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PATTILLO'S
"GEOGRAPHICAL CATECHISM

EDITED BY
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and
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CHAPEL HILL, N. C.
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Education

GIFT

PREFACE

In this reprint of Pattillo's *Geographical Catechism* the original text has been reproduced line for line and page for page. The spelling, punctuation, and capitalization also remain as in the original. The only liberties the editors have taken consist (1) in substituting the modern style for the old-style "s" and (2) in correcting a few typographical errors. The changes made are as follows:

"Equinoxical", p. 7, ll. 19-20, has been changed to "Equinoxial".

".Q 13", p. 8, l. 11, has been changed to "Q. 13".

"africa", p. 11, l. 16, has been changed to "Africa".

"lighter", p. 20, ll. 17-18, has been changed to "lightest".

"grant", p. 21, l. 16, has been changed to "grand".

"more that once", p. 26, l. 37, has been changed to "more than once".

"Q. 41", p. 37, l. 11, has been changed to "Q. 91".

"Setna", p. 40, l. 36, has been changed to "Aetna".

"Lariffa", p. 41, l. 10, has been changed to "Larissa".

"Augsbury", p. 42, ll. 4-5, has been changed to "Augsburg".

"Their", p. 47, l. 4, has been changed to "Their".

A few errors have been allowed to remain: as, for instance, "Q. 56" which is repeated on page 17. Spellings like "ruggid", p. 7, "Labrodor", p. 9, "chearfully", p. 26, and

many others have not been regarded as typographical errors and have been left as in the original.

So far as the editors have been able to learn there are only two copies of the original edition of the *Catechism* that can be located: one (an imperfect copy) is in the library of the University of North Carolina; the other belongs to Dr. Stephen B. Weeks, Trinity, N. C., who has kindly furnished the editors those parts which are missing from the University copy.

THE EDITORS.

Chapel Hill, N. C.

INTRODUCTION

A peep into any schoolroom typical of any age or method of teaching is always of great interest and value to the progressive teacher. A close perusal of this work of Henry Patillo, a North Carolina Preacher-Teacher of the 18th century, takes the reader into a schoolroom of over one hundred years ago and gives him a clear view of how our great-grandparents were taught. The book shows us the old-time teacher and his pupils on recitation, and from start to finish the reader is struck not only with the quaint style of expression but with the steady stream of information poured forth.

The title-page and the preface together give us a clear-cut description of what is to be found in the text, and from these we learn that the author hopes (1) to make the study of Geography easy for ambitious youth; (2) to enable the farmer and his family to read intelligently descriptions of foreign lands; (3) to bring all to know something of the works of God; and (4) to receive in the end "a few dollars which will be welcome visitors." This book, like all text-books written by teachers, is the fruitage of the author's experience in the class-room, and it reveals clearly and distinctly the pedagogy of his time.

A good old Scotch Presbyterian preacher of Granville had a class of "three lads" and began to teach them the fascinating subject of geography. He had no beautifully illustrated text-books, nor wall-maps, nor blackboards with which to do effective work; and so with question and answer he leads his "three lads" around the world, and to the stars,

to distant lands and through far off space, describing every land and star and phenomenon with a style and method that do not fail to catch the eye and the ear of even the modern reader. And on nearly every page he puts into the answers to his ponderous questions an humble reverence for the Deity, as on page 29-30 in speaking of comets: "No part of God's works that have come to my knowledge, astonish me more than the infinite wisdom, foreknowledge and divine art of the Deity, in throwing from his creating hand more than 40 enormous globes, whose paths oppose and cross each other for thousands of years, in every direction, without the rapid fiery comet once touching or interrupting a single planet, which must have frequently happened had the planet been in that part of its orbit in which it was before the comet passed, or would be soon after. Adore ye sons of men, and in humble gratitude acknowledge the power, wisdom and goodness of GOD! If he is thus tremendous in one of his works, who can stand when HE ariseth? Make peace with him whilst thou art in the way; for he is as gracious to returning penitents, as he will be terrible to the sinner in his crimes."

M. C. S. N.

SKETCH OF PATTILLO

(1726-1801)

Henry Pattillo was an eminent Presbyterian preacher and teacher who lived and labored in the counties of Orange and Granville from 1765 until his death in 1801. He was born in Scotland in 1726 "of pious parents well situated in point of religious privileges." About 1740 he with his brother George emigrated to America and settled in Virginia. He at first engaged with a merchant as clerk but soon gave up this occupation in order to study for the ministry. He was licensed to preach about 1757, and in 1765 moved to North Carolina. He came from an ancient and honorable Scotch family residing at Balermic near Dundee. The original name of this family was Pattulloch, of which name there are at least eighteen variations or modifications ranging in spelling from Pattillo to Petilly. The subject of this brief sketch married in 1755 Miss Mary Anderson of Virginia. His descendants are now living in North Carolina, Virginia, Georgia, and Canada.

Henry Pattillo was a man of large public spirit and took a deep and active interest in all matters relating to the welfare of his state and nation. He was a man, too, of great energy and force of character and he exerted a strong influence upon the political as well as the religious and educational life of his state. Because of his prominence he was chosen one of those sent by Governor Tryon to pacify the Regulators. During his brief residence in old Bute county (now Warren and Franklin) he was sent as a delegate to the Provincial

Congress at Hillsboro in 1775. He was chosen one of the chaplains of that body and was called to preside in the Committee of the whole. He also served as a member of the Committee of Safety for the Halifax District.

He began his teaching career in Virginia while studying for the ministry. After coming to North Carolina he conducted schools at Hawfields, Williamsboro, and at Granville Hall, a school "incorporated in 1779 when the country was convulsed in war," the exact site of which is not now known. He doubtless taught at several other places — wherever, in fact, his pastoral duties called him to reside.

Mr. Pattillo is said to have been an excellent classical scholar for his day and opportunity. In recognition of his varied talents and scholastic attainments Hampden-Sidney College conferred upon him in 1787 the honorary degree of A.M. He wrote a good deal, but because of the limited facilities for printing, published but little. He left many manuscripts which have never been published. In 1787 he published in Wilmington a volume of *Sermons*; in 1796 his *Geographical Catechism*, the first text-book written in North Carolina, appeared; his only other publications consist of a few pamphlets.

N. W. W.

A GEOGRAPHICAL
C A T E C H I S M,

To assist those who have neither Maps nor Gazetteers,

TO READ

NEWS-PAPERS, HISTORY, OR TRAVELS;

With as much of

The SCIENCE of ASTRONOMY, and the DOCTRINE of the AIR,

As is judged sufficient for the FARMER, who wishes

to understand something of

The Works of GOD, around him;

And for the studious YOUTH, who have or have not a prospect of

further prosecuting those SUBLIME SCIENCES.

BY HENRY PATTILLO, A. M. GRANVILLE.

The works of the Lord are great, sought out of all them that have
pleasure therein. *Psalmist.*

Lord how manifold are thy works! In wisdom hast thou made them all.
Sun, Moon and Stars, praise ye the Lord.
For ever singing as they shine,
“The hand that made us is divine.” *Adison.*

HALIFAX: PRINTED BY ABRAHAM HODGE.
M,DCC,XCVI.

GRANVILLE, *November 27, 1795.*

T O

GENERAL DAVIE.

SIR,

I RELY on your goodness to admit this address, without any previous notice. Though I write not for the learned, yet I wish my book to pass through the hands of such. They only are judges of literary merit. It is only the learned who know the work of science; and what a rugged steep they had to climb, to attain but a moderate share of it. A writer expects more mercy, and even more gratitude from men of real knowledge, than from an hundred of the less knowing, for whose sake he writes. If your kindness inclines, and your numerous avocations permit you, to peruse these sheets before they go to the press, they will remind you of the road you once travelled, as far as they go; and cause you to recollect the time when you would have joyfully received such an introductory assistance to the study of these sciences. If my little book meets with your approbation, sir, and in your judgment answers the design of the writer, expressed in the title page, any way you please to take to express that approbation to the numerous and respectable circle of your acquaintance, will be agreeable and obliging to

SIR,

Your most obedient humble servant,

HENRY PATTILLO.

P R E F A C E.

THE following Catechism is designed to smooth the way to the study of Geography. What put it in the way of question and answer, was, that I intended three young lads then under my care, should commit it to memory. It is published in the same order, that others may take the same advantage. This was my first view. My second arose from this consideration, that as news-papers are happily and pretty generally circulated among us, there must be many honest farmers and their families who must be ignorant of many countries, towns, rivers and seas mentioned in them; and my book would enable them to read with more intelligence. Though these were laudable and sufficient motives for its publication, yet I acknowledge a third, and a more powerful reason, knowing what false and absurd ideas the bulk of mankind entertained of the works of God around them, and consequently how dishonourable such opinions are to the Deity, and how unworthy of that wisdom and beauty manifested in his works; I judged it a duty I owed to my Creator and to my fellow-creatures, to attempt to lead common readers to some more just conceptions of the divine works; and this in so small a compass that the size of my book should not deter them; and I hope in a manner suited to their understandings. If I did not add a fourth inducement for publishing, my reader would for me. I did, and still do hope my book may bring me in a few dollars, which will be welcome guests when they arrive.

The reader will readily discover the intimate connection betwixt Geography, and its elder sister Astronomy. I hope that hard word will fright no reader. It signifies no other than the doctrine of the heavenly bodies, of which the Sun, Moon, Planets and Comets, compose the part we are most nearly connected with. A moderate share of acquaintance with these, must constrain us to say, *O the depth of the wisdom and knowledge of God!* And sure I am, the more he is known in his works, as well as in his word, the more he will be adored and loved by his creatures.

A large

A large volume on these sciences, that condescends not to a low beginning, distresses the teacher, and discourages the learner. My book is designed to pave the way for authors who enter deeper into science; therefore all youths at our seminaries, will find their advantage from them; while the planter, and those youths who are not intended for the learned professions, will perhaps satisfy themselves with what is here offered to them.

