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TWELVE YEARS' WORK OF THE ORDNANCE SURVEY, 1887 TO 1899.*

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PRELIMINARY.

I AM afraid I am about to deal with a very dry subject. The record of the work of a public department, however interesting to specialists or to those who have taken part in it, can hardly be made interesting to a general audience. For it must necessarily in a large measure consist of dull figures and uninteresting dates. As, however, it is now twelve years since any Survey officer has written or spoken on the subject (the last occasion having been when Sir Charles Wilson read a paper at Manchester on September 6, 1887), I could hardly see my way to refuse when I was asked to write a short account of the recent work of the Ordnance Survey. I can only hope that you will receive what I have to say with as much patience and indulgence as you can.

There is nothing new or original in the paper. Its main subject is the work of the Survey from 1887 to March, 1899, when I left Southampton, but it is necessary to make a few preliminary observations on the previous work of the department.

I have endeavoured to shorten the paper, and to avoid stating to you a number of figures as to areas, which would convey little information to your minds, by preparing shading diagrams to show the progress made by the Survey during the above period upon the various branches of its work. The extent of the shading shown upon each diagram represents the extent of the work done during the twelve years; and

* Read at the Royal Geographical Society, March 20, 1900.

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the shading will enable you to see at a glance both the amount of the work done and the localities in which that work has been proceeding.

Another point which I have desired that you should have an opportunity of criticizing is the variety and the quality of the Ordnance Survey maps. Criticisms have been at various times made as to the quality of the latter as compared with the quality of the maps of other countries. The Survey has no desire to avoid such comparisons. I have made a collection both of the English Survey maps and also of the maps of foreign countries, on all the scales available. These collections are open to the inspection of such of you as take an interest in map-making, and I think that they will not only enable you to compare the relative quality of the maps, but that they will, incidentally, also indicate to you the differences between the nature of the work carried out by the National Survey of England and the nature of the work done by the Government map-making departments of other countries.

I. THE WORK OF THE SURVEY FROM 1784 TO 1887.

1. *One-inch Scale Surveys.* 1784 to 1824.

The first operation of the Ordnance Survey of the United Kingdom, namely, the measurement of a base-line in 1784, was undertaken as a consequence of the action of the Government of France. In 1783 the French Government invited the British Government to connect the Paris and Greenwich observatories by a series of triangles. This proposal was supported by the Royal Society, who recommended that General Roy, one of its members, should carry out the work. In 1784 the first base-line was measured on Hounslow Heath, and on September 23, 1787, the triangulation having been carried eastward to the coast of Kent, three French scientific men met General Roy and others at Dover, and arrangements were made for carrying reciprocal observations across the Straits of Dover. Soon afterwards two stations on the French coast (Blanc Nez and Montlambert) were intersected by observations from the two English stations at Dover and Fairlight Down. The result was that the distance from Dover across the Channel as computed from the Hounslow Heath base was found to be 7 feet longer than the distance as computed from the French triangulation.

From the triangulation of Kent thus established, a survey, on the scale of 1 inch to a mile, of that county was undertaken in 1797, and the resulting map in four sheets was published on January 1, 1801. It was a wonderfully good and accurate map for the period at which it was produced.

A second edition of the same survey was published by Colonel Mudge in 1819 as Sheet III. of the old series 1-inch map of England and Wales. This Sheet III. shows that there was by 1819 a considerable improvement in the English style of map-engraving. These old series

1-inch maps of England and Wales were the only maps prepared and published by the Ordnance Survey down to 1824, but they continued to be produced, simultaneously with other surveys, down to 1844, when they had reached as far north as South Lancashire and Yorkshire. They were, especially the later sheets, excellent topographical maps. There are two specimens of them, the sheet containing Birmingham, and the sheet containing Snowdon, in the portfolio of English maps.

2. *Six-inch and 5-feet Surveys.* 1824-1855.

The first advance as to the scales of the Survey was made in 1824, when surveys on the scale of 6 inches to a mile began. In 1824 there was an Irish land question, as there is now; and for valuation purposes the Government gave Ireland 6-inch maps, the 1-inch survey of England being meantime largely suspended. This 6-inch survey of Ireland proceeded from 1824 until its completion in 1840. By that time it had been found so useful for purposes other than those connected with land that the 6-inch scale was adopted by the Government for the survey of the counties of York and Lancaster in England, and of several counties of Scotland, the 1-inch maps to be obtained from the 6-inch by reduction. These 6-inch maps were engraved on copper; there is a specimen in the portfolio of English maps. They were well engraved, and had more numerous contours than the later maps. These 6-inch surveys proceeded from 1824 to 1855.

The towns in the above counties were at the same time—that is, in 1840, ordered to be surveyed and published on the scale of 5 feet to a mile. These town maps were also engraved on copper, and there is a specimen of them in the portfolio of English maps.

3. *Six-inch, 25-inch, and 10-feet Surveys from 1855 to 1880.*

The next advance as to the scales of the Survey was made in 1855.

In the early fifties Parliament had taken up the subject of the best scale for the National Surveys, had held various discussions, and, as might be expected from the constitution of that body, had come to various conflicting decisions regarding it. About this time Sir Henry James had become Director-General of the Survey. He held very strong views on the subject of scales, lost no opportunity of pressing them upon the Government and the country, and in 1855 he gained his point. In that year the Treasury, in accordance with the recommendations of a scientific committee, ordered that for Great Britain the agricultural districts should be surveyed for the scale of 1 : 2500, or about 25 inches to a mile; the towns for the scale of 1 : 500, or about 10 feet to a mile; and uncultivated or mountainous districts for the scale of 6 inches to a mile. The 1-inch maps were to be obtained by reduction from those larger scales; and, later, it was decided that the "Old Series" 1-inch maps, so far as already completed, that is for the whole of England and

Wales south of Lancashire and Yorkshire, should be superseded by a "New Series" 1-inch map based on the new large-scale surveys.

This year, 1855, therefore, marks an entirely new departure in the work of the Survey. Nearly the whole of the survey maps of Great Britain which are now in use are based on the new surveys and scales decided upon in that year, and nearly the whole of the survey work done in Great Britain before that year has been put on one side.

From 1855 until 1880 the Survey had a comparatively quiet time. By 1880 the four northern counties of England and nearly the whole of Scotland were completed on the new scales. Some progress had also been made in England in the south-eastern counties and in the mining districts. At first an endeavour was made to engrave the new 25-inch and 10-foot plans on copper, but the attempt was found to be hopeless; Sir Henry James found that the time taken would be too great, and that the necessary engravers could not be got. The plans on the two largest scales were therefore published by zincography, the buildings being coloured by hand. For these large scales the zincographic method of production has been found for all practical purposes sufficient, while it is much more rapid and much less expensive than copper-plate engraving.

Specimens of the earlier and later 25-inch and 10-foot maps can be seen in the portfolio of English maps. The latest of the changes made in the style of these maps are in accordance with the recommendations of the Departmental Committee of 1892, alluded to later on.

4. *Acceleration of the Cadastral Surveys, 1880 to 1890, and Completion from 1887 to 1890 of the Publication of the Cadastral Plans of Great Britain.*

By 1880 a new political question had arisen—that of the cheap transfer of English land. A select committee had reported to the Government that the Ordnance Cadastral Survey was suitable for carrying out this object, and had recommended that that survey should be immediately completed for England and Wales. At the then annual rate of expenditure and the then established strength employed on the survey, it was estimated that it would not be completed until the twentieth century—that is, it would not have been completed now. The Government in 1880 asked Colonel Cooke, the then Director-General, whether, if they doubled his Survey vote, he would undertake to complete the Cadastral Survey of England and Wales within half the estimated time—that is, if he would undertake its completion by 1890 instead of 1900. The question was a difficult one. To double within a limited time the strength of a large number of surveyors involved manifest risk to the accuracy of the work, and accuracy has always been one of the paramount objects of the Ordnance Survey. But Colonel Cooke faced this risk. He drew up a scheme, with estimates, for completing the work, and organized the large additional force which had to be employed.

His confidence was justified by the result. The total estimated cost of the work for the ten years was about £1,600,000. It was completed within the time and cost estimated, and it has stood the test of accuracy as well as the work done before the acceleration, while the cost per acre was not increased. I do not think that Colonel (now General) Cooke has ever received the credit due to him for this service. If, as he might very easily have done, he had declined the responsibility of undertaking it, not merely the Cadastral Survey, but all the smaller scales would have been greatly delayed; Devonshire and the Midlands would still have been without a one-inch map of later date than the earlier part of this century, while any revision of the older maps on all scales could not even now have been begun, much less have made the considerable progress which has been made. It is true that the main object of the acceleration, namely, the cheap transfer of agricultural land, has not even now been attained; but that is not the fault of the Ordnance Survey or of General Cooke; rather, I suppose, it is the fault of our system of government by party. It is true that in 1897, by some happy accident, the present Government at last succeeded in passing a Land Transfer Act; but, hitherto at least, it applies only to the county of London, which had already, long before 1880, had large-scale surveys. The application of the Act to the country in general and to agricultural land remains still a question for the future.

But the acceleration of the survey had caused another change to be made in the method of production of the maps. This time it was the 6-inch maps for which copper-plate engraving had to be abandoned. After 1880 the output of 6-inch maps under the acceleration became so large that the time and cost of copper-plate engraving became prohibitive, and Colonel Cooke decided that those maps should be produced by photo-zincography. Under this method it was possible to publish the 6-inch maps not only as soon as, but earlier than, the maps on the 25-inch scale, while if engraved their publication would have had to be postponed for years. But the exigencies of photography required that they should be published by quarter-sheets instead of full sheets. Recently this difficulty has been got over, and the 6-inch maps of part of Scotland and Ireland are now being published by photo-zincography in full sheets. Although, from the nature of the case, zinc maps can never rival copper-plate maps, the object has been to bring the former as near the latter as possible in quality. Specimens of the various forms of the English 6-inch map are in the portfolio for English maps.

5. *The Departmental Committee of 1892.*

Some of the advantages of the service done by Colonel Cooke in 1880 have been already mentioned, but there is another, which, although not strictly in chronological order, may be mentioned here. In 1892 the Board of Agriculture appointed a Departmental

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Committee, of which Sir John Dorington, M.P., was the chairman, and Colonel Johnston, the present Director-General of the Survey, was the secretary, to report upon the work generally of the Ordnance Survey. The committee was a very strong one. It received a large amount of evidence, and made a most valuable report, which has in every way greatly strengthened the position of the Survey. But many of their recommendations, the most important of which have been given effect to by the Board of Agriculture, and which have either been already alluded to or will be alluded to later on, could not have been carried out unless the acceleration of the Cadastral Survey of Great Britain had been completed, as it had been, before the committee was appointed.

