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How the World Became Known

Author: Joseph Jacobs

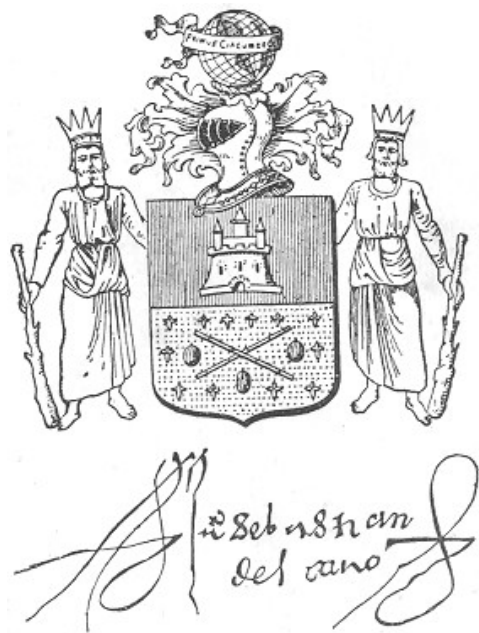
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*** START OF THIS PROJECT GUTENBERG EBOOK GEOGRAPHICAL DISCOVERY ***

Produced by Robert J. Hall.



Arms granted to SEBASTIAN DEL CANO, Captain of the *Victoria*, the first vessel that circumnavigated the Globe
[For a description, see pp. [129-30](#)]

The Story of Geographical Discovery

How the World Became Known

By Joseph Jacobs

With Twenty-four Maps, &c.

PREFACE

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In attempting to get what is little less than a history of the world, from a special point of view, into a couple of hundred duodecimo pages, I have had to make three bites at my very big cherry. In the Appendix I have given in chronological order, and for the first time on such a scale in English, the chief voyages and explorations by which our knowledge of the world has been increased, and the chief works in which that knowledge has been recorded. In the body of the work I have then attempted to connect together these facts in their more general aspects. In particular I have grouped the great voyages of 1492-1521 round the search for the Spice Islands as a central motive. It is possible that in tracing the Portuguese and Spanish discoveries to the need of titillating the parched palates of the mediævals, who lived on salt meat during winter and salt fish during Lent, I may have unduly simplified the problem. But there can be no doubt of the paramount importance attached to the spices of the East in the earlier stages. The search for the El Dorado came afterwards, and is still urging men north to the Yukon, south to the Cape, and in a south-easterly direction to "Westralia."

Besides the general treatment in the text and the special details in the Appendix, I have also attempted to tell the story once more in a series of maps showing the gradual increase of men's knowledge of the globe. It would have been impossible to have included all these in a book of this size and price but for the complaisance of several publishing firms, who have given permission for the reproduction on a reduced scale of maps that have already been prepared for special purposes. I have specially to thank Messrs. Macmillan for the two dealing with the Portuguese discoveries, and derived from Mr. Payne's excellent little work on European Colonies; Messrs. Houghton, Mifflin, & Co., of Boston, for several illustrating the discovery of America, from Mr. J. Fiske's "School History of the United States;" and Messrs. Phillips for the arms of Del Cano, so clearly displaying the "spicy" motive of the first circumnavigation of the globe.

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I have besides to thank the officials of the Royal Geographical Society, especially Mr. Scott Keltie and Dr. H. R. Mill, for the readiness with which they have placed the magnificent resources of the library and map-room of that national institution at my disposal, and the kindness with which they have answered my queries and indicated new sources of information.

J. J.

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Coat-of-arms of Del Cano (from Guillemard, *Magellan*. By kind permission of Messrs. Phillips).—It illustrates the importance attributed to the Spice Islands as the main object of Magellan's voyage. For the blazon, see pp. [129-30](#).

The Earliest Map of the World (from the Rev. C. J. Ball's *Bible Illustrations*, 1898).—This is probably of the eighth century B.C., and indicates the Babylonian view of the world surrounded by the ocean, which is indicated by the parallel circles, and traversed by the Euphrates, which is seen meandering through the middle, with Babylon, the great city, crossing it at the top. Beyond the ocean are seven successive projections of land, possibly indicating the Babylonian knowledge of surrounding countries beyond the Euxine and the Red Sea.

The World according to Ptolemy.—It will be observed that the Greek geographer regarded the Indian Ocean as a landlocked body of water, while he appears to have some knowledge of the sources of the Nile. The general tendency of the map is to extend Asia very much to the east, which led to the miscalculation encouraging Columbus to discover America.

The Roman Roads of Europe (drawn specially for this work).—These give roughly the limits within which the inland geographical knowledge of the ancients reach some degrees of accuracy.

Geographical Monsters (from an early edition of Mandeville's *Travels*).—Most of the mediæval maps were dotted over with similar monstrosities.

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The Hereford Map.—This, one of the best known of mediæval maps, was drawn by Richard of Aldingham about 1307. Like most of these maps, it has the East with the terrestrial paradise at the top, and Jerusalem is represented as the centre.

Peutinger Table, Western Part.—This is the only Roman map extant; it gives lines of roads from the eastern shores of Britain to the Adriatic Sea. It is really a kind of bird's-eye view taken from the African coast. The Mediterranean runs as a thin strip through the lower part of the map. The lower section joins on to the upper.

The World according to Ibn Haukal (from Lelewel, *Géographie du moyen âge*).—This map, like most of the Arabian maps, has the south at the top. It is practically only a diagram, and is thus similar to the Hereford Map in general form.—Misr=Egypt, Fars=Persia, Andalus=Spain.

Coast-line of the Mediterranean (from the *Portulano* of Dulcert, 1339, given in Nordenskiöld's *Facsimile Atlas*).—To illustrate the accuracy with which mariners' charts gave the coast-lines as contrasted with the merely symbolical representation of other mediæval maps.

Fra Mauro Map, 1457 (from Lelewel, *loc. Cit.*).—Here, as usual, the south is placed at the top of the map. Besides the ordinary mediæval conceptions, Fra Mauro included the Portuguese discoveries along the coast of Africa up to his time, 1457.

Portuguese Discoveries in Africa (from E. J. Payne, *European Colonies*, 1877).—Giving the successive points reached by the Portuguese navigators during the fifteenth century.

Portuguese Indies (from Payne, *loc. Cit.*).—All the ports mentioned in ordinary type were held by

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the Portuguese in the sixteenth century.

The Toscanelli Map (from Kretschmer, *Entdeckung Amerikas*, 1892).—This is a reconstruction of the map which Columbus got from the Italian astronomer and cartographer Toscanelli and used to guide him in his voyage across the Atlantic. Its general resemblance to the Behaim Globe will be remarked.

The Behaim Globe.—This gives the information about the world possessed in 1492, just as Columbus was starting, and is mainly based upon the map of Toscanelli, which served as his guide. It will be observed that there is no other continent between Spain and Zipangu or Japan, while the fabled islands of St. Brandan and Antilia are represented bridging the expanse between the Azores and Japan.

Amerigo Vespucci (from Fiske's *School History of the United States*, by kind permission of Messrs. Houghton, Mifflin, & Co.)

Ferdinand Magellan (from Fiske's *School History of the United States*, by kind permission of Messrs. Houghton, Mifflin, & Co.)

Map of the World, from the Ptolemy Edition of 1548 (after Kretschmer's *Entdeckungsgeschichte Amerikas*).—It will be observed that Mexico is supposed to be joined on to Asia, and that the North Pacific was not even known to exist.

