CHAPTER 1

INTRODUCTION TO MAP READING

Introduction

1. You have probably seen atlas maps in which the whole world is laid out flat on a couple of sheets to give you an idea of the shapes of the sea and land masses, their position in relation to the North or South Pole and in relation to each other. You may even have been warned that, although the shapes of the countries shown are correct, their relative size can be grossly incorrect. For example, on a whole world atlas map, Greenland may appear to be much larger than India, whereas in fact India is about twice as large as Greenland. On such a map you may see where the highest mountains lie and get some idea of distance — eg the interesting facts that the highest mountain is Everest in the Himalayas at 8,847 metres (29,028 feet); that the deepest ocean is in the Pacific off the Philippines at 11,033 metres (36,198 feet); and that New York is about 5,560 kilometres (3,456 statute miles) from London. However, the map presentation of just where these points lie might be distorted because of the difficulty of depicting the round world on a flat sheet of paper.

2. In the same atlas there may be single sheets showing a much smaller part of the world such as a single country and these will show much more detail. They will show the names and positions of towns and it might be possible to calculate a rough "bearing" (direction) and distance between them. The geographical features, ie the mountainous areas, the flat areas, the rivers and harbours, are clearer and the detail will be more accurate; some maps might show which areas are industrial and therefore have the denser population, or areas where deposits of coal lie under the surface; and some might show the agricultural areas — or the barren areas unsuitable either for industry or agriculture. Thus the smaller the area of the earth's surface depicted on a flat map, the more accurate the map becomes.

3. Although all of this type of information is interesting, it would not help us much if we wanted to go out on a map reading expedition. You might well ask why a map is needed at all, since to get from one place to another in the industrial and agricultural world one simply follows a signposted road. Certainly, if the place you want to get to has a road leading to it and there is a signpost pointing along the road in the right direction, then you don't need a map. But, if you had a map and could read it you would get a much better idea of what sort of country you would be passing through — and there are many parts of the earth where there are no roads or signposts to follow anyway. It is in these places that a map becomes essential. In the Air Training Corps and in the RAF, "map reading" means finding one's way in open country where roads and signposts are scarce and this is what we are going to introduce you to in this chapter.

The Map — What is the country like?

4. If you want to map read from one place to another it is necessary to have a map that shows as clearly as possible the type of land to be crossed; whether there are rivers, streams, hills, high cliffs or fences which would bar your path and prevent the journey

being made. Special maps are therefore made for this purpose and they show just a small area of the surface of the country. Such a map is in use in the Air Training Corps — the metric series, scale 1 to 50,000. You will learn more about scale in your Leading Cadet training; all you need to remember here is that 1 centimetre measured anywhere on this map represents a real distance of 50,000 centimetres on the ground ie, 500 metres or ½ km.

5. One of the main attractions of using a map of a small area of the earth's surface is that all the measurements taken from it are accurate, ie the direction of any feature on it is the same direction over the ground; the distance measured on it is the horizontal distance between the objects on the ground, and shapes and areas are correct.

6. However, even this small area (40 kilometres square) of the earth's surface is a large area when you come to roam about in it and even a single sheet may not tell you *all* you would like to know. However, it does tell you a tremendous amount — every line, every mark on it is there for a reason — and learning what they all mean is what map reading is all about. As an example we will take a line between two places on a map and, looking along it, see what we can learn about it by "reading the map".

Reading the Map

7. Fig 1 is an area of Sherwood Forest (Sheet No 120 in the metric series maps). Suppose you wish to walk from the telephone kiosk near Welbeck Abbey to the Normanton Inn. A line has been drawn between these two places and this is known as a "track", meaning the line we need to follow to travel direct between two places. By glancing along it you can see straight away that the track crosses two blue areas and goes through many green areas. These are, respectively, lakes and woods; you could discover this for yourself by taking your own Squadron's map (it need not be Sheet 120) and looking in the key list of signs in the right-hand margin. Because of the lakes you could not follow the track in Fig 1 over the ground and would have to seek ways round the obstacles. But before we do that, let us look carefully and see what other features we can spot along this track.

8. First of all, how do we know where the telephone kiosk is? Look again in the right-hand margin of your own map. Under the section headed "Abbreviations" you will see that a black dot marks the position and the "T" indicates that the dot is a Post Office telephone kiosk and not an AA or an RAC one. We must look in the map margin to find the meaning of any symbol or line.

9. From the telephone kiosk the track crosses an open area (white) which may be a field. The difficulty with open areas on a map is that we do not know what the surface will be like eg, whether it will be a ploughed field, crops or grass; nor do we know whether it is private property and we cannot therefore cross it without permission. However, in this case we note that a thin black line of short dashes crosses it from one of the village streets ending at the field's edge. Looking in the map margin, we note that such a line indicates a path. Although it does not follow that this path has any right of way, if we go from the telephone kiosk via the village streets to this path we at least know that it is a way across. Rights of way are a problem to map readers and can only be solved by local knowledge or by application to the local District Council. There will be more about rights of way in the following paragraphs.