II. THE WORK OF THE SURVEY ON LARGE-SCALE MAPS FROM 1887 TO 1899.

1. *Completing the publication of the Cadastral Survey of Great Britain.* 1887-1890.

We have now reached the period in the history of the Survey—1887 to 1899—with which this paper has mainly to deal, and it will be convenient to divide the account of the work done during that period into two heads, namely, first, maps on the larger scales—that is, maps on scales of 6 inches to a mile and upwards; and, secondly, maps on the smaller scales, namely, maps on scales of 1 inch to a mile and less, usually called topographical maps.

It has been stated above that Colonel Cooke in 1880 had undertaken that the survey would complete and publish the large-scale or cadastral survey of England and Wales by 1890. By 1887 the field work and most of the manuscript plans for the accelerated survey had been practically completed, and little remained to be done except to finish the publication of the maps. From 1887 to 1890 this work was pushed on as rapidly as possible by Colonel Bolland, who was then in charge of the Publication Branch of the Survey, and by 1890 it was complete, as had been in 1880 promised by Colonel Cooke.

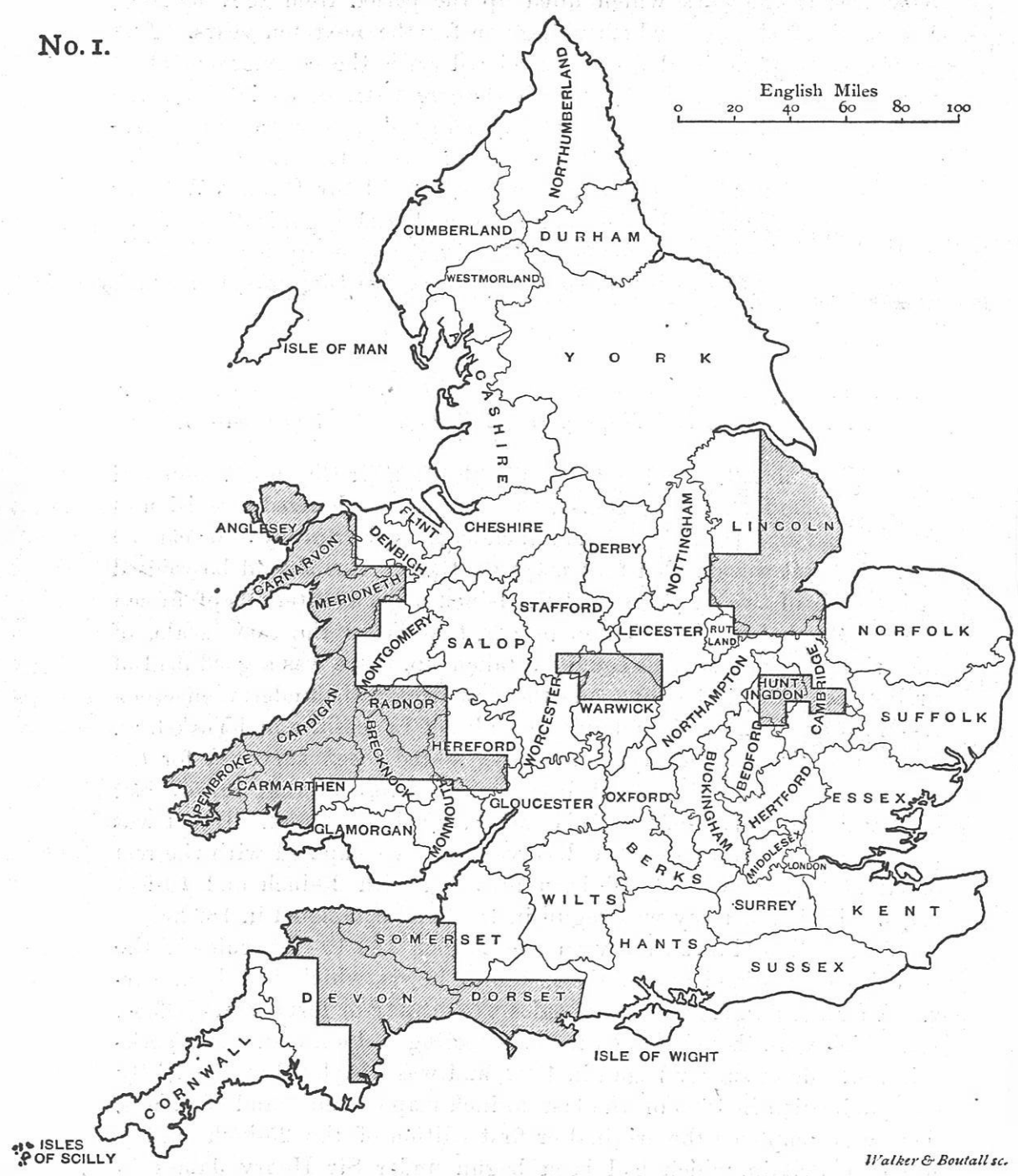
Diagram No. 1 shows the area published after 1887. It amounts to about 10,000 square miles.

2. *Large-scale Revision Surveys, ordered 1886.*


Apart from the completion of the publication of the Cadastral Survey just mentioned (1887 to 1890), the principal work of the Survey in Great Britain from 1887 onwards assumed the character of revision surveys as distinguished from original surveys. In November, 1886, Colonel Sir Charles Wilson was appointed Director-General. It was fortunate for the Survey that an officer so able and distinguished, and

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No. I.



COMPLETION OF PUBLICATION OF CADASTRAL SURVEY OF ENGLAND AND WALES.

Published 1887-90, 

Walker & Boutall sc.

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of so large a survey experience both at home and abroad, took charge of the work at so important a time. He had practically to organize not only most of the work which filled up the period from 1887 to 1899, but much of the work which will go on for the next ten years. Just as the name of General Roy is associated with the commencement of the Survey, of General Colby with the great triangulation and the introduction of 6-inch maps, of Sir Henry James with the introduction of the 25-inch and 10-foot maps, and of General Cooke with the acceleration of the Cadastral Survey, so will Sir Charles Wilson's name be associated with the commencement and organization of the work of Revision Surveys for Great Britain, the necessity for which had long been pressed upon the Treasury by successive Directors, but which it fell to him to begin. .

3. *Preliminary Re-surveys and Revisions, and Completion of the Original or First Edition 25-inch Maps of Great Britain.* 1887 to 1894-95.

On December 22, 1886, about a month after Sir Charles Wilson had been appointed Director-General, the Treasury authorized a revision of the original 10-foot, 25-inch, and 6-inch maps of the Survey to be carried out. Later it was decided that maps on those scales should be revised at intervals of twenty years, and the 1-inch maps at intervals of fifteen years. But before the revision proper, that is, on the same scale, of the original 25-inch maps could be taken up, there was a good deal of preliminary work to be done, and the first work to be undertaken was a re-survey on the 25-inch and 10-foot scales of Lancashire and Yorkshire. Those counties had, as has been above stated, been surveyed for the 6-inch and 5-foot scales about forty-years before, and that survey had been reckoned as part of the Cadastral Survey of England. But it was plain that they were now at a disadvantage as compared with the rest of Great Britain, which had been provided with 25-inch and 10-foot maps. Their re-survey was begun in 1887 and completed in 1892.

There followed a re-survey on the 25-inch and 10-foot scales of the counties of Scotland and of the island of Lewis, which had been surveyed for the 6-inch and 5-foot scales over thirty or forty years before, and which were therefore on the same footing as Lancashire and Yorkshire. Their re-survey began in 1892, and was completed in 1895. By the publication in 1895 of the last 25-inch map of the island of Lewis, there was completed the original or first edition of the 25-inch survey of Great Britain, which had been begun under Sir Henry James in 1855, just forty years earlier.

The most prominent feature in the re-survey of Yorkshire and Lancashire was the immense development of towns and urban districts since the last survey. Practically the whole of South-west Yorkshire and South Lancashire had to be entirely re-surveyed, the original survey

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being quite lost in the universal additions to, and changes in, the buildings and streets which had been first surveyed. Although the town or 10-foot surveys were curtailed as much as possible, yet for the two counties they extended over 124,745 acres, requiring about 3250 plans. The same feature occurred in the revision of London on the 5-foot scale, which followed on the re-survey of Lancashire and Yorkshire. It included the town survey of 116,582 acres, requiring about 760 5-foot plans. An entirely new survey had to be made of the whole of the outer ring of London. It was begun in 1890 and completed in 1894.

Re-surveys or revisions of the 10-foot plans of Edinburgh, Glasgow, the Tyneside towns, and Plymouth were taken up and completed about the same time. Their original large-scale plans were very old.

The total number of plans of the above towns, which were completed from 1887 to 1894, amounted to nearly 5000, covering an area of 275,000 acres, or about 410 square miles. When it is remembered that the scale of most of these plans is about 40 feet to an inch, that is, large enough to show door-steps, which are in fact shown on them, the laborious and costly nature of this town work will be understood.

Complaints have been made, and down to quite recently, of the slow production of its topographical maps by the Ordnance Survey as compared with the rapid production of their topographical maps by other countries. The systems in this country and abroad are so different that there are no grounds for such comparisons. Foreign countries do not publish at all such maps as our plans on the 10-foot or even the 25-inch and 6-inch scales; they only publish topographical maps analogous to our 1-inch maps. France, for instance, with the exception of a few towns on a scale of about 3 inches to a mile, publishes no maps on a scale larger than 1 : 50,000, which is a little larger than our 1-inch map on the 1 : 63,360 scale. The result is that the whole of France, about 206,000 square miles, is covered by 1100 of these 1 : 50,000 sheets. I have had two diagrams prepared, both on the same scale. One (Diagram 1A) is of Great Britain, of which the total area is about 91,000 square miles, showing by shading the areas—amounting to a few hundred square miles—for which, from 1887 to 1894, as above stated, the Ordnance Survey had to prepare nearly 5000 maps. The other shows the area—about 206,000 square miles, namely, the whole of France*—for which the French General Staff would have to prepare only about 1100 maps. A comparison of these two diagrams, and of the relative number of maps, shows the entirely different nature of the work done by the respective Government map establishments of the two countries.

* It is not thought necessary to print this diagram of France; any map of France will show the area.

4. *Abandonment of the Town Scales.* 1894.

