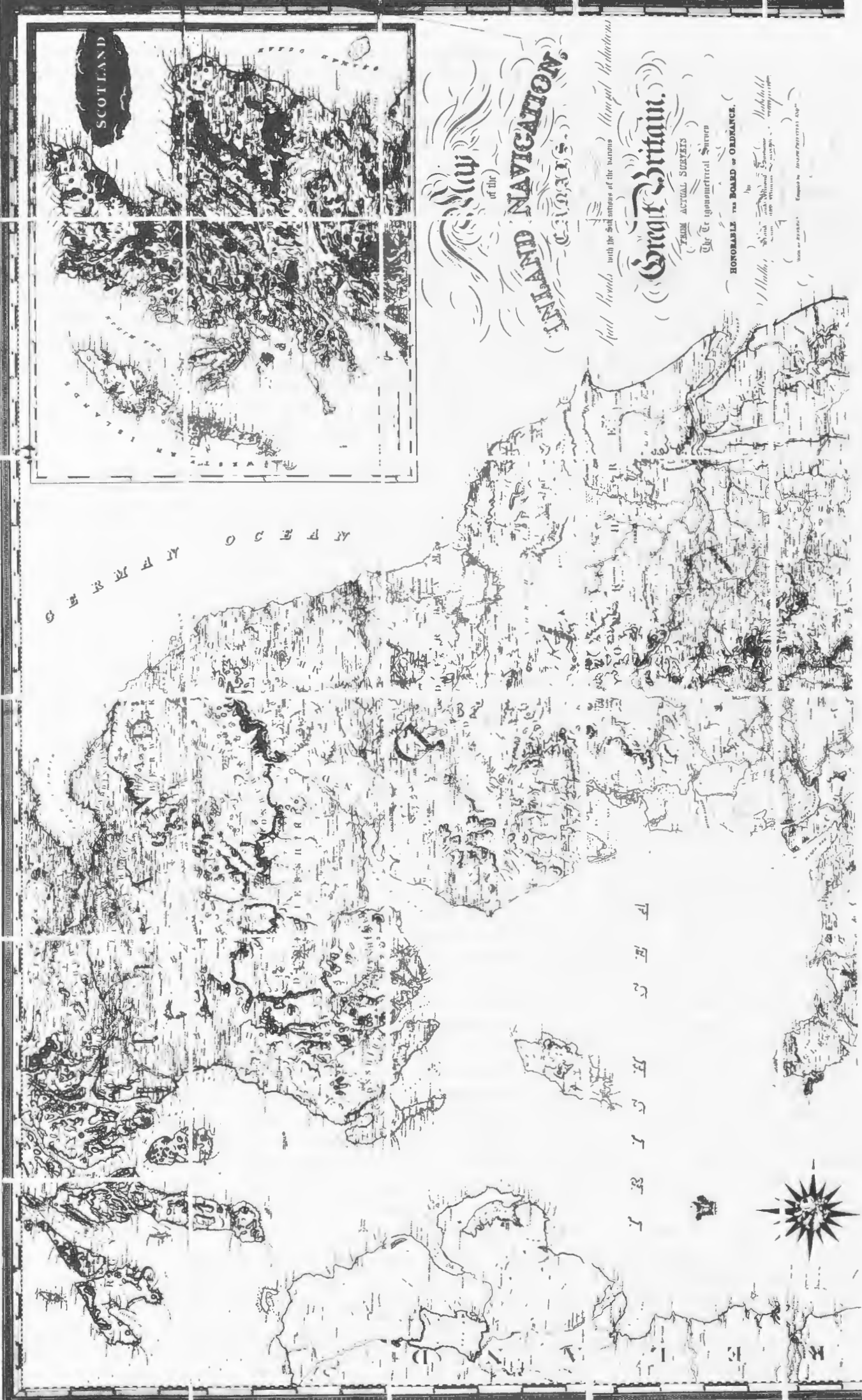
By 1830, it is estimated, nearly 4000 miles of canals had been constructed. This total was only to be increased by 100 miles or so over the next twenty years so Walker's map shows the national system at its peak. Very few localities in industrial England were more than fifteen miles from the nearest canal or navigable river. Inland water communications offered a safe and reliable means, albeit by slow stages, for the transportation of raw materials, manufactured goods and passengers. However, by the 1830s their use was in decline, already starting to be overtaken by the new steam railways, many of whose lines were initially built as feeder channels to the canal system. Indeed, the threat of the coming invasion of the railways had been seen for many decades, and it is reported that not long before his death in 1803 the great British canal builder, the Duke of Bridgewater had remarked sourly 'I see mischief in these damned tramroads'.