Russian Asia (after the Atlas published by the Russian Academy of Sciences in 1737, by kind permission of Messrs. Hachette). Japan is represented as a peninsula.

Australia as known in 1745 (from D'Anville's *Atlas*, by kind permission of Messrs. Hachette).—It will be seen that the Northern and Western coasts were even by this time tolerably well mapped out, leaving only the eastern coast to be explored by Cook.

Australia, showing routes of explorations (prepared specially for the present volume). The names of the chief explorers are given at the top of the map.

Africa as known in 1676 (from Dapper's *Atlas*).—This includes a knowledge of most of the African river and lakes due to the explorations of the Portuguese.

Africa (made specially for this volume, to show chief explorations and partition).—The names of the explorers are given at the foot of the map itself.

North Polar Regions, Western Half (prepared specially for the present volume from the *Citizen's Atlas*, by kind permission of Messrs. Bartholomew).—This gives the results of the discoveries due to Franklin expeditions and most of the searches after the North-West Passage.

North Polar Regions, Eastern Half.—This gives the Siberian coast investigated by the Russians and Nordenskiöld, as well as Nansen's *Farthest North*.

Climbing the North Pole (prepared specially for this volume). Giving in graphic form the names of the chief Arctic travellers and the latitude N. reached from John Davis (1587) to Nansen (1895).

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THE STORY OF

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GEOGRAPHICAL DISCOVERY

INTRODUCTION

How was the world discovered? That is to say, how did a certain set of men who lived round the Mediterranean Sea, and had acquired the art of recording what each generation had learned, become successively aware of the other parts of the globe? Every part of the earth, so far as we know, has been inhabited by man during the five or six thousand years in which Europeans have been storing up their knowledge, and all that time the inhabitants of each part, of course, were acquainted with that particular part: the Kantschatkans knew Kantschatka, the Greenlanders, Greenland; the various tribes of North American Indians knew, at any rate, that part of America over which they wandered, long before Columbus, as we say, "discovered" it.

Very often these savages not only know their own country, but can express their knowledge in maps of very remarkable accuracy. Cortes traversed over 1000 miles through Central America, guided only by a calico map of a local cacique. An Eskimo named Kalliherey drew out, from his own knowledge of the coast between Smith Channel and Cape York, a map of it, varying only in minute details from the Admiralty chart. A native of Tahiti, named Tupaia, drew out for Cook a map of the Pacific, extending over forty-five degrees of longitude (nearly 3000 miles), giving the relative size and position of the main islands over that huge tract of ocean. Almost all geographical discoveries by Europeans have, in like manner, been brought about by means of guides, who necessarily knew the country which their European masters wished to "discover."

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What, therefore, we mean by the history of geographical discovery is the gradual bringing to the knowledge of the nations of civilisation surrounding the Mediterranean Sea the vast tracts of land extending in all directions from it. There are mainly two divisions of this history—the discovery of the Old World and that of the New, including Australia under the latter term. Though we speak of geographical discovery, it is really the discovery of new tribes of men that we are thinking of. It is only quite recently that men have sought for knowledge about lands, apart from the men who inhabit them. One might almost say that the history of geographical discovery, properly so called, begins with Captain Cook, the motive of whose voyages was purely scientific curiosity. But before his time men wanted to know one another for two chief reasons: they wanted to conquer, or they wanted to trade; or perhaps we could reduce the motives to one—they wanted to conquer, because they wanted to trade. In our own day we have seen a remarkable mixture of all three motives, resulting in the European partition of Africa—perhaps the most remarkable event of the latter end of the nineteenth century. Speke and Burton, Livingstone and Stanley, investigated the interior from love of adventure and of knowledge; then came the great chartered trading companies; and, finally, the governments to which these belong have assumed responsibility for the territories thus made known to the civilised world. Within forty years the map of Africa, which was practically a blank in the interior, and, as will be shown, was better known in 1680 than in 1850, has been filled up almost completely by researches due to motives of conquest, of trade, or of scientific curiosity.

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In its earlier stages, then, the history of geographical discovery is mainly a history of conquest, and what we shall have to do will be to give a short history of the ancient world, from the point of view of how that world became known. "Became known to whom?" you may ask; and we must determine that question first. We might, of course, take the earliest geographical work known to us—the tenth chapter of Genesis—and work out how the rest of the world became known to the Israelites when they became part of the Roman Empire; but in history all roads lead to Rome or away from it, and it is more useful for every purpose to take Rome as our centre-point. Yet Rome only came in as the heir of earlier empires that spread the knowledge of the earth and man by conquest long before Rome was of importance; and even when the Romans were the masters of all this vast inheritance, they had not themselves the ability to record the geographical knowledge thus acquired, and it is to a Greek named Ptolemy, a professor of the great university of Alexandria, to whom we owe our knowledge of how much the ancient world knew of the earth. It will be convenient to determine this first, and afterwards to sketch rapidly the course of historical events which led to the knowledge which Ptolemy records.

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In the Middle Ages, much of this knowledge, like all other, was lost, and we shall have to record how knowledge was replaced by imagination and theory. The true inheritors of Greek science during that period were the Arabs, and the few additions to real geographical knowledge at that time were due to them, except in so far as commercial travellers and pilgrims brought a more intimate knowledge of Asia to the West.

The discovery of America forms the beginning of a new period, both in modern history and in

modern geography. In the four hundred years that have elapsed since then, more than twice as much of the inhabited globe has become known to civilised man than in the preceding four thousand years. The result is that, except for a few patches of Africa, South America, and round the Poles, man knows roughly what are the physical resources of the world he inhabits, and, except for minor details, the history of geographical discovery is practically at an end.

Besides its interest as a record of war and adventure, this history gives the successive stages by which modern men have been made what they are. The longest known countries and peoples have, on the whole, had the deepest influence in the forming of the civilised character. Nor is the practical utility of this study less important. The way in which the world has been discovered determines now-a-days the world's history. The great problems of the twentieth century will have immediate relation to the discoveries of America, of Africa, and of Australia. In all these problems, Englishmen will have most to say and to do, and the history of geographical discovery is, therefore, of immediate and immense interest to Englishmen.

[*Authorities: Cooley, History of Maritime and Inland Discoveries, 3 vols., 1831; Vivien de Saint Martin, Histoire de la Géographie, 1873.*]

CHAPTER I

THE WORLD AS KNOWN TO THE ANCIENTS

Before telling how the ancients got to know that part of the world with which they finally became acquainted when the Roman Empire was at its greatest extent, it is as well to get some idea of the successive stages of their knowledge, leaving for the next chapter the story of how that knowledge was obtained. As in most branches of organised knowledge, it is to the Greeks that we owe our acquaintance with ancient views of this subject. In the early stages they possibly learned something from the Phœnicians, who were the great traders and sailors of antiquity, and who coasted along the Mediterranean, ventured through the Straits of Gibraltar, and traded with the British Isles, which they visited for the tin found in Cornwall. It is even said that one of their admirals, at the command of Necho, king of Egypt, circumnavigated Africa, for Herodotus reports that on the homeward voyage the sun set in the sea on the right hand. But the Phœnicians kept their geographical knowledge to themselves as a trade secret, and the Greeks learned but little from them.