But the large amount of work thrown upon the Survey by the town scales from 1887 to 1894 had drawn attention to the great, and rapidly increasing, cost and delay which they involved. The Departmental Committee of 1892 recommended, after hearing Sir Charles Wilson's evidence, that in future all towns should bear the cost of keeping up their own maps on any scale larger than 25 inches to a mile; and in 1893 the Board of Agriculture asked the Survey what would be the relative cost of revising the whole of Great Britain, firstly, if the town scales were retained, and, secondly, if they were abandoned. The answer was to the effect that if the towns were to be revised on the 10-foot scale the cost of revision would be about 50 per cent. more than if the whole country were revised only on the 25-inch and 6-inch scales. The Treasury then, in January, 1894, ordered that in future these town surveys should not in Great Britain be carried out except at the cost of the towns themselves. This decision was amply justifiable, and has given great relief to the work of the Ordnance Survey. Town surveys had gone on from 1855 to 1894, or nearly forty years. During that time every town of any importance in Great Britain has been provided with either 5-foot or 10-foot plans, which it can if it pleases keep continuously up to date at no great difficulty or expense.

Specimens of these town maps at various periods are in the portfolio of English maps.

5. *General Revision of the 25-inch and 6-inch Maps of Great Britain.* 1894-1899.

By 1894 the preliminary re-surveys or revisions of Lancashire and Yorkshire, the six Scottish counties, and the towns above mentioned, had been completed, and it was possible to begin, for the first time, that regular and general revision of the original 25-inch and 6-inch maps of Great Britain, which it is intended in future to carry out every twenty years. The districts which had the oldest surveys were taken up first; they were mainly in the north of England and south of Scotland. The work was of a kind new to the Survey. Chain surveyors had to be trained to take the original maps to the ground, and plot on them to scale the alterations which had taken place, and the draughtsmen in the field divisions had to be trained to trace the revised maps for zincography. The work has, however, proceeded rapidly. The rate of progress is two or three times that of the original survey. But there is a danger for which the Director-General may have to provide. One of the survey divisions has already been seriously retarded by having to revise a large town at the town's expense on the 10-foot scale. If many such cases occur either additions should be made

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to the survey strength, or the work will not be completed by 1910, the estimated time.

In 1896 a scheme, based partly upon extent of country, partly upon population, was drawn up under which each of the eight survey divisions in Great Britain is the centre of a district of which it will in future carry out revision surveys. It is, however, liable to modification according to the results of experience.

There have had to be changes in the method of producing the revised 25-inch maps, which are produced partly by zincography and partly by photo-zincography. The buildings on these maps are now printed cross-ruled instead of being coloured by hand, a change recommended by the committee of 1892, but which would in any case have had to be adopted after 1894; it would be impossible without adding largely to the buildings and staff at Southampton to colour by hand the largely increased number of maps now printed.

The progress on all the 25-inch and 6-inch re-surveys and revisions from 1887 to 1899 for Great Britain is shown on diagram No. 2. It will be seen that by far the most difficult areas of the country, and most of the oldest maps, have been re-surveyed or revised since 1887, but part of this area will come within the twenty-year limit, and will have to be again revised before 1910. I have, however, for the sake of simplicity, included in one diagram all the large-scale re-surveys and revisions carried out from 1887 to 1899.

6. *25-inch Re-survey of Ireland.* 1887-1899.

Meanwhile, while the work of the Survey in Great Britain had changed from surveys to revisions, the work in Ireland had changed from revisions to re-surveys. I have already stated that in 1840 Ireland had 6-inch maps for the whole of the island, and was then as to its maps far ahead either of England or of Scotland. By 1887 it was as much in arrear as it had been ahead in 1840. With the exception of County Dublin, which had been surveyed and published on the 25-inch scale, Ireland had still in 1887 only its 6-inch maps. In the end of the latter year the Treasury sanctioned the re-survey of Ireland for the 25-inch scale; but it was not until 1891 that two additional survey divisions, one at Ennis and the other at Cork, could be organized for the work. Since 1891 the progress of the work has been slow. It has been all in what are usually called the congested districts in the west of Ireland. I have obtained one of the maps of these districts on the 25-inch scale, as an example of the kind of work that has had to be done. This map has more than fifteen hundred enclosures, or parcels, as we call them on the survey; the area of the whole map is 960 acres, so that the average area of each enclosure is about two-thirds of an acre. The Survey had previously not met with work so laborious in any agricultural or country

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district, and I am glad to hear from the present Director-General that he has been authorized to organize a fourth division for pushing on the re-survey of Ireland.

The diagram No. 3 shows the progress which has been made in the field on the re-survey of Ireland on the 25-inch scale up to March, 1899; and the specimen 25-inch map of County Mayo above mentioned, as well as, for comparison, an ordinary English 25-inch sheet near Canterbury, and a Scotch sheet, are in the portfolio of English maps.

III. THE WORK OF THE SURVEY ON SMALL-SCALE MAPS FROM 1887 TO 1899.

1. *Completion of Original 1-inch New-series Map of England and Wales in Outline. 1887-1896.*

Having now completed the record from 1887 to 1899 of the large-scale maps, I will turn to the record for the same period of the topographical maps on the 1-inch and smaller scales; and the first of these is the first edition of the new-series outline map of the United Kingdom on the 1-inch scale.

On December 31, 1887, the outline 1-inch maps of Scotland and Ireland were complete, but 220 sheets of England and Wales remained unfinished. They were completed in 1896. All these 1-inch maps have been obtained by reductions from the Cadastral or large-scale maps of Great Britain and Ireland. It has been contended that it would have been better to have made an entirely independent 1-inch survey of the whole country. I doubt this. At any rate, I believe one thing is certain, namely, that we are much better off now with the 1-inch maps based on the larger scales than we should have been if a separate 1-inch map had been made.

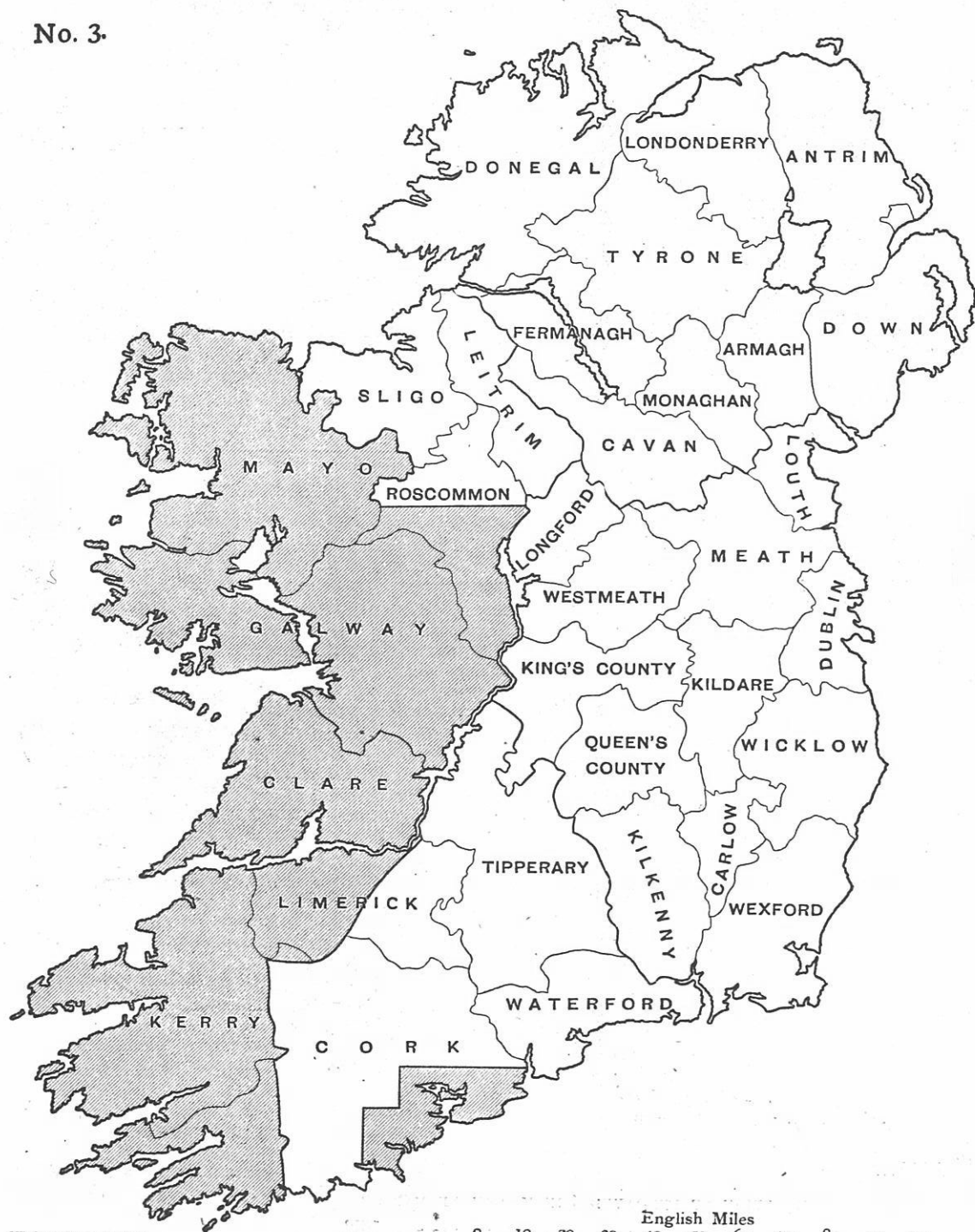
Specimens of the various kinds of the 1-inch maps of Great Britain, from the earliest to the latest, are in the portfolio for English maps.

Diagram No. 4 shows the progress made on engraving the 1-inch outline map of England and Wales from 1887 to its completion as above-mentioned in 1896.

2. *Progress of the 1-inch Hill Map of the United Kingdom, New Series, from 1887 to 1899.*

As to the 1-inch map of the United Kingdom with engraved hill features, about 40 sheets of Scotland out of 131, most of them containing only islands, about 30 out of 205 sheets of Ireland, and about 280 out of 360 sheets of England and Wales, remained to be completed on December 31, 1887. Scotland and Ireland were completed in 1895. On March 31, 1899, about 100 full sheets of England and Wales still remained to be engraved with hills, so that about 180 sheets of England,


No. 3.