Knowledge is the cure of ignorance: Let it not therefore spurn the hand of its physician. Leave it, my dear reader, to a few silly women, to cry down a book for assertion that the planet Jupiter is a thousand times as large as the Earth—that the human body is pressed with thirty thousand weight of air—that the Earth and Moon fly one million and an half of miles daily—that the Sun is larger than ten millions of the Moon. These are well known and established truths; and those who cry them down as impossibilities, only betray an incurable ignorance. Farewell, courteous reader. My best wishes attend you through my book; through life, death and the whole of your existence.

A GEOGRAPHICAL CATECHISM.

Question 1. **W**HAT is the meaning of the word *Geography*?

Answer. It is compounded of two Greek words, *Ge*, the Earth, and *graphie*, a description; and is the science that describes the Earth, or the globe of sea and land.

Q. 2. Why do you call the sea and land a globe?

A. Because it is round as a globe or ball.

Q. 3. How is the land on the globe divided?

A. Into four quarters or large continents.

Q. 4. What are their names?

A. *Asia*, *Africa*, *Europe* and *America*.

Q. 5. How are these situated, with respect to each other?

A. Asia on the east, Africa on the south, Europe west of Asia, and north of Africa, and America to the west of all.

Q. 6. How are places on the Earth known, as to their situation?

A. By their *latitude* and *longitude*.

Q. 7. What is latitude?

A. Latitude counts the distance of places, from the Equinoxial, north or south, in degrees, minutes, seconds, &c.

Q. 8. What is longitude?

A. Longitude counts the distance of places east or west, from some given point, called the first meridian, and is also reckoned in degrees, minutes, &c.

Q. 9. What is a degree and a minute?

A. A degree is the 360th part of the Earth's circumference; a minute is the 60th part of a degree; a second the 60th part of a minute, &c.

Q. 10. Why are lines of longitude called meridians?

A. Because when the Sun is on any particular meridian, it is mid-day to all who live under that line, on the same side of the globe, and midnight to all who live on the opposite meridian.

Q. 11. Are degrees of latitude and longitude the same?

A. On the Equinoxial only; *there* a degree of each is $69\frac{1}{2}$ of our miles: latitude is the same every where; but longitude decreases from the Equinox, north or south; so that in the lat. of N. Carolina 37° , a degree of longitude is only

48 miles; and continues to decrease to the pole, where all the meridian lines meet.*

Q. 12. What is the *Equinoxial*?

A. The Equinoxial is that part of our globe that is at an equal distance or 90 degrees from both poles. Sailors call it the *line*, and it surrounds the Earth where its diameter is the greatest. When the Sun is on the Equinox, in March and September, the day and night is equal, all the world over. There is no latitude at the line, for there that reckoning begins.

Q. 13. What are the poles?

A. They are those two spots on our globe, that lie directly under the poles in the heavens, and where there is no longitude: So that were a rod to pass from the north pole in the heavens to the south, it would enter the Earth at its north pole; pass through the center, and out at its south pole, to the south polar star, and be in fact what it is called, *the axis of the Earth*, the pole stars being its supporters.

Q. 14. What is the *diameter* of the Earth?

A. The distance from side to side, passing through the center. This line would be about 8000 miles in length, and half of it, the *semi-diameter*. Consequently the circumference, or line that would surround the Earth at the equinoxial, where it is largest, would be 25,000 miles, for the one is to the other as 7 to 22.

Q. 15. You say the Earth is divided into land and water; how are the waters divided?

A. Into oceans, seas, gulfs, bays, lakes, straits, rivers and canals.

Q. 16. What is an *ocean*?

A. An ocean is one of the largest collection of waters.

Q. 17. What are the principal oceans in the globe?

A. I. The *Pacific* ocean, or great South sea; which lies betwixt the western coast of America, and the eastern coast of Asia, where it is called the Eastern ocean. It is ten thousand miles over.

II. The *Atlantic* ocean, which lies from the eastern coast of America, to the western coast of Europe and Africa, and is about 1000 leagues, or 3000 miles over.

III. The *Indian* ocean, on the east of Africa, and south of Asia.

IV. The Southern ocean, towards the south pole.

* They are marked thus, a degree °, a minute ', a second ". As 25° 37' 42", 25 degrees 37 minutes 42 seconds.

V. The Northern or Frozen ocean, to the north of *Asia*, Europe and America.

Q. 18. What is a *sea*?

A. A sea is a smaller collection of water than an ocean.

I. The Mediterranean sea, which has Europe on its northern shore; Africa on its southern, and Asia on its eastern.

II. The *Euxine* or Black sea, which has Asiatic Turkey on the south, Turkey in Europe and Crim Tartary on the north, and communicates with the sea of Asoph, through the straits of Kaffa.

III. The *Baltic* sea, surrounded by Denmark, Sweden, Russia and Poland.

IV. The *Red* sea, which has Africa on its western shore, and *Arabia* on the eastern, and hence it is called the Arabic gulph.

V. The *Caspian* sea, a large collection of fresh water near the middle of Asia.

There are many other seas that are named from the countries they lie on; as the *German* sea, betwixt Germany and Britain: The *Irish* sea, betwixt England and Ireland, &c.

Q. 19. What is a *bay*?

A. A bay is a part of the ocean, that has land on each side, but a wide entrance; as

I. The bay of Biscay, which is that part of the Atlantic that washes the western coast of France, and the northern shore of Spain.

II. Chessapeak bay, which washes the shores of Virginia and Maryland, and receives all their great rivers.

III. Hudson's and Baffin's bays, large arms of the sea, in the high latitudes of North America, &c.

Q. 20. What is a *gulph*?

A. A gulph is a collection of water, nearly surrounded by land.

I. The gulph of *Mexico*, which has the continent of America on the north, west and south, and the West-India islands on the east.

II. The gulph of *Saint Lawrence*, which has *Labrador* or New-Britain on the north, Nova-Scotia on the west, and the islands of Newfoundland and Cape Breton on the east.

III. The gulph of *Venice*, betwixt European Turkey on the north-east, and Italy on the south-west, formerly called the Adriatic sea.

Q. 21.

Q. 21. How does a gulph and a bay differ?

A. A gulph has a narrow entrance, and a bay a wider, in proportion to the water within: hence the Mediterranean, the Euxine, and the Baltic seas, are all real gulphs; for they have narrow entrances, and widen greatly within.

Q. 22. What is a *lake*?

A. A lake is a piece of fresh water, surrounded by land; some of which receive rivers, but emit none; as those two famous lakes in Asia, the *Caspian*, which receives the Volga, and many other rivers; and the lake of *Sodom*, or the *Dead sea*, into which the Jourdan mouths and is lost, after running through the sea of *Tiberias*. Africa has few lakes that are known. Europe has the lakes of Constance, Geneva, and some in Sweden, Russia and Ireland. But the American lakes, which divide the British dominions in Canada from the United States, are the most remarkable:—they are lake Superiour, lake Huron, lake Michigan, lake Erie and lake Ontario, through which the river St. Lawrence runs.

Q. 23. What is a *strait*?

A. A strait is a narrow passage betwixt two lands; as the straits of Dover, betwixt France and England; the straits of Gibraltar, betwixt Spain on the north, and Morocco on the south; the straits of Babelmandel, at the mouth of the Red sea, betwixt Arabia on the east, and Abissinia on the west; the straits of Magellan, betwixt Patagonia on the north, and Terra del fuego, the southern part of America; the straits of Bellisle, betwixt Labrador north, and Newfoundland south; Davis's and Hudson's straits; the sound at the entrance of the Baltic, &c.

Q. 24. What is a *river*?

A. Rivers have their origin in the bowels of mountains or hills, from whence flow springs, which uniting form brooks, creeks and small rivers, which pouring themselves into a large bed, are thus united, conveyed to the sea.

Q. 25. What is a *canal*?

A. A canal is a large ditch, into which water is conveyed, for the carriage of vessels with goods and passengers; and the banks are earth, wood, brick or stone work.

Q. 26. Tell me how the land on the globe is divided?

A. Land is divided into continents, islands, peninsulas, mountains, capes, promontories, isthmuses, hemispheres, zones, and climates.

Q. 27. What is a *continent*?

A. A con-

A. A continent is a large surface of earth, not divided by water, and answers to an ocean, not divided by land.

Q. 28. What is an *island*?

A. An island is land, wholly surrounded by water, and agrees to a lake, wholly surrounded by land.

Q. 29. What is a *peninsula*?

A. A peninsula is, as the word signifies, *almost an island*, joined to other lands by an isthmus, and answers to a gulph or bay.

Q. 30. What is an *isthmus*?

A. An isthmus is a narrow neck of land, betwixt two larger tracts, and answers to a strait by water.

Q. 31. What are the most noted isthmuses on the globe?

A. I. The isthmus of *Suez*, betwixt the northern end of the Red sea, and the Mediterranean; about 60 miles of land; which is all that prevents Asia and Africa from being islands, and renders them two vast peninsulas.

II. The isthmus of *Darien*, betwixt Panama, on the Pacific ocean, and Porto Bello an the gulph of Florida, but 60 miles over; from which America widens into two mighty continents, north and south; and being every where else surrounded by water, they are also very large peninsulas.

Q. 32. What is a *mountain*?

A. A mountain is a large hill, standing either alone, or joined to others, and then it makes part of a ridge. Mountains are the sources of fountains and rivers; the beds of metals, minerals, and building materials; the refuge and shelter of man and beast; the girdles or hoops of the earth; the boundaries of nations, and frequently their best defence; the collectors and condensers of clouds and vapours, and the checks and barriers of furious storms. They beautifully variegate the scene; strike the beholder with awe, and entertain his eye with their majestic glories.