The first glimpse that we have of the notions which the Greeks possessed of the shape and the inhabitants of the earth is afforded by the poems passing under the name of HOMER. These poems show an intimate knowledge of Northern Greece and of the western coasts of Asia Minor, some acquaintance with Egypt, Cyprus, and Sicily; but all the rest, even of the Eastern Mediterranean, is only vaguely conceived by their author. Where he does not know he imagines, and some of his imaginings have had a most important influence upon the progress of geographical knowledge. Thus he conceives of the world as being a sort of flat shield, with an extremely wide river surrounding it, known as Ocean. The centre of this shield was at Delphi, which was regarded as the "navel" of the inhabited world. According to Hesiod, who is but little later than Homer, up in the far north were placed a people known as the *Hyperboreani*, or those who dwelt at the back of the north wind; whilst a corresponding place in the south was taken by the Abyssinians. All these four conceptions had an important influence upon the views that men had of the world up to times comparatively recent. Homer also mentioned the pigmies as living in Africa. These were regarded as fabulous, till they were re-discovered by Dr. Schweinfurth and Mr. Stanley in our own time.

It is probably from the Babylonians that the Greeks obtained the idea of an all-encircling ocean. Inhabitants of Mesopotamia would find themselves reaching the ocean in almost any direction in which they travelled, either the Caspian, the Black Sea, the Mediterranean, or the Persian Gulf. Accordingly, the oldest map of the world which has been found is one accompanying a cuneiform inscription, and representing the plain of Mesopotamia with the Euphrates flowing through it, and the whole surrounded by two concentric circles, which are named briny waters. Outside these, however, are

seven detached islets, possibly representing the seven zones or climates into which the world was divided according to the ideas of the Babylonians, though afterwards they resorted to the ordinary four cardinal points. What was roughly true of Babylonia did not in any way answer to the geographical position of Greece, and it is therefore probable that in the first place they obtained their ideas of the surrounding ocean from the Babylonians.



THE EARLIEST MAP OF THE WORLD

It was after the period of Homer and Hesiod that the first great expansion of Greek knowledge about the world began, through the extensive colonisation which was carried on by the Greeks around the Eastern Mediterranean. Even to this day the natives of the southern part of Italy speak a Greek dialect, owing to the wide extent of Greek colonies in that country, which used to be called "Magna Grecia," or "Great Greece." Marseilles also one of the Greek colonies (600 B.C.), which, in its turn, sent out other colonies along the Gulf of Lyons. In the East, too, Greek cities were dotted along the coast of the Black Sea, one of which, Byzantium, was destined to be of world-historic importance. So, too, in North Africa, and among the islands of the Ægean Sea, the Greeks colonised throughout the sixth and fifth centuries B.C., and in almost every case communication was kept up between the colonies and the mother-country.

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Now, the one quality which has made the Greeks so distinguished in the world's history was their curiosity; and it was natural that they should desire to know, and to put on record, the large amount of information brought to the mainland of Greece from the innumerable Greek colonies. But to record geographical knowledge, the first thing that is necessary is a map, and accordingly it is a Greek philosopher named ANAXIMANDER of Miletus, of the sixth century B.C., to whom we owe the invention of map-drawing. Now, in order to make a map of one's own country, little astronomical knowledge is required. As we have seen, savages are able to draw such maps; but when it comes to describing the relative positions of countries divided from one another by seas, the problem is not so easy. An Athenian would know roughly that Byzantium (now called Constantinople) was somewhat to the east and to the north of him, because in sailing thither he would have to sail towards the rising sun, and would find the climate getting colder as he approached Byzantium. So, too, he might roughly

guess that Marseilles was somewhere to the west and north of him; but how was he to fix the relative position of Marseilles and Byzantium to one another? Was Marseilles more northerly than Byzantium? Was it very far away from that city? For though it took longer to get to Marseilles, the voyage was winding, and might possibly bring the vessel comparatively near to Byzantium, though there might be no direct road between the two cities. There was one rough way of determining how far north a place stood: the very slightest observation of the starry heavens would show a traveller that as he moved towards the north, the pole-star rose higher up in the heavens. How much higher, could be determined by the angle formed by a stick pointing to the pole-star, in relation to one held horizontally. If, instead of two sticks, we cut out a piece of metal or wood to fill up the enclosed angle, we get the earliest form of the sun-dial, known as the *gnomon*, and according to the shape of the *gnomon* the latitude of a place is determined. Accordingly, it is not surprising to find that the invention of the *gnomon* is also attributed to Anaximander, for without some such instrument it would have been impossible for him to have made any map worthy of the name. But it is probable that Anaximander did not so much invent as introduce the *gnomon*, and, indeed, Herodotus, expressly states that this instrument was derived from the Babylonians, who were the earliest astronomers, so far as we know. A curious point confirms this, for the measurement of angles is by degrees, and degrees are divided into sixty seconds, just as minutes are. Now this division into sixty is certainly derived from Babylonia in the case of time measurement, and is therefore of the same origin as regards the measurement of angles.

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We have no longer any copy of this first map of the world drawn up by Anaximander, but there is little doubt that it formed the foundation of a similar map drawn by a fellow-townsmen of Anaximander, HECATÆUS of Miletus, who seems to have written the first formal geography. Only fragments of this are extant, but from them we are able to see that it was of the nature of a *periplus*, or seaman's guide, telling how many days' sail it was from one point to another, and in what direction. We know also that he arranged his whole subject into two books, dealing respectively with Europe and Asia, under which latter term he included part of what we now know as Africa. From the fragments scholars have been able to reproduce the rough outlines of the map of the world as it presented itself to Hecatæus. From this it can be seen that the Homeric conception of the surrounding ocean formed a chief determining feature in Hecatæus's map. For the rest, he was acquainted with the Mediterranean, Red, and Black Seas, and with the great rivers Danube, Nile, Euphrates, Tigris, and Indus.

The next great name in the history of Greek geography is that of HERODOTUS of Halicarnassus, who might indeed be equally well called the Father of Geography as the Father of History. He travelled much in Egypt, Babylonia, Persia, and on the shores of the Black Sea, while he was acquainted with Greece, and passed the latter years of his life in South Italy. On all these countries he gave his fellow-citizens accurate and tolerably full information, and he had diligently collected knowledge about countries in their neighbourhood. In particular he gives full details of Scythia (or Southern Russia), and of the satrapies and royal roads of Persia. As a rule, his information is as accurate as could be expected at such an early date, and he rarely tells marvellous stories, or if he does, he points out himself their untrustworthiness. Almost the only traveller's yarn which Herodotus reports without due scepticism is that of the ants of India that were bigger than foxes and burrowed out gold dust for their ant-hills.

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One of the stories he relates is of interest, as seeming to show an anticipation of one of Mr. Stanley's journeys. Five young men of the Nasamonians started from Southern Libya, W. of the Soudan, and journeyed for many days west till they came to a grove of trees, when they were seized by a number of men of very small stature, and conducted through marshes to a great city of black men of the same size, through which a large river flowed. This Herodotus identifies with the Nile, but, from the indication of the journey given by him, it would seem more probable that it was the Niger, and that the Nasamonians had visited Timbuctoo! Owing to this statement of Herodotus, it was for long thought that the Upper Nile flowed east and west.

