

**THE DISCOVERY OF AMERICA. A
COMMEMORATION ADDRESS
DELIVERED IN UNIVERSITY HALL,
OCTOBER 21, 1892**

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The discovery of America. A commemoration address delivered in University Hall, October 21, 1892 by B. A. Hinsdale

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B. A. HINSDALE

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UNIVERSITY OF MICHIGAN.

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THE DISCOVERY OF AMERICA.

A COMMEMORATION ADDRESS

DELIVERED IN UNIVERSITY HALL, OCTOBER 21, 1892,

By the Invitation of the University Senate.

^{Burke}
^{Baron}
B. A. HINSDALE, LL. D.

Professor of the Science and the Art of Teaching.

Published by the University.

1892.

THE DISCOVERY OF AMERICA.

Gentlemen of the University Senate:

The great event that we have assembled to commemorate came on a flood-tide of great events. In 1453 the Turks took Constantinople, thereby putting an end to the Roman Empire and extinguishing the pharos of learning that had burned on the Bosphorus through the Middle Ages, but also scattering the Greek scholars over Europe and contributing to the revival of letters. In 1454 some printer at Mayence, perhaps Gutenberg, published the thirty-one line indulgence, thus demonstrating the art of printing with movable types. In 1487 Dias discovered the Cape of Good Hope, which Da Gama doubled ten years later on his great voyage to the Indies. In 1492 the Western Mohammedan Empire came to an end. In 1517 Luther nailed his theses to the door of the Castle Church in Wittenberg and began the Protestant Reformation. In 1519-1522 Magellan sailed through the strait that bears his name, named and crossed the Pacific Ocean, and not only touched hands with Da Gama but made the first circumnavigation. In 1543 Copernicus published his "De Orbium Revolutionibus," thus preparing the way for Galileo, Kepler, and Newton. Within the limits of these years other things of great importance were done. Latin and Greek letters were practically restored to men, modern art attained its highest perfection, the boundaries of knowledge were immensely expanded, mental freedom was gained, and the human mind born again. With all the rest, civilization changed front; hitherto it had faced the Mediterranean Sea, henceforth it faces the Atlantic Ocean. Well might Humboldt ask where in the history of nations we can find another epoch fraught with such triumphs of the human mind. The New World was not, indeed, uncovered and placed in the clear

light of knowledge at any one time, or by any one man; it was a process rather than an act, occupying many years and enlisting many agents, but the transaction of October 12, 1492, so far transcends all the rest that historians have appropriately given it the name that in strictness belongs to the whole series,—THE DISCOVERY OF AMERICA.

In the long series of antecedents culminating in this discovery, scientific ideas and practical achievements are so blended that it is hard to tell which of the two contribute most to the interest of the story. At a university commemoration, certainly, it would be unpardonable not to give the scientific elements due recognition.

Knowledge of the earth has been widened mainly by war, commerce, missionary undertakings, and travel; but the facts that the soldier, the trader, the missionary, and the traveler have collected, students have always stood ready to systematize. More narrowly, the History of Geography presents four stages of progress: (1) Certain facts are observed or discovered; (2) from these data a general conception or theory is deduced; (3) additional facts are accumulated; (4) this new material is distributed according to the old theory or scheme, or compels the formation of a new one.

The first men to frame a theory of the earth represented it as a flat, disc-like surface of small area. We read of the "circle of the earth" in the prophecy of Isaiah, and of a "compass upon the face of the depth" in the Proverbs. The world of Homer is a circle, having Greece as a center, drawn with a radius long enough to include Asia Minor, the Valley of the Lower Nile, and most of Italy, the whole surrounded by the Ocean. How naturally this conception came to the mind of the primitive geographer, we cannot fail to see the moment we put ourselves in his place. To the unscientific mind seeing is believing; and Sir John Herschel very justly observes that "almost all of the conclusions of astronomy stand in open and striking contradiction with those of superficial and vulgar observation and with what appears to every one, until he has understood and weighed the proofs to the contrary, the most positive evidence of his senses."

Time compelled the abandonment of the disc theory and the creation of a new one. Cold shut out from the north the races that contributed to geographical knowledge and heat shut them out from the south, while within the two oceans east and west they encountered no insuperable mete or bound. The relations of the three old continents to one another and to the waters that furnished the theaters of commerce—the Mediterranean, the Red Sea, the Persian Gulf, and the Indian Ocean—gave to history an east-and-west movement. The Phœnicians laid one hand upon India and the other upon Britain. As a result, the men who now thought out the problem conceived of the earth as a flat, trencher-like surface of much greater extent from east to west than from north to south. Traces of this theory are thickly scattered over the pages of ancient literature, and we have survivals of it in the terms "latitude" and "longitude" still in current use.

Still fuller knowledge compelled the abandonment of the parallelogram theory. Men who became somewhat emancipated from superficial and vulgar observation, saw the heavenly bodies in different positions in different latitudes, at different hours of the day and at different seasons of the year; they saw day and night varying in length with latitude and with the season; they saw that the shadow cast by the earth in eclipses of the moon is round, and that ships "hull down" as they go out to sea. In these observations originated the central ideas of geographical and astronomical science, the sphericity of the earth and its revolution around the sun. Whether he originated these ideas or not, they bore in antiquity the name of Pythagoras, and more than two thousand years later Galileo was condemned for teaching "a false Pythagorean notion." On the conception of the sphericity of the earth, such men as Eratosthenes, Hipparchus, and Ptolemy built up the system known to scholars as the Greek Geography. To be more definite, this geography may be described as follows: (1) The ancients accumulated a great mass of geographical material; (2) they developed the spherical theory of the earth; (3) they systematized the materials that they accumulated; (4) they invented a complete geographical apparatus, maps, globes, parallels and merid-

ians, zones and equator, projections, and the accepted division of the circle. As to the relations of the earth and the sun, the Greek philosophers were not agreed.