Q. 33. What is a *cape*?

A. A cape is a point of low land that makes out into the sea, and a promontory does the same, but is high and rocky.

Q. 34. What is the *hemisphere*?

A. If you cut an apple through the middle, at an equal distance from the stem and the flower, it will represent the Earth divided at the Equinoxial, into the northern and southern hemispheres, or half globes, as the word signifies: or if you cut the apple through the stem and the flower, it will represent the Earth, divided by the two opposite meridians, into the eastern and western hemispheres.

Q. 35.

Q. 35. What are the *zones*?

A. The Earth is divided into five zones, or *girdles*, to wit, 1. The two *frigid*, or *cold zones*, that lie one round the north, the other round the south pole, and extend $23^{\circ} 30'$ from them all round. 2. The two *temperate zones*, so called from their lying betwixt the extremes of heat and cold. The northern temperate zone, extends from the arctic circle to the northern tropic; the southern temperate zone, from the antarctic circle, to the southern tropic, and are each of them 43° in breadth. 3. The *torrid*, or burning zone, which extends from tropic to tropic, 47° in breadth, with the equator in the middle of it.

Q. 36. What are the *tropics*?

This question brings us to

THE YOUTH'S AND FARMER'S ASTRONOMY.

Answer. The tropics are two circles, supposed to be drawn round the earth, parallel to the Equinoxial, and at $23^{\circ} 30'$ from it; the one north of the line, called the tropic of *Cancer*; the other south, called the tropic of *Capricorn*.

Q. 37. Why are they called tropics?

A. From a Greek word, that signifies *to turn*. For when the Sun, at our longest day, has arrived at the tropic of Cancer, he begins to *turn*, or gradually lowers, towards the southern tropic of Capricorn, when all on the south of the line have their longest days, and we the shortest.

Q. 38. What mean those words, *Cancer* and *Capricorn*?

A. Cancer is the most northern sign of the Zodiac, or that cluster of stars that has some resemblance to a *crab*. Capricorn is the most southern sign or constellation in the Zodiac, which is called the *horned goat*.

Q. 39. What is the *Zodiac*?

A. The Zodiac, so called from a word that signifies living creatures, is that imaginary broad belt in the heavens, within which lie those 12 constellations, or clusters of stars, that are called the twelve signs of the Zodiac, and generally called by the names of creatures.

Q. 40. What are the names and marks, by which these constellations are known?

A. The names are Latin: the marks are arbitrary; both which I recommend to you, to commit to memory, at this place, that you may know them on sight. The Sun enters the twelve signs in the following order:

- | | |
|-------------------------------|------------------------------------|
| 1. ♈ Aries, the ram, in March | 7. ♎ Libra, balance, Sept. |
| 2. ♉ Taurus, the bull, April | 8. ♏ Scorpio, scorpion, Oct. |
| 3. ♊ Gemini, the twins, May | 9. ♐ Sagittarius, archer, Nov. |
| 4. ♋ Cancer, the crab, June | 10. ♑ Capricorn, goat, Dec. |
| 5. ♌ Leo, the lion, July | 11. ♒ Aquarius, water bearer, Jan. |
| 6. ♍ Virgo, virgin, August | 12. ♓ Pisces, fishes, Feb. |

Q. 41. Why are these constellations called by such animals' names?

A. Those who divided the starry heavens into constellations, must call them by some name, to know and distinguish them by; and the several clusters thus laid off, probably bear some resemblance to the animals on Earth whose names they wear.

Q. 42. What do you mean by the Sun entering the 12 signs?

A. When the Sun is said, for instance, to enter Aries, the meaning is that he then comes between the Earth, and the first degree of that sign.

The names and order of the twelve signs, may be easily remembered by the following verses of Dr. Watts:

The *Ram*, the *Bull*, the heavenly *Twins*;
And next the *Crab* the *Lion* shines,
The *Virgin* and the *Scales*:
The *Scorpion*, *Archer*, and *He Goat*;
The *Man that bears the water pot*,
And *fish* with glittering tails.

Q. 43. What is the *Ecliptic*?

A. The *Ecliptic*, so called from eclipses happening under it, is that circle, supposed in the middle of the *Zodiac*, which crosses the *Equator* at an angle of $23^{\circ} 30'$, and is the path the Sun describes, and never quits, while he passes through the twelve signs, as above described.

Q. 44. What causes an *eclipse* of the Sun?

A. An eclipse of the Sun can never happen, but at the change of the Moon; and as the Moon continually wheels round the Earth left about, and completes her revolution in her month; so it will sometimes happen, that in passing from the east to the west of the Sun, she must come betwixt him and the Earth, and hide a part, and sometimes, though very seldom, the whole of his disk from us.

Q. 45. How can the Moon come between us and the Sun? Are they not both at an equal distance from us?

A. The distance of the Moon from the Earth, is 240,000 miles;

miles; the distance of the Sun, is about 96,000,000, which is 400 times as far. Now though it would take several millions of Moons to make a globe equal to the Sun, yet she can hide his light from us, by the same law of nature that your finger held near your eye, will cover a whole field; and if you were on a mountain, might hide 100 miles from you.

Q. 46. What causes an eclipse of the Moon?

A. This can never happen, but when the Moon is full, and in direct opposition to the Sun. Now as the Moon has no more light than a clod, unless the Sun shines upon her, if any body large enough, comes between, and intercepts his rays, she must be in darkness. When the Moon then, for example, rises full in the east, and the Sun sets in the west, the Earth is betwixt them; and if exactly betwixt them, she must prevent the rays of the Sun from falling on a part of the Moon, or, in other words, the Moon must pass through the shadow of the Earth; and if it be a central eclipse, that is, if the centers of the Sun, Earth and Moon, be in a direct line, the Moon will be totally darkened as long as she would be running thrice the width of her own body in her monthly course round the Earth; for the shadow of the Earth at that distance, would contain three such Moons by the side of each other.

Q. 47. What is the *horizon*?

A. The horizon is either sensible or rational. 1. The *sensible* horizon is as far as a person can see around him by sea or land: Every part of the Earth's surface has its horizon, and the more elevated the station, the more it is extended. 2. The *rational* horizon surrounds the Earth at 90° from a person every way around him, and thus divides it exactly into two hemispheres, the pole of which, or point over head, is called the *Zenith*; the opposite point the *Nadir*.

Q. 48. What is a *climate*?

A. Climates are imaginary lines, that run parallel with the Equator north or south of it, where the day is *half an hour longer*. Now as the day is always 12 hours long at the Equinoxial, to complete the first climate, that is to arrive where the day is 12 1-2 hours long, you must travel above 500 miles north or south of the line, and then be in the 8th degree of latitude. But this distance greatly lessens as you proceed; for as high as the 10th climate, where the day is 17 hours long, you will arrive at the 11th climate, only by going north or south 150 miles. And from the 20th to the 21st climate, 20 miles will make the day *half an hour longer*.

Q. 49.

Q. 49. What gives us day and night?

A. Why, do not the Sun, Moon and Stars rise in the east, and wheel round to the west and back again, every twenty-four hours.

Q. 50. So it evidently seems to every body, but some deny it: what say you?

A. They must not deny what appears so plain; and you can convince them directly, by pointing to the meat on the spit, around which the house and the fire turn like a *wheel*, till it is roasted; and to the turkey hung by the line, round which the fire and hearth turn *millstone-fashion*, to give every side its due share.

Q. 51. But this is not so, and it is absurd to talk of it. How do you say it is?

A. Let us be satisfied it is not *one* way, before we try *another*. When you wish for a good view of the adjacent country, you climb a hill, and on the eminence you stand *quite still*, till the whole prospect turns round you, do you not?

Q. 52. No: I am not fool enough to expect such impossibilities. I turn round and round again, and view the whole at my leisure. Why do you ask me such a question?

A. Because I only wish you to allow the Almighty Creator to be as wise as you and your cook; for to save the whole creation from turning round a little spot, HE has commanded the Earth to turn all its sides to the Sun and Stars, every twenty-four hours, and thus to have day and night alternately.

Q. 53. This is new indeed; but can you make me understand it?

A. The daily motion of the Earth is easily understood. Have a ball of cotton or wool—dark will best suit the colour of Earth. Run a wire exactly through the middle. Stand in the sun, and point one end of the wire towards the north star. Turn your ball gradually to the east about; and if you stick a pin deep in the ball, it will represent yourself. You will then see, that when the sun first touches the pin, it west and he east, you have sunrise. When the pin and sun are in a line, you have midday. When you in the east lose sight of the sun in the west, you have sunset. When the pin comes opposite to the sun, you have midnight, and so on again to sunrise.

Q. 54. This would be very beautiful, and convenient indeed; but how can things avoid *falling off*, when the Earth turns her sides downwards?

A. This

A. This childish fear arises from the silly notion of an *universal up*, and an *universal down*, through the whole creation. Whereas the Earth has its own *particular up*, and *particular down*. From the center, or middle point to the surface in any direction, is *up*; and from any spot on the surface, towards the center, is *down*. Thus it is with the Sun, the Moon, and all the planets, with which I hope you will presently be better acquainted. Nothing therefore can fall from the Earth, till attraction ceases to operate.

Q. 55. What is *attraction*?

A. Attraction is that property, power or law the Great Creator has given to all material bodies, to draw all other bodies towards them; and this in proportion to their distance from each other, and their quantity of matter. It is this law that gives weight to all bodies; for weight is nothing but the Earth's attraction, drawing every thing to it; not in proportion to the bulk, but quantity of matter. It is by this law the stone you throw up, is again drawn to the Earth, which would otherwise fly off in a straight line, and could never cease to fly. This power acts in all directions: for if you throw up a stone at six in the morning, and another at six in the evening, they both return by the same law; the Earth's attraction quickly overpowers the force you gave them; and yet these two stones were *thrown to directly opposite points in the heavens*. Cease then, your ridiculous fears for the inhabitants of Asia, on the opposite side of the globe: the ignorant among them are as apprehensive, that you must *fall up to the skies*, as you are for them; for the the same law of nature keeps you both steady to your places, as well as operates through all the visible creation. The Sun attracts the Earth and all the other planets; and they attract him, and each other.

