

LETTERING ON MAPS; *A paper read at the Afternoon Meeting of the Society on 12 November 1928, by*

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FOR several reasons the subject of this paper is of peculiar importance at the present time. There is a great revival of interest in maps of all sorts, and especially in those decorative productions of the past which are being collected for the sake of their artistic qualities, of which the lettering is one of the chief. The great renaissance of typography and fine printing which has come about during the past twenty or thirty years again directs attention to lettering, whilst the change in methods of map reproduction calls for some changes in technique, and affords an opportunity to return to the traditional style which was lost during the eighteenth and nineteenth centuries.

Lettering has been very much neglected, and for a very long time cartographers have been contented to follow the conventions of the trade map-engravers, and yet the subject is one of great importance, for apart altogether from artistic considerations, the legibility and therefore the practical value of a map largely depends upon the writing used. Cartography, like every other craft, is based on tradition, and in order to improve the style of modern maps it is necessary to know something of the past history of the conventions we use. A careful study of the history and evolution of map making will repay every cartographer: it is because such study has been neglected that the productions to-day are as poor as they are.

Several influences have always been at work to mould the style of maps—the prevailing fashions in type design and handwriting, and the methods of reproduction used, amongst them. But map makers have always been slow to adopt new characters, and we find them using conventions long after the technical need for them has disappeared. Handwriting, type design, and engraving have all re-acted one on the other, and a thorough study of lettering on maps takes one very far afield.

From the sixteenth century until to-day three alphabets have been used on maps: (1) The Roman Capitals; (2) The Roman Text or "Lower Case"; and (3) The Italic. From the first of these the others have been derived, and in our Roman alphabet we still use the letters which were brought to perfection in Classical times. They were designed for cutting in stone, and the artists and craftsmen of the Renaissance went back to Roman inscriptions for their models. Leonardo da Vinci and Durer took infinite pains to design alphabets based on the classic letters, and the great type designers who followed them worked along the same lines. It was to Trajan's Column that they returned to study the perfection of Roman lettering, and we can still go back to it, in our turn, with advantage.

The Roman text or lower case used on our maps for names of moderate importance, such as village names, was based on the strokes of the reed or quill pen and derives from the monastic texts. It evolved from the classic Roman alphabet, and the letters took the forms with which we are so familiar by the simple process of being written quickly with a pen. The Italic alphabet in which most of the names on maps are written, and which was used in its pure form until the end of the eighteenth century, was directly derived from hand-

writing, the once fashionable pointed Italian hand. The Map engravers copied the hand-written script just as the early type designers did. Both the Roman text and the Italic were developed by calligraphers from the Roman alphabet, and afterwards adopted and modified by type designers and engravers.

From the latter part of the fifteenth century until well on in the nineteenth, the only method of map reproduction was engraving on metal plates. Before the introduction of map engraving on copper about 1480 wood blocks were used, but admirable as some of the woodcut maps are as works of art, they seem to us very archaic and crude attempts at map reproduction when compared with the results obtained by the metal engravers. By the middle of the sixteenth century copper had replaced wood, and for nearly two hundred years cartographers and map engravers were artist craftsmen who looked upon it as part of their duty to make their productions beautiful as well as accurate and practically serviceable. From the first they realized the importance and decorative possibilities of fine lettering. They took the alphabets I have described, which had been evolved by the penmen, and reproduced them on copper. The cartographers usually supplied the engravers with fair drawings which were copied stroke for stroke, and it was a long time before the tradition of the reed-pen writer was superseded; for nearly two hundred years engravers continued to imitate pen strokes with the Burin, and the old style Italic type was used until the end of the eighteenth century.

The map designers treated the Roman capitals with respect. These were carefully drawn and not freely written like the Italic and Roman texts. A looser and more calligraphic form of them was evolved which lent itself to decorative treatment; these "swash" letters, as they are called, were often adorned with flourishes which were obviously the work of the penmen. Names written in the swash letters were a characteristic feature of sixteenth and seventeenth century maps, and served, in company with mermaids, sea monsters, wild Indians, and ships in full sail, to fill the blank spaces.

In the latter half of the eighteenth century a change took place, and it was not a change for the better. The pointed Italian handwriting began to give place to the commercial round hand taught by the writing masters. This hand of the copy-books, with which we are all too familiar, is often called "copper plate," indicating that the engraver was beginning to set the style for the penman instead of copying him. The change can be followed very clearly on some of Isaac Taylor's county maps on which round hand replaced Italic. The introduction of steel pens enabled writers to imitate fine engraved lines very easily, and the ultimate result on our maps was the substitution of "stump" for Italic. The former is really a compromise between the flowing copper plate round hand and the authentic Italic script, and, so far as I know, its use has been entirely confined to maps.

This was not the only change which took place. Both the Roman capitals and lower case were modified, hair lines were introduced, and the proportions of the letters altered. The Roman alphabets were not only ruined æsthetically but as the degeneration proceeded they became less legible. In the case of the capitals, the letters became narrower in proportion to their height, the very fine hair lines and thickened down-strokes lost all relation to each other, and the serifs came to be so exaggerated that instead of emphasizing they con-

cealed the distinctive forms of the letters. Perhaps the lower case did not suffer quite so badly, but here, too, hair lines too thin to support the down-strokes were introduced, and the fine balance of the old letters was lost. The same influences were at work amongst type designers, and books as well as maps were printed in ugly illegible type until a world with impaired eyesight at last revolted against the final atrocities of the mid-Victorian printers and, returning to the sixteenth and seventeenth centuries, to Venice and Amsterdam for models, brought about the great revival of fine printing, the results of which we are enjoying to-day. The importance of this revival cannot be over-estimated. Book printers, advertisement and poster designers, architects, shop sign and fascia writers have all gone back to the traditional style of lettering, but cartographers have been slow to abandon the convention of the engravers. There is a distinction between tradition and convention which has been well defined by Mr. Clive Bell. "Tradition," he says, "is the expression of accumulated experience, whilst conventions are no more than the tricks and habits of a recent past standardization for general use." The engraving conventions were undoubtedly useful standardizations for engravers; but the question we have to ask ourselves is: "Are these engravers' conventions still useful to us?"

The lettering on the earlier engraved maps of the Ordnance Survey is very fine. Although the style had altered, it still retained much of the spirit of the old cartographers, but gradually that influence has faded. The introduction of lithography made a great change; until well on in the nineteenth century the only medium for printing maps was the copper plate. The engraved copper plates were printed from direct, and the results were very fine indeed. Of course the process of printing was slow, and as soon as lithography came into general use it was adopted by map printers, who found that it was easy to transfer from their copper plates to stone and so avoid re-drawing, and to retain the copper plates as records. So it came about that engraving has been used for small-scale maps until quite recently. The last revision of the 1-inch map of England and Wales was carried out on engraved plates, and we still actually print sales editions from the copper plates of the 1-inch small sheet series and the Ordnance Survey map of the British Isles on the 1/1,000,000 scale. But, although it had a long respite, the copper plate as a means of map reproduction was doomed when lithography was discovered. It has recently been finally abolished on the Ordnance Survey and the Helio process has taken its place, as it is doing all over the world.