It is in the portrayal of the known railways that Walker's map has particular historical interest. It is one of the earliest general maps with this feature as specific thematic content. The five years following the first steam passenger train on the Stockton and Darlington Railway in 1825 were years of feverish planning, promotion and railway construction. The famous Rainham trials confirmed the pre-eminence of Stephenson as the foremost railway engineer and led to the successful opening of the Liverpool and Manchester line in September 1830. Walker's map marks these and other newly-established services as well as ancillary freight lines serving collieries and quarries in industrial areas.

The railway revolution had however scarcely touched the whole of south and south-east England where only two lines are marked: the Surrey Iron Railway line from Wandsworth to Reigate (opened in 1803) and the recently opened Canterbury and Whitstable railway. To the west, there are several lines servicing the now almost deserted industrial townships then clustered around Bath and Bristol, and in the Forest of Dean. The important iron trades manufacturing centre of Ironbridge in Shropshire is well served by railways but the industrial concentration in the Black Country of Wolverhampton and Dudley is still reliant on a dense network of canals. As expected, a number of lines feed the South Wales valleys, with their coal mines and limestone and iron ore deposits. In the Derbyshire, Nottinghamshire and South Yorkshire coalfields there are as yet relatively few lines, other than links to the Aire and Calder Navigation just north of Wakefield. A notable exception is Brandlings Railroad marked on Walker's map running from Middleton Colliery to Leeds. According to Priestley, this belonged to the Reverend R H Brandling and was incorporated as long ago as 1758. In the early 1800s, a few years after Richard Trevithick's experiments applying steam traction to loaded wagons in the Cornish mines, '... his scheme was improved upon by Mr John Blenkinsop, manager of the collieries at Middleton... who obtained a patent for the construction of a railway and steam carriages thereon which he immediately put into practice from Middleton to the coal staith at Leeds, a distance of about 4 miles on which road the coals for supplying the town are daily conveyed by steam.' This took place in 1811-12 and Priestley, writing in 1830, goes on to acknowledge that passenger carriage by steam locomotives will now become common, as exemplified by the celebrated engineers of the Liverpool and Manchester Railway. It is now probable, he adds, that His Majesty's mails will soon be conveyed in this way.

As there are doubtless keen railway enthusiasts among the readers of the IMCoS Journal I have summarised all the early railways cited by Walker and Priestley in Table 1, together with their dates of incorporation by Act and their lengths where this is given. How all these lines developed and came together by take-over, amalgamation, bankruptcy and final nationalisation is another story.

Part of this story unfolds in the examination of the second classic map from the 1830s – George Bradshaw's large general map of the railways of Great Britain, published on 14 January 1839. The full title is: 'Map and Sections of the Railways of Great Britain. Dedicated by Permission to James Walker FRS L & E President of the Institution of Civil Engineers by George Bradshaw'. The map is usually found mounted on linen and folded between embossed maroon leather covers accompanied by tables of the lengths, levels, and gradients of the principal lines. At the time Bradshaw's maps were highly praised: '... unmatched in England for boldness of conception, accuracy of delineation and richness of colouring. Taken from the Ordnance Survey they provide the fullest and most accurate geographical information extant: a ready school for instruction, or authority for reference, to all interested in the progress and construction of railways'.