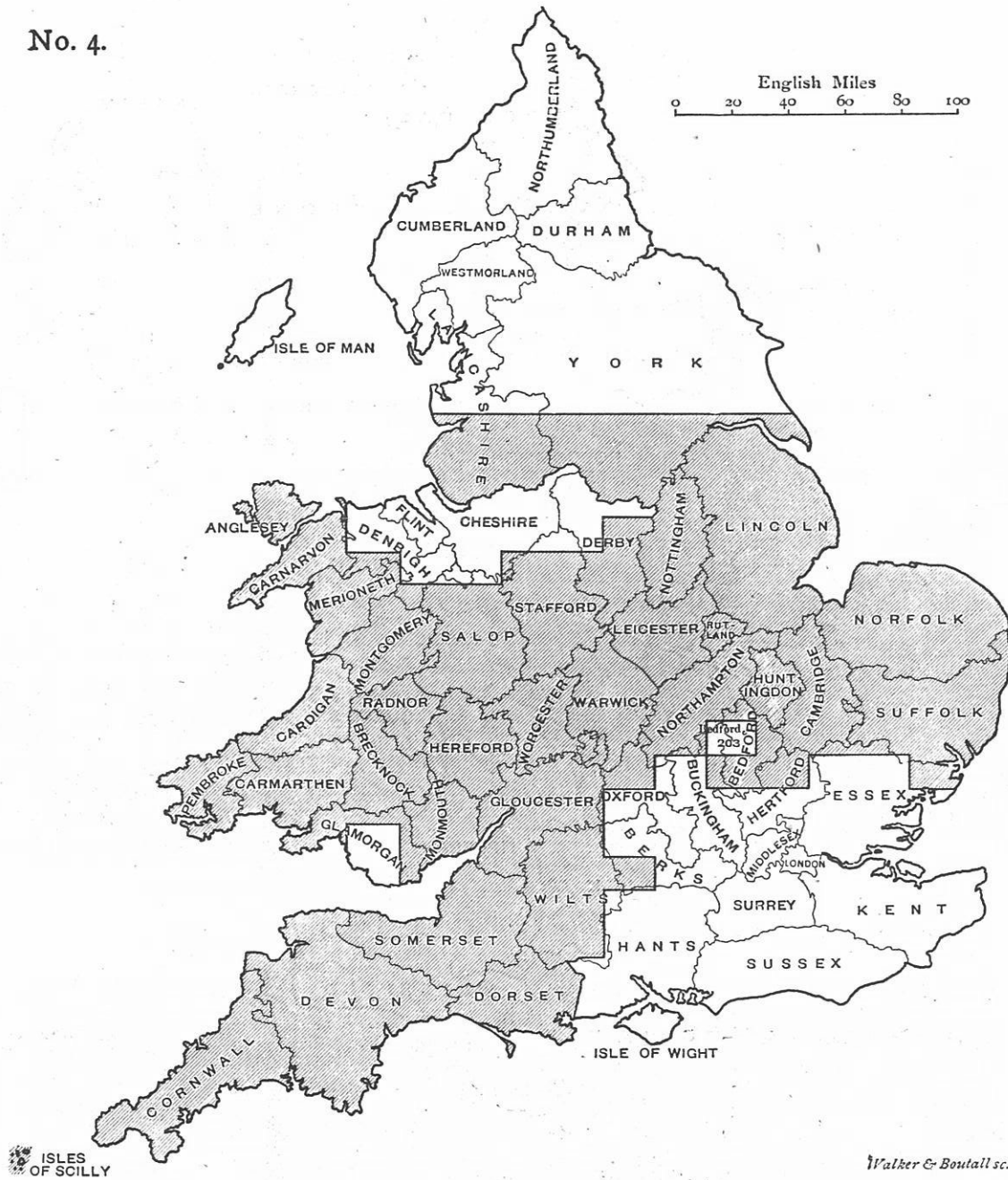
Walker & Boutall sc.

English Miles
0 10 20 30 40 50 60 70 80 90 100


IRELAND: PROGRESS ON 25-INCH RESURVEY.

Resurveyed 1891 to March, 1899, 

No. 4.



COMPLETION OF ENGRAVED 1 INCH OUTLINE MAP OF ENGLAND AND WALES.

Engraved and published 1887-96, 

Walker & Boutall sc.

40 of Scotland, and 30 of Ireland were completed from 1887 to 1899. The estimated date for completion of the entire work in the United Kingdom was at one time 1925, later it was 1910, now it is 1902. I do not now think the work can be satisfactorily completed by 1902, and I think the Director-General should apply for authority to extend the time for either two or three years. Competent hill engravers are most difficult either to get from outside or to train in the department. It must be remembered that this work once done remains always good, that great part of that already done has been extremely well done, that the most important part of the country from a military point of view is already completed, and that, judging by the sales, the general public prefers using the outline map to using the hill map. I have no doubt that undue pressure for completion will injure the quality of the sheets remaining to be done. Owing to this pressure, I had recourse some time ago, but only as an experiment, to a firm in London to push on the work. Some of the work done by them had not in 1899 turned out as satisfactory as had been expected. Unless their work has since considerably improved, I think that this mode of accelerating the hill engraving should be abandoned, and that more young engravers should, if possible, be trained to this duty by the Survey itself.

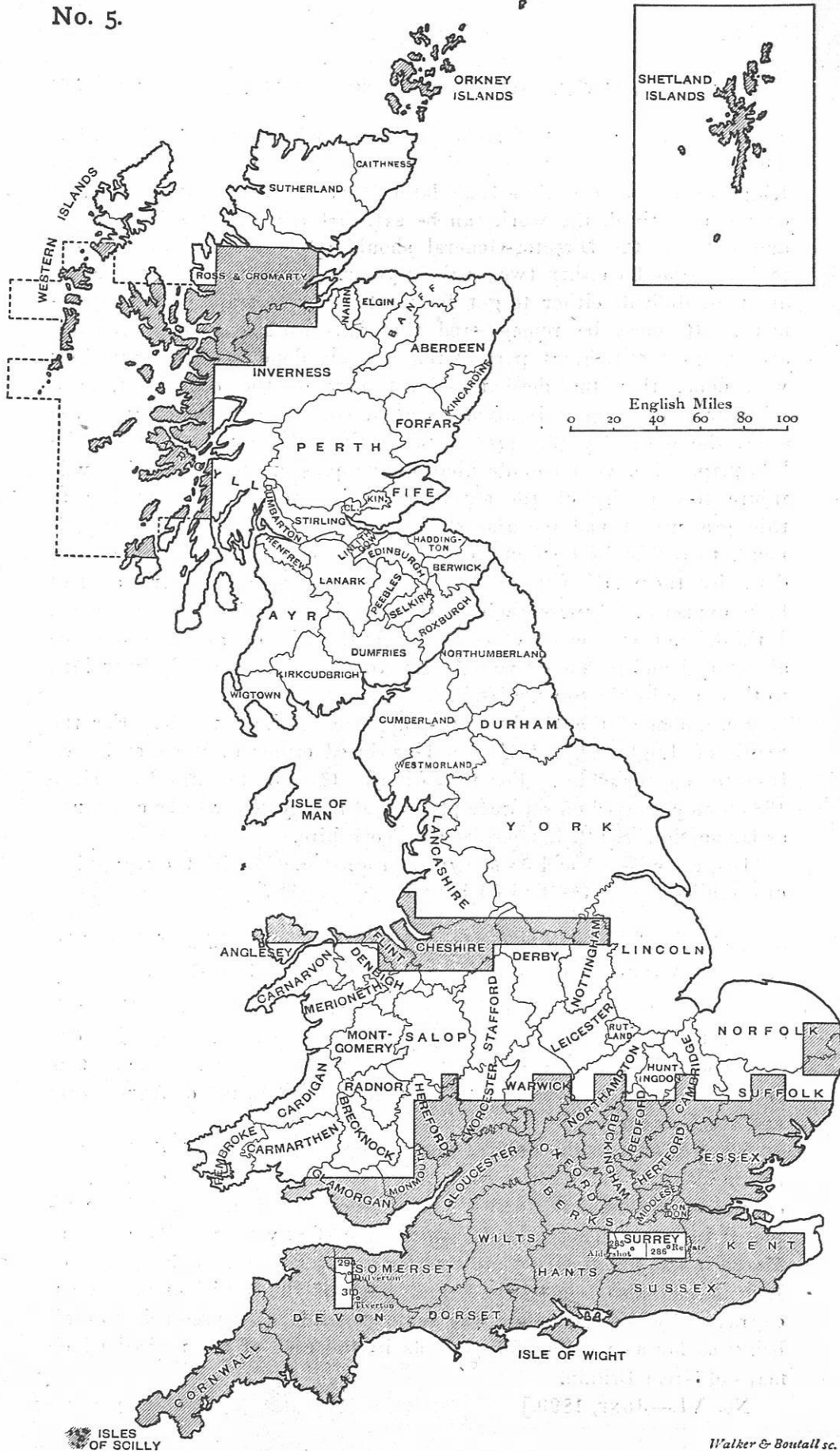
Specimens of the English hill-maps are in the portfolio. For the South of England the hills can be printed either in black or brown from the copper plates. For that district the hill features have since 1889 been engraved on separate plates, and this system will be continued as far north as South Lancashire and Yorkshire.

Diagrams Nos. 5 and 5A show the progress made with the engraving of the hill-maps of the United Kingdom since 1887.


3. *Revisions of the Small-scale Maps. Completion of Revision of the Outline New Series, One-inch Map, Great Britain. 1893-1899.*

The Departmental Committee of 1892 recommended that the revision of the 1-inch map of the United Kingdom should be carried out independently of the revision of the maps on the larger scales, and this recommendation has been given effect to by the Board of Agriculture and the Treasury.

The revision in the field of the 1-inch maps of Great Britain was begun in 1893, but all the engravers were not free to go on with the engraving of this work until the original outline 1-inch map was completed in 1896. Thereafter the work proceeded very rapidly, and last March it was practically completed for Great Britain. A large area of Ireland had also been revised, and part of the revisions had been engraved by March, 1899; the same methods of representing detail being as far as possible followed as in the case of the revised 1-inch maps of Great Britain.