As long as great skill and care were used in transferring, and stone was the printing medium, the quality of the work obtained by transferring from copper was good, although it lacked the rich effect combined with clear definition which the direct print from copper afforded. Zinc plates gave less satisfactory results; the grained surface tended to break up the fine lines and to thicken the down-strokes, whilst the smaller white spaces in the letters were apt to fill up in printing. The introduction of colour gave rise to fresh difficulties. The engraved maps had been designed in black and white, and the imposition of strong colour on the roads upset the balance and often obscured the legibility of the names. However, the lettering remained on the plates as it always had been.

Now the situation has entirely changed. Heliozincography has set the draughtsman free from the limitations imposed by engraving. But we are very conservative creatures, and draughtsmen have not yet realized the possibilities which the Helio process opens for them. Having in the past drawn for engravers, they continue to copy the engravers' lettering, although it is even more unsuitable to the Helio process than it was for transferring. The very fine up-strokes which were the draughtsman's pride, besides being difficult to draw and spoiling the legibility of the writing, photograph very badly and need the expenditure of a great deal of labour on the negatives.

The Ordnance Survey is about to commence the revision of the 1-inch Map of England and Wales. The new map will be replotted and redrawn for reproduction by heliozincography. It is a great opportunity to restore the traditional style of lettering and decoration, which, as I have tried to show, has been degenerating steadily for the past 150 years. Before undertaking the task of designing a set of alphabets for Helio reproduction, it is well to be quite clear as to what qualities such alphabets should possess, but great care must be taken to guard against the reckless introduction of styles hitherto untried on maps, merely because they are easy to write and reproduce.

The essentials to aim at are, I think :

1. *Legibility*.—The letters must not only be legible when standing alone but also when superimposed upon the detail of a map.

2. *Suitability for reproduction by the photographic process which is to be used*.—The names should not need retouching on the negative, should go down easily on to the zinc plate, and should be free from any tendency to clog and thicken in rolling up.

3. *Good style and intrinsic decorative qualities*.—The style of the lettering on a map should be as good as that exhibited by the best founts of type in use by book printers. As legibility is one of the characteristics of every really good alphabet, the first aim will be attained if really good style is achieved.

4. *Distinction and contrast*.—Certain classes of names should be clearly distinguished and the different types of alphabets used and their gauge and spacing should achieve this.

5. *Harmony of effect*.—The alphabets appearing on any one map should harmonize with each other, with the detail of the map, and with the lettering and figures used in the margin for the title, imprints, references, and so on. This is a point which has been almost forgotten altogether. The more styles and sizes of writing that can be crammed on to a sheet the better pleased the designers seem to have been. The use of heavy block letters (known as Egyptian, but who knows why?)—and various other sans serif or grotesque characters, and even the sacred stump itself side by side with Roman, is bound to destroy the general effect and style of a map.

Keeping these points before us, we have tried to design a set of alphabets for small-scale maps reproduced by the helio process. Mr. Ellis Martin has made a careful study of lettering and type design, and these alphabets of his are based on the traditional characters which have been used on maps since the fifteenth century, but he has tried to adapt them to our special needs, I think with success.

Examining the Roman capitals first, the chief thing that strikes one is that

the proportion of the letters has been restored: during the nineteenth century the tendency was to make each letter fill about the same space, but the carver of Trajan's Column, Leonardo, Durer, and the medieval type designers are safer guides to follow than the printers of the early Victorian era, and the narrow S (based on two circles), the wide O, M, and W, together with a hundred other more subtle points, all make for legibility and beauty. The serifs give distinctive form to each letter without being too obtrusive. There is no violent contrast between the up and down strokes, and the former are stout enough to be easily seen from a distance. The white spaces within the letters are well designed. In a good alphabet these will always be beautiful shapes contained by harmoniously disposed curves; abrupt angles are avoided, and the containing lines flow smoothly into one another.

The lower-case alphabet which goes with these capitals is based on pen strokes. An effect of lightness and grace is obtained by the natural tapering of the strokes to a point instead of by a violent change from the thick down-stroke to a hair line. Care has been taken to keep the enclosed white spaces simple and strong in shape and so to avoid clogging. So far we have followed the type designers pretty closely.

The Italic alphabet has been based on the traditional Italic alphabets but adapted to our special requirements. The old style Italic letters are very narrow, and beautiful as they are, they are apt to lack legibility on the map. The constricted form of the letters narrowed the white spaces, and these would be apt to clog and fill up on the zinc plate. Therefore Mr. Martin has produced a rounder and, I think, a more legible letter which, whilst avoiding the faults of stump, retains its virtues. There are no hair lines, and the mechanical horizontal serifs of stump which were quite out of keeping with the flowing character of the text have been replaced by curves. The distinctive form of the g and some other letters has been restored, and the letters are finished with a strong tapering stroke which will photograph and reproduce well, instead of with the curving copper-plate hair line which was characteristic of stump. The Italic capitals provide another distinctive alphabet, having the same characteristics as the Roman capitals. I have refrained from mentioning the Old English and Gothic texts. These are used for the names of antiquities on Ordnance Survey maps. They are difficult to draw and reproduce and their style is at variance with the Roman and Italic alphabets, but long use has rendered them indispensable to us. On the new maps they will be simplified as much as possible.

So far this paper has dealt with lettering engraved or written by hand on small-scale maps and on small-scale maps of a certain type: sheets of a national map executed in what may be called the grand style. Such a map calls for the greatest accuracy and fineness of execution, and a sense of accuracy and precision should be conveyed by the style of the lettering and can best be achieved by handwriting. Considerations of cost and time or lack of expert writers often make it necessary to resort to typing, but the principles which I have tried to make clear apply as well to type as to written lettering. Nowadays the choice of type faces is very wide. There are so many beautiful old style founts on the market that there is no excuse whatever for using the inferior ugly modern and sans serif faces which disfigure so many of the maps which

are being produced, both in this country and abroad. If care be taken, a set of alphabets possessing the characteristics which were postulated as essential can be selected, and these will approximate very closely to the written letters designed by Mr. Martin.

Type will never look as well as good writing, but good type is infinitely preferable to inferior handwritten lettering. It is sometimes possible to type the bulk of the names on the map (the less important names which appear for the most part in Stump and Roman lower case), and to write the fewer but more important and prominent names which are in Roman capitals and those where careful spacing and placing make it impossible to use type successfully. In this way the "hand made" look of the map can be preserved; but at least one expert writer is needed. The saving of time effected by the substitution of typing for writing is not as great as might be imagined, and the difficulty of training expert writers has been much exaggerated. Given a letter which can be formed by natural strokes of the pen, a little sound tuition and a really intelligent interest on the part of the draughtsman, and a writer can be made efficient almost as quickly as a typer.