Q. 56. Then I should suppose the largest would draw all the others to it. How is this prevented?

A. Your supposition is very natural, and the Earth would be quickly drawn to the Sun, by his vastly superiour attraction, had not infinite wisdom given the Earth a circular motion round the Sun, that exactly balances his attraction, and keeps the Earth and Moon continually at or nearly the same distance from him. To have some idea of this, tie two weights to a string, to represent the Earth and Moon, the one ten or twelve times as large as the other: face the south, and turn them round you, left about. Your hand will be the Sun—the string acts as the *centripetal* force, or the *constan*

stant inclination of the Earth and Moon to draw near the Sun by the force of his attraction — the circular motion you keep the weights in, will represent the *centrifugal* force, or the constant inclination of the Earth and Moon, to fly off farther from the Sun: but from their wonderful adjustment, neither of these can happen, but by the will of HIM that made them. Every turn you give the cord, will represent the course of the Earth and Moon round the Sun, once a year, called the *annual orbit*.

Q. 56. Is the speed of the Earth, in her yearly course round the Sun, known?

A. You will see hereafter, from the distance of the Sun, that the Earth flies every year more than 500 millions of miles; and of course about a million and an half every 24 hours.

Q. 57. Prodigious! Is not such speed inconceivable?

A. It is so. But consider that you have hitherto believed in a speed 365 times swifter. For you believed that the Sun flew round the Earth every day and night. Thus you gave him the task every day, that the Almighty has assigned to the Earth and Moon in a whole year: for we *must* travel that mighty circuit in a *year*, or the Sun in a *day*. And what infinitely adds to the absurdity, the *fixt stars*, the nearest of which are several hundred thousand times farther from us than the Sun is, *they* must join in this useless whirl, with a velocity past the conception of angels; and all this to twinkle on us, in a clear night, when one little additional Moon could have given us more light than all of them together. Never believe such folly can proceed from the God of wisdom, who performs all his works in the easiest and most simple, that is, in the wisest manner possible.

Q. 58. I cannot reconcile the annual motion of the Earth round the Sun, to complete her year, and her daily motion round her axis, to receive day and night.

A. The Earth's two motions are easily reconciled.—When the rolling hogshead or the carriage wheel go the road, consider a moment, whether they have not the same two motions which the Earth has. One of these is round their axis, on which they could be moved, though lifted from the ground—by the other they proceed forward, the extent of their own circumference every turn. If you throw a ball from your hand, it has the same two motions, both in the air, and on the ground; and if you roll your ball with the wire

wire in it along the floor, it will not be an unapt resemblance of the real thing.

Q. 59. I thank you sir, I see it plainly, and admire the beauty, ease and harmony of the Earth's double motion; but I do not see by what law the Moon accompanies her, in the annual orbit?

A. The Earth's superiour attraction draws the Moon with her, and would soon draw it to her, had not creating wisdom given the Moon a circular course around the Earth, once in a lunar month, left about, which exactly balances the Earth's attraction: the Moon also attracts the Earth with force sufficient to raise great tides, as well in the ocean as in the air; and at the full and change, when the attraction of the Sun and Moon act together, or in straight lines, the tides are highest.

Q. 60. When I think of the Earth's diurnal motion on her axis, I find every part must fly swiftly, and at the Equinoxial, one thousand miles each hour; I should think there would be always a furious wind blowing from the east, that must level every upright thing on the surface; but when the annual motion is added, at the rate of a million and an half of miles each day, I wonder anything is left on the face of the Earth.

A. I am glad you make the objection; it is a very natural one, and proves that you *think* as we proceed. What you mention would happen in a moment, if the great Creator had not given the same motion to the *air* that he gave to the *Earth*, and made it as much a part of our world, as the waters of the sea are. The air in your room would remain undisturbed, could the house fly off from the Earth a thousand miles in a minute, you would be quite insensible of any motion—you would step as far, and move as easily the one way as the other, and a drop of water would fall as perpendicular as if the house was at rest. All this is verified in the cabin of a ship under sail; while sailors experience no difference in their motions or actions, whether the ship is sailing or at anchor. They are insensible of the ship's motion, when sailing out of harbour; for it is the land that appears to retire from them, and not they from the land; and if they sail past any thing at rest, it is that thing which seems to have all the motion the contrary way.

Q. 61. This, sir, removes several difficulties that had occurred to me. I could not account for our flying so fast, and not be sensible of any motion: and if I threw a weight upwards,

upwards, I judged it ought to fall a great way to the west; nor could I see how the clouds or birds could ever fly to the east. But if the air moves with us, as a part of the Earth, and if I might fly in a close house with the lightning's speed, and not be sensible of any motion at all, it removes my difficulties; but it seems to require that the air should have some *weight*, to cleave so close to the Earth in her swift motions, which is a thing I never thought of; for we commonly say, as *light* as the air or the wind.

A. The wind has weight enough at times, to level with the ground, the stubborn oak and stately pine; for the wind is only air in motion. And to engage your attention I tell you, that the air is so heavy, whether in motion or still, that in clear weather, it presses on every middle sized man with a weight equal to *thirty thousand pounds*.

Q. 62. I am learning not to oppose my ignorance to the works of the Creator, seem they ever so strange; but you must allow me to wonder, that we can be pressed with such a weight, and not suffer by it, nor be sensible of it.

A. I honour your modesty; and to encourage and reward it will assure you that I have told you nothing, and dare tell you nothing, but what is strictly true. Had I no regard to the *God of truth*, nothing could induce me to publish to the world, what a thousand learned men could refute to my confusion. Your present difficulty respecting the pressure of the air on the human body, and on every thing of the same size on the face of the Earth, will be removed by a maxim in philosophy, that action, and re-action are equal. The blow you give is repelled with just the force you give it. The ball strikes your hand just as hard as your hand strikes the ball. The waggon draws back to an ounce, what the horses draw forward, whether 1000 weight on a level, or 2000 on an ascent; for they cannot possibly draw more at the time, than they have to draw: and if you increase the weight, you increase the resisting power. Apply this rule to the case in hand. Creating wisdom has exactly balanced the pressure of the atmosphere on our bodies, by the resistance of the *air within us*; and the lower air repels, or *presses upward*, with a force just equal to all the weight or pressure of the upper air, that bears on it by the Earth's attraction. But to assist you in this important subject, I must acquaint you with some properties of the atmosphere.

I. The air surrounds the whole globe of sea and land, a number of miles high.

II. The

II. The air being as proper a fluid as the water, but very elastic or springy, which the water is not; it must be thickest or heaviest at the Earth's surface, and becomes lighter or thinner the higher it ascends.

III. The weight of air to water is nearly as 1 to 1000; and though this may appear light, yet could a vessel, a foot square, be erected to reach the top of the atmosphere, the air in it would weigh as much as the water in a vessel a foot square and 33 feet high. This is known to every pump-maker; because the pressure of the air on the surface of the well, will force the water to rise in the pump 33 feet, and no more without another valve.

IV. The air differs in its weight, at different times. When the weather is quite clear and serene, the air is heaviest, and our bodies and minds feel the most agreeably. When the weather is foggy or cloudy, it is a proof that the air has become lighter. In rain it is lighter still, and lightest of all when stormy. This is proven by the *barometer*, a long glass tube filled with quicksilver, which rises in the glass in clear weather, by the pressure of the air on the little vessel of quicksilver, in which its lower open end stands; but sinks on the approach of rain, from the decreased weight and pressure of the air. Rhumatic, ruptured, asthmatic, and other ailing people, are very sensible of this change in the state of the atmosphere, by their pains and complaints; which they, by a great mistake, ascribe to the thickness or weight of the air; whereas the true reason is, they are deprived of at least 2000 weight of that 30,000 that braces them up in clear weather, and gives them more agreeable sensations. And as the surface of the human body measures about 14 or 15 square feet, so every thing on Earth of that size loses also 2000 in rainy weather. This abatement of weight is, on the whole very great: the air becomes too light or thin, any longer to support the watery vapours above; consequently they must descend, form themselves into clouds, and fall in rain. Heat is the common instrument of lightning the air.

V. From the elasticity or springiness of the air it is, that it may be compressed into much less space than it naturally fills, or expanded into vastly greater. Your pop-gun has taught you, that all the air in it could be compressed into an inch or two, till the spring of the condensed air forced out the lower plug with a little crack. The elastic or expansive property of the air, you have proved, or may prove, by
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holding a well-tied bladder to the fire, with apparently no air in it. You will presently, however, see it dilate till it not only fills, but bursts the bladder with a great explosion.

VI. The air is the medium of breathing, to every living creature.—It is the great instrument of conveying sounds; of conversation; of all the instruction you give or receive by the voice; of speaking comfort to the distressed; and of praying to and praising GOD. Sound is conveyed through the air 383 yards in a second—a thread and weight 39 inches long will count seconds, 10 1-2 inches will count half seconds; thus you may know the distance of a great gun by the flash, and of a thunder cloud by the lightning. Fires cannot exist without air—and on it pumps and many other useful engines depend. It takes up all filthy effluvia from the Earth, that would otherwise destroy us; yet winds and tempests purify it for our use. Air is the grand agent in sailing the ocean, and of conveying the productions of the most distant nations to each other. The air is the grand medium of sight, as well as hearing. It is the atmosphere that receives, conveys, retracts and reflects the rays of light; and without it, if we could live a moment without it, the Sun would appear a glaring spot, and he and the Stars be seen through the blackest darkness at midday. No tree nor vegetable can grow or live without it, more than creatures. It turns thousands of mills every day, and all bellows have their use from it. Supported by it, the birds wing their way; and you move through this mighty fluid with the same ease and celerity, with which the fishes cut the stream.