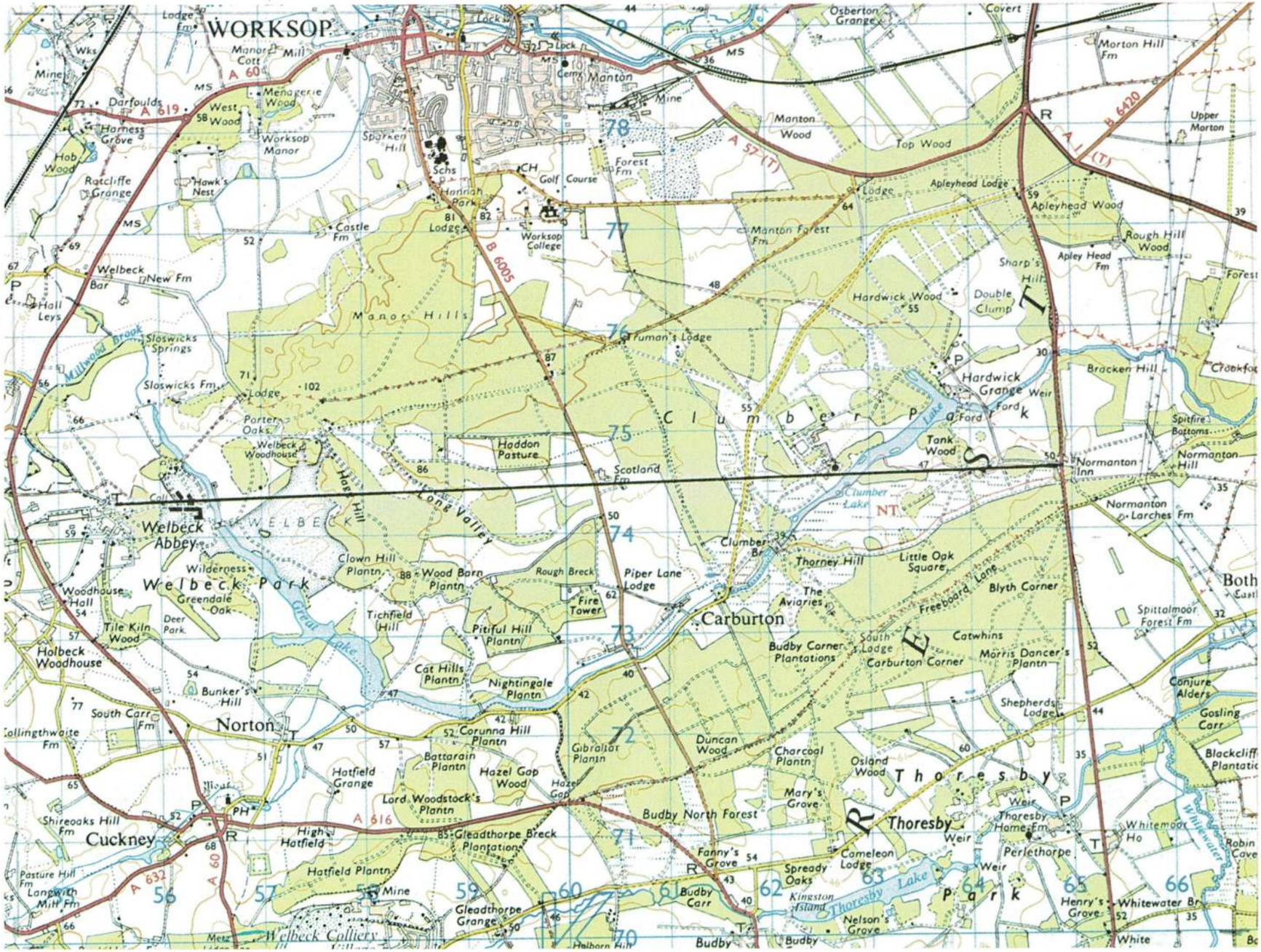

Fig 1

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10. After the open area is a wood (green), and we must look carefully to see if there is a fence around it or not. If there is a fence, the edge of the wood will be marked by a thin continuous black line. In this case there is a minor unfenced and unmetalled road or drive (*see* Roads and Paths Section in your map margin), skirting the edge of the wood just where our track crosses. Immediately to the North, the wood is edged by a thin continuous black line which means a fence of some sort. The difficulty with fences is that one cannot tell what they are like. For example, the one round the Abbey might be solid stone and be very high, the one round the woods, might be anything from a few strands of wire to impenetrable hedges. Thus, although we know that a thin black line enclosing something — a road, a field, a wood, a park — means a fence, we do not know whether we can cross it or not. Obviously our map reading plan must be to avoid fences, therefore, note the need, when checking a track, to look carefully for thin continuous black lines crossing the track.