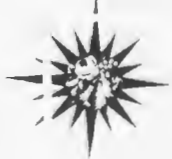
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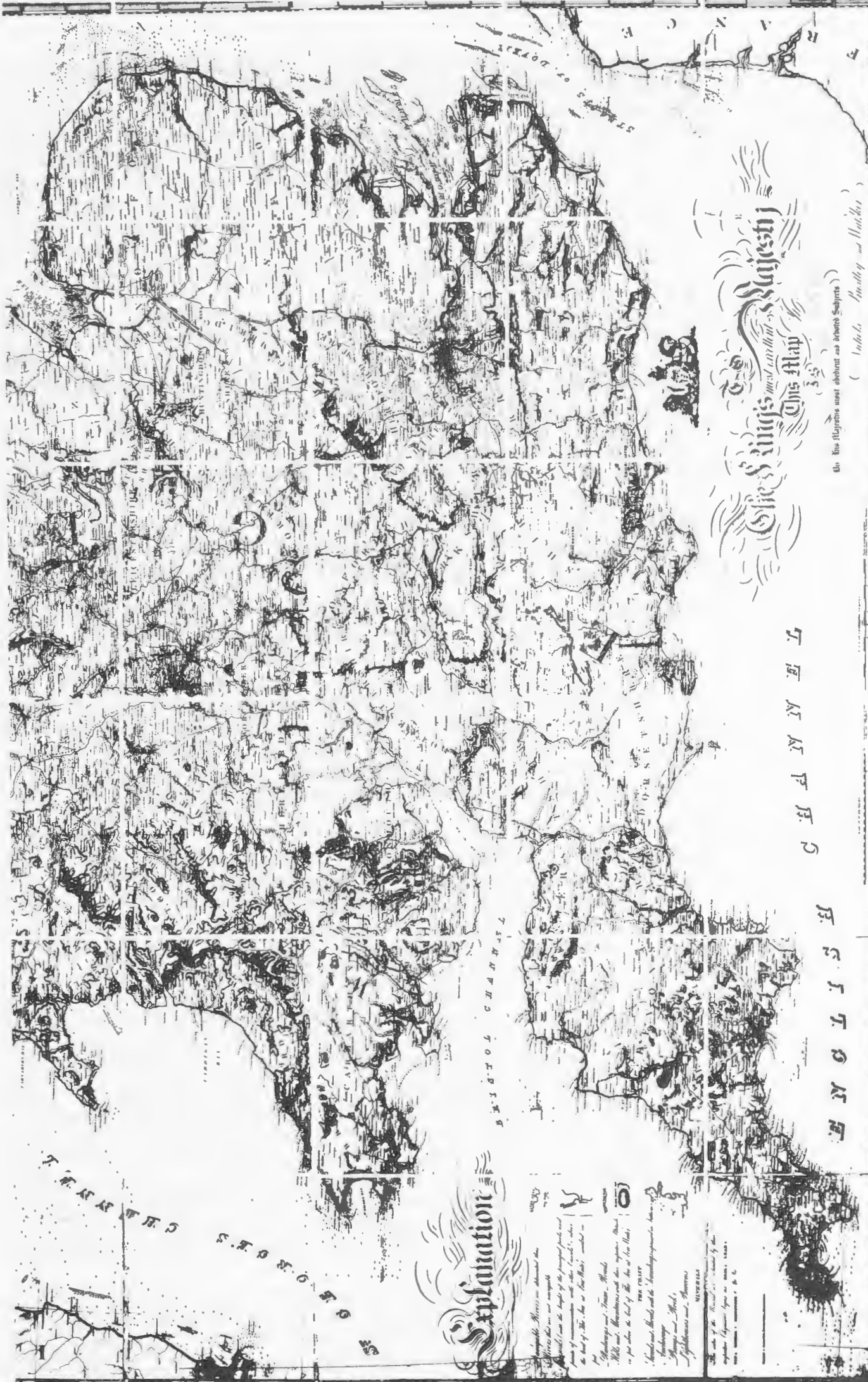
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John Walker's Map 1830



The King's Most Excellent Majesty's
This Map
 (1790)
 (*London, Printed by W. Woodcut, and R. Wallcut.*)

G R E A T B R I T A I N
I R E L A N D

Explanation

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 symbol of a mountain, and the height of the highest point and
 the distance from the sea are marked in fathoms, where
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Coast is denoted by the symbol of a line, and the name of the coast is marked in letters.