Q. 63. I thank you, sir: I shall think more of the air than I ever have, study its properties, and adore its Creator. Wonderful! to think that I am at the bottom of such a vast ocean, that is of such use and advantage—that I am pressed by it up and down, and on all sides with such a weight, and yet by the resistance and re-action of the air within me, I move through it with as much ease as if I could move on its surface. Surely the wisdom and goodness of the Deity are manifested in all his works, could we study and understand them. But before we leave this wondrous element, pray inform me how deep the ocean of air is; or in other words, how high does the atmosphere arise above the surface of the Earth and sea, all round the globe?

A. The height of the air cannot be exactly ascertained, on account of its gradual increasing rarity as it ascends. But two things we are sure of. 1. That if the atmosphere extends

tends to the orbit of the Moon, it is there so very rare, that it does not affect the Moon in her monthly course round the Earth. 2. We know the air has density enough about 50 miles high, to bend the Sun's rays down to the Earth, an hour before he rises, and as long after he sets. The grateful twilight then, is another blessing we owe to the atmosphere, otherwise we should have pitchy darkness the moment the Sun was out of sight, and till he appeared again in the morning.

Q. 64. At what rate does the air lighten, or become rare, as it ascends from the Earth's surface?

A. The regular rarefaction of the air, has been discovered by experiments on the air pump, and by carrying the barometer up mountains. As they ascend, they perceive the mercury or quicksilver to sink gradually in the tube, and proves that the air lightens or rarefies as they mount. Now as you already know, that 33 feet of water in a vessel of an inch or a foot square, is equal in weight to the whole atmosphere, of the same size or base, so 14 inches of quicksilver is equal to the whole weight of air, of the same base; for mercury is to water as 14 to 1 in weight. When they rise about 1200 feet high, the mercury will sink an inch, and the air will lose a thirtieth part of its weight. There the air would force water up a pump but 32 feet high. At five miles up, the air loses half its density; at seven miles up, its weight is about as 1 to 4; at 14 miles high, it is as 1 to 16; at 21 miles high, as 1 to 64; at 28 miles high, as 1 to 256; at 35 miles high, as 1024 to 1. That is, a cubic foot of air on the Earth, would expand into 1024 cubic feet at the height of 35 miles from the Earth's surface.

Q. 65. Pray sir, does the water increase in its weight, according to its depth, as the air does?

A. In the same exact proportion, but with much quicker transitions, from the water's superiour weight, which you know is to air as 1 to 33. When men descend 33 feet in the diving bell, they feel the weight of two atmospheres, one of air and one of water; at 66 feet deep they have three, and at 99 feet deep they have four atmospheres upon them, 1 of air and 3 of water, and so down to any imaginable depth. Curious gentlemen at sea, have sunk a bottle, with a large cork fixed two-thirds of its length, in the mouth; and from the depth of 50 or 100 fathom, have drawn it up, and found the whole cork pressed into the bottle.

Q. 66. I acknowledge the pains you take with me, sir,
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and beg to be indulged with one question more: Is it possible to know the weight with which the air presses the whole teraqueous globe; or what the whole body of air weighs?

A. It is not only possible, but yourself shall do it, by plain multiplication. Remember, if the Earth were covered with water 33 feet deep, it would just equal in weight, the whole incumbent atmosphere. Now a cubic foot of water weighs 63 pounds, which multiplied by 33, makes 2079; the number of pounds that the air presses on every square foot on the face of the globe. That multiplied by 9, gives you the weight on a square yard. Multiply 1760 by itself, and that product by the weight on a yard, will give you the weight on a square mile. That multiplied by 200,000,000, the square miles on the face of the globe, which, if I have figured right, will read thus, 11 trillions, 595,824 billions, 720,000 millions, gives the whole weight of the air in pounds; and if the air descends two or three thousand miles down, and the calculation could follow it, I doubt not it would be found as heavy as gold, which is to water as 19 1-2 to 1; and consequently to air on the surface, as 20,000 to 1.

Q. 67. How wonderful the works of GOD, in this one element the air! But let us now descend to the Earth, if we can find our way, after so long a voyage.

A. The Earth's attraction will secure our way, if we can but arrive with whole bones, without the help of the little Spaniard's geese, which carried him to the Moon and back. We have, and are now on a more solid element.

Q. 68. I have, sir, as you directed, procured myself a ball, and have run a wire through it pretty exactly. I have tried it in the sun and by the candle; but I find the light always shines on the same parts, which would make the days and nights constantly of a length. Pray tell me what makes them of different length, and gives the different seasons?

A. I rejoice to have a pupil that labours for knowledge: the teacher has then as much pleasure as the learner. Your own industry must make your ball supply the place of a small terrestrial globe. You know that round the Earth either way, is 360° , consequently, from pole to pole, or from wire to wire is 180° . Cut a slip of paper that will reach from wire to wire; half of that lay off into nine equal divisions, and each of these into nine more, which will give you 90° or a quadrant. At 90° degrees from each pole, wrap two white threads round your dark ball for the Equinoxial, and if the ball is white, wrap black threads. $23\ 1-2^{\circ}$ from
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which, wrap a thread, parallel to the Equator, for the northern tropic, and another at equal distance south, for the tropic of Capricorn. If they are exact, they will be every where 47° asunder, and include the torrid zone. 43° from each tropic, or $23^{\circ} 30'$ from each pole, stick a white thread around, for the two polar circles. Thus you have the two frigid zones, round the two poles; the two temperate zones, betwixt the polar circles and the tropics, and the torrid zone from one to the other tropic, and the Equator betwixt them. Now tie your thread to one wire, and passing close by the other, bring it quite round; this gives you two meridians, but as you need four, wrap it round again, at an equal distance from the other two, and you divide the globe into 4 quarters, each quarter 90° , as well where narrowest as widest. Tie your thread to a pin, and run it into the ball, where one of the meridians crosses one of the tropics; thence conduct it diagonally to where the next meridian crosses the Equator, which it will do at an angle of $23^{\circ} 30'$; thence to where your second meridian crosses the opposite tropic, and there stick another pin, with the thread round it. Then carry it to where the third meridian crosses the Equator, and thence to your first pin, to which fasten it. This gives you the Ecliptic. Stick another pin half way into the ball, where one of the meridians crosses the north polar circle; and another where the opposite meridian crosses the other polar circle, and these will be the axis of the Ecliptic, $23^{\circ} 30'$ from the axis of the Earth. Procure a large wire, 9 or 10 feet long, and bend it into a circle; or if that cant be had, tough hoop-wood, cut small, may do. Have 12 slips of paper, of equal length, that will go round the hoop; set on them the marks of the 12 signs, and divide each into 30° . Fix these on your hoop, touching each other all round, in the order mentioned above. Set a candle on the table, and raise the hoop even with the blaze; having bent one end of your wire into a hook, and hung it to a thread, twisted so as that the ball will turn left about, or opposite to the hands of a watch laid on the table; you can carry it round, left about too, for the annual motion, while the thread untwisting, gives you the diurnal motion. But thus you have day and night still equal, and no change of seasons; because you cannot make your ball turn on its axis, and at the same time incline or lean $23^{\circ} 30'$, as the Creator has the Earth. To obtain an idea of the seasons, and different length of days, let those who

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hold the hoop, a little raise the side ☉, and the other a little depress the side ☾; ♀ and ☊ being exactly in a line with the candle. Now if you suspend your ball in Aries, the light will shine to both poles; and you have the vernal equinox, or day and night equal in spring, and your equator will be in a line with the hoop. Then steadily conducting your rolling ball, so that the middle of it shall always be in a line with the hoop; you will see how gradually the light arises on the north polar circle, and sets on the southern, till when you arrive at Cancer, the whole arctic circle is enlightened, and the antarctic all in darkness, and the tropics are in a line with the hoop, and we have our longest days. As you proceed through Leo and Virgo, the days gradually decrease; the north polar circle loses, and the southern gains light, till your ball arrives at Libra, your equator again in a line with the hoop, and we have day and night equal, at the autumnal equinox. Thence rolling through Scorpio and Sagitary, our day continues to shorten, theirs to lengthen, till in Capricorn, the north polar circle will be all in darkness, the southern all in light; we have our shortest days, the southern hemisphere the longest, and the tropics are again in line with the hoop, at the winter solstice. Proceeding now through Aquarius and Pisces, the days gradually lengthen to us, and shorten to the south, till you again arrive at Aries, have the vernal equinox, your equator and the hoop again on a line, and your ball supposed to have turned 365 times during the revolution through its annual orbit. This is as good a representation as can be given without an orrery. The candle is the Sun, the hoop the ecliptic among the fixt stars, and the ball the Earth. The candle seems to move into the sign opposite to the ball, tho' it remains at perfect rest. So to a spectator in the Sun, the Earth alone would be seen to move through all the 12 signs, and the Sun at rest in the centre.

Q. 69. I will study this great subject, as you direct, that your labour may not be lost on me. But as you have sundry times mentioned the planets, it is time for me to know what they are?

A. Yes; the very proper time. The *planets* are a number of globes, that revolve round the Sun, as the Earth does; some less than the Earth, some vastly larger, some nearer to him, others much farther from him, some primary, others secondary; and the Sun, Planets and Comets compose the SOLAR SYSTEM.

Q. 70. What is the distinction of primary and secondary, among the planets?

A. The Earth is a primary planet; the Moon a secondary, called a satellite, guard or attendant; and so of the rest.

Q. 71. How I long to know the names, sizes and distances of the planets, and the length of their days and nights!

A. I will cheerfully gratify your wishes in the plainest and briefest manner I am able. The Sun ☉ is the grand center of the system, around which all the planets move; and when they have accomplished the revolution, they have completed their year.