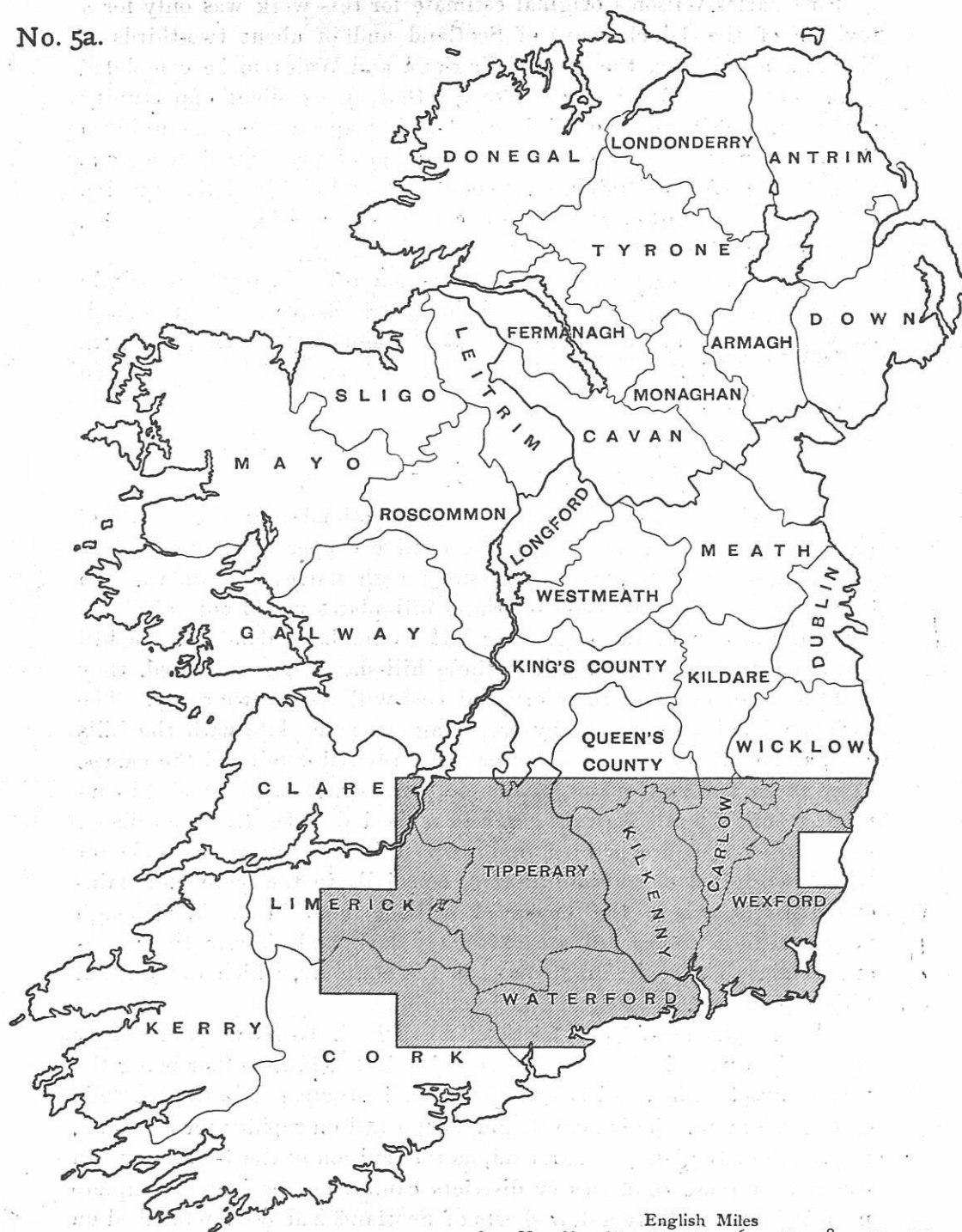


PROGRESS ON ENGRAVED 1-INCH HILL MAP OF GREAT BRITAIN.

Engraved and published 1827 to March, 1899, 

Walker & Boutall sc.

No. 5a.



Walker & Boutall sc.

English Miles
0 10 20 30 40 50 60 70 80 90 100

COMPLETION OF ENGRAVED HILL-MAP OF IRELAND.

Engraved and published 1887-95.

Sir Charles Wilson's original estimate for this work was only for a revision of the 1-inch maps of Scotland and of about two-thirds of England and Wales, the rest of England and Wales to be completed more gradually. But it seemed to me that an excellent opportunity now presented itself for obtaining a 1-inch map on the same uniform lines, and nearly up to date, for the whole of the United Kingdom. The Board of Agriculture readily concurred, and obtained the sanction of the Treasury to this work being carried out at once to completion, not only for Great Britain, but also for Ireland.

Diagram No. 6 shows the area of 1-inch revision of Great Britain completed from 1893 to 1899. It amounts, as above stated, to practically the whole of the area of Great Britain, only some five or six sheets in the Midlands remaining to have the engraving completed on March 31, 1899.

4. *Revised 1-inch Maps of Scotland, Ireland, and the North of England, with Hills in Brown.* 1898-1899.

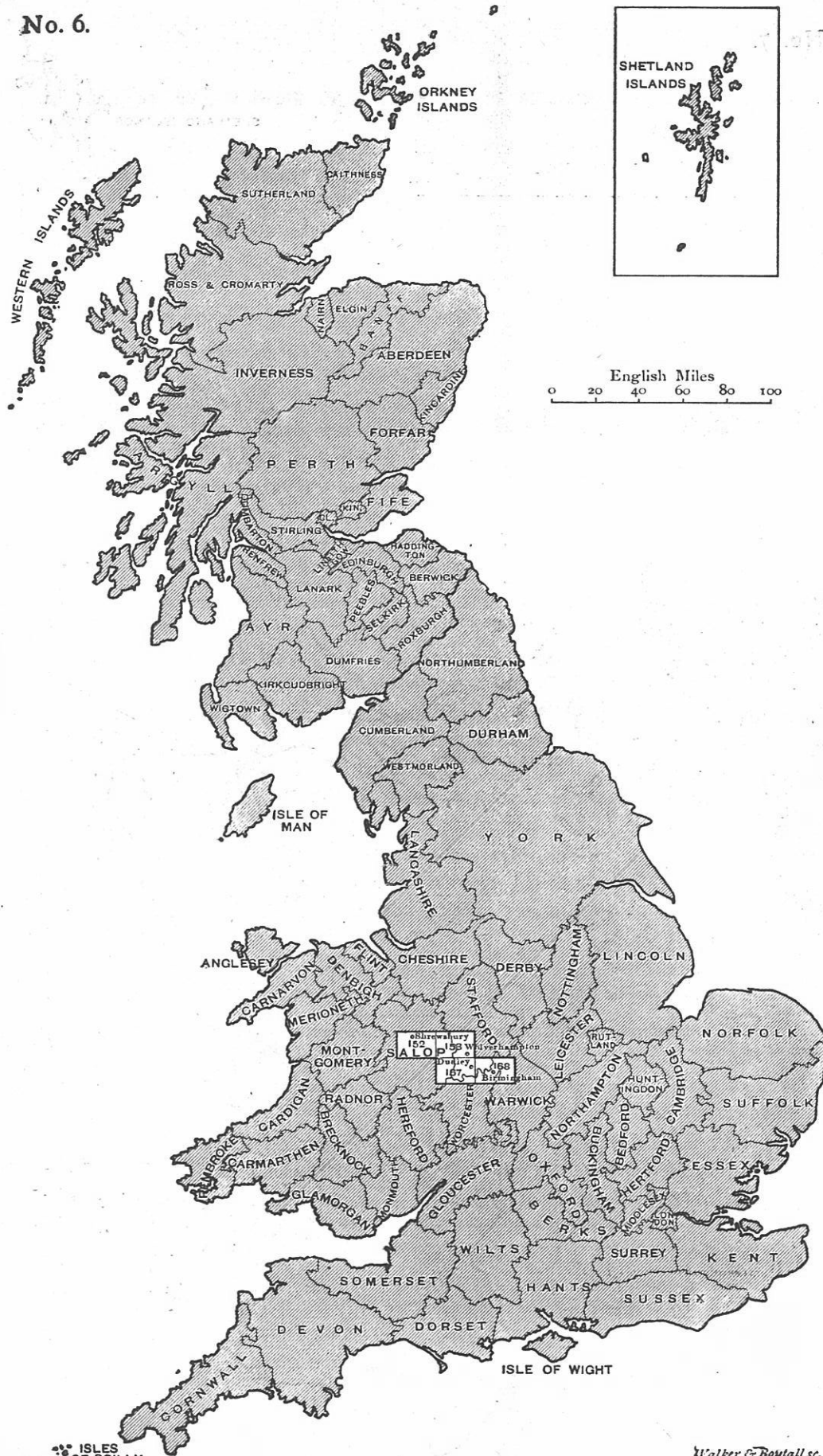
The revision of the 1-inch maps of Scotland and the north of England was only carried out on the outline copper plates, and not on the hill copper plates, which contained both names and detail. To have carried out the revision on these hill plates would not only have doubled the cost of the engraving but would have damaged the hill features. On the other hand, if these hill-sheets are unrevised, they will go out of use, and their original cost will be thrown away. The difficulty has been got over by preparing one zinc plate with the hills only, and another zinc plate with only the revised detail and the names. From these two zinc plates, by double printing, a map is obtained containing both the hill features and the revised details. As the hills on this revised map are printed in brown, it is in many respects clearer than the original engraved hill-map, especially in the more mountainous districts, where the engraved hills, printed in black, although very artistically executed, are extremely dark, and obscure the names and detail. The revised map also has the contours, which the original hill-map has not.

Two specimens of Sheet 54 Scotland ("Loch Rannoch"), one being the original unrevised sheet with the hills in black, the other being the revised sheet with the hills in brown, can be compared in the portfolio of English maps. This map should be pushed on rapidly for Scotland, the North of England, and Ireland, as the revision of the 1-inch maps in the case of those countries or districts cannot be considered complete until it is done. Only a few sheets of Scotland had been published on March 31, 1899 (see Diagram No. 7).

5. *Progress of One-inch Coloured Map. England and Wales.* 1893-1899.

In March, 1892, the War Office appointed a Committee, of which Sir Charles Wilson was a member, to report upon the best means for

No. 6.