11. In this area of the track there is an unfenced, unmetalled drive going through the woods towards the Abbey and we could follow that except that, once again, we cannot tell by looking at the map whether such a drive has any right of way. Neither can we be quite certain whether it is metalled or tarred or neither. The map margin says that it is unmetalled if it is white, but much may have changed since the map was drawn and the owner of the drive may have had it tarred. You will see very many of these black double pecked lines (meaning unfenced) or black double continuous lines all over the map. They mean that the drive they depict is wider than a path but probably less than the 4.3 metres (14 feet), which would be classed a road. If you look at the section on "Public Rights of Way" in the map margin you will see the red symbols that indicate rights of way. On the map you will often see one of these red symbols along one of the drives that we are discussing. It is therefore best to assume that any country drive which is plain white does not have a right of way and only those which have a red right of way symbol overprinted on them have a right of way.

12. In the middle of the wood is a brown line. Under the section on "Relief" in your map margin this can be seen to be called a contour line. Follow the contour line around until you come to a number on it. In this case the number is 61. This means that any point on that particular line is 61 metres (200 feet) above mean sea level. Much of interest can be deduced from these lines by the map reader. First, the ground between any two contour lines must slope, (even if the two lines are of the same height, the ground between might go up and down); second, the lines trace out the shape of the land. And an important fact you must know is that the figures are printed facing up the slope. Returning to the contour line in the wood, this line joins up if you trace it all the way round, and the figure 61 points north, indicating that from the telephone kiosk the ground might rise a little towards the north and then fall to the same level in the middle of the wood. Looking along the whole length of the track from the kiosk to Normanton Inn we can see that:

a. The next contour line is in Welbeck Park and this, too, is 61 metres, indicating that the land this far is flat — or might rise and fall a little between the contour lines of the same height.

b. The next contour just outside the Park is 76 metres (250 feet), indicating a fairly sharp upward slope of 15 metres (50 feet); but the next three are also 76 indicating flat or slightly undulating ground, dropping down again to 61 by Scotland Farm.

c. Soon after the Scotland Farm area the land drops to the 46 metres (150 feet) contour line and remains flat or slightly undulating up to Normanton Inn.

You can see that a brief study, like this, of the contour lines gives you a useful feel for the lie of the land along your track.

(AL4, Sep 78)

13. Note also the importance of being very careful about colour. Just across the second lake another line coloured very like the contour lines crosses the track. But this one is more red and is the outline of a National Trust area — see the letters NT in red; they mean that this particular National Trust area is always open. See if you can trace the whole area.

14. We will now go back to the woods at the beginning of the track, and note all the things that cross the track. They will be numerous and repetitive, but bear with this because it shows the great amount of information that can be extracted. After the wood comes Welbeck Abbey, the grounds of which are shown by black dots — meaning park or ornamental grounds — see the section on "General Features" in your map margin. A thin continuous black line borders it; so we know that a fence of some sort bars our way. We also know that there may be no right of way for the public to pass through the Abbey or the grounds.

15. After the Abbey and over the Great Lake comes another field with its problems of type of surface and right of way. Then comes a fence to the ornamental grounds of Welbeck Park but note that the other side of Welbeck Park has no fence. Then uphill (Hogg Hill), through the wood in the centre of which is an unfenced, unmetalled drive, but no fence at the edge of the wood. Then more unfenced open areas, unmetalled drives and woods until one reaches a field fenced on both sides just south of Haddon Pasture. Then a narrow wooded area followed by the fenced, metalled road, B6005 (coloured brown).

16. After the B6005 comes another field, followed by a fence to a wood and then an unfenced, unmetalled drive. On the other edge of this path in the wood is a new feature, a black dotted line which is a Parish boundary line. Note the importance of carefully checking colour, type and style of line. At the edge of the wood is another fence which borders an unmetalled drive, unfenced on the other side. Then comes another new feature, a series of short, straight, dotted, black lines which indicate bracken, heath or rough grassland. Glancing ahead you can see that this is a feature of the surrounding country from this point up to Normanton Inn.

17. Next comes an unfenced, metalled road (coloured yellow) on the edge of a narrow rectangular-shaped wood (unfenced), more heathland, another wood partly fenced, then more heathland followed by another unfenced, unmetalled drive. Here a series of red dots follows the road and this means that a footpath with a public right of way follows this part of the road.

18. Now comes a small area of ornamental grounds on which is situated a hamlet with a church with a spire — see the signs for churches under "General Features" in the map margin. One of the boundaries of this area is the edge of Clumber Lake and across the lake is another wood, unfenced along its lakeside edge, but fenced on the others.