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Other places are denoted by the symbol of a place, and the name of the place is marked in letters.

John Walker's Map 1830

George Bradshaw is best known for his famous train timetables which were first produced in 1839 and continued through until 1961. Born in 1801, he was apprenticed to an engraver in his home town, Manchester. After a short sojourn with his parents in Belfast he returned to Manchester in 1821 and started to specialise in map engraving. Three important works by him dating from 1829-32 are his detailed maps of the canals in the Midland Counties, Counties of Lancashire, Yorkshire, Derbyshire and Cheshire, and Southern Counties respectively. These are large scale regional maps on the scale of nearly six miles to the inch, each map showing with great clarity the canals with their wharves, tunnels and locks, and their heights above the Old Dock still at Liverpool. Nearly all of the early railways in each region are also shown, paralleling Walker's map in this respect. It is interesting that in the first of Bradshaw's canal maps he refers to 'railroads' but in the last to be produced, that of Southern Counties, the term is now 'railways'.

In the introduction to his complete railway map of Great Britain in 1839 Bradshaw says: 'It would be superfluous to expatiate on the vast utility of a correct map of the Railways of this Kingdom. The want of such a work has been long felt and acknowledged.' The map contains, so he says, every public railway sanctioned by legislature up to the present time; unlike Walker the map confines itself to operating passenger lines rather than including private lines or those primarily carrying freight traffic. And Bradshaw is at pains to point out that the railways on his map coloured red denote those completed or in progress; the lines in blue are those for which Acts of Parliament have been obtained; those in yellow are proposed. The extensions of the London and Cambridge Railway northwards through Lincoln and York, and from Newcastle to Edinburgh, are in this latter category. Although not quite as large as Walker's map in size (5' 4" by 3' 4") and on the smaller scale of ten miles to the inch throughout including Scotland, Bradshaw's map nevertheless marks a greater number of localities and more roads. Hills are omitted but in lieu there are thirty-three sections of railway routes drawn to scale in length and elevation.

With the uncertainties of steam traction at the time, unnecessarily sharp gradients represented an undesirable hazard. Few of the earliest routes have gradients exceeding 1:100, although there are two short sections on the Stockton and Darlington Railway with gradients of 1:30½ and 1:30¾ respectively. The sharpest incline cited by Bradshaw is the Swannington plane approaching the Hinckley terminal on the Leicester and Swannington Railway, where the slope is as steep as 1:17. The sections on the map depict in graphical form similar information to that contained in the printed introduction and tables which are usually bound with the map. Bradshaw employed an accomplished engraver for his railway map, John Dower of Cumming Place, Pentonville. Dower also engraved in the same year the even larger general map by Samuel Lewis showing roads, rivers, canals and railways on the scale of five miles to the inch.

During the decade 1830-1840 Britain's railway system grew by leaps and bounds. At the time of Walker's map of 1830 only a dozen or so lines were advertising passenger tariffs, the majority of these being at the planning stage. Less than 100 miles of steam passenger track had actually been constructed. On Bradshaw's map of 1839, as well as the thirty-three lines depicted in section, a further twenty-three lines are drawn on the map and named as part of the country's passenger network with a total mileage exceeding 2000 miles. All the lines marked on Bradshaw's map are listed in Table 2.

It is not definitely established which general map is the first to show railways or which is the 'first' railway map. Clearly, maps or plans were made of individual railway routes and, well before the nineteenth century, mineral railroads will have been marked on local or regional maps, probably on continental maps before those of Great Britain. As far as I am aware British general maps of the late eighteenth century (for instance, John Cary's large scale map of 1794) do not mark any railroads or railways, even those such as Brandlings which had been in existence for some time. Early in the nineteenth century Charles Smith's six-sheet map of 1806 records the Surrey Iron Railway, and Pinkerton's map of 1812 adds some coalpit lines in South Wales. Hodgkiss, in his *Understanding Maps* suggests that British railways were first delineated on a printed map in Van der Maelen's *Atlas of Europe* published in Brussels in 1829-31. In 1830 the passenger railways operating were marked on a map of England published by T L Murray but George Bradshaw's map of 1839 is undoubtedly the first large scale map to treat railways as the primary subject in terms of content and presentation. The first state of his map is now rare, and even later editions with the overprinting of the routes of newly constructed lines are relatively uncommon.