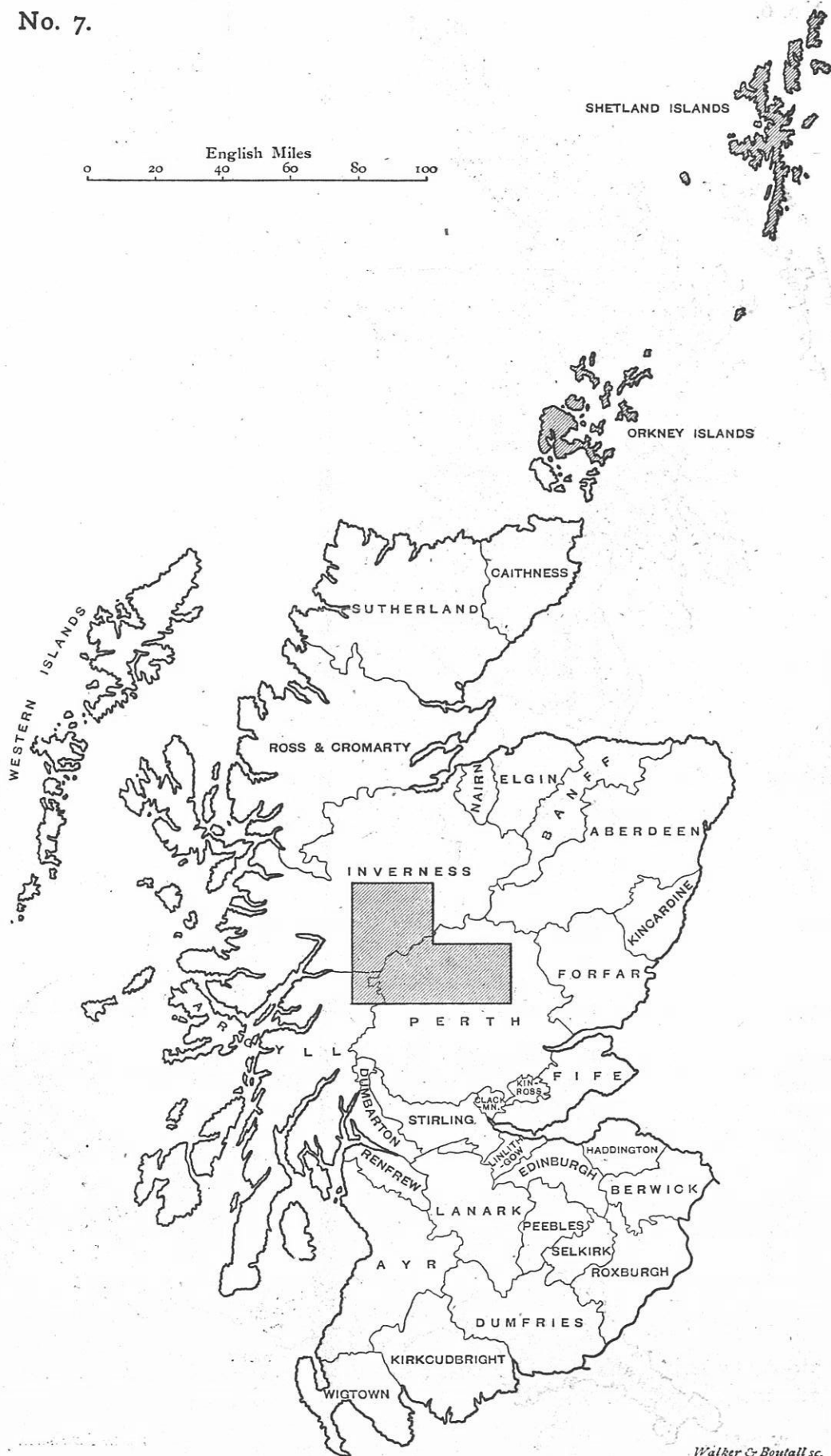


ISLES OF SCILLY

Walker & Dentall & Co.

REVISION OF ENGRAVED 1-INCH OUTLINE MAP OF GREAT BRITAIN.

Revised and published 1893 to March, 1899



SCOTLAND: PUBLICATION OF REVISED 1-INCH MAPS, WITH HILLS IN BROWN.

Published 1898 to March, 1999.

obtaining a military map of the United Kingdom, and in April, 1892, the Board of Agriculture appointed, as has been stated above, a Departmental Committee to report upon the work of the Ordnance Survey generally. Both committees agreed that the military map should be based upon the 1-inch map of the Ordnance Survey, which should be printed in five or six colours, and that it should be on sale to the public. They also agreed, with some minor exceptions, as to the details which should appear on the map. The Treasury at first refused to appropriate any money for this coloured map, but General Sir Redvers Buller, who was then Adjutant-General, and who is a strong advocate of maps in colour, brought pressure to bear on the Treasury, and obtained permission for me to divert £500 of the Survey Vote to making an experiment in the preparation of 1-inch coloured maps. Later on, the Treasury, on the recommendation of the Board of Agriculture, sanctioned the preparation of these coloured maps as part of the regular work of the Survey; the map was not, however, intended to extend beyond the southern counties of England, until it should be seen whether it would be taken up by the public.

But colour printing from zinc or stone was till recently comparatively unknown on the Ordnance Survey, and practical difficulties arose in organizing a staff for carrying it out. The earlier maps produced were not satisfactory, but a considerable improvement has since been effected. Two specimens of these maps, one being an early sheet containing Margate, and the other being the Shaftesbury sheet, which was one of the last done before I left Southampton in March, 1899, are in the portfolio of English maps. The latter is a great improvement on the former, and is a good clear map. Diagram No. 8 shows the progress which had been made in the preparation of these 1-inch coloured maps up to March 31, 1899.

6. *One-inch Civil Parish Map in Colours for Great Britain.* 1898-1899.


Another experiment in colour printing has been the production of 1-inch maps for civil purposes with the parishes shown in colour. They are also used as indexes for the 6-inch and 25-inch maps, and are on sale to the public, but enough time has hardly yet elapsed to show whether they will have any sale as maps. Two specimens, one for England and one for Scotland, are in the portfolio of English maps.

When the next census comes, these 1-inch maps, and a general map in colour on the scale of 2 miles to an inch for each county of England and Wales, a specimen of which was prepared in 1898, may be found to be not only useful but necessary. The latter map was prepared at the instance of the Board of Agriculture. Both maps ought to be of great service for all purposes connected with local government, although, as is mentioned elsewhere, the Local Government Board, the department principally concerned, appears rather to dread than to

No. 8.



PROGRESS ON 1-INCH MAPS OF ENGLAND AND WALES IN COLOUR.

Published in colour 1894 to March, 1899, 

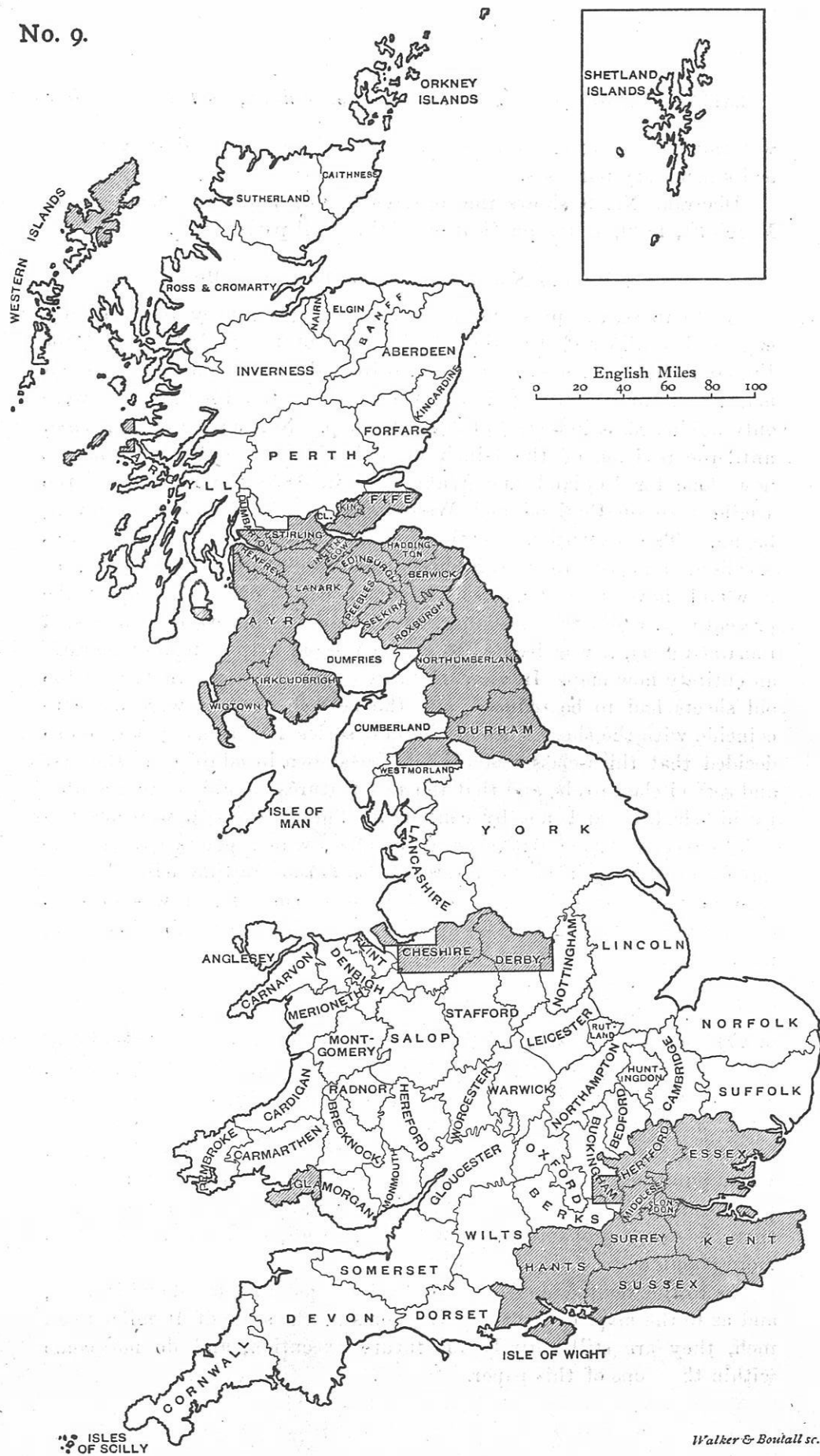
welcome the use of any kind of maps for either its local government or its boundary purposes.

Diagram No. 9 shows the progress which had been made up to March 31, 1899, on the publication of this civil parish map.

7. *Maps on Scales smaller than 1-inch to a Mile.*

As to these, the present instructions of the Survey include only engraved 4-mile and 10-mile maps. Both of these already exist for England and Wales and for Ireland, principally based on the old 1-inch maps, and consequently not up to date, while the 10-mile maps were only published as indexes to the 1-inch map. Neither could be revised until the revision of the 1-inch map should be completed. That is now done for England and Wales, and in 1898 the revision of the 4-mile map of England and Wales was approved, and the drawing begun. The execution of the original map on that scale was excellent and up to the highest standard of engraving, and, as it would have been hopeless to get a better executed map at the present day, while the most important detail on the original map still remained good, it was decided to revise the old map instead of making an entirely new map. In view of future colour-printing, the size of the old sheets had to be reduced, and the new sheet lines were made to coincide with the sheet lines of the new series 1-inch map; it was also decided that third-class roads should be shown in addition to the first and second class roads, and that the hill features should be represented by hill-shading, and not by contours. These decisions were arrived at after consultation with the War Office, which places considerable importance upon this 4-mile map. As the outline edition must precede the hills edition, no decision was come to, or was in 1898 necessary, as to the method of hill-shading to be adopted for this map; nor am I aware that any decision has yet been arrived at; but I very strongly hope that the hill-shading will be by engraved vertical hachures. This course, in addition to being, I believe, the best method of representation, would have the additional advantage of continuing for a time the employment of hill-engravers, who are, as already stated, so much required for the completion of the hill-engraving of the 1-inch map. I hope, also, that this revised 4-mile map in outline will be pushed on as rapidly as possible; the original map in outline, even when published unrevised some years ago, has been one of the most popular maps ever published by the Survey, and in its revised state there is every probability, for various reasons, of its becoming even more popular.

As to the revised and engraved 4-mile maps of Scotland and Ireland, and as to the maps of the three kingdoms on the scale of 10 miles to an inch, they are still entirely for future execution, and do not come within the scope of this paper.



PROGRESS ON 1-INCH COLOURED PARISH MAP OF GREAT BRITAIN.