I. *Mercury* ☿, the planet nearest to the Sun, revolves round him in 88 of our days, which is his year, at the distance of about 35,000,000 of miles from the Sun. The diameter of this planet is 2600 miles, and he moves in his orbit 95,000 miles each hour. He has seven times the light and heat that we have; so that our water would there quickly evaporate, and our earth be in flames. From his constant vicinity to the Sun, nothing can be seen on his surface, to ascertain the length of his day and night.

II. *Venus* ♀, the next in course, is our morning and evening Star, about the size of our Earth, or 8000 miles in diameter. She revolves round the Sun at the distance of 60,000,000 of miles from him; and flying at the rate of 70,000 miles each hour, completes her year in 225 of our days; though she turns so slow on her axis, that she has had but 9 days and nights in all that time. As seen through a telescope, she has all the appearances of the Moon, at her different ages. You must not judge it contradictory, when you see Venus to the west of the Sun, as morning star, or to the east of the Sun, as evening star, really longer than her whole year; for the Earth is flying the same way, though with a slower course, and in a larger circle. If any person and you agree to walk round a small house, he 20 yards from it and you 30; he takes three steps for your two, you will see that he surrounds the house more than once before he is hid behind it; and when he appears again on your other hand, he will be much longer in your sight than he is making his whole round. Continue this for a few circles and you cannot fail to understand it. You are the Earth, the other person Venus, and the house the Sun.

III. The Earth is the third planet from the Sun, and revolves round him, as you have seen, in 365 1-4 days, at
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the rate of 60,000 miles each hour, and at the distance of 96,000,000 of miles from him; while her secondary or satellite, the Moon, attends her through the whole of her annual course, but partakes not of her daily motion round her axis: instead of which, the Moon has an orbit of about 1,400,000 miles around the Earth, from change to change; and consequently travels so much more than the Earth every month. The diameter of the Moon is about 2200 miles, and she moves in her monthly orbit 2300 miles each hour, besides the 1,500,000 she daily travels with the Earth. To have the course and different appearances of the Moon represented, set a candle at one end of the room, for the Sun, and you set a few yards from the other end, for the Earth—let a person hang a ball betwixt you and the candle, to represent the Moon at her change: and if directly betwixt your eye and the candle, it is the Sun eclipsed. Let the person gently move the ball left about in a circle, of which your head is the centre; you will soon see a narrow streak of the enlightened part, as the new Moon. While he moves on you will see more and more of the enlightened part, till she comes a quarter round, when you see half; and still moving round, you see more and more of her clear side, till she comes directly opposite to the Sun, and the Moon is full. If you would have a lunar eclipse, let the ball pass through the shadow of your head. Thence proceeding on, you see every day less of her enlightened part, till she comes to her third quarter, and on again to the change. A few rounds will make a whole room full of people understand it. You will see that the Sun always enlightens one half of the Moon—that at the change, or when she passes from the east to the west of the Sun, her dark side is towards the Earth; and when on the opposite side of her orbit, you see her whole enlightened side. In other parts of her course you see her light increasing from the change to the full, and decreasing from the full to the change. Remember the Earth is a Moon to the Moon, and reflects much more light on her than she does on it, from the Earth's superiour size. It is by the light the Earth reflects on her, that the whole of the Moon is always visible, when the tenth part of what the Sun shines on cannot be seen. The Moon turns once on her own axis, during her monthly course; for she always keeps the same side to the Earth, which can never be seen from the Moon's farther side. Lastly, the Earth is to the Moon the best time-keeper it can have by turning every day all its seas,

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continents and islands to her. The Lunarians may very probably breakfast on China and Japan, dine over Europe and Africa, sup with America, and sleep through the whole Pacific ocean.

IV. *Mars* ♂ is the fourth planet from the Sun, and the first above us, or exterior to the orbit of the Earth. His distance from the Sun is about 140,000,000 of miles, and by travelling 48,000 miles each hour, he completes his course round the Sun in 687 of our days, and in 668 of his own, which are 40 minutes longer than ours. His diameter is about 5000 miles. He has a thick atmosphere, but no Moon yet discovered. He appears among the stars of a red fiery colour, has but half the light and heat that we have, and the Sun appears to him but half as large as to us.

V. *Jupiter* ♃, the next from the Sun, and fifth in the system, is the largest of all the planets. His distance from the Sun is 495,000,000 of miles, and he finishes his course in a little less than twelve of our years, by flying 30,000 miles each hour. His diameter exceeds ten times the length of the Earth's, which makes his bulk above a thousand times the size of our Earth; and yet he turns so amazingly swift on his axis that his day and night are equal to but 9 hours and 56 minutes. He has but the thirtieth part of light and heat that we have from the Sun: but he has a quick return of day, and at least four Moons* to enlighten him; some of those Moons larger than our Earth. What a glorious scene of wonders does that mighty Planet, with so many attendants, present to all who are disposed to admire the works of GOD! His Moons are of great use to seamen, in discovering their longitude. Jupiter is the brightest star in the heavens, next to Venus, and he has been visible for some months past, and will be to the end of the year.

VI. *Saturn* ♄ the sixth, and till lately judged by all astronomers the highest and most distant of all the planets, is 900,000,000 of miles from the Sun; and by travelling 18000 every hour, completes his revolution in 29 1-2 of our years, which is the length of his. He is 67,000 miles in diameter, so must be 600 times the size of the Earth. The Sun appears to him one ninetieth part of the size he does to us; but the gracious Creator has given him five moons to enlighten him, besides a vast luminous arch or ring 21,000 miles

* I have been told, that the famous Dr. Herchell has by the superior power of his glasses, discovered two more Moons attending Jupiter, interior to all the former.

miles wide, and about the same distance from the body of the planet all round. Nothing can be seen on this planet to determine his revolution on his axis, consequently we are ignorant of the length of his day.

VII. The seventh and most exterior of all the planets was discovered a few years ago by Dr. Herchell, which in honour of the British King, he calls the *Georgian Planet*. Its distance from the Sun is 1565,000,000 of miles, and moving in its orbit 7000 miles each hour, accomplishes its year or revolution in 83 of our years, and 5 months. His diameter is 34,000 miles, of course he is as large as 80 of our Earth. Two moons have been discovered attending him; and this is all that is yet known of him.

Q. 72. You have drawn a glorious plan of seven primary and fourteen secondary planets or moons, which revolve round the Sun and each other, and receive all their light and heat from him; but vast as this system is, you mentioned also comets, as belonging to it. Pray what are the *comets* or *blazing stars*, as they are commonly called?

A. The comets, more than twenty of which have come within observation and calculation, have their regular course round the Sun, as the planets have; but in orbits very different. The orbit of comets generally resemble the handle of a gimlet, or two sugar loaves butted together, and the Sun nearly in one end of them. They are named from a Greek word that signifies *hairy* or *bearded*, from their appearing with beards and long tails, which are judged to be oily vapours carried from the body of the comet by the Sun's rays. Comets are not vapours or meteors, as formerly imagined, but exceedingly hard and solid bodies, capable of bearing the greatest extremes of heat and cold; through which they pass in their progress round the Sun, and at the mighty distance they fly off from him. The orbits of the comets differ from those of the planets, not only in their very elliptical or oval shape, but in their direction. The orbits of the planets lie all nearly in the same plane or level: but those of the comets lie some the same way, some crossing the orbits of the planets, and some directly against their course. No part of GOD's works that have come to my knowledge, astonish me more than the infinite wisdom, foreknowledge and divine art of the Deity, in throwing from his creating hand more than 40 enormous globes, whose paths oppose and cross each other for thousands of years, in every direction, without the rapid fiery comet
once

once touching or interrupting a single planet, which must have frequently happened had the planet been in that part of its orbit in which it was before the comet passed, or would be soon after. Adore ye sons of men, and in humble gratitude acknowledge the power, wisdom and goodness of GOD! If he is thus tremendous in one of his works, *who can stand when HE ariseth?* Make peace with him *whilst thou art in the way*; for he is as gracious to returning penitents, as he will be terrible to the sinner in his crimes.

Q. 73. I thank you sir, for your observations on a subject so uncommon; and shall impatiently wait for the awful glories of the next comet. But please to remove another difficulty. I observe as the planets are placed farther from the Sun, and consequently have longer journeys round him, they move slower in proportion to their distance. This does not appear natural, but I dare not say it is not wise.

A. Your objection would have weight if all the planets moved round the Sun in the same space of time, like a number of weights tied to a stick and moved round you; for then indeed they will travel faster in proportion to their distance from your hand. But it is very different with the Sun and planets. You should remember that the centripetal force, or the Sun's attractive power on a planet, and the centrifugal circular force which constantly inclines the planet to fly farther from him, exactly balances each other. Now as attraction acts in proportion to the distance betwixt the attracting and attracted bodies, so the Sun's attraction must act strongest on the planets nearest to him; of course they must wheel round him the more swiftly, to prevent falling down to him; whereas the more distant planets can move more slowly without any such danger. Had Mercury the slow motion of Saturn, or the Georgian, he would be drawn to the Sun in a few days; but if either of them had the rapid motion of Mercury, it would quit its orbit and fly off forever through the voids of space. If you tie a weight to a string four feet long and let it represent Mars, which travels 48,000 miles per hour, and swing it round your hand with just force enough to keep it going; and then to represent Mercury, which travels with twice the speed of Mars, swing it round with half the length of string; and you will see how swiftly you must turn it to keep it going at all. Hence you will discover the necessity of the swifter motion of the interior planets, and the slower progress of those that are more remote from the Sun.

Q. 74. I now plainly see that the planets must move quicker or slower in proportion to their nearness to, or distance from the Sun, and ardently wish I had a plan of the *Solar System*, as you called it: I would study it with pleasure, till it became familiar.