In the same year as publication of his railway map, 1839, Bradshaw entered into partnership with William T Blacklock and his name continued to be associated with the publication of railway timetables and guides. A few other separate maps bear his name, such as the 'Map of the Railways, Canals, Navigable Rivers and Mineral Districts', 1852. This particularly handsome wall map, also engraved by John Dower is in fact a much-amended re-issue of Walker's 'Inland Navigation, Canals and Rail

Roads' map of 1830 with a new title and the addition of many more railways. John Dower's signature appears with no acknowledgement to Walker or his original sources. In later life Bradshaw was elected as an associate of the Institution of Civil Engineers – a considerable recognition of his greatness by an august body that had earlier withheld membership from George Stephenson. When visiting Norway in 1853 Bradshaw was stricken by a local epidemic of cholera and died at Christiania within a very short time.

TABLE 1

MAIN RAILWAYS CITED IN PRIESTLEY'S HISTORICAL ACCOUNT

<i>Railway</i>	<i>Date of Act(s)</i>	<i>Stated Mileage</i>	<i>Comments</i>
Aber Dulais	1826	8½	
Airdrie & Ballochney	1826	5	
Avon & Gloucestershire	1828	n.s.	
Berwick & Kelso	1811	n.s.	Abandoned incomplete
Bolton & Leigh	1825-28	7¾	Stationery engines on inclined planes; locomotives on other parts
Brandlings Railroad (Middleton & Leeds Plateway)	1758	4	Mr Blenkinsop first applied locomotive engine; ceased commercial operation 1967 but line now preserved.
Bridgend	1828	4½	
Bristol & Gloucestershire	1828	9	
Bullopill or Forest of Dean	1809	4½	
Canterbury & Whitstable	1825-28	6	First steam locomotive convey fare-paying passengers: 6d per person up to 3 miles
Carmarthenshire	1802	16	Parts of line still in use for freight services
Clarence	1828-29	45½	
Cromford & High Peak	1825	34	Remaining sections of line closed
Croydon, Merstham & Godstone	1803-06	12	Closed 1846.
Duffryn Llynn & Porthcawl	1825	16¾	
Dundee & Newtyle	1826	11½	
Edinburgh & Dalkeith	1826	10¾	
Garnkirk & Glasgow	1829	4	
Glasgow, Paisley & Androssan	1827	22	
Gloucester & Cheltenham	1809	9	Still horse-drawn in 1859, when closed.
Hay Bridge	1811	26	
Heck & Wentbridge	1826	7	Never completed.
Hereford	1826	n.s.	Passengers 6d per person.
Kenyon & Leigh	1829	4	
Kilmarnock (& Troon)	1808	10	
Kington	1818	14	To facilitate exports because of the ruinous state of the turnpikes.
Kirkintilloch & Monkland	1824	10	
Leeds & Selby	1830	20	Passenger scale tariff.
Leicester & Swannington	1830	15¾	Passenger scale tariff.
Liverpool & Manchester	1821-26	30¾	1/6 per person up to 00 miles; 2/6 10-20 miles; 4/- over 20 miles.
Llanfihangel (& Grosmont)	1811-12	13½	
Mamhilad	1793	5	Link to Abergavenny Canal.
Manchester & Oldham	1826	n.s.	Passengers 2½d per mile.
Mansfield & Pinxton	1817	8	6d per mile for every carriage contain-

TABLE 1 (continued)