Maps for reproduction by the helio process are usually drawn on a larger scale for reduction, and it is very necessary to consider the effect of reduction on the writing used. Each size of type is designed specially. An 8-point letter is designed as an 8-point letter; it is not a reduction of a 12-point or an enlargement of a 6-point character. If a 5-point alphabet is enlarged to say 10 point and compared with the 10-point alphabet of the same fount, the differences between the two will be seen to be very great. As the size gets smaller the letters must be wider and more open, the interior white spaces larger, and all the black portions thicker in proportion with less contrast between the up and down strokes, whilst the size of the serifs must be exaggerated. It must be remembered that the result of all this is to make the smaller alphabet the same in appearance as the larger.

It will be seen at once that any type face will suffer more or less from reduction, and it is better to have alphabets specially designed for reduction to the sizes which they will ultimately assume on the map. If this is impossible, letters on the wide, open, heavy side should be chosen for reduction, and of course the same principle applies to hand lettering. It is very difficult to persuade draughtsmen of this. They naturally take a pride in their work, and it is the appearance of the drawing and not that of the ultimate reproduction by which they are apt to judge their own achievement. It is fairly safe to say that a drawing which looks just right will not make a good reduction. There is another danger which a draughtsman who is proud of his writing is liable to fall into. He is often inclined to sacrifice detail to names. Of course this is a grave fault. The map is the important thing, and no name, however well written, should obscure or crowd out any feature which ought to be shown. It sometimes happens that a choice has to be made between an important name and a piece of detail. Such a case should be decided on its merits, but one's bias should always, I think, be in favour of making the map complete at the expense of the names.

The subject of Lettering is inseparable from that of general decoration, for writing is one of the chief factors which distinguish a fine map having a dis-

tinct æsthetic value from a mere diagram, which, however accurate it may be, makes no appeal to the imagination and rather offends than pleases the eye. There is no merit in ugliness, and, as I have tried to show, good lettering makes for legibility and efficiency, and this applies not only to the writing on the face of the map but also to that in the margins. The title, the arrangement of the scales and references and the characters used for these and the marginal notes and imprints are all important. Clear readable type, harmonizing with the map itself, should always be used and the marginal information should be grouped in such a way as to make reference easy, and to enhance the balance and general artistic effect of the sheet. The exuberance of decoration on some of the old maps was a fault, but we have gone too far in the other direction. A well-designed decorative border which sets off a map to advantage and the enclosure of the title, scales and references in cartouches, may actually help to make reference easy by guiding the eye to the information sought. Here again it is better to try to carry on and develop the tradition of the great map designers of the past than to try to invent something quite new or to apply decoration to maps which was originally intended for other uses. It is safest to take the strapwork map ornament of the sixteenth and seventeenth centuries and to modify it to fit modern requirements, carrying it further and developing it if we have the ability to do so.

I have said nothing about large-scale plans, but of course lettering on these is quite as important as that on topographical maps, and the same principles apply. There is a fine tradition to be followed here too, for many of the seventeenth-century estate plans are very beautifully executed and they repay careful study. Recently the old style letters have been introduced into the Ordnance Survey 25-inch plans with success, and a better balance of weight between names and detail is being aimed at.

Much has been done during recent years outside the Ordnance Survey to improve the style of maps by a return to the traditions of the past, but the problems of a National Survey are peculiar to themselves, and the freedom of style and experiments in decorative lettering, which can be used with effect on single sheets or maps illustrating books and journals, would be out of place on a series of official maps. If we adhere to the best Roman and Italic types, and adapt them intelligently to the requirements of our reproductive technique, I think we shall find that we have carried the art of cartography a step forward, and it may even be possible to bring about a revival of fine map-making comparable to that which we have seen in the sphere of book-printing and typography.

DISCUSSION

Before the paper the CHAIRMAN (Admiral Sir WILLIAM GOODENOUGH) said: I have great pleasure in introducing to you Captain Withycombe of the Ordnance Survey, who will lecture on "Lettering on Maps."

Captain Withycombe then read the paper printed above, and a discussion followed.

Colonel WINTERBOTHAM: I think that map-makers in England and throughout the Empire will feel that they owe a considerable debt of gratitude to Brigadier Jack and his staff. The question of lettering on maps is a burning one, and I can illustrate it no better than by telling you that every small letter that we have

recently drawn on our War Office maps has been costing us an additional three-pence to cut clear on the subsequent negative because it is written in a style which is not proper to modern photo-mechanical method. The alphabets now provided are pleasing, and if there are remarks to make they are only on minor detail. It is, no doubt, largely a question of individual taste.

Captain Withycombe has referred to Trajan's Column and to the benefit we should derive by a return to early times. One feels rather a vandal in suggesting that possibly the twentieth-century Englishman may, on occasion, letter as well as an early Roman. I would not like to press the point, but there may be some who would agree with me. Taking one or two of his letters in detail, there are some that are not quite convincing. There is about the letter "C" a certain Teutonic amplitude which is certainly not familiar, and I am not sure I quite like it. Contrast it with the elegance and female slimness of the E's, S's, and B's. If we are to hark back to the past, I have no objection so long as we retain only what is really useful; but I would not like, on my own maps, to introduce little twirligigs between the *s*'s and *t*'s as is done in the alphabet exhibited; nor do the *ffi*'s or *l*'s of the Italic seem to me clear and legible to the modern eye. They remind one rather of those *s*'s one used to find in old-fashioned books of carols that certainly went with the spirit of a festive Christmas though unsuitable for a map. If one wants to be artistic in map-making I think one must remember that the art of lettering is to make it so neat and unobtrusive as not to absorb attention. Names are given to signify something in the topographical sense. I do not think one would wish to make a J or K so distinctive as to draw the eye as, for example, would a man in Bond Street in pink trousers.

With these few remarks let me add again that I think the alphabets are a real advance, that they have been employed already in certain War Office maps, and that all will join in being grateful to Brigadier Jack and his staff for giving us so handsome a lead.

Brigadier E. M. JACK: Colonel Winterbotham, having made his criticisms, has gone! There is one small point I might mention. Captain Withycombe spoke of the helio process, and it is possible some may not know what he meant. It is the reproduction of a map by photography. It is possible to draw the map, write freely on it and photograph it. Our old method of map production was by engraving on the copper plate. The difference is between the use of the graver and the use of the pen; that is to say, the introduction of heliozincography enables one to use the pen freely, as in old days.

Captain Withycombe mentioned that the Ordnance Survey were following type design rather than writing, whereas the Royal Geographical Society had been following writing. There is a very good reason for the Ordnance Survey following type design: we have to use type largely, whereas the small maps and plans reproduced in the Society's *Journal* can be done entirely by writing. The Ordnance Survey is bound to use a great deal of type; it is used a good deal on small-scale maps and almost exclusively on large-scale maps. So that we are committed to type and therefore it is quite right for us to follow type design. As Captain Withycombe pointed out, there are many beautiful type designs, and we are trying to get both our writing and type back to the old standard of beauty. In fact, that is generally our policy now on the Ordnance Survey. We are trying to restore, as far as possible, the beauty of the map without in any way impairing its clearness or its usefulness. I think you will see examples of the beginning of that in some of our recent maps. Take the new edition of the map of Roman Britain. The border, to begin with that, has nothing to do with writing, but the mere addition of that very pleasing border has made an extraordinary difference to the appearance of the map. If you examine some of the

writing and the numbers for latitude and longitude you will find the lettering very pleasing. There are many improvements to be made yet, but we are, I hope, making a beginning. If you compare the second edition with the first you will see a great difference in the border and also in the names. Of course, as Captain Withycombe said, we have our great opportunity in the new edition of the 1-inch map of England which we shall be commencing shortly. We are going to try and make it, as much as is in our power, beautiful and at the same time just as clear and good as the old engraved 1-inch.