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After Herodotus, the date of whose history may be fixed at the easily remembered number of 444 B.C., a large increase of knowledge was obtained of the western part of Asia by the two expeditions of Xenophon and of Alexander, which brought the familiar knowledge of the Greeks as far as India. But besides these military expeditions we have still extant several log-books of mariners, which might have added considerably to Greek geography. One of these tells the tale of an expedition of the

Carthaginian admiral named Hanno, down the western coast of Africa, as far as Sierra Leone, a voyage which was not afterwards undertaken for sixteen hundred years. Hanno brought back from this voyage hairy skins, which, he stated, belonged to men and women whom he had captured, and who were known to the natives by the name of Gorillas. Another log-book is that of a Greek named Scylax, who gives the sailing distances between nearly all ports on the Mediterranean and Black Seas, and the number of days required to pass from one to another. From this it would seem that a Greek merchant vessel could manage on the average fifty miles a day. Besides this, one of Alexander's admirals, named Nearchus, learned to carry his ships from the mouth of the Indus to the Arabian Gulf. Later on, a Greek sailor, Hippalus, found out that by using the monsoons at the appropriate times, he could sail direct from Arabia to India without laboriously coasting along the shores of Persia and Beluchistan, and in consequence the Greeks gave his name to the monsoon. For information about India itself, the Greeks were, for a long time, dependent upon the account of Megasthenes, an ambassador sent by Seleucus, one of Alexander's generals, to the Indian king of the Punjab.

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While knowledge was thus gained of the East, additional information was obtained about the north of Europe by the travels of one PYTHEAS, a native of Marseilles, who flourished about the time of Alexander the Great (333 B.C.), and he is especially interesting to us as having been the first civilised person who can be identified as having visited Britain. He seems to have coasted along the Bay of Biscay, to have spent some time in England,—which he reckoned as 40,000 stadia (4000 miles) in circumference,—and he appears also to have coasted along Belgium and Holland, as far as the mouth of the Elbe. Pytheas is, however, chiefly known in the history of geography as having referred to the island of Thule, which he described as the most northerly point of the inhabited earth, beyond which the sea became thickened, and of a jelly-like consistency. He does not profess to have visited Thule, and his account probably refers to the existence of drift ice near the Shetlands.

All this new information was gathered together, and made accessible to the Greek reading world, by ERATOSTHENES, librarian of Alexandria (240-196 B.C.), who was practically the founder of scientific geography. He was the first to attempt any accurate measurement of the size of the earth, and of its inhabited portion. By his time the scientific men of Greece had become quite aware of the fact that the earth was a globe, though they considered that it was fixed in space at the centre of the universe. Guesses had even been made at the size of this globe, Aristotle fixing its circumference at 400,000 stadia (or 40,000 miles), but Eratosthenes attempted a more accurate measurement. He compared the length of the shadow thrown by the sun at Alexandria and at Syene, near the first cataract of the Nile, which he assumed to be on the same meridian of longitude, and to be at about 5000 stadia (500 miles) distance. From the difference in the length of the shadows he deduced that this distance represented one-fiftieth of the circumference of the earth, which would accordingly be about 250,000 stadia, or 25,000 geographical miles. As the actual circumference is 24,899 English miles, this was a very near approximation, considering the rough means Eratosthenes had at his disposal.

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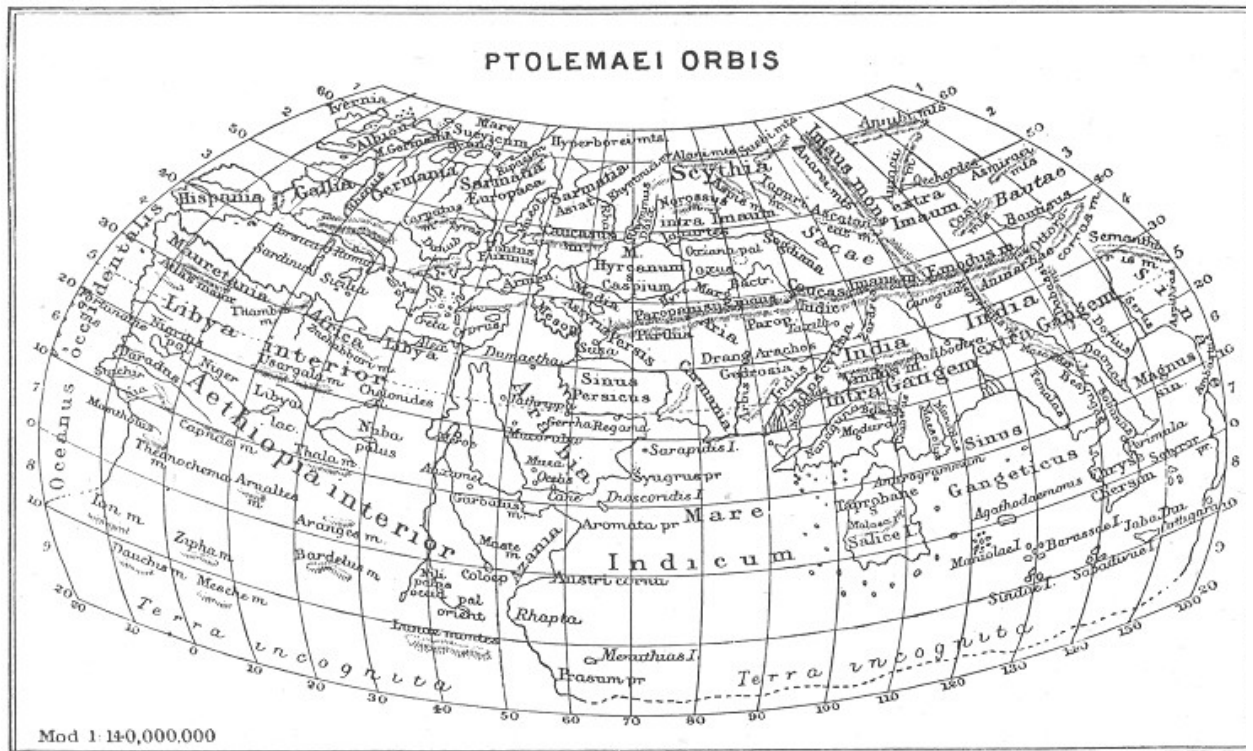
Having thus estimated the size of the earth, Eratosthenes then went on to determine the size of that portion which the ancients considered to be habitable. North and south of the lands known to him, Eratosthenes and all the ancients considered to be either too cold or too hot to be habitable; this portion he reckoned to extend to 38,000 stadia, or 3800 miles. In reckoning the extent of the habitable portion from east to west, Eratosthenes came to the conclusion that from the Straits of Gibraltar to the east of India was about 80,000 stadia, or, roughly speaking, one-third of the earth's surface. The remaining two-thirds were supposed to be covered by the ocean, and Eratosthenes prophetically remarked that "if it were not that the vast extent of the Atlantic Sea rendered it impossible, one might almost sail from the coast of Spain to that of India along the same parallel." Sixteen hundred years later, as we shall see, Columbus tried to carry out this idea. Eratosthenes based his calculations on two fundamental lines, corresponding in a way to our equator and meridian of Greenwich: the first stretched, according to him, from Cape St. Vincent, through the Straits of Messina and the island of Rhodes, to Issus (Gulf of Iskanderun); for his starting-line in reckoning north and south he used a meridian passing through the First Cataract, Alexandria, Rhodes, and Byzantium.