<i>Railway</i>	<i>Date of Act(s)</i>	<i>Stated Mileage</i>	<i>Comments</i>
Monmouth	1810	n.s.	6d per mile for every carriage containing persons; not over 5 cwt.
Nantlle	1825	n.s.	
Newcastle-upon-Tyne & Carlisle	1829	61	Passengers 6d per 5 miles remains part of BR system today.
Oystermouth (Swansea & Mumbles)	1804	13	First public passenger-carrying railway.
Peak Forest, Beard & Woodlands	1816	9½	Not completed.
Pembrey Harbour Canal	1825	n.s.	
Penrhynmawr	1812	7	1d per passenger.
Plymouth & Dartmoor	1819	30	Specifically to communicate with the 'prison of War'.
Polloc & Govan	1830	1	
Portland	1825	n.s.	
Redruth & Chasewater	1824	10	Closed 1939.
Rumney	1825	22	Closed 1962.
Saundersfoot	1829	6½	Closed 1939.
Severn & Wye (Lydney & Lydbrook)	1809	26	
Sirhowey Tramroad	1802-09	10	Link to Monmouth Canal.
Spittal & Kelso	1811	n.s.	Not completed.
Stockton & Darlington	1821-28	42	Horse-drawn until 1833. 6d per mile every carriage, waggon or cart used for passengers.
St. Helens & Runcorn Gap	1830	9	Passenger scale tariff.
Stratford & Moreton-in-Marsh	1821	18½	
Surrey Iron	1801	9	First public railway, opened 1803. Services still run over part of route.
Usk Tramroad	1814	n.s.	
Warrington & Newton	1829	6	Passengers 3d per mile.
West Lothian	1825	15	
Wigan	1830	6½	Passengers 1/6 any distance.
Wishaw & Coltness	1829	n.s.	

Note: Some lines cited by Priestley were not mapped by Walker because construction was incomplete; for instance the Leicester & Swannington line (opened 1832) and the Leeds & Selby line (opened 1834).