Published 1898 to March, 1899.

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A good deal of the revised 4-mile map of England and Wales had been drawn under the above decisions, and some of it had been engraved, before March 31, 1899, as shown on the accompanying diagram, No. 10.

Specimens of the old and of the revised 4-mile map are in the portfolio of English maps. The engraving in both cases is above the average in quality. The old sheets contained an area of about 120 miles by 90 miles. The new sheets contain an area of about 90 miles by 60—that is, they each include 25 sheets of the new series 1-inch map.

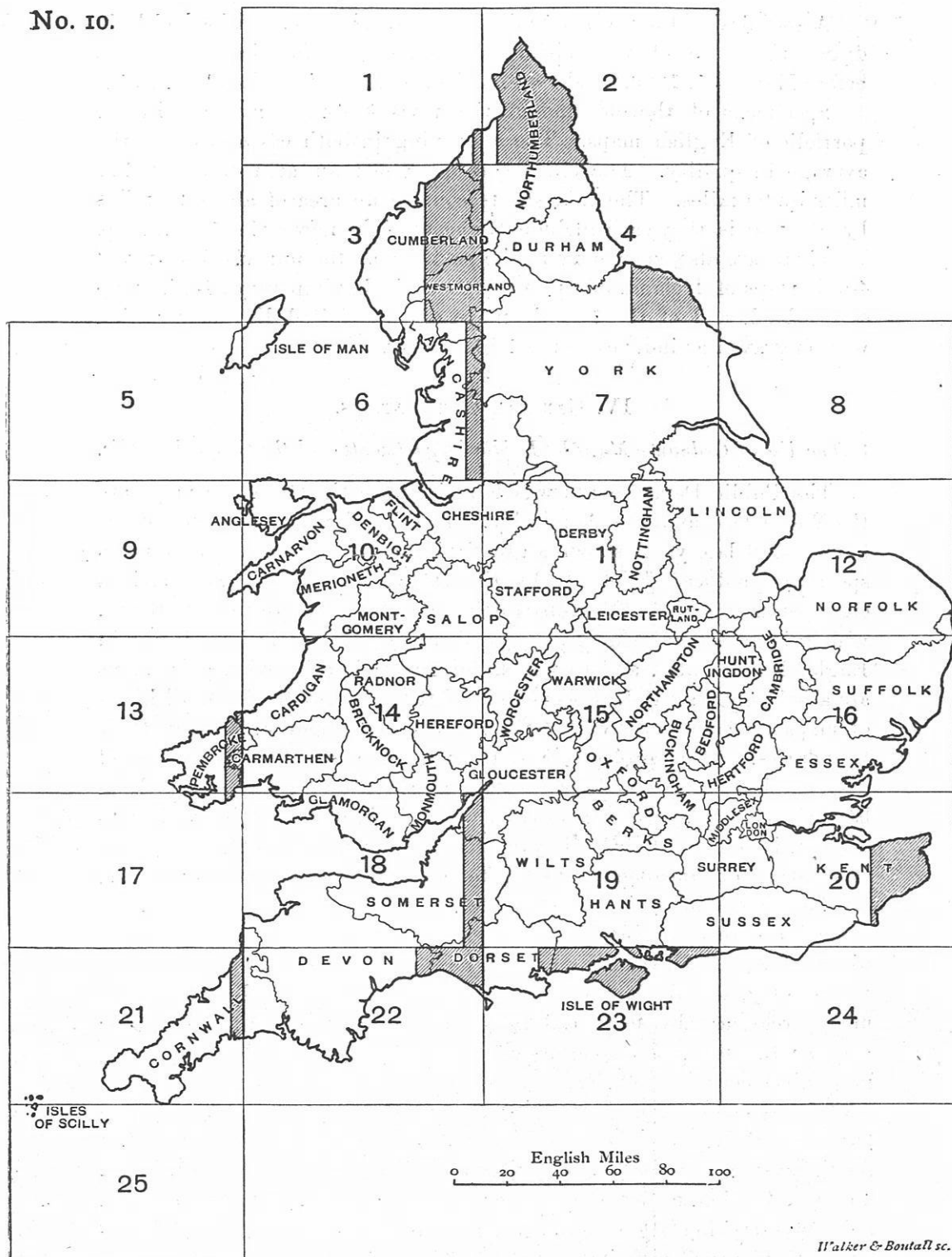
There are also specimens in the portfolio of the unrevised engraved 4-mile maps of Ireland, of a photozincographed (temporary) 4-mile map of Scotland, and of the 10-mile maps of the United Kingdom which were engraved as indexes to the 1-inch maps.

IV. GENERAL OBSERVATIONS.


1. *The Use of Ordnance Maps by Public Departments and the General Public.*

The Public Departments which mainly use the Ordnance maps are the War Office and the Admiralty. The Foreign and Colonial offices have also of late years shown a greatly increasing appreciation of maps specially produced for them by the Ordnance Survey. The curious circumstance is that the department, the Local Government Board, which is most concerned with local areas and their boundaries in England and Wales, and to which for good administration good maps are absolutely essential, appears to have the greatest dislike of all kinds of maps in connection with both Local Government areas and their boundaries. It is probably not too much to say that the chaos of different local areas and authorities under which England has been labouring for many years, and from which it is only now beginning to emerge, is due to the timidity of this public department, and to its reluctance or incapacity to make any intelligent use of maps. Scotland is not much better off. Ireland is, in fact, hitherto the only one of the three countries in which the public gets full practical benefit from its Ordnance maps. There the whole of the valuation of the country, and all decisions as to the boundaries of the Local Government areas, are by legal enactment based on the Ordnance Survey maps; while under a system organized some forty years ago by Colonel, now Sir George, Leach, upwards of five thousand estates have been mapped by the Ordnance Survey for the Land Judges Court. A similar Ordnance Survey organization should undoubtedly have been adopted for the system of Land Transfer by maps, which has been recently introduced in London, but other influences were too strong. A new Government map-making organization has thus been established for carrying out work identical with that of the Ordnance Survey, with the certain result that the cost of both organizations will be largely increased, accompanied by an unnecessary addition to the cost of land transfer.

No. 10.



PROGRESS ON NEW 4-MILE MAP OF ENGLAND AND WALES.

Revised and engraved 1898 to March, 1899, 

As to the published maps of the Survey on sale to the public, I hope they will always be limited to the scales and forms at present authorized, and that maps on all other scales and in all other forms will continue to be left to private enterprise. The publication branch of the survey at Southampton is becoming over-weighted with the work already allotted to it, while efficient firms of map publishers like Messrs. Bartholomew and Stanford are well able to supply the public with maps on other scales based on those of the Ordnance Survey. It seems to me to be in accordance with public policy that they should be encouraged to continue the production of all such maps, if not even, in case of necessity, to assist the Survey in the publication of its own maps. Inferior productions on the other hand, which are, unfortunately, numerous, should be discouraged as much as possible.

2. Style and Quality of the Ordnance Maps.

Time only allows a very brief allusion to this point. The general principles followed hitherto by the Ordnance Survey Department have been the following :—

1. That the accuracy of its maps is the first consideration.
2. That for scales larger than 1 inch to a mile, the more rapid and cheaper processes of printing from zinc or stone are, in nearly all cases, sufficiently good for all practical purposes, and are practically enforced on the Survey by considerations not only of time and cost, but also by the limits imposed by the number of available copper-plate engravers, and by the extent of the publication establishments at Southampton and Dublin.
3. But, on the other hand, for maps on the 1-inch or smaller scales, copper-plate engraving is in the first instance essential both for clear outline and for the hill features, whether the printing is done from the copper direct, or by transfer to stone or zinc; and the engraving for these scales should be maintained at the original survey standard.
4. It follows that the engraving of these small-scale maps should not be unduly hurried; and this applies more particularly to the hill engraving, which is a permanent work, and which should be completed with as great perfection as possible, the estimated time of completion (1902) being extended if necessary.

As to this point of hill engraving, the system introduced in 1889 by Sir C. Wilson of engraving the hills on separate plates is no doubt open to minor objections, but it has been rendered indispensable by the recent demands for coloured 1-inch maps with the hill features.

As to the principles above stated, they will, I think, be found to be supported and corroborated by an examination of the maps of foreign countries. The best of these foreign topographical maps are in every case first produced by copper-plate engraving, both of the detail and of the hill features.

3. *Sale of Maps.*

On January 1, 1897, the charge of the sales of the ordnance maps was, in accordance with the recommendations of a Departmental Committee, appointed by the Board of Agriculture, and of which Mr. Hayes Fisher, M.P., was chairman, transferred from the Stationery Office to the Ordnance Survey Department. This change was mainly owing to the general complaints from the bookselling trade in England, and from professional men all over the country, that they could only get maps by sending to London for them. The results have hitherto been distinctly successful. The net value of the sales increased from about £17,700 in 1896-97 to about £23,750 in 1898-99, an increase of about 33 per cent. in two years. But another branch of the new system, that of sales through post-offices, has distinctly failed. I believe the reason to be that the Postmaster-General offers entirely inadequate remuneration to the postmasters for the rather complicated work they have to do under the rules laid down.

4. *Organization of the Department.*

This has now stood the test of the experience of a hundred years, and although the Ordnance Survey has been successively attached to four different public departments, viz. the Board of Ordnance, the War Office, the Office of Works, and now to the Board of Agriculture, its organization throughout has remained practically unchanged. The Board of Agriculture has taken, and takes, a keen interest in the work of the survey, and this interest has in various ways benefited and advanced the work of the department. But in the future this very interest may easily entail not only that advantage, but the disadvantage of undue interference as to the details of administration. So long, however, as an administrator of the strong practical common sense of the present (1899) President of the Board of Agriculture remains at the head of affairs, this danger is unlikely to arise. Nor, under the same condition, is it likely that the present organization of the survey, or its system of pay and discipline, will be seriously interfered with.

That organization is, so far as I know, absolutely peculiar to the Ordnance Survey as a branch of the public service. Its basis is a military establishment of some 20 officers and some 400 or 500 non-commissioned officers and men of the Royal Engineers. To this military establishment are attached at the present time about 2000 civilians. The civilians vary as to class from unskilled labourers, at the bottom of the tree, to a few able and superior public servants at the top. Nearly all the men employed, military and civilian, are trained to their survey duties by the Survey itself. For the field work, which is the basis of the Survey, with its frequent moves from district to district or from country to country, the military element is manifestly invaluable, if not

indispensable. On general grounds also its value is steadily increasing, in view of the principle which appears now, with the sanction and encouragement of most of our modern members of the House of Commons, to be in course of rapid application to those branches of the Civil Service which have most Parliamentary votes—the principle, namely, that the general tax-payer ought to pay to his civil servants of those branches the maximum of pay and pension without much regard to the value of the work rendered in return.