There is no more I can say, except that I am very grateful to Captain Withycombe for the work he has done. I think we are extraordinarily fortunate in having him in charge of this work, because he is an artist by profession and by nature, in addition to being a surveyor. We also owe a great debt to Mr. Martin, who has put a great deal of thought into his work, and without thought no amount of work is of any value.

Mr. REEVES: A great deal of the good resulting from discussions of this kind would be lost if those who take part in them were not at liberty to state freely what they honestly think about the matter under consideration, which is what I must try to do this afternoon, although I regret to have to disagree from some whose judgment I greatly respect; and am especially sorry to differ from my honoured chief, our secretary, Mr. Hinks.

This subject of the "Lettering on Maps" is an important one, and over thirty years ago I remember its coming before the Society, with the result that a specimen sheet of styles of writing to be used on maps was printed and served as our guide for years afterwards. Then came the specimen sheet of lettering for the 1/M International Map of the World, which, with certain modifications, has been followed until recently in maps drawn by the Society's draughtsmen. This was the final outcome of much deliberation by an international committee, and it seems to me to be a serious matter to set it aside.

The necessity of having any names at all on a map is to be regretted, for next to accuracy, clearness is the important thing; and it must be admitted that the physical features and topographical details are seriously interfered with by covering the map with place-names. Still, since names there must be, care should be taken to see that they do not obscure the map more than can be helped. They should be as plainly and concisely written as possible, with no unnecessary ornamental decorations or flourishes. We do not want to attract attention to the names, but to the map features.

Although it may be all right on engineers' plans, and sketch-maps for page blocks with few names, I consider that writing with flourishes or "swank" or "swash" letters, or whatever they are called, would be altogether out of place on small-scale maps with many names and full of detail, such for instance as a good atlas sheet. On such maps the names must be as small as is possible with legibility, and there is no space to spare for unnecessary flourishes. I say this especially because it is proposed to use ornamental lettering, not only for the names on sketch block maps, but on others for which I believe it to be quite unsuitable and impossible.

While it is doubtless true, as Captain Withycombe states, that map draughtsmen have at times in past years got into bad ways with regard to lettering, yet on the whole it is not the case that the writing of names, like all other branches of cartography, has gradually evolved from crude beginnings to what has been found to be generally most suitable for the purpose; and that the lettering on the best type of map of the present day is a sort of "survival of the fittest"? Take, for instance, many of the maps published by the Geographical Section of the War Office, those of the Colonial Survey Departments, the maps of good atlases

of recent years, or some of this Society's best folding maps in the *Geographical Journal*; it seems to me that in these little more can be desired in the way of clear and well-written names. As pointed out in the paper and shown in the bad examples exhibited by Captain Withycombe, the chief faults of the so-called "stump" writing are that the serifs are frequently too long, and tend to run into one another, and the fine hair lines are too thin and the down strokes too thick; but these faults are due to the writing being badly done, and have nothing to do with the style of writing itself.

Things are not necessarily best because they are old, and I fail to see why we should go back to Trajan's Column with its disproportionate letters, some fat and others thin, for good examples of our capitals; nor do I see why, because in early days italics were written in an ugly pointed style, followed afterwards by our grandparents, we should imitate this on our maps to-day. The modified forms of this lettering Captain Withycombe proposes to use on the new Ordnance Survey map is, of course, a great improvement on these early types, at any rate so far as maps are concerned, but I believe they will not be found so clear and generally suitable as the best styles of writing on former Ordnance Survey maps, especially for the smaller names, and will occupy more space.

To have all the names on a map in one kind of writing is, I feel sure, a great mistake. Of course, a needless multiplicity of styles is objectionable; but to my mind nothing helps more to render a map clear and legible than to have different styles of writing for different features. For instance, in a map of Central Africa or Asia, to prevent confusion it is most important that the same style of writing should not be used for districts as for tribes, ancient sites again should be written in another style, and the names of mountain ranges and peaks, particularly when there is nothing but the name to indicate their direction and position, should be written in a special type, and for this purpose, in spite of all that has been said to the contrary, I believe the most suitable to be the Egyptian or block letter. It is compact and has a suggestion of solidity about it that is very appropriate.

We must not spoil the general clearness and utility of a map for the sake of some supposed artistic effect, which after all is a matter of opinion and taste.

Names printed from set-up type instead of being written are as a rule unsatisfactory. They are too rigid and run roughshod over all physical features; whereas written names are more pliable, and with a little care can be arranged so as to avoid covering up important details.

Finally, as regards borders. For my part, and I know many agree with me, there is nothing better for any map than a simple, restrained, and well-drawn line border, such as we have been accustomed to; but whatever may be said about elaborate ornamental borders for large maps, I feel sure it is a great mistake to surround a small block map measuring say about 4 inches, by a broad and elaborate border. In my opinion it frequently gives the map a ridiculous appearance, besides which it takes up space which could be much better utilized by having the map on a larger scale.

Mr. HINKS: You will perceive that my excellent colleague and old friend, Mr. Reeves, is a Die Hard; and any one who tries to introduce considerable reforms, as he supposes they may be, into the maps produced by the Society has an uphill task before him. Nevertheless, you will see on the screen some specimens of work done by our junior draughtsmen, more or less, you may say, at my instigation, and you will have noticed that in the *Journal* of recent years a style of map-drawing has been used which contrasts very forcibly and vividly with the style of map produced, under Mr. Reeves' care, by our senior draughtsmen. So that we are at present in the interesting position of having two schools of thought

in this Society: one represented by those who have been here long in the Map Department and who are wedded to the style which Mr. Reeves remarks was laid down some thirty years ago, and the other represented by those who have been less long in the Society—I for about fifteen years and my junior draughtsmen for periods ranging from two years to eighteen months. What we may call the junior branch is at present experimenting.

It was a first principle, when I started thinking out how the appearance of our maps could be improved, to get away from what I am bound to feel was an extreme mistake made by the Committee on the International Map. Mr. Reeves considers that their pattern should be taken as sacred. I do not, and if only for this reason: that it was the result of the consideration of an International Committee. If you think what would happen if you set an International Committee to paint a picture you will, perhaps, be inclined to agree with me that an International Committee is not necessarily the best body to get a harmonious and consistent style of map-drawing. Naturally every one likes to have a bright idea and to distinguish some particular feature by a new style of letter. Consequently, there are in the specimen sheet of the International map something like twelve or fourteen entirely discordant characters. What I feel most strongly is that one should never use that style of letter which is called, for no reason at all, Egyptian—the solid block lettering—for physical features like ranges of mountains. I was sorry to see in the characteristic sheet of the new 1-inch map of England which, in many respects, marks extraordinary improvement, that Captain Withycombe has allowed that style of lettering for hills.