TABLE 2**MAIN RAILWAYS ON GEORGE BRADSHAW'S RAILWAY MAP OF 1839**

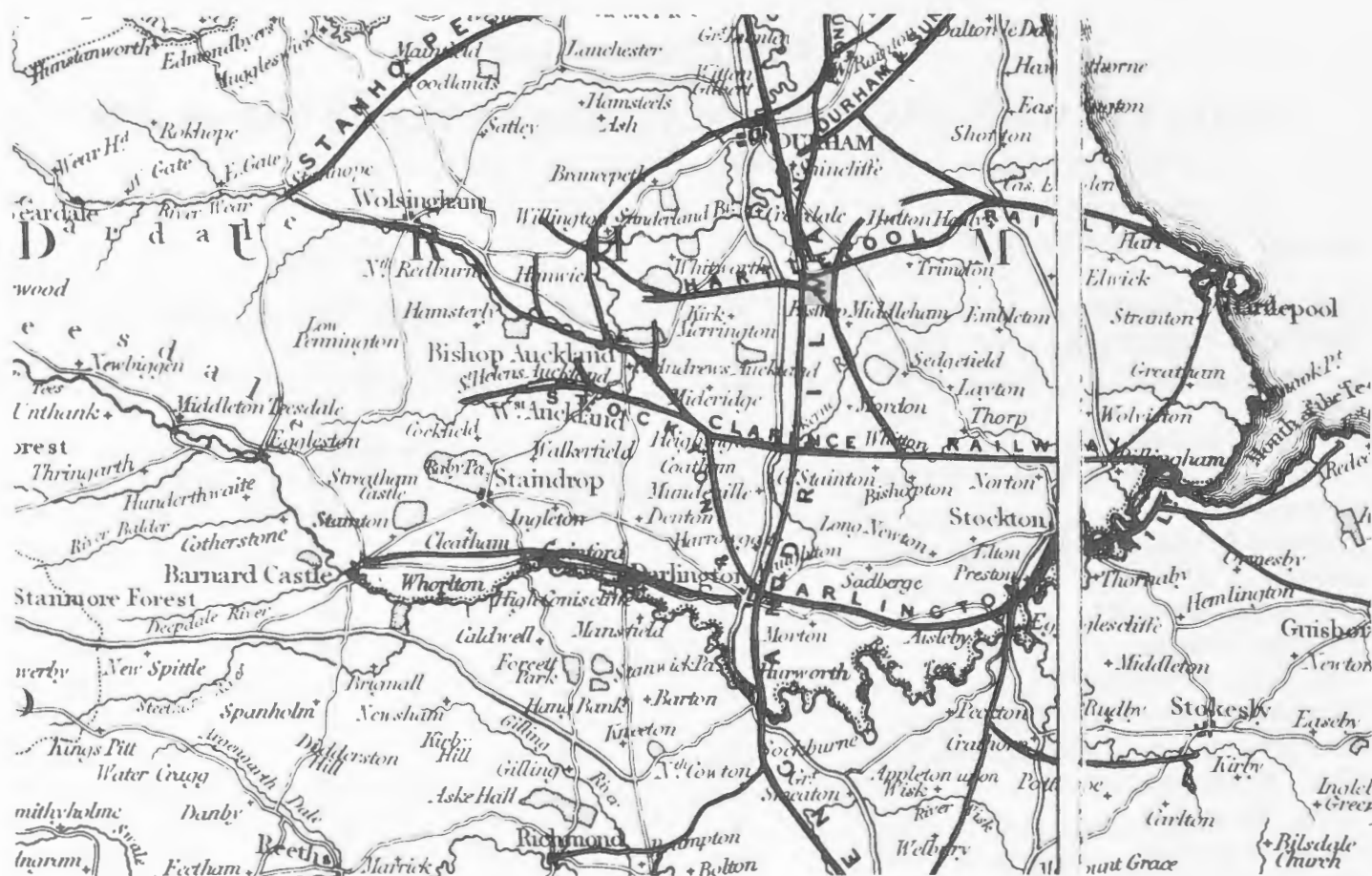
<i>Railway</i>	<i>Mileage</i>
*Arbroath & Forfar	15
Aylesbury	10
*Birmingham & Derby Junction	39
Birmingham & Gloucester	51
Blackwall	7
*Bolton & Preston	} 24
Bolton & Manchester	
*Bolton & Leigh	} 10
Kenyon & Leigh	
Brighton	62
*Bristol & Exeter	76

TABLE 2 (Continued)

MAIN RAILWAYS ON GEORGE BRADSHAW'S RAILWAY MAP OF 1839

<i>Railway</i>	<i>Mileage</i>
*Carlisle & Newcastle	62
*Chester & Birkenhead	} 36
Chester & Crewe	
Clarence	22
Cromford & High Peak	32
Cheltenham & Great Western Union	52
*Croydon	10
Durham & Sunderland	20
*Dundee & Arbroath	16
Dundee & Newtyle	15
*Eastern Counties	108
*Edinburgh & Glasgow	46
*Glasgow, Paisley & Greenock	22
*Glasgow, Paisley, Kilmarnock & Ayr	40
*Great North of England	74
*Great Western	117
*Grand Junction	82
Greenwich	10
Hartlepool	25
*Hull & Selby	31
*Lancaster & Preston Junction	20
*Leeds & Selby	20
*Leicester & Swannington	16
*Liverpool & Manchester	31
*London & Birmingham	112
*London & Southampton	76
*Manchester & Birmingham	46
*Manchester & Leeds	50
*Maryport & Carlisle	28
*Midland Counties	47
*North Midland	72
North Shields	7
*North Union	22
Northern & Eastern (London & Cambridge)	194
Norwich & Yarmouth	17
Portsmouth Junction	21
Preston & Longridge	15
Preston & Wyre	25
Sheffield & Manchester	41
Sheffield & Rotherham	6
South Eastern	75
Stanhope & Tyne	40
*Stockton & Darlington	25
Taff Vale	33
*Thames Haven	15
Whitby & Pickering	33
*York & North Midland	23

*Also shown in gradient section.