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The next two hundred years after Eratosthenes' death was filled up by the spread of the Roman Empire, by the taking over by the Romans of the vast possessions previously held by Alexander and his successors and by the Carthaginians, and by their spread into Gaul, Britain, and Germany. Much of

the increased knowledge thus obtained was summed up in the geographical work of STRABO, who wrote in Greek about 20 B.C. He introduced from the extra knowledge thus obtained many modifications of the system of Eratosthenes, but, on the whole, kept to his general conception of the world. He rejected, however, the existence of Thule, and thus made the world narrower; while he recognised the existence of Ierne, or Ireland; which he regarded as the most northerly part of the habitable world, lying, as he thought, north of Britain.

Between the time of Strabo and that of Ptolemy, who sums up all the knowledge of the ancients about the habitable earth, there was only one considerable addition to men's acquaintance with their neighbours, contained in a seaman's manual for the navigation of the Indian Ocean, known as the *Periplus* of the Erythraean Sea. This gave very full and tolerably accurate accounts of the coasts from Aden to the mouth of the Ganges, though it regarded Ceylon as much greater, and more to the south, than it really is; but it also contains an account of the more easterly parts of Asia, Indo-China, and China itself, "where the silk comes from." This had an important influence on the views of Ptolemy, as we shall see, and indirectly helped long afterwards to the discovery of America.



PTOLEMAEI ORBIS

It was left to PTOLEMY of Alexandria to sum up for the ancient world all the knowledge that had been accumulating from the time of Eratosthenes to his own day, which we may fix at about 150 A.D. He took all the information he could find in the writings of the preceding four hundred years, and reduced it all to one uniform scale; for it is to him that we owe the invention of the method and the names of latitude and longitude. Previous writers had been content to say that the distance between one point and another was so many stadia, but he reduced all this rough reckoning to so many degrees of latitude and longitude, from fixed lines as starting-points. But, unfortunately, all these reckonings were rough calculations, which are almost invariably beyond the truth; and Ptolemy, though the greatest of ancient astronomers, still further distorted his results by assuming that a degree was 500 stadia, or 50 geographical miles. Thus when he found in any of his authorities that the distance between one port and another was 500 stadia, he assumed, in the first place, that this was accurate, and, in the second, that the distance between the two places was equal to a degree of latitude or longitude, as the case might be. Accordingly he arrived at the result that the breadth of the habitable globe was, as he put it, twelve hours of longitude (corresponding to 180°)—nearly one-third as much again as the real dimensions from Spain to China. The consequence of this was that the distance from Spain to China *westward* was correspondingly diminished by sixty degrees (or nearly 4000 miles), and it was this error that ultimately encouraged Columbus to attempt his epoch-making voyage.

Ptolemy's errors of calculation would not have been so extensive but that he adopted a method of measurement which made them accumulative. If he had chosen Alexandria for the point of departure in measuring longitude, the errors he made when reckoning westward would have been counterbalanced by those reckoning eastward, and would not have resulted in any serious distortion of the truth; but instead of this, he adopted as his point of departure the Fortunatæ Insulæ, or Canary Islands, and every degree measured to the east of these was one-fifth too great, since he assumed that it was only fifty miles in length. I may mention that so great has been the influence of Ptolemy on geography, that, up to the middle of the last century, Ferro, in the Canary Islands, was still retained as the zero-point of the meridians of longitude.

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Another point in which Ptolemy's system strongly influenced modern opinion was his departure from the previous assumption that the world was surrounded by the ocean, derived from Homer. Instead of Africa being thus cut through the middle by the ocean, Ptolemy assumed, possibly from vague traditional knowledge, that Africa extended an unknown length to the south, and joined on to an equally unknown continent far to the east, which, in the Latinised versions of his astronomical work, was termed "terra australis incognita," or "the unknown south land." As, by his error with regard to the breadth of the earth, Ptolemy led to Columbus; so, by his mistaken notions as to the "great south land," he prepared the way for the discoveries of Captain Cook. But notwithstanding these errors, which were due partly to the roughness of the materials which he had to deal with, and partly to scientific caution, Ptolemy's work is one of the great monuments of human industry and knowledge. For the Old World it remained the basis of all geographical knowledge up to the beginning of the last century, just as his astronomical work was only finally abolished by the work of Newton. Ptolemy has thus the rare distinction of being the greatest authority on two important departments of human knowledge—astronomy and geography—for over fifteen hundred years. Into the details of his description of the world it is unnecessary to go. The map will indicate how near he came to the main outlines of the Mediterranean, of Northwest Europe, of Arabia, and of the Black Sea. Beyond these regions he could only depend upon the rough indications and guesses of untutored merchants. But it is worth while referring to his method of determining latitude, as it was followed up by most succeeding geographers. Between the equator and the most northerly point known to him, he divides up the earth into horizontal strips, called by him "climates," and determined by the average length of the longest day in each. This is a very rough method of determining latitude, but it was probably, in most cases, all that Ptolemy had to depend upon, since the measurement of angles would be a rare accomplishment even in modern times, and would only exist among a few mathematicians and astronomers in Ptolemy's days. With him the history of geographical knowledge and discovery in the ancient world closes.

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In this chapter I have roughly given the names and exploits of the Greek men of science, who summed up in a series of systematic records the knowledge obtained by merchants, by soldiers, and by travellers of the extent of the world known to the ancients. Of this knowledge, by far the largest amount was gained, not by systematic investigation for the purpose of geography, but by military expeditions for the purpose of conquest. We must now retrace our steps, and give a rough review of the various stages of conquest. We must now retrace our steps, and give a rough review of the various stages of conquest by which the different regions of the Old World became known to the Greeks and the Roman Empire, whose knowledge Ptolemy summarises.

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[Authorities: Bunbury, *History of Ancient Geography*, 2 vols., 1879; Tozer, *History of Ancient Geography*, 1897.]

CHAPTER II

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THE SPREAD OF CONQUEST IN THE ANCIENT WORLD

In a companion volume of this series, "The Story of Extinct Civilisations in the East," will be found an account of the rise and development of the various nations who held sway over the west of Asia at the dawn of history. Modern discoveries of remarkable interest have enabled us to learn the condition of men in Asia Minor as early as 4000 B.C. All these early civilisations existed on the banks of great

rivers, which rendered the land fertile through which they passed.

We first find man conscious of himself, and putting his knowledge on record, along the banks of the great rivers Nile, Euphrates, and Tigris, Ganges and Yang-tse-Kiang. But for our purposes we are not concerned with these very early stages of history. The Egyptians got to know something of the nations that surrounded them, and so did the Assyrians. A summary of similar knowledge is contained in the list of tribes given in the tenth chapter of Genesis, which divides all mankind, as then known to the Hebrews, into descendants of Shem, Ham, and Japhet—corresponding, roughly, to Asia, Europe, and Africa. But in order to ascertain how the Romans obtained the mass of information which was summarised for them by Ptolemy in his great work, we have merely to concentrate our attention on the remarkable process of continuous expansion which ultimately led to the existence of the Roman Empire.