19. The interesting feature here is the red line boundary of the National Trust area which we mentioned in para 13. Note the extent of this area and that it lies mostly between Clumber Lake and Normanton Inn but has a hook-shaped extension on the other side of the lake over Clumber Bridge. Note too, that most of this area is bracken, heath and rough grassland. The letters NT being in red means that this National Trust area is always open.

(AL4, Sep 78)

20. We are now almost at Normanton Inn, the remainder of our track running in and out of the northern edge of the National Trust area and crossing a series of unfenced and fenced drives and woods which, we have discovered, criss-cross the track throughout most of its length.

What Have You Learnt?

21. The main thing you will have learnt is that there is very much that can be deduced by studying a map. We have taken a lot of paragraphs to describe this simple cross-country track, but there is much still to be learnt because there are other symbols that have not been used in this section. For just one example, extend the line of our track across the A614 at Normanton Inn and you can see to the east, double Electricity Transmission lines. You will learn more about how to make practical use of this map information when you come to study the subject more deeply in your Leading Cadet training. In the meantime, remember to look at every line or symbol — everything in the map has a meaning — and to deduce or look up its meaning. And remember, too, how to work out from the contour lines whether your track is taking you uphill, downhill or level.

How to Get There

22. Having studied the direct track and noted all the obstacles and difficulties, it now remains to work out the best route that can be followed, ie what is the best and quickest route to walk from the telephone kiosk to Normanton Inn?

23. The first requirement would normally be to study the rise and fall of the ground, because steep hills slow you down considerably and it is often necessary to look for routes around them especially if you are in a hurry. However, in this particular route we have already noted that the ground rises only 15 metres from the starting point and then falls by 30 metres to the destination. Thus hill climbing is not a vital consideration in this exercise.

24. There is little point in looking for a way through Welbeck Abbey or in trying to travel east, because of the doubts about rights of way and the need to cross the lakes and very many fences. Thus we must look north or south.

25. Looking south from the telephone kiosk you can see that there is a public right of way through Tile Kiln wood (red dots) and this continues along the drive leading to Norton. From Norton there is a metalled (fenced) road (coloured yellow) all the way eastwards to Carburton. However, from Carburton the way is not so straight-forward. There is a road used as a public path well to the south, but this is too far away and to reach it you would have to retrace your steps, via the B6005 (back from Carburton). It would be possible to go from Carburton to Clumber Bridge as there is a right of way, red dots, on the access (unfenced) drive leading up to the bridge and after crossing the bridge you would enter the National Trust area. The National Trust area is heathland and could be heavy going, but we know that it is flat. It looks to be possible to reach Normanton Inn from the NT area via the Normanton Inn — Hardwick Grange unmetalled road as there is an unfenced access drive leading to this road. This is therefore a possible route but let us see if we can find a better one.

(AL4, Sep 78)

26. Now, prospecting on your map for another possible route, north and east of the telephone kiosk we note that there is a bridleway with public right of way (red dashes) which skirts the wood, crosses a field and joins an unfenced drive through a wood to cross the lake over a bridge just north of Welbeck Abbey. It follows an unfenced drive (unmetalled) across a field to the Lodge, where it meets a road used as a public path which runs east through the forest to cross the B6005 and continues on past Truman's Lodge, following the line of a metalled road (yellow). Notice the special red sign for a road used as a public path. Soon after the Lodge, another bridleway with public right of way joins our path from the right and this would take us eventually to Clumber Bridge and the National Trust area. However, it might be best not to take this route because it is such a long way round, but to go on to the next bridleway which comes in from the right. Following along this one, we can see that it would take us to Hardwick Grange and thence direct across the fields to Normanton Inn; but it crosses the river near Hardwick Grange by means of a ford. Here, of course you would almost certainly get wet feet, and the decision which route to take indicates whether you are prepared to do this or not!

The Art of Map Reading

27. This, then, is the art of map reading — the ability to study every mark, line or symbol on the map in order to extract all the information it gives about a particular part of the earth's surface you are interested in. Having extracted the information you can then:

a. Choose a route.

b. Calculate the distances.

c. Work out the time it will take to reach a destination.

d. Once embarked on the journey, use the map to follow the chosen route and to "fix" position.

You will learn the details of these processes in your Leading Cadet training. There will not always be paths or drives for you to follow and you may have to resort to using a compass to follow a required track (remember this word is used in the sense of a line drawn on a map between the point of departure and the point of destination). You may also have to camp overnight if the journey is too long for one day and this we will introduce in the next chapter.

28. In the meantime, practise your map reading by drawing a track (in soft sharp pencil so that it will rub out easily) between any two points on a map in use at your Squadron and then working out all the information you can extract from the map about the features which your track crosses.