The known world when the Græco-Roman civilization had reached its culmination was quadrilateral in form, lying northwest and southeast. Roughly speaking, a right line drawn from the southern tip of Scandinavia to the northern end of the Caspian Sea, and thence to the mouth of the Ganges, was its northern boundary, and a similar line connecting Cape Non and Cape Guardafui, and thence extending eastward, its southern boundary. This world covered some sixty degrees of latitude, and twice that extent of longitude. Within these limits, however, were extensive regions of which the best informed men knew little or nothing; while the relations of the world that they knew to the world that they did not know, was then an insolvable problem. Two antagonistic theories were evolved, the Oceanic and the Continental. Eratosthenes, starting perhaps from the Homeric notion of a circumfluent ocean, held that all the seas and oceans were connected. Among the writers who held this theory was Pomponius Mela, who maintained, in his treatise written about the year 50 A. D., that the only obstacle to the circumnavigation of Africa was the intense heat of the torrid zone. Hipparchus, and still more strongly Ptolemy, repelled the idea of outside oceans, and made land the connecting tissue of the surface of the earth. Ptolemy believed in the indefinite northward and eastward extension of Asia, and a similar southward extension of Africa; he even went so far as to maintain that the two continents came together in the far southeast, thus holding the Indian Ocean in their firm embrace. How very different were these two theories, a glance at the maps of the world according to Mela and Ptolemy will show. The first was evidently much the more favorable to maritime adventure and discovery; and it is pertinent to observe that the great discoverers and geographers of modern times belong to the lineage of Eratosthenes and not of Ptolemy. And yet it was Ptolemy who gave the Greek geography its final shaping, and who controlled for centuries the thinking of scientific men on these subjects.

Those who accepted the Greek geography, at least those who leaned to the Oceanic theory, could hardly fail to speculate on the relations of the eastern and western parts of the earth as they knew it. Aristotle wrote: "They who maintain that Spain and India are separated simply by the sea do not appear to maintain an incredible notion." Strabo reports Eratosthenes as saying: "If the extent of the Atlantic Ocean did not prevent, it would be possible for us to sail from Spain to India along the same parallel." Strabo himself threw out this conjecture: "It is very possible that in the same temperate zone, near the parallel of Thineæ or Athens, which passes through the Atlantic Ocean, besides the world we inhabit, there may be one or more other worlds peopled by beings different from ourselves." Seneca was still bolder: "In tardy years the epoch will come in which the ocean will unloose the bonds of nature, and the great earth will stretch out, and the sea will disclose new worlds; nor will Thule be the most remote on the globe." Such passages as these are valuable, not merely as constituting a part of the great store of Greek thought, but also as links in the chain of causes that finally led up to the great event which we commemorate.

In fact a plurality of worlds was rather a favorite idea of ancient men of science. It is conjectured that it was the thought of these other worlds that caused the great Alexander to weep because he had nothing more to conquer. Cicero at one time contemplated embodying current learned opinion in a work on geography. "Cicero's popularization of this doctrine of more *oikoumenai* than one," says Mr. Payne, "fell in with the ideas of the Augustan age. The dream of the Greek conqueror was transferred to the victorious people who had succeeded to his heritage. Poets sang of the worlds which still awaited the rule of the master of the *oikoumene*. Geographers boldly spoke of an *alter orbis* or second and new world." However it may have been with scientific interest, practical seamanship and economical and political needs were quite too feeble in that age to warrant attempts to test these notions.

It must not be supposed that the Greek geography was at any time generally accepted; the vulgar were still bound by the apparent

evidence of their senses to the disc or parallelogram theory; but men who were abreast of the scientific work of their time appear to have accepted its fundamental ideas as fully as the same class of men accept the current scientific theories of our own day.

With the final triumph of Christianity over heathenism, the Christian hierarchy took charge of the human mind. Pagan science, literature, and philosophy were placed under ban. The Middle Ages drew their dark mantle over Europe. In the great declension of knowledge that now ensued, perhaps no sciences suffered more than geography and astronomy. Whole regions of the earth fell out of sight; the *oikoumene* shrank up, and the old and crude theories of the earth were revived. In the Patristic Geography the "firmament" of Genesis, the "circle" of Isaiah, the "compass" of the Proverbs, the "tabernacle" of the letter to the Hebrews, the "foundations" and the "ends" of the earth, and "the running about of the sun," took the places of the ideas that the Greeks had deduced by long and careful observation. In the sixth century Cosmas Indicopleustes, an Alexandrian monk who had been a merchant and a traveler, wrote his famous "Christian Topography," which is at once a great delight to the curious and also a good example of Middle Age cosmography. Cosmas made the universe a box or chest, in the bottom of which, in the northern part, under the firmament, he placed a lofty conical mountain, around which the heavenly bodies revolve. In summer the sun wheels around the top of the cone, in the winter around the base, thus causing the long days and the short days of the two seasons. This system, established by demonstration from Divine Scriptures, it was not lawful for a Christian to doubt.

But by and by the clouds began to lift. The Saracens had a genius for science as well as for conquest, and they considerably widened the circle of geographical knowledge. The Jews also, traders and sojourners, made their contribution to the common stock. The Crusades revealed to the Western nations extensive regions of which before they knew little, and also threw open the portals to Central Asia, inviting the merchant and traveler to enter. Mission-