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All early histories of kingdoms are practically of the same type. A certain tract of country is divided up among a certain number of tribes speaking a common language, and each of these tribes ruled by a separate chieftain. One of these tribes then becomes predominant over the rest, through the skill in war or diplomacy of one of its chiefs, and the whole of the tract of country is thus organised into one kingdom. Thus the history of England relates how the kingdom of Wessex grew into predominance over the whole of the country; that of France tells how the kings who ruled over the Isle of France spread their rule over the rest of the land; the history of Israel is mainly an account of how the tribe of Judah obtained the hegemony of the rest of the tribes; and Roman history, as its name implies, informs us how the inhabitants of a single city grew to be the masters of the whole known world. But their empire had been prepared for them by a long series of similar expansions, which might be described as the successive swallowing up of empire after empire, each becoming overgrown in the process, till at last the series was concluded by the Romans swallowing up the whole. It was this gradual spread of dominion which, at each stage, increased men's knowledge of surrounding nations, and it therefore comes within our province to roughly sum up these stages, as part of the story of geographical discovery.

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Regarded from the point of view of geography, this spread of man's knowledge might be compared to the growth of a huge oyster-shell, and, from that point of view, we have to take the north of the Persian Gulf as the apex of the shell, and begin with the Babylonian Empire. We first have the kingdom of Babylon—which, in the early stages, might be best termed Chaldæa—in the south of Mesopotamia (or the valley between the two rivers, Tigris and Euphrates), which, during the third and second millennia before our era, spread along the valley of the Tigris. But in the fourteenth century B.C., the Assyrians to the north of it, though previously dependent upon Babylon, conquered it, and, after various vicissitudes, established themselves throughout the whole of Mesopotamia and much of the surrounding lands. In 604 B.C. the capital of this great empire was moved once more to Babylon, so that in the last stage, as well as in the first, it may be called Babylonia. For purposes of distinction, however, it will be as well to call these three successive stages Chaldæa, Assyria, and Babylonia.

Meanwhile, immediately to the east, a somewhat similar process had been gone through, though here the development was from north to south, the Medes of the north developing a powerful empire in the north of Persia, which ultimately fell into the hands of Cyrus the Great in 546 B.C. He then proceeded to conquer the kingdom of Lydia, in the northwest part of Asia Minor, which had previously inherited the dominions of the Hittites. Finally he proceeded to seize the empire of Babylonia, by his successful attack on the capital, 538 B.C. He extended his rule nearly as far as India on one side, and, as we know from the Bible, to the borders of Egypt on the other. His son Cambyses even succeeded in adding Egypt for a time to the Persian Empire. The oyster-shell of history had accordingly expanded to include almost the whole of Western Asia.

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The next two centuries are taken up in universal history by the magnificent struggle of the Greeks against the Persian Empire—the most decisive conflict in all history, for it determined whether Europe or Asia should conquer the world. Hitherto the course of conquest had been from east to west, and if Xerxes' invasion had been successful, there is little doubt that the westward tendency would have continued. But the larger the tract of country which an empire covers—especially when different tribes and nations are included in it—the weaker and less organised it becomes. Within little more than a century of the death of Cyrus the Great the Greeks discovered the vulnerable point in the Persian Empire, owing to an expedition of ten thousand Greek mercenaries under Xenophon, who had been

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engaged by Cyrus the younger in an attempt to capture the Persian Empire from his brother. Cyrus was slain, 401 B.C., but the ten thousand, under the leadership of Xenophon, were enabled, to hold their own against all the attempts of the Persians to destroy them, and found their way back to Greece.

Meanwhile the usual process had been going on in Greece by which a country becomes consolidated. From time to time one of the tribes into which that mountainous country was divided obtained supremacy over the rest: at first the Athenians, owing to the prominent part they had taken in repelling the Persians; then the Spartans, and finally the Thebans. But on the northern frontiers a race of hardy mountaineers, the Macedonians, had consolidated their power, and, under Philip of Macedon, became masters of all Greece. Philip had learned the lesson taught by the successful retreat of the ten thousand, and, just before his death, was preparing to attack the Great King (of Persia) with all the forces which his supremacy in Greece put at his disposal. His son Alexander the Great carried out Philip's intentions. Within twelve years (334-323 B.C.) he had conquered Persia, Parthia, India (in the strict sense, *i.e.* the valley of the Indus), and Egypt. After his death his huge empire was divided up among his generals, but, except in the extreme east, the whole of it was administered on Greek methods. A Greek-speaking person could pass from one end to the other without difficulty, and we can understand how a knowledge of the whole tract of country between the Adriatic and the Indus could be obtained by Greek scholars. Alexander founded a large number of cities, all bearing his name, at various points of his itinerary; but of these the most important was that at the mouth of the Nile, known to this day as Alexandria. Here was the intellectual centre of the whole Hellenic world, and accordingly it was here, as we have seen, that Eratosthenes first wrote down in a systematic manner all the knowledge about the habitable earth which had been gained mainly by Alexander's conquests.

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Important as was the triumphant march of Alexander through Western Asia, both in history and in geography, it cannot be said to have added so very much to geographical knowledge, for Herodotus was roughly acquainted with most of the country thus traversed, except towards the east of Persia and the north-west of India. But the itineraries of Alexander and his generals must have contributed more exact knowledge of the distances between the various important centres of population, and enabled Eratosthenes and his successors to give them a definite position on their maps of the world. What they chiefly learned from Alexander and his immediate successors was a more accurate knowledge of North-West India. Even as late as Strabo, the sole knowledge possessed at Alexandria of Indian places was that given by Megasthenes, the ambassador to India in the third century B.C.

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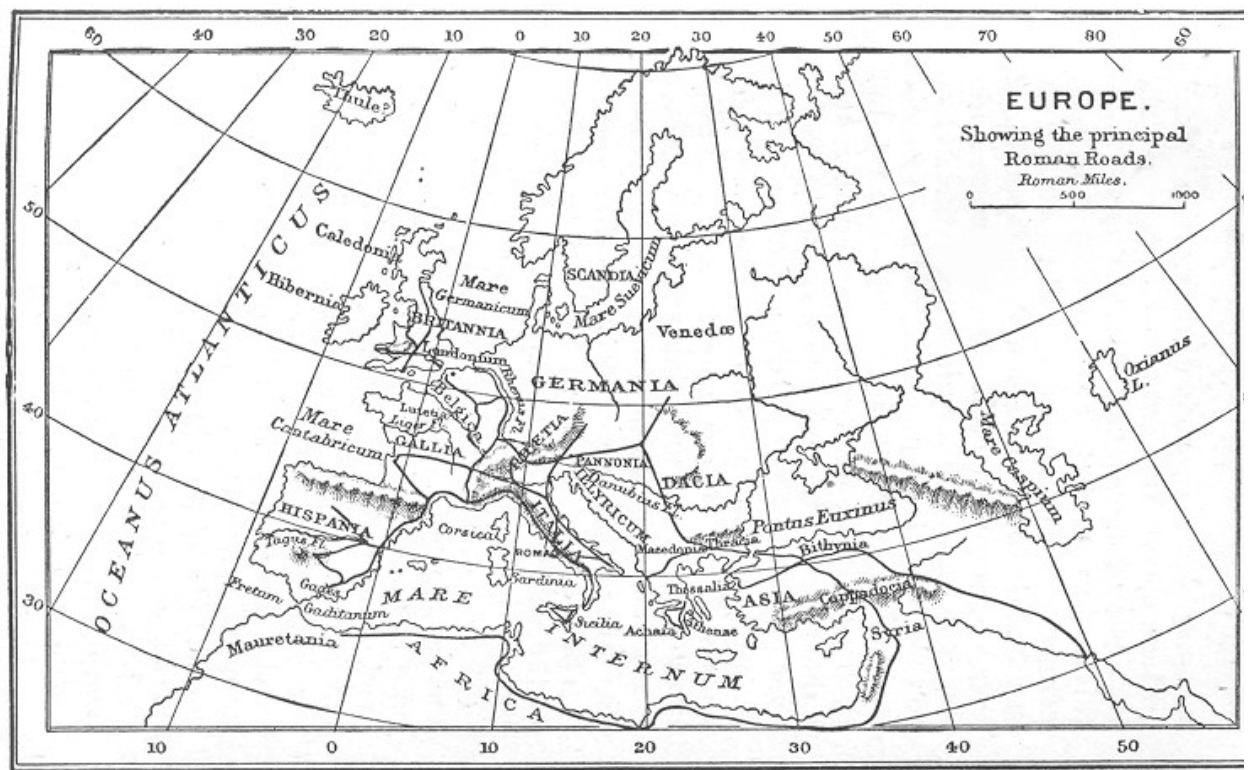
Meanwhile, in the western portion of the civilised world a similar process had gone on. In the Italian peninsula the usual struggle had gone on between the various tribes inhabiting it. The fertile plain of Lombardy was not in those days regarded as belonging to Italy, but was known as Cisalpine Gaul. The south of Italy, as we have seen, was mainly inhabited by Greek colonists, and was called Great Greece. Between these tracts of country the Italian territory was inhabited by three sets of federate tribes—the Etrurians, the Samnites, and the Latins. During the 230 years between 510 B.C. and 280 B.C. Rome was occupied in obtaining the supremacy among these three sets of tribes, and by the latter date may be regarded as having consolidated Central Italy into an Italian federation, centralised at Rome. At the latter date, the Greek king Pyrrhus of Epirus, attempted to arouse the Greek colonies in Southern Italy against the growing power of Rome; but his interference only resulted in extending the Roman dominion down to the heel and big toe of Italy.