It is maintained by Mr. Reeves and other friends that you must try to distinguish the different features by different styles of lettering. Those of us who differ from him maintain, on the other hand, that if the map is drawn properly it is obvious when the name belongs to river or hill, and there is no need to alter the style of lettering for that, any more than there is necessity during the course of a novel to alter type for a pathetic passage or to have larger capitals for the heroic episodes. It is not artistic and not necessary. That is, however, a question we shall hardly ever be likely to agree upon.

Let me come to details. Some time ago the Society had the great good fortune to acquire the Hondius map, and, looking at its style of engraving, it appeared to me that nothing more beautiful had ever been done. I do not think that it was necessarily the method of Hondius; he was an admirable engraver, but I believe his engraved letter was based upon the best penmanship of the time, and that it is a mistake to say that we cannot now imitate by writing, and get an effect equal to the Hondius letter, because Hondius was a copper-plate engraver. I believe you can argue in a circle, as Captain Withycombe has pointed out. It is said that Trajan's Column contains the most perfect monumental lettering, but there seems to be every reason to argue that the letters were really cut from pen designs. The character of those letters belongs to the pen, and I maintain that the character of Hondius belongs to the pen too, although so beautifully engraved on copper.

We have tried to develop for the Society's work a style of lettering based upon the map of Hondius, and I should like, very briefly, to put a few slides upon the screen. You will see Captain Withycombe's idea and Mr. Ellis Martin's idea of the best type of italic for the map. Some of my youthful draughtsmen have rather rapidly made a specimen which has certain considerable differences from the style of the Ordnance Survey, due to the fact that the Ordnance Survey use steel pens whereas our draughtsmen use quills. The disadvantage of using pens is that you have to draw. When you want a thick stroke you put a fine line and another parallel to it and then fill up between the two, and you do about a fifth

of the number of names during an hour that you do when using a quill. It seemed to me one of the essentials of my scheme to get something that could be done rapidly. Certainly the work of the Society's junior draughtsmen has produced some very rapid results. You will see two attempts by some of my junior colleagues to write the names upon the Ordnance Survey specimen types in the style of the Hondius Italic, and I quite humbly submit to the Director-General of the Ordnance Survey and his staff that that style of Italic is, on the whole, more legible as well as being considerably easier to draw than the style which has been submitted in the very interesting sheet before us. When you get up to the Roman capitals, of course the biggest must be built up, and there is not so much difference, but the small ones are done by single strokes of the quill instead of multiple strokes of the pen. That is a point that has to be borne in mind as very important. The use of the quill enables one to make very good Roman capitals indeed, but of course produces a slightly different shape of serif.

In the Roman alphabet designed by one of our draughtsmen for making up with the quill the last two letters show how the serifs are formed; and how the letter is built up and then filled in, the idea being that each thick stroke is made of three thicknesses of the quill.

Then we come to what Mr. Reeves has so happily miscalled the "swank" capitals—a delightful expression. I think it is a mistake to suppose that anybody wants to swank with those capitals when the map is crowded, but they have the advantage over the ordinary capitals that the Arabic has over the Roman. You know that when the Turk wants to write "Turkey in Asia" he writes it right across the map, and that is exactly how the seventeenth century used the "swash" capitals. When you want to carry a name across you do the "swanking"; when you do not, you keep yourself compressed just as before. This style of lettering lends itself to rapid work.

The next picture shows characteristic signs which were lettered up very rapidly indeed without any laying out in pencil. One gets the line, not of course as carefully as would be given in a finished map but, at the same time, I maintain quite good enough for a great deal of sketch-map work such as is used in newspapers and books, which can be done in this style of lettering very much quicker than any other.

For about eighteen months or two years now we have had all the line blocks in the *Journal* done in this style, and though I am far from saying that we have arrived at anything like perfection, there are certain points about it. Let me show you a map which has not yet been reproduced in the *Journal* but which was used at the lecture on Monday last. The map contains about one hundred names. It was, of course, sketched out in pencil first, but the hundred names were written in a day, and I venture to think that in the built-up system of the Ordnance Survey they could not have written one hundred names in a day. I do not say the mechanical production is as good as the Ordnance Survey would have achieved, but I maintain that there is a certain freedom and pleasing character about it which is better than the Ordnance Survey achieve. At any rate, it is more useful for putting in blocks in the text when illustrating books. I am not prepared to say it is more useful for a highly finished map. The map shows what I was remarking: that if you want to write a mountain name, for instance the Qarliq Tagh, it can be written just as well in that style of capital, and there can be no doubt that you mean, in that case, a mountain.

In the next slide you see how well the Italic lends itself to the curved names along rivers. No one maintains that that river name ought to be written in a totally different style of Italic from the others, and it seems to me that if they do not maintain that they can hardly expect us to agree that the mountains must be.

One of the points in which we are likely to go wrong from want of technical experience is in the question of filling up in printing, and from time to time I have noticed that my younger draughtsmen have been getting away from the Italic of Hondius, which is rather close and pointed, and making a rounder style of Italic, because I believe they find that it reproduces rather better, and upon that I simply have to admit that we are still in the experimental stage. It is a mistake to suppose that this rapid style of drawing with the quill pen is applicable only to the Italic. It is possible to make a very useful kind of lower case Roman. The words "Shanghai" and "Hong Kong" have been written with single strokes of the quill, not built up, but yet very serviceable Roman, and the word "Mongolia" across the map is done with single strokes of the quill, and although not so machine-perfect as built-up letters yet, as I say, it takes about a fifth of the time.

Finally, as to the decorated borders. All these little blocks have been made with this simple decorated border, merely done by blocking in the degree or 10' divisions. I am bound to say that I do not think that the fact that you might get that map 5 per cent. bigger in the text of the *Journal* if there was not that decorated border will convince me that one had better sacrifice the border and have the map 5 per cent. bigger, because I think that the border and the good style of numbering in the margins are extremely important.

I noticed, with some horror, that Captain Withycombe had left upon his characteristic sheet the block numerals that are, perhaps, the most illegible style of numeral ever invented by a wicked world. It has been known for many years past that in printing logarithm tables it is necessary to go back to the old numerals because they are so much more legible, and I would ask Captain Withycombe to consider the desirability of abolishing the block figures altogether.

There is just one more point, namely, the unnecessary of having a different style of lettering for mountain names. It is asked, What if you have a single mountain? Well, there was an excellent invention made by either German or Austrian cartographers some time ago—about the one thing they have invented in cartography—and that is writing the names of peaks on a curve, with the spot to which the height belongs, and then the height in figures below. That seems a very compact way of writing the essential information about a mountain, and when so written it is not possible to maintain that it is anything else. It is not necessary to have a number of different styles of lettering if the job is done correctly. But all these are matters of choice upon which we are apt to differ bitterly, and one can easily talk too much. I would say, in conclusion, that those who are interested might be glad to look at some of the specimens of the recent drawings we have done at the Society and perhaps talk to some of our draughtsmen about them.