A. That could be easily drawn on paper, but it would require a particular plate which printing-offices are not expected to be furnished with: however, you can do it yourself.

Q. 75. You have a higher opinion of my apprehension than it deserves; but I will attempt it with your direction.

A. A large rough draft will suit you best at first. If you are on a floor with which you can make free, and a piece of chalk at hand, make a round spot for the Sun, in the middle. Then if you will allow an inch for 17 or 18,000,000 of miles, draw a circle two inches from the Sun for the orbit of Mercury; only remember the planets move through pure ether, and leave no tract behind them; but you must for the present, imagine they do. Three inches and an half from the Sun draw a circle for the orbit of Venus, and an inch without that draw the orbit of the Earth, and a very small circle round the Earth for the orbit of the Moon. Eight inches from the center draw the orbit of Mars, and about 27 inches from the Sun draw the whole or a part of the orbit of Jupiter, and six small circles for his Moons. Fifty inches from the centre draw a part of Saturn's orbit, and his five Moons, the outermost of which is so distant from its primary, that it is believed to have a Moon attending it. Eighty-six inches from the Sun draw a part of the orbit of Georgian, with his two Moons. After this you can proportion it so as to draw it off on a sheet of paper; and you will value it more as your own work, than if you could have it from the press. Let me inform you, that the orbits of the planets are not exactly circular, but a little oval or egg-like, as the word signifies; and the Sun in their lower focus, or nearest to one end; in which part of their orbit all the planets fly swiftest.

Q. 76. Can you make me understand the orbits of the comets?

A. Try three that are best known. The comet of 1661 has appeared since, but I forget the year. It is first seen in the south, in the thirtieth degree of Sagitary. It crossed the orbits of all the planets but Mercury, passed round the Sun to the right, betwixt the orbits of Venus and Mercury,
and

and disappeared in the southeast, in the seventeenth degree of Aquarius, about forty-eight degrees from where it was first seen. This comet has a wide orbit, and therefore not a long one. The comet of 1682, whose period I have also forgot, was first discovered northwest, in the thirtieth degree of Leo, and having crossed the orbits of all the planets, but that of Mercury, it turned round the Sun to the left, and disappeared in the fifth degree of Cancer, fifty-seven degrees from where it entered, and has a wider orbit than the former. But the most remarkable comet of the system appeared in 1680 in the north, the nineteenth degree of Gemini; it crossed the orbits of all the planets, and turned round the Sun to the right, so close to his surface as to imbibe a heat, that scarcely anything on Earth could bear the thousandth part of. Its period is 575 years; and its orbit so exceedingly narrow that it falls almost perpendicularly to the Sun for 280 odd years, and acquires the amazing velocity of 880,000 miles in an hour. It was accurately observed by the great Sir Isaac Newton. The orbit of this comet is more like two tapering sticks butted together, than sugar loaves like the other two.

Q. 77. You have given me the dimensions of the primary planets, is the size of the Sun known?

A. The maritime powers of Europe have sent their best astronomers with proper instruments, to various parts of the Earth, to observe the passage of Venus over the face of the Sun, in the years 1761 and '69. Many important purposes in astronomy and geography were to be answered by their observations, and providence favored their laudable endeavours, by sending a clear day every where, during the planet's passage. Such was the accuracy observed by a thousand telescopes, and the best time-keepers, that the Sun was discovered to be not 82, but 96,000,000 of miles from the Earth. His distance and visible diameter being known, his real diameter is found to be equal to 100 times the diameter of the Earth, or 800,000 miles through his body. But to have a juster idea of his dimensions, let me bring him nearer. Suppose the Earth could be removed, and the Sun brought into its place; before the center of the Sun arrived where the center of the Earth is, you would see him push the Moon out 160,000 miles, and extend the same distance all round, just as your ball would fill a hole of the same size, cut in a sheet of paper.

Q. 78. Prodigious! The idea terrifies me. Pray inform

form me of the necessity there is for the Sun being such a vast globe?

A. Could you have a steelyard only 100 feet long, and 40 different weights suspended on it from end to end, some of them 100 weight, and the three nearest the farther end 1000 weight each; consider what a weight must that be which all these could not move. But in this very position all the planets were 600 years ago. Hence conjecture the necessity for the vast weight and dimensions of the Sun, which has to rule, attract, and keep in their stations, so many enormous globes, at such distances from him, and be but little affected by their motions and attraction.

Q. 79. Has the Sun no motion at all?

A. The Sun has certainly two motions. The attraction of the superior planets draws him a little from his place; so that he makes a small circle as they move round him; and by spots observed on his surface, he is known to move round on his center in 25 days. The great Herchell has published to the world, that the Sun moves 1,500,000 miles every day. If so, he must carry all the planets and comets with him, as his satellites; and is probably himself a primary planet to some vastly more enormous center.

Q. 80. What are fixt stars?

A. As they appear through the best telescopes smaller than they do to the naked eye, and mere shining specks, their distance from our system is past all calculation; and our Sun appears to them a luminous spot, as they do to us. They therefore receive no more light from our Sun, than he does from them; and must be just such luminous bodies as he is, giving light and heat to a system of worlds floating round them, as he does.

Q. 81. More and more wonderful! at this rate there is no knowing the extent of the creation, or what are its limits.

A. Nothing can set limits to *infinite power*, which has *infinite space* to work in.

Q. 82. But what can all the supposed worlds be made for? and particularly what can the planets be created for?

A. To prevent you and me from stumbling of a clear evening, when they happen to be above the horizon.

Q. 83. Pray sir, be serious, for my question was such.

A. Seriously then, I refer you to your own thoughts on the subject.

Q. 84. Let me consider.—When I think for instance, of the planet Jupiter; that he is 1000 times the size of the
E globe

globe I live on; that he is enlightened by the same Sun; that he is kept in his orbit by the same attraction; that he has so many Moons to reflect the light of the Sun upon him; that he has more than two days and nights for one on the Earth, and different seasons from his position to the Sun; that he appears in all these respects to resemble the world I live on, and as well accommodated for the dwelling of living creatures as it is, I must conclude he is an inhabited world, and appears a most desirable dwelling for rational creatures, if his little light and great cold do not prevent it. But is my reasoning just?

A. To me, and to such as know much more than you and I do, it is perfectly just; all but your trifling objection respecting the cold, and the want of light. HE who made man's eye, could have formed it to see as well by the Moon or the Stars as by the Sun. Allow him the same power and skill in the upper planets. The light of the Sun even in Saturn, is a thousand times as great as the light of the full Moon with us; and in Jupiter it is 3000 times as great. And as for the cold, either warm exhalations from his body, or the temperature of his atmosphere may render it a very comfortable dwelling; or divine wisdom has formed the bodies of the inhabitants so that cold shall be as much their chosen element, as the frigid zones with us, are the region of numerous creatures that could not live in a temperate climate.

Q. 85. But what are we to think of the other planets, and their use in the creation?

A. I return your question: employ your own thoughts upon them.

Q. 86. I am afraid to say, *Mercury* is too hot to be inhabited; because I am sure divine power can form creatures to live in fire as happily as others live in water. Their bodies therefore, if bodies they have, are much more refined than ours, and perfectly suited to their warm station. *Venus* seems a most delightful habitation for vigorous spirits, whether with or without active bodies. *Mars* is 15,000 miles in compass, and I must not suppose that part of GOD's creation is left destitute of rational and animal life. And we have already seen that cold may be the proper element for the inhabitants of the upper planets. But what are we to think of the Moons?

A. The Moons you know are all made of *green cheese*, and fit for nothing but mites to live in.

Q. 87.

Q. 87. You make merry sir, with my ignorance; but still my question is unanswered.

A. You can answer it yourself, after attending to a few facts. Our Earth was never seen since the creation, from either of the three upper planets or from their Moons; for this plain reason their Moons were never known on our world to have existence, till 200 years ago, when telescopes were invented; and yet some of their Moons are much larger than our globe. The Georgian and his two Moons have been known to the learned but very few years; and yet that planet is 80 times the size of our Earth. They are not made then for our use, no more than we are made for theirs. All the Moons in the system have as much light and heat from the Sun as the primaries they attend; and receive much more light from the larger planet than they can reflect on him. If our own Moon, the least in the system, has all these advantages, and a circumference of near 7000 miles, with mountains, valleys, pitted, and level plains, and some other Moons be more than twenty times her size—now solve your own question.

Q. 88. As the SUPREME BEING has made nothing in vain: as he delights to multiply his creatures, and to render them as happy as their conduct toward him and each other will admit; and as he has formed fourteen secondary planets that appear to be as well suited to the accommodation of rational and animal life as the primaries are, I must believe the great CREATOR has stocked every Moon in the system with creatures capable of enjoying his goodness, and adoring his wisdom and power. Is my reasoning just and conclusive?

A. You will soon be able to teach me. The most learned astronomers on Earth have long drawn the same conclusion from the same sure premises. All the creation of GOD abounds with proofs of his infinite power, wisdom and goodness. But all would be vain and useless without rational creatures to behold and to study, to wonder and adore. Yes, my dear pupil, you are surrounded with wonders. Never lift your eyes to the glories around you,

“Those bright temptations to idolatry.” *Young.*

But with the most humble adoration; for

“An undevout astronomer, is mad.” *Young.*

You have now a plan to go by. You will see the Earth turning her side to the Sun in the morning, and your meridian towards him, till it comes directly in a line with him at midday,

midday, and turns from him till he disappears in the west, and rises to enlighten other nations. You will see the Moon, from the change to the full, travelling to the eastward, betwixt you and the planets and the fixt stars; and leaving them behind her to the westward, about 50 minutes in 24 hours; and back again on the other side of her orbit, decreasing in her light till she passes again betwixt you and the Sun at her change. You will commence acquaintance with the planets; their rising, southing, setting, conjunctions, and oppositions. The planets are sometimes *stationary*, or seem to stand still in their course: at other times *retrograde*, or seem to go backward among the fixt stars; and their motions appear *accelerated*, as they seem to go faster than they really do. The planets never stop, never move back, nor faster in one part of their orbit than another, that a naked eye can discern; but these appearances arise from the Earth's motion in the several parts of her orbit, as well as from the motion of the inferior planets in theirs. If you will walk round a tree on your left hand, at 20 yards distance; and another person 100 yards on your right hand, the same course, but with a slower step, you will see this illustrated respecting the upper planets. The tree the Sun, you the Earth, the other person Jupiter. Then if you change places, and call yourself the Earth, and the other man Venus or Mercury, you will see it as it takes place in the inferior planets; for by a few rounds you must understand it.