If Rome was to advance farther, Sicily would be the next step, and just at that moment Sicily was being threatened by the other great power of the West—Carthage. Carthage was the most important of the colonies founded by the Phœnicians (probably in the ninth century B.C.), and pursued in the Western Mediterranean the policy of establishing trading stations along the coast, which had distinguished the Phœnicians from their first appearance in history. They seized all the islands in that division of the sea, or at any rate prevented any other nation from settling in Corsica, Sardinia, and the Balearic Isles. In particular Carthage took possession of the western part of Sicily, which had been settled by sister Phœnician colonies. While Rome did everything in its power to consolidate its conquests by admitting the other Italians to some share in the central government, Carthage only regarded its foreign possessions as so many openings for trade. In fact, it dealt with the western littoral of the Mediterranean something like the East India Company treated the coast of Hindostan: it established factories at convenient spots. But just as the East India Company found it necessary to

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conquer the neighbouring territory in order to secure peaceful trade, so Carthage extended its conquests all down the western coast of Africa and the south-east part of Spain, while Rome was extending into Italy. To continue our conchological analogy, by the time of the first Punic War Rome and Carthage had each expanded into a shell, and between the two intervened the eastern section of the island of Sicily. As the result of this, Rome became master of Sicily, and then the final struggle took place with Hannibal in the second Punic War, which resulted in Rome becoming possessed of Spain and Carthage. By the year 200 B.C. Rome was practically master of the Western Mediterranean, though it took another century to consolidate its heritage from Carthage in Spain and Mauritania. During that century—the second before our era—Rome also extended its Italian boundaries to the Alps by the conquest of Cisalpine Gaul, which, however, was considered outside Italy, from which it was separated by the river Rubicon. In that same century the Romans had begun to interfere in the affairs of Greece, which easily fell into their hands, and thus prepared the way for their inheritance of Alexander's empire.

This, in the main, was the work of the first century before our era, when the expansion of Rome became practically concluded. This was mainly the work of two men, Cæsar and Pompey. Following the example of his uncle, Marius, Cæsar extended the Roman dominions beyond the Alps to Gaul, Western Germany, and Britain; but from our present standpoint it was Pompey who prepared the way for Rome to carry on the succession of empire in the more civilised portions of the world, and thereby merited his title of "Great." He pounded up, as it were, the various states into which Asia Minor was divided, and thus prepared the way for Roman dominion over Western Asia and Egypt. By the time of Ptolemy the empire was thoroughly consolidated, and his map and geographical notices are only tolerably accurate within the confines of the empire.



EUROPE.
Showing the principal Roman Roads.

One of the means by which the Romans were enabled to consolidate their dominion must be here shortly referred to. In order that their legions might easily pass from one portion of this huge empire to another, they built roads, generally in straight lines, and so solidly constructed that in many places throughout Europe they can be traced even to the present day, after the lapse of fifteen hundred years. Owing to them, in a large measure, Rome was enabled to preserve its empire intact for nearly five hundred years, and even to this day one can trace a difference in the civilisation of those countries over which Rome once ruled, except where the devastating influence of Islam has passed like a sponge over the old Roman provinces. Civilisation, or the art of living together in society, is practically the

result of Roman law, and this sense all roads in history lead to Rome.

The work of Claudius Ptolemy sums up to us the knowledge that the Romans had gained by their inheritance, on the western side, of the Carthaginian empire, and, on the eastern, of the remains of Alexander's empire, to which must be added the conquests of Cæsar in North-West Europe. Cæsar is, indeed, the connecting link between the two shells that had been growing throughout ancient history. He added Gaul, Germany, and Britain to geographical knowledge, and, by his struggle with Pompey, connected the Levant with his northerly conquests. One result of his imperial work must be here referred to. By bringing all civilised men under one rule, he prepared them for the worship of one God. This was not without its influence on travel and geographical discovery, for the great barrier between mankind had always been the difference of religion, and Rome, by breaking down the exclusiveness of local religions, and substituting for them a general worship of the majesty of the Emperor, enabled all the inhabitants of this vast empire to feel a certain communion with one another, which ultimately, as we know, took on a religious form.

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The Roman Empire will henceforth form the centre from which to regard any additions to geographical knowledge. As we shall see, part of the knowledge acquired by the Romans was lost in the Dark Ages succeeding the break-up of the empire; but for our purposes this may be neglected and geographical discovery in the succeeding chapters may be roughly taken to be additions and corrections of the knowledge summed up by Claudius Ptolemy.

CHAPTER III

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GEOGRAPHY IN THE DARK AGES

We have seen how, by a slow process of conquest and expansion, the ancient world got to know a large part of the Eastern Hemisphere, and how this knowledge was summed up in the great work of Claudius Ptolemy. We have now to learn how much of this knowledge was lost or perverted—how geography, for a time, lost the character of a science, and became once more the subject of mythical fancies similar to those which we found in its earliest stages. Instead of knowledge which, if not quite exact, was at any rate approximately measured, the mediæval teachers who concerned themselves with the configuration of the inhabited world substituted their own ideas of what ought to be.[1] This is a process which applies not alone to geography, but to all branches of knowledge, which, after the fall of the Roman Empire, ceased to expand or progress, became mixed up with fanciful notions, and only recovered when a knowledge of ancient science and thought was restored in the fifteenth century. But in geography we can more easily see than in other sciences the exact nature of the disturbing influence which prevented the acquisition of new knowledge.