The CHAIRMAN: I am obliged to leave, but before doing so I would like, on behalf of the Society, to tender most sincere thanks to Captain Withycombe for his excellent and suggestive lecture. I use the word "suggestive" because there has been considerable disagreement among those who have spoken after him. It shows, as in all things, that it is not more easy to come to an agreement on these points than it is on anything else, and our friend, Brigadier Jack, is fortunate in being able to tell his draughtsman to do it, and there's an end of it. Mr. Hinks mentioned the appropriate expression Mr. Reeves used with regard to some of the lettering, and I must say it is a "swashbuckling" style of lettering, I do not like it at all. However, that's not what I wanted to say. I hope when matters come to something rather more certain that the Brigadier will get in touch with the Hydrographer, or whoever has to do with these things, and that we shall come to some definite conclusion as to Admiralty charts and shore-

going maps and plans. I was recently shown, with immense pride, a plan of the river down by Tilbury; the possessor had not been satisfied with what had been done by the Admiralty and he had made a plan. I asked him what guide, generally speaking, he had as to the lettering, and he said, "I choose what I thought was the best." Certainly his plans were entirely different from anything shown this afternoon. They were very good.

There is one point I would like to put before the Brigadier in regard to maps. I happen to have followed the sea all my life. What we who go to sea want maps for is to find our way from place to place or else, when reading interesting books, to see where the places are that we do not know. We want a clear legible map that we can understand, not the precious thing of which the expert says, "Oh, but if you were really a map-reader and understood these things, then you would know." Maps are made for the general public to use when they want to get from one place to another. I am told that in the lettering one should write the name of the town, or whatever it is, to the right of where it is, but if you will look at various maps you will find that sometimes a name is written on top, sometimes underneath, sometimes to the left and sometimes to the right of where the place is. It is quite true if you know beforehand where the place is or if you have had a good deal of teaching and knowledge of maps, you will know whether the town is to the right, left, or where, and whether what is represented is a river or a range of mountains. Personally I think if the range of mountains had not been put in, for instance, where Kunlun is, many would not know whether it was a range of mountains or a district. It seems to me one does want something indicative of all those points. But the best point of all has been a most charming and delightful lecture, followed by a most interesting discussion. I will ask Brigadier Jack to take my place, and, before I finally leave, call upon Mr. Emery Walker.

Mr. EMERY WALKER: I think in the Ordnance Survey there is a somewhat melancholy feeling with regard to lettering, but if you look at Ortelius' Atlas you will see that the small names, although beautiful, are quite legible. I am, of course, quite aware of the difficulty in regard to Ordnance Maps. It is necessary to have the villages in very small lettering, and it is not possible to get so much character in the letters on a small-scale as on a large-scale map. But I think the maps Mr. Hinks showed us were going in the right direction; at any rate, the artist has looked at good maps, and it is quite possible that we may come to something very much better than we have now. I think it was about fifty or sixty years ago that the Ordnance Survey first started making photo-lithographic maps—at least that is as long as I can remember—and had some types cut from models of the very ugliest description that had ever been made. They were based upon the type of Bodoni at the end of the eighteenth century. The characteristic of Bodoni's type is a very fat down-stroke and a hair line for the up-stroke. The types cut for the Ordnance Survey were based upon that kind of type, and they used to stamp them—and I believe they do still—on paper and they were then photographed. If they are reduced much the thin lines tend to be lost altogether. The letters used for small lettering on a map must be, more or less, the same thickness; the smaller the letter, so the thin lines, the up-strokes and the down-strokes, must approximate to the same thickness.

Major BOULNOIS: Mr. Reeves, so far, seems to have been quite alone in his criticism of the new lettering, but I should like to say that I fully agree with him. I think in some respects that we have gone rather wrong on the subject, and in a way the worst man to choose to design letters for maps is an artist. The man I should like to see put to design the lettering on maps is just the "averagesort of bloke" who is a poor map reader, constantly losing his way, and if possible a

somewhat short-sighted fellow! The main essentials to my mind of lettering on maps are absolute legibility and the possibility of differentiating between the various things that have to be shown on a map by using different styles of lettering on the same map. I think we worry too much about the artistic look of the lettering, though of course one does not want to see actually ugly letters. There are, however, plenty of styles of lettering which are, first of all, legible, and, secondly, are nice to look at. Some of the lettering which we have just seen on the slides filled me, I must own, with—I was almost going to say—horror. Having, I suppose, no artistic soul, I merely looked at them from the point of view of being somewhat illegible and somewhat highbrow. I think that if there is to be a re-design of lettering the main points should be entirely those of legibility and simplicity. A map is, after all, an expression, not of art, but of jolly hard work in the field. A man has gone out and made surveys for that map, and it seems to me that some very simple style of lettering—even that Egyptian which has been described as so dreadful—best expresses the work that has been done in the making of the map. I do not in fact think that it is an occasion for attempts to get back to da Vinci and Trajan, and on these grounds I find myself ranged beside Mr. Reeves.

Captain WITHYCOMBE: I will take the remarks of the last speaker first while they are fresh in my mind. He puts up a plea for simplicity. Well, I think it is exactly what we are striving for. Look at the alphabets submitted: Roman capitals, the lower case and the Italic. I do not see what more can be asked in the way of simplicity. You have there the bare bones of lettering. That little bracket connecting the S with the T to which Colonel Winterbotham objects is not essential, and need not be used at all—you see the S and T in juxtaposition in another place without it—it is not really part of the alphabet. For a simple legible straightforward alphabet, I do not think you can better the Roman capitals or the Roman lower case as shown; there are no frills, but just straightforward letters which could be easily written and which, above all things, can be easily reproduced. I claim that they are far more legible, for instance, than the word on the specimen, namely, *armunno*, in which the straight serifs or lines are so long that they connect the *u* to the *n* and the *m* to the *u*, and the thin arches and even spacing defeat the eye in its effort to distinguish one letter from another. If you will study the specimen sheet you will see that there are a hundred little subtle points, but they are introduced to get legibility, and it is legibility that we are really aiming at.

Then with regard to what Mr. Reeves said, one can only say *de gustibus non est disputandum*. It is purely a matter of taste. If a person likes the lettering on the International map better than that of Hondius, then he does, and it is no good arguing about it. But I sympathize with him because I know how I should feel if I had been working all my life at one style of lettering and a new school suddenly sprang up and said, "You are all wrong." With regard to the necessity for various styles of type. Personally, I think that the sans serif character used on the characteristic sheet for the hills, which Mr. Hinks disagrees with, is unnecessary, but it was felt that as the Ordnance Survey maps have been showing the hills in that way it was perhaps a dangerous precedent to depart from it. Whether it will be ultimately adopted or not, I do not know. But I do not go quite all the way with Mr. Hinks. I think that there are certain types of detail which necessitate another sort of lettering to distinguish them. For instance, the Antiquities. If you did not indicate the Antiquities by means of old English characters it would not be possible to pick them out as at the present time. If you are interested in barrows, earthworks, or other objects of antiquity, these things jump to the eye at once because the old English print guides you to the

information you seek. So that there is something to be said on both sides, but for rivers and natural features I do not think anything can beat the Roman and Italic alphabets.