5. *Future Work of the Survey.*

There is still very important survey work remaining to be completed. I should myself place first in importance the completion of the edition of the revised maps of Great Britain, with the hills in brown, followed by similar work in Ireland; until this is done, as has been already mentioned, the 1-inch revisions cannot be considered complete. Next in importance, I should place the completion of the revised 4-mile and 10-mile maps in outline of the United Kingdom. As to the 1-inch coloured maps of England and Wales, they are mainly required only as military maps of the district south of a line running east and west through Cardigan, and it still remains to be seen whether they will be popular with the public, while as to the hill-engraving of the 1-inch map of England and Wales, its rate of progress and date of completion should, as has been stated above, be made entirely dependent on good quality being ensured. As to the large-scale revisions, the heavy expenditure on them will always require that close attention should be paid to the rate of progress.

But as to the completion not only of the work now in hand, but also of any new work which the Board of Agriculture and the Treasury may sanction for execution by the Ordnance Survey, I cannot be wrong in assuming that in the hands of my successor, Colonel Johnston, R.E., the reputation of the Survey for good work honestly carried out will be fully maintained.

Colonel JOHNSTON: I have only a very few remarks to make on the excellent paper we have heard. I must say, in the first instance, that I am very glad it has been read, as it could not have been in better hands, and the present is a very good opportunity for reading it. The Survey, until a few years ago, was concerned mainly with large-scale work; of late years, more especially during Sir John Farquharson's time, a very great deal of attention has been paid to the small or geographical work of the Survey, with which this Society is more especially interested. I may say I fully endorse the view of my predecessor as to the importance of this small-scale work. An advantage that I hope may arise out of this paper is, that we may get suggestions as to improvements in the survey maps, as the department has always shown itself willing to listen to suggestions or criticisms as to the maps produced. We shall be very glad to receive any to-day from members of this Society; especially I shall be glad to receive them as regards the

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coloured maps, to which Sir John Farquharson referred. The coloured map will very shortly be completed south of a line, speaking roughly, running from Ipswich to Cardigan. A considerable number of sheets are already published, but so far the sale has not been very great. It may be that the public do not know of them. I would like to remark on one or two points raised. Sir John Farquharson referred to the dead weight of the town surveys; in the past that has been a dead weight on the Survey, and I am bound to say, if the revision and resurvey of towns had continued, it would have prevented the Survey doing much other valuable work. At present we are not severely pressed in that way; Carlisle and Cardiff are nearly completed, and Aberdeen and Dundee are both in progress. As regards Ireland, the difficulty in the resurvey is very great. The fourth division, to which Sir John Farquharson referred, has not been formed owing to the calls on the Ordnance Survey due to the present war. As soon as it is over, and we get fully established again, I hope the fourth Irish division will be formed. On the other hand, the revision of Great Britain has so far progressed, that it has been possible to transfer one division from England to Ireland. As regards hill engraving, I may say that the measures taken by Sir John Farquharson have been extended, and I hope that, without any loss of quality, the 1-inch hill map will be completed by 1902, or very soon afterwards. As far as I am concerned, there is no intention of sacrificing quality in any way. It may be of interest to indicate what the Survey has done since Sir John Farquharson's time. As far as the large scale is concerned, practically the whole of England is within the twenty-years limit; that is, no appreciable number of counties have surveys over twenty years old. Scotland is not quite so satisfactory, but the few counties with older surveys are being taken up. The 1-inch revised map of Great Britain was completed last year. We are getting on with the 1-inch revised map of Ireland as fast as possible; the work has been extremely heavy. The present is based on an old survey, and the alterations are extremely heavy; the field work, drawing, and engraving have been very slow, but a quarter of the country has been done. The work is being pushed on as rapidly as possible. In England the 1-inch hills have been already alluded to; we have prepared revised hill sheets for a third of Scotland, and I hope in a year the whole of Scotland will be published. As the revision of the 1-inch map of Ireland is completed, so will the revised maps with hills be completed; it will go on *pari passu*. The revised 4-mile map is being engraved as fast as is consistent with good work. I hope within a year's time it will be practically completed. Engraving the 4-mile Scotland has been commenced, and that will go on as rapidly as possible. Ireland will follow. It has not been possible to do anything with the 10-mile map yet, as it has been thought better to concentrate our efforts on the 1-inch and 4-inch scales. There is one other work I should refer to; it has been heavy—that is, the work for the War Office. Ordnance Survey officers and men have been sent to South Africa for survey work, in addition to others for ordinary Corps work, and the result is we are extremely short. In other ways we have been drawn upon, by men of the reserves and volunteers being called out for army service, and we have had very heavy demands by the War Office for maps; so far we have been able to meet them. I don't think I have anything more to say, except that there is every intention on the part of the Ordnance Survey that its reputation for accuracy and good work shall be maintained.

Sir CHARLES WILSON: I wish to express my concurrence in Sir John Farquharson's excellent epitome of the work of the Survey to the present time, and to say how perfectly I concur in his estimate of the services rendered by General Cooke to the Survey, which have never been sufficiently appreciated. I should also wish to mention what Sir John has not been able to allude to himself, that he

conducted the affairs of the Survey during his period of office in an admirable way. He had many difficulties to contend with, and I think he steered through all of them in a most successful manner. One difficulty the Survey has had to contend with in any new departure has been that of getting people in the different departments of the Government to understand what maps are and what their uses may be. As long ago as 1883, when I had charge of the Irish Survey, I was struck by the great expense to which landed proprietors in Ireland were put in selling their property. They often had to have 25-inch surveys made for the purposes of the court, and had to pay the whole of the cost themselves. I then advised the commencement of a 25-inch survey of Ireland, and was strongly supported by the boundary commissioner, Sir John Ball Green, and by the authorities of the law courts, but the Government would have nothing to do with a large-scale survey in Ireland. When I was appointed director-general I again took up the question, and with very great difficulty was able to persuade the Treasury that a 25-inch survey was absolutely necessary to enable the terms of the Land Acts for Ireland to be carried out. Exactly the same difficulty occurred afterwards with regard to the revision. It is impossible to get officials to recognize the absolute necessity of having accurate maps. At first only a small sum was allowed for revision; but gradually, when questions were asked in Parliament, the vote was increased, and at last continuous revision was authorized. I am glad that such excellent progress has been made in the revision. I am quite sure, from what I know of the present director-general, that the reputation of the Survey will not suffer in his hands, and that he will meet any new departure or any questions that may arise in the best possible way.

Lord BELHAVEN: Sir John Farquharson said the Local Government Board did not make much use of the Ordnance Survey maps, but certainly those who work under them use the Ordnance Survey maps on every possible occasion. For instance, the County Council to which I belong: we have to pay for them ourselves.

Mr. HUGH LEONARD: I may be permitted to say that I think, if the Survey Department took a little more trouble in making known what maps they have for sale, there would be a much larger sale of their maps than there is now. I have been connected with maps for many years, and was not aware that there is a coloured 1-inch map published until to-day. We have had a great deal of information given to us with which I was not acquainted, and I think if any reasonable means were taken to let the public know what is going on, the sale would be increased, and the maps would thus be made more useful to the country, which has to pay for them in the end.

Mr. DOUGLAS FRESHFIELD: Having represented the Royal Geographical Society eight years ago, when the Council made representations regarding the Ordnance Survey maps, I think that we, who belong to the Society, may congratulate ourselves on the very great extent to which the recommendations I was authorized on behalf of the Society to make have been carried out. In the important matter of the use of colour in maps, it appears that great progress has been made. We have heard that there is a very small sale for coloured maps; this arises from want of knowledge by the public. I am convinced that the Ordnance Survey Department are now doing everything they can under the conditions in which they live; they have the same enemy that Lord Salisbury lately mentioned—the Treasury, and the Treasury is encouraged in its traditional policy by the extreme apathy and want of knowledge of the use of maps, which is not confined to the Government departments, as one of the speakers suggested, but extends through the whole nation.

Dr. A. J. HERBERTSON: In the first place, I would suggest that it should be

compulsory for every head post-office to have an Ordnance map of the district framed and hung up on the walls. In the second place, it would be desirable if the Ordnance Survey could issue maps to schools at a cheap rate, in the way the American Government has arranged, where the maps are sold to teachers for school purposes at the cost of printing and paper; I think that would contribute to the popularization of maps, and would very much help all schoolmasters, who find the expense of buying maps very heavy.

Sir JOHN FARQUHARSON: I had something to say to you about the sales of Ordnance maps, but I began to think the paper was very long, and perhaps you would be getting tired of it. Roughly, it was that the Survey had had the sales in charge since 1897. Formerly it was in the hands of three agents, as you know—Stanford for England, Menzies for Scotland, and Hodges and Figgis for Ireland; but the Ordnance Survey took it up in 1897, and the results of that change have been distinctly successful. The value of the increase of sales was, after two years, about thirty-three per cent. But another branch, that of sales through the post-office, has distinctly failed. I believe the reason to be, as is stated in the paper, that the Postmaster-General offers inadequate remuneration for the complicated work the postmasters have to do. I think that you can get the Ordnance maps at a post-office in a fairly large town, if there is no local agent there for the sale of the maps; but the postmasters have to write such complicated forms that very often they make mistakes, and it is as troublesome to the Southampton people as it is to the postmasters themselves. Then, I think, the postmasters are only paid the fraction of a penny, in the same way as with money orders, and the result is that the postmasters don't care for the work. As to making the maps known, I think you will find that in places where visitors go, the local bookseller has a local map of his own that he wants to sell, and if you ask for a map of the district you will seldom be shown an Ordnance map, but a rough map that he has had compiled himself.

The PRESIDENT: The meeting will wish to pass a vote of thanks to Sir John Farquharson for reading his paper, and for his kindness in bringing these interesting foreign survey maps here, which he will allow to remain for a few days, so that a number of people who are interested in them can examine them in detail. The most interesting part of the paper to us, and all those who care for the spread of geographical knowledge, is the paragraph on the sale of maps. It is much to be deplored that the system of sale through the local post-offices has failed, owing to the obstruction and the want of interest in the matter at the General Post-office. Of course, if the postmasters were properly remunerated, the sales by that means, I cannot doubt, would be very large indeed. Since I was examined by the departmental committee of the Board of Agriculture, I have had a register kept of the number of people who come to examine the Ordnance Survey maps in this room. It is very large comparatively; it goes on increasing year by year, and I have very little doubt that most of those who come here afterwards buy the maps. It would not be of much avail, I think, to advertise very largely, as the advertisements would not be seen. I don't see any means of making the existence of coloured maps better known than those used by the different agents of the Survey Department. I now ask you to pass a vote of thanks to Sir John Farquharson for his very interesting paper, and for kindly showing us these foreign maps.