Section of Bradshaw's map 1839

Acknowledgements

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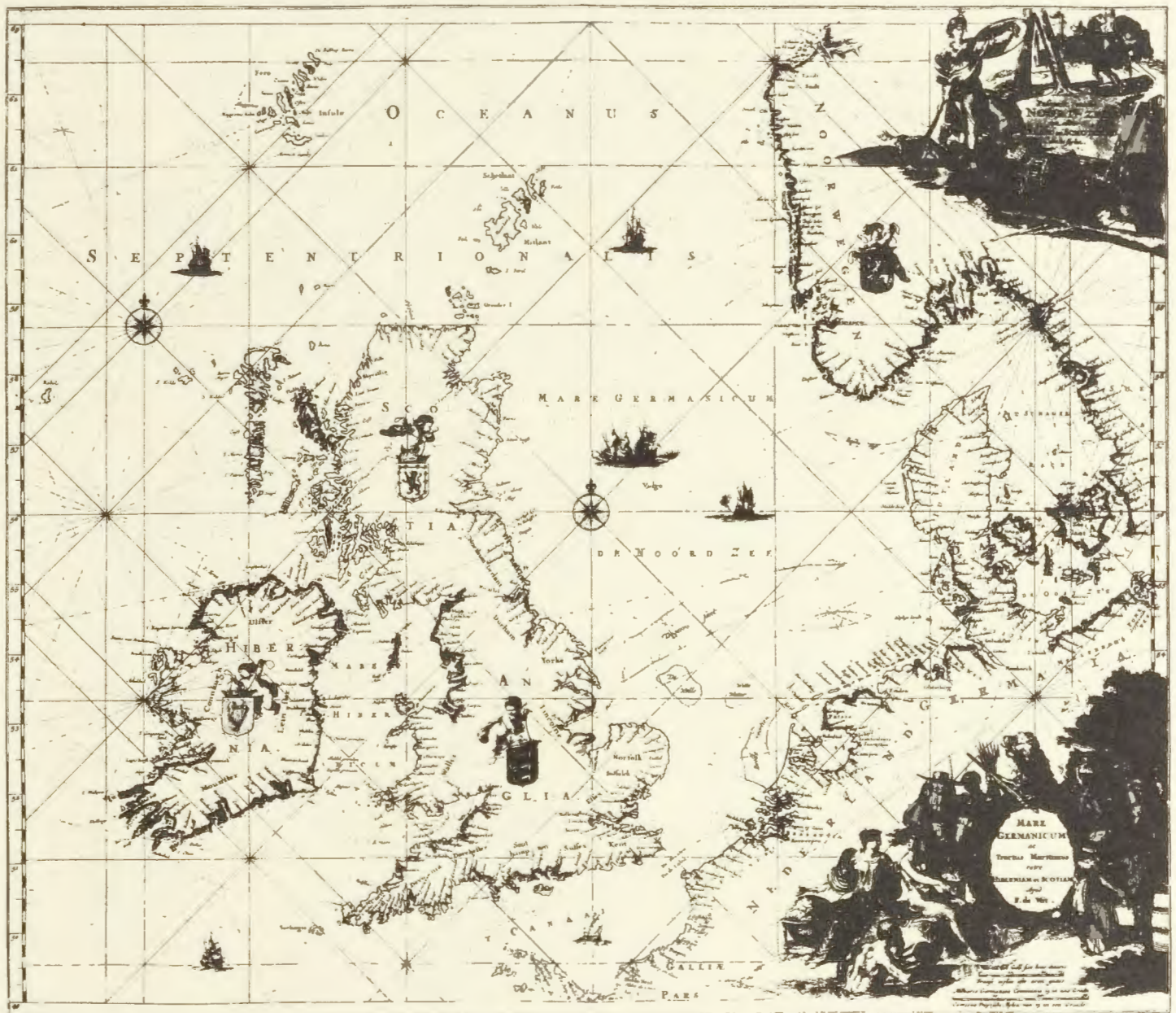
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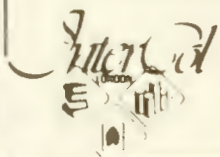
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