Mr. HINKS: Could you tell us if, in your opinion, the Italic we have been using would fill up more than the one you have designed?

Captain WITHYCOMBE: I admire the Italic enormously, and I think it would reproduce well. In fact, I do not think there is any doubt about that. I am not at all sure it would harmonize with our maps; I fear that quill-pen Roman capitals and even the quill-pen lower case would not do. We need a drawn letter to convey that sense of precision and accuracy that we must get into the Ordnance Survey maps. It is a psychological point. When you look at an Ordnance Survey map it must look accurate just as we hope it is accurate, and the writing must convey that idea right through. I do not think that would be possible with the slight irregularities and also the idiosyncrasies of the individual draughtsman which are sure to occur in quickly written quill-pen work. Each draughtsman is artistic, and he puts himself into it. Our draughtsmen at the Ordnance Survey have to plod along conforming to an exact standard; each man has to be able to put his work down beside that of every other man and it must assimilate. With the quill-pen work I am afraid there will be difficulty in getting that perfect assimilation. I regret that because, of course, it is really a revival of the art of the scribe, and an important and most interesting work that is being done at the Society's house upon which I congratulate Mr. Hinks' draughtsmen very heartily.

Brigadier JACK: I expect you would all like to spend a little time looking at the specimens and discussing them; but having been put into the chair I have the advantage of being able to say something more. I also would like to add my great appreciation of the writing being done by the R.G.S. draughtsmen now. I think it is charming. But we have at the Ordnance Survey, as I am sure Mr. Hinks and others will admit, a quite different problem, and there are certain things we would like to do that we feel we cannot. We cannot be quite so free as your draughtsmen are. On the point of block letters for hill features, Captain Withycombe let the cat out of the bag by confessing that it was not his choice at all. It was I who chose them, and I had a reason. Although I quite agree one ought not to have a great variety of styles on maps, there are, I think, certain cases where some variety is necessary. Captain Withycombe mentioned antiquities. I do not think we can get away from a different style of type in that case. I may be wrong in thinking that it helps the eye to have a different style for hill features; I am quite ready to think about it, and Mr. Hinks can take comfort from the thought that our new map is not yet begun. It is a point we shall have to consider.

Admiral Goodenough said he wanted a map that everybody could understand. Well, I can assure him that our object at the Ordnance Survey and the object of every decent map-maker is to produce a map that does not require an expert to understand it, but one which any person of ordinary intelligence can understand without difficulty. We have in addition to making it legible and useful to make it a thing of beauty, which is quite possible to combine with its practical uses.

I am sure that you will agree that we have had a most interesting discussion, and that much good has come out of it.

Professor FAWCETT: Unfortunately I was not able to be here for the opening of this meeting and so missed the greater part of Captain Withycombe's paper. I look forward to reading it with the interest and the care it deserves. My chief comment is a repetition of the view already expressed, that legibility should be

the prime consideration to determine our choice of styles of lettering. I believe that legibility is fully consistent with a really artistic style; though it is equally true that any superfluous ornament reduces legibility and is therefore to be condemned—and all ornament should be suspect of superfluity until it has made out a good case for itself.

May I suggest that the presentation of new, or old, styles of lettering in whole alphabets, or in familiar words and phrases, does not offer so severe a test of their legibility as presentation in unfamiliar groups of letters, in which those letters which may possibly be confused are brought together? The word "armunno" which Captain Withycombe has used for *m*, *u* and *n* illustrates my point. I feel that the *t* and *r* of the italic styles shown are not very clear and might come badly out of such a test.

I remember an article in *Nature* a few years ago on the forms of the Arabic numerals (24 February 1916) which put forward ideas some of which would be valuable in this connection. One point was that the form should be such that even the destruction of part of the figure should not make it impossible to determine what figure it was.

Though it is strictly outside the topic of the paper I should like to refer to the matter of the border round the maps mentioned by Brigadier Jack and Mr. Reeves. Here I hold that it is desirable to make use of the border to give much additional information not only as to scales, in degrees and other units, but also as to bordering lands and seas. This information can be, and should be, set forth in a pleasing style; but map space is too limited and too valuable to be used for any purposeless ornament, even outside the map itself.

Mr Hinks suggested that the use of different styles of lettering for names of hill ranges and so on is unnecessary. Here one must agree; but though not strictly necessary it is often a real convenience. Personally I like the style used for this purpose on the sheet of O.S. writing which has been handed round, but it might add clearness if the plan of writing sea names in blue were extended and hill names were written in brown. Lastly, it is perhaps worth while to note that the two sets of writing before us, the O.S. and what we may call the R.G.S. styles, have been devised for somewhat different purposes. Each can learn something from the other; but it is unlikely that the solutions of such different problems can be identical.

Note on a few specimens of lettering by the Junior Draughtsmen of the Society.

In developing the style of lettering which is now used for blocks in the text of the *Journal* and for the simpler lithographed maps we have aimed at two things: beauty of appearance and rapidity of execution. The former has been sufficiently discussed above, and opinions will differ whether the aim has been achieved. A few words may be added here on the more practical question of the speed and consequent economy of the new style, that is, of the old style revived. Instead of building up the letters, large and small, with a steel pen, drawing the outlines first, and then filling in the thick strokes, our junior draughtsmen are learning to write the letters with quills, drawing and building up only a few of the largest names. The Rome Ptolemy of 1490 and the Hondius World Map of 1608 have been studied for forms of the Roman and Italic letters, modified a little to suit the quill. We are still in the experimental stage, and the specimens here given must be considered as suggestions for criticism rather than as adopted models. Incidentally we venture a few suggestions on the new Ordnance Survey alphabets.

Numbers 1 and 3 are upright and sloping numerals drawn with the steel pen, built up and filled in. Time about sixty minutes for each set. Numbers 2 and 4 are written with a quill: time about three minutes for each set.

Number 5 suggests a few alternatives to the single letters of the O.S. alphabet, and in the word MINUTE written twice shows the advantage of writing the capital U with two heavy strokes, which in most combinations balances better than the O.S. form. These two words are built up with the quill to give a result much like that of the steel-pen drawing, but easier and quicker.

Number 6 is reproduced from an early version of the specimen for the new One-inch map of the O.S., since somewhat modified. Drawn with the steel pen.

Number 7 gives some of the same names drawn or written with the quill: the first two built up; the third in single strokes with built-up serifs; the rest simply written with the quill.

Number 8 is a map in which the names are written direct with the quill, except for the name ARABIA, in which the serifs are built up. Speed about one hundred names in seven hours, or about five times as fast as the same drawn with the steel pen.

Numbers 9 and 10 are alphabets written freely with the quill in single strokes with the quill held in one position throughout: no building up of serifs. Time about thirty minutes for each complete alphabet of upper and lower case. These show on a large scale the formation of the writing used in Number 8.