Q. 89. The labour you bestow on me sir, and the experiments you set me on so easy and without cost, claim my gratitude. But you have not yet told me the dimensions nor uses of the comets?

A. And for a very good reason; I am not acquainted with them myself. But take what little I know of them, which does not merit the name of knowledge. They are larger than our globe. Their uses are mere conjecture. Some judge them the seats of punishment, where sinners suffer the extremes of heat and cold. Mr. Whiston says, a comet approaching the Sun, brushed the Earth with its tail, and caused the deluge; and that another will cause the conflagration. Some say they finally fall into the Sun, and supply him with fresh fuel. Others ascribe great utility to them, by supplying the planets as they pass through their orbits, with recruits of water, and other useful fluids; and perhaps carrying the filth of the whole system out of the way of doing injury. They are surely not made in vain; but we can only guess at their use, while confined to Earth.

Q. 90.

Q. 90. Having surveyed wonders sufficient to bring an infidel to his knees, and to animate the devotion of the most devout; may we now return to *Geography*, if any thing on our globe be worthy of notice, after the more illustrious scenes we have passed through?

A. It is true our world is but a speck in the creation, and yet it has wonders of power and wisdom belonging to it, sufficient to employ the deepest researches of the wisest of men, and fresh wonders discovered every day; and it has one thing to glory in, above all the creation of GOD.

Q. 91. What is that pray?

A. It is that great gospel truth, *GOD so loved the world, that he gave his only begotten Son, that whosoever believeth in him should not perish, but have everlasting life.* A world thus redeemed, is well worthy of our notice. We return then to *Geography*, or that description of countries, cities, and seaports, without the knowledge of which, no person can read a news-paper, nor follow a traveller by sea or land.

Q. 92. Where will you begin sir?

A. With the smallest, but most improved quarter of the world, *Europe*, and with the most western part of it, *Spain* and *Portugal*. This last mentioned little kingdom borders on Spain to the east and north, and on the west and south it is bounded by the Atlantic ocean. Its most frequented ports are Lisbon, the capital city, near the mouth of the Tagus, and Oporto on the Douro. Their chief exports are wine. It has several other ports, as St. Ubes, Lagos, Faro, &c. Its population 2,000,000 of souls; 300,000 of whom are said to be ecclesiastics of both sexes.

Q. 93. Has Portugal any foreign dominions?

A. It owns *Brasil* in South America, which extends 2 or 3000 miles north and south, on the Atlantic to the east; the river Amazon on the north, and La Plata on the south, the two largest rivers on earth. From St. Salvador, the chief city, and other towns, they send to Europe gold, diamonds, pearls, Brasil wood, tobacco, hides, sugar, drugs, &c. Brasil is supplied with negroes from the Portugese colonies in Africa. The other foreign dominions of Portugal, are the *Madeiras*, famous for wine; the *Azores*, or western Islands, the chief of which are St. Michael, Tercera, Fayal and Flores. They are very fruitful. The island of Goa on the Malabar coast, is their chief port in the East Indies.

Spain is a very large kingdom, 700 miles in length, and 500 in width, including Portugal; it is bounded on the north
by

by the bay of Biscay, on the west by the Atlantic ocean and Portugal, on the south and east by the Mediterranean, and on the northeast by the Pyrenean mountains, which divide it from France. It is composed of 14 small kingdoms. The capital city is *Madrid*, in the middle of Spain, and lies about 3200 miles east of *Philadelphia*. The principal seaports on the north and west, are St. Sebastian, Bilboa, Oviedo, Ferrol, Corunna and Vigo. On the south, without the straits of Gibraltar, are St. Lucar, Seville, and the famous port of Cadiz. Within the straits, in the Mediterranean, are Malaga, Carthagená, Alicánt, Valencia, Barcelona, Palamos and Roses, with three islands off the coast, Majorca, Minorca and Yvica. Its inhabitants are 9 or 10,000,000.

Q. 94. Has Spain any foreign dominions?

A. Spain claims as much territory in *North America*, as thrice the *United States*; extending from the isthmus of Darien, to the polar circle; and from the Pacific ocean on the west, to Canada, Mississippi and the gulph of Florida, on the east. In such a vast extent of coast they have many ports and harbours, the chief of which are New-Orleans, on the Mississippi; Vera Cruz, Campechy, Honduras, St. Jago and Porto Bello, on the gulph of Florida; and Aquapulcho and Panama, on the Pacific. These dominions contain Mexico, New-Spain, and many other provinces. Spain owns in South America, from the Carribean sea to the straits of Magellan, near 5000 miles north and south, and about 600 miles wide, containing the large countries of Terra Firma, New-Granada, Amazonia, Peru, Chila, Paragua, La Plata, &c. The chief places of trade are Quito, Cusco, the capital of Lima, Potosi, rich in silver mines, Valparissa and Baldavia, on the Pacific ocean: and Carthagená, St. Martha, Venezuela, on Terra Firma. In Paragua, Assumption, St. Jago, and Buenos Ayers, the capital. The maritime powers of Europe supply the Spaniards with vast quantities of goods, for their American dominions; and of course carry off the greatest share of the returns in gold, silver, cocoa, cotton, sugar, cochineal, jesuits bark, and other productions of Spanish America. And the Spaniards are so just and honourable, that they never have deprived foreigners of their share, though they should be at war with the nation they belong to. This nation also owns Cuba, the largest island in the West-Indies, with its famous port of Havanna. Their part of Hispaniola they have ceded to the French republic, in their late treaty of peace. To Spain
also

also belong Porto Rico, Trinidad, and some other American islands; and the Philippines, with their capital, Manila, in the East-India ocean.

Q. 95. Are not the Spaniards, with such amazing extent of territory, the most powerful nation on earth, and formidable to all their neighbours?

A. Their aversion to industry, and their dependence on other nations for what their own would abundantly produce, is the grand reason why they are neither a populous, rich, nor powerful nation. Their bigotted attachment to Popery, drove off millions of industrious Moors, who had long resided among them: America has drained the mother country of millions more; and the multitude of clergy and nuns, who never marry, are a great drawback on the population of Spain.

Q. 96. What country will you next describe?

A. *France*, that is separated from Spain, only by the Pyrenean mountains, and lies northeast of that country, is 600 miles in length, and 500 in breadth; and was formerly divided into a number of provinces.* But since the revolution France is divided into *departments*, which cannot be understood without a map. However, as our principal concern is with their seaports, I shall describe them, after observing that France is bounded on the north by the British channel, on the west by the bay of Biscay, on the south and southwest by Spain and the Mediterranean, and on the east by Italy, Switzerland and Germany. The capital city is Paris, up the river Seine. The chief ports and trading towns in the north of France on the channel, are Dunkirk, Calais, Bologne, Abbeville on the river Somme, Dieppe, Havre de Grace near the mouth of the Seine, Rouen and Paris higher up the stream; Caen, Lifeux, Cherbourg, St. Malos, Dinnan, Morlaix. On the Atlantic, the famous port of Brest, L'Orient, Vannes, Nantz on the river Loir, Rochelle, Rochfort, the islands of Bellisle, Ree and Oleron, Bourdeaux on the river Garonne, and Bayon, near the border of Spain. French Ports on the Mediterranean, are Perpignan, Narbonne, Arles on the river Rhone, Marseilles, Toulon, Antibes and Nice. Britain has taken from France during the present war, the islands of Corsica, Bastia, its capital, and Pondicherry, in the East-Indies; Martinique, and some other islands in the West-Indies; most of which
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* The idea of starving them out is given up, and the British are reduced to the distress to which they attempted to bring the French.

they have retaken. They still retain the islands of Bourbon and Mauritius, in the Indian ocean, east of Madagascar. The French in 1794, conquered the ten provinces of the Austrian low countries; and brought the seven provinces of the United Netherlands to a compliance with all their wishes. Heaven grant they may not be crushed at last, especially by the powerful naval force that Britain has afloat this year. The exports of France are numerous and valuable, particularly in wines, the best and greatest varieties the world produces. The population of France is estimated from 20 to 24,000,000 of souls.

Q. 97. Whither turn you next?

A. To *Italy*, which, with Spain and European Turkey, make the southern division of Europe. This fine country is about 800 miles in length, from northwest to southeast; and from 120 to 400 in breadth. It is separated from France and Switzerland on the N. W. by the Alps, the highest mountains in Europe; on the east by the Adriatic sea, or gulph of Venice; and on the south and west by the Mediterranean. The chief Italian islands are Sicily, Sardinia, Corsica & Malta. Its southern parts compose the kingdom of Naples, or of the two Sicilies; Naples the capital, and most populous city in Italy. In the middle part lie the state of the Church, the Pope's dominions, the capital cities Rome and Bologna. The grand dutchy of Tuscany, Florence the capital. The two noted republics of Venice and Genoa. The dukedoms of Modena, Parma and Milan. The upper parts of Italy, are the dutchies of Savoy and Piedmont, Turin the capital, whose Duke has the title of King of Sardinia; the chief town