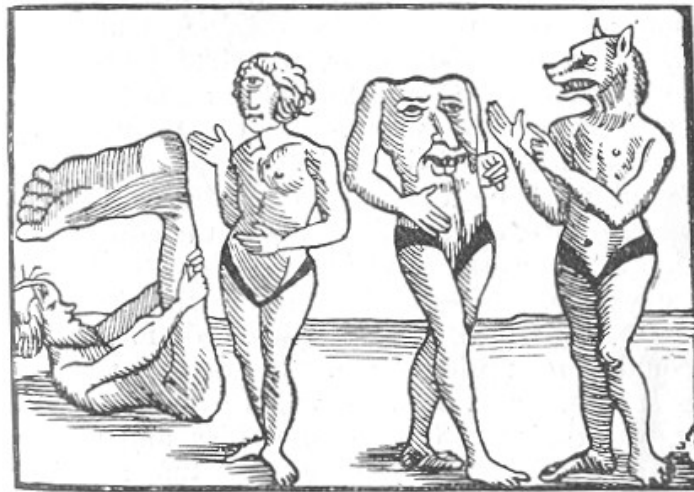
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[Footnote 1: It is fair to add that Professor Miller's researches have shown that some of the "unscientific" qualities of the mediæval *mappæ mundi* were due to Roman models.]

Briefly put, that disturbing influence was religion, or rather theology; not, of course, religion in the proper sense of the word, or theology based on critical principles, but theological conceptions deduced from a slavish adherence to texts of Scripture, very often seriously misunderstood. To quote a single example: when it is said in Ezekiel v. S, "This is Jerusalem: I have set it in the midst of the nations... round about her," this was not taken by the mediæval monks, who were the chief geographers of the period, as a poetical statement, but as an exact mathematical law, which determined the form which all mediæval maps took. Roughly speaking, of course, there was a certain amount of truth in the statement, since Jerusalem would be about the centre of the world as known to the ancients—at least, measured from east to west; but, at the same time, the mediæval geographers adopted the old Homeric idea of the ocean surrounding the habitable world, though at times there was a tendency to keep more closely to the words of Scripture about the four corners of the earth. Still, as a rule, the orthodox conception of the world was that of a circle enclosing a sort of T square, the east being placed at the top, Jerusalem in the centre; the Mediterranean Sea naturally divided the lower half of the circle, while the Ægean and Red Seas were regarded as spreading out right and left

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perpendicularly, thus dividing the top part of the world, or Asia, from the lower part, divided equally between Europe on the left and Africa on the right. The size of the Mediterranean Sea, it will be seen, thus determined the dimensions of the three continents. One of the chief errors to which this led was to cut off the whole of the south of Africa, which rendered it seemingly a short voyage round that continent on the way to India. As we shall see, this error had important and favourable results on geographical discovery.



GEOGRAPHICAL MONSTERS

Another result of this conception of the world as a T within an O, was to expand Asia to an enormous extent; and as this was a part of the world which was less known to the monkish map-makers of the Middle Ages, they were obliged to fill out their ignorance by their imagination. Hence they located in Asia all the legends which they had derived either from Biblical or classical sources. Thus there was a conception, for which very little basis is to be found in the Bible, of two fierce nations named Gog and Magog, who would one day bring about the destruction of the civilised world. These were located in what would have been Siberia, and it was thought that Alexander the Great had penned them in behind the Iron Mountains. When the great Tartar invasion came in the thirteenth century, it was natural to suppose that these were no less than the Gog and Magog of legend. So, too, the position of Paradise was fixed in the extreme east, or, in other words, at the top of mediæval maps. Then, again, some of the classical authorities, as Pliny and Solinus, had admitted into their geographical accounts legends of strange tribes of monstrous men, strangely different from normal humanity. Among these may be mentioned the Sciapodes, or men whose feet were so large that when it was hot they could rest on their backs and lie in the shade. There is a dim remembrance of these monstrosities in Shakespeare's reference to

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"The Anthropophagi, and men whose heads
Do grow beneath their shoulders."

In the mythical travels of Sir John Maundeville there are illustrations of these curious beings, one of which is here reproduced. Other tracts of country were supposed to be inhabited by equally monstrous animals. Illustrations of most of these were utilised to fill up the many vacant spaces in the mediæval maps of Asia.

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One author, indeed, in his theological zeal, went much further in modifying the conceptions of the habitable world. A Christian merchant named Cosmas, who had journeyed to India, and was accordingly known as COSMAS INDICOPLEUSTES, wrote, about 540 A.D., a work entitled "Christian Topography," to confound what he thought to be the erroneous views of Pagan authorities about the configuration of the world. What especially roused his ire was the conception of the spherical form of the earth, and of the Antipodes, or men who could stand upside down. He drew a picture of a round ball, with four men standing upon it, with their feet on opposite sides, and asked triumphantly how it was possible that all four could stand upright? In answer to those who asked him to explain how he could account for day and night if the sun did not go round the earth, he supposed that there was a huge mountain in the extreme north, round which the sun moved once in every twenty-four hours. Night was when the sun was going round the other side of the mountain. He also

proved, entirely to his own satisfaction, that the sun, instead of being greater, was very much smaller than the earth. The earth was, according to him, a moderately sized plane, the inhabited parts of which were separated from the antediluvian world by the ocean, and at the four corners of the whole were the pillars which supported the heavens, so that the whole universe was something like a big glass exhibition case, on the top of which was the firmament, dividing the waters above and below it, according to the first chapter of Genesis.



THE HEREFORD MAP.

Cosmas' views, however interesting and amusing they are, were too extreme to gain much credence or attention even from the mediæval monks, and we find no reference to them in the various *mappa mundi* which sum up their knowledge, or rather ignorance, about the world. One of the most remarkable of these maps exists in England at Hereford, and the plan of it given on [p. 53](#) will convey as much information as to early mediæval geography as the ordinary reader will require. In the extreme east, *i.e.* at the top, is represented the Terrestrial Paradise; in the centre is Jerusalem; beneath this, the Mediterranean extends to the lower edge of the map, with its islands very carefully particularised. Much attention is given to the rivers throughout, but very little to the mountains. The only real increase of actual knowledge represented in the map is that of the north-east of Europe, which had I naturally become better known by the invasion of the Norsemen. But how little real knowledge was possessed of this portion of Europe is proved by the fact that the mapmaker placed near Norway the Cynocephali, or dog-headed men, probably derived from some confused accounts of Indian monkeys. Near them are placed the Gryphons, "men most wicked, for among their misdeeds they also make garments for themselves and their horses out of the skins of their enemies." Here, too, is placed the home of the Seven Sleepers, who lived for ever as a standing miracle to convert the heathen. The shape given to the British Islands will be observed as due to the necessity of keeping the circular form of the inhabited world. Other details about England we may leave for the present.

It is obvious that maps such as the Hereford one would be of no practical utility to travellers who desired to pass from one country to another; indeed, they were not intended for any such purpose. Geography had ceased to be in any sense a practical science; it only ministered to men's sense of wonder, and men studied it mainly in order to learn about the marvels of the world. When William of Wykeham drew up his rules for the Fellows and Scholars of New College, Oxford, he directed them in the long winter evenings to occupy themselves with "singing, or reciting poetry, or with the chronicles of the different kingdoms, or with the *wonders of the world*." Hence almost all mediæval maps are filled up with pictures of these wonders, which were the more necessary as so few people

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