Two of the three junior draughtsmen received their early training in the Art Schools of the London County Council, and all three have attended evening classes at the Hammersmith School since they have been employed at the R.G.S. We are especially indebted to their instructor, Miss Madelyn Walker, for the interest she has taken in this experiment of developing an effective style of rapid draughtsmanship.

A. R. H.

A note on the illustrations - in the original these were arranged on two folding plates: the first contained "Alphabets designed for the new One-Inch Map of the Ordnance Survey", the second contained the examples, nos. 1 to 10, referred to at the top of this page. To facilitate reproduction here, these have been rearranged as follows:

page 140: "Alphabets designed for the new
One-Inch Map"
page 141: Examples nos 1, 2, 3, 4, 5
page 142: Examples nos 6, 7
page 143: Example no 8
page 144: Examples nos 9, 10

All have been reduced to 41.65% approx of original published size.

ALPHABETS DESIGNED FOR THE NEW ONE INCH MAP OF THE ORDNANCE SURVEY

A A B C D E	A B C D E F G
F G H I J K L M	H I J K L M N O
M M N O P Q R	P Q R S T U V
R S T U V W W	W X Y Z & £
W X Y Z & £	<i>abcdefghijklmnop</i>
<i>abcdefghijklmnop</i>	<i>opqrstuvwxyz</i>
<i>opqrstuvwxyz</i>	1 2 3 4 5 6 7 8 9 0
1 2 3 4 5 6 7 8 9 0	

"Alphabets designed for the new one inch map of the Ordnance Survey" - reduced to approx. 41.65% of original

LETTERING ON MAPS
Witfycombe

① 1 2 3 4 5 6 7 8 9 0

② 1 2 3 4 5 6 7 8 9 0

③ 1 2 3 4 5 6 7 8 9 0

④ 1 2 3 4 5 6 7 8 9 0

⑤ m u a y
U R U K Q R

MINUTE

MINUTE

"Lettering on Maps" - examples 1, 2, 3, 4, 5, reduced to approx. 41.65% of original size.

⑥

LIVERPOOL

SUNDERLAND

CHELTENHAM

DARTFORD

LICHFIELD

WINCHESTER

Hambleton

*Bracknell**Swanwick**Coleman Green**Welbeck Abbey**Newland Fm**Clifton***RICHMOND PARK**

⑦

LIVERPOOL

CHELTENHAM

LICHFIELD

WINCHESTER

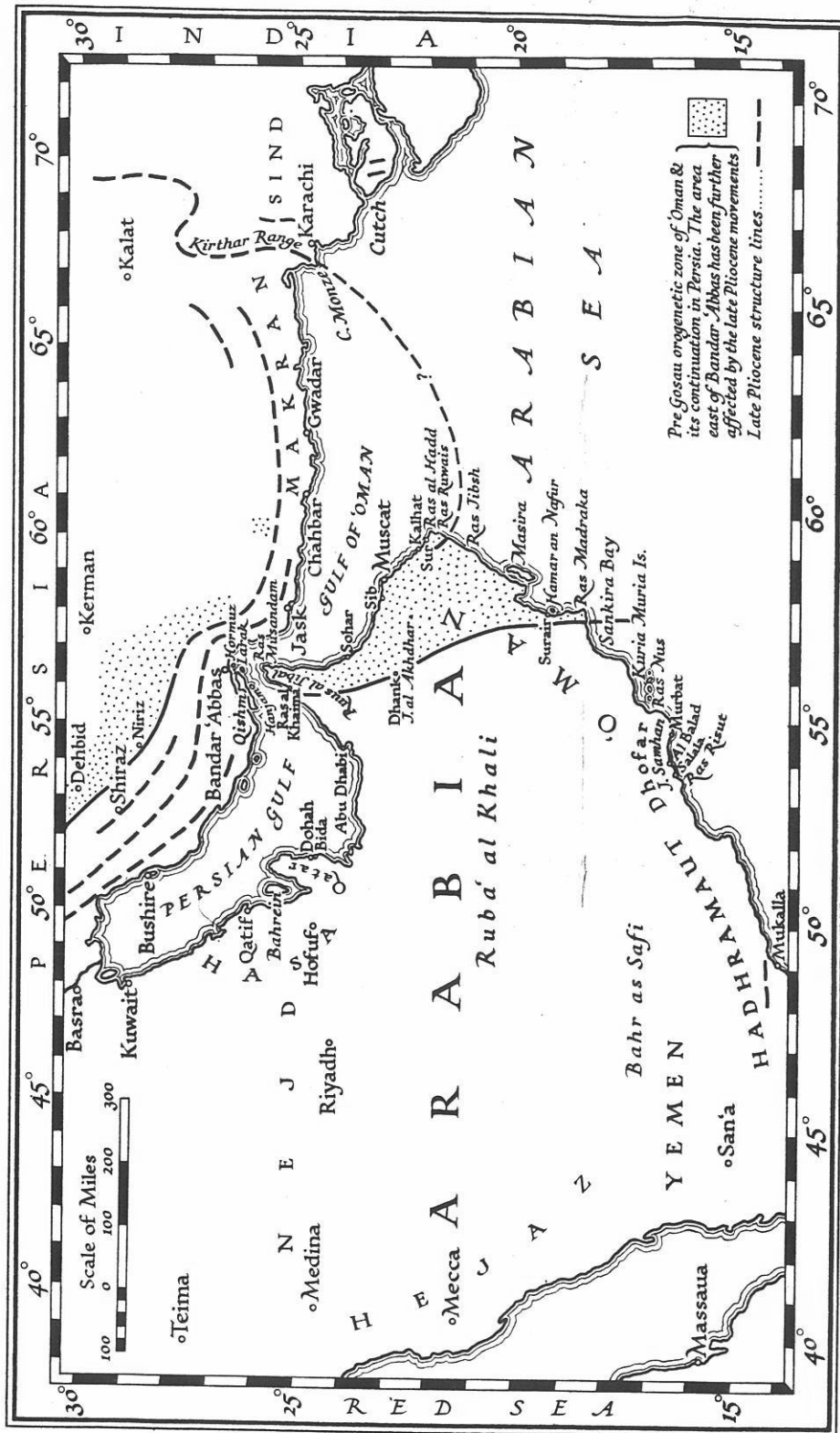
Hambleton

*Bracknell**Swanwick**Coleman Green**Welbeck Abbey**Newland Fm.***RICHMOND PARK**

"Lettering on maps" - examples 6 and 7, reduced
to approx. 41.65% of original size

The Geographical Journal, May, 1929.

8



"Lettering on maps" - example 8, reduced to 41.65% of original size

⑨
 ABCDEFG
 HIJKLMN
 OPQRSTU
 VWXYZ
 abcdefghijk
 lmnopqrstu
 vwxyz

⑩
 ABCDEFG
 HIJKLMN
 OPQRSTU
 VWXYZ
 abcdefghijk
 lmnopqrstu
 vwxyz

LETTERING ON R.G.S. MAPS

"Lettering on maps" - examples 9 and 10, reduced to 41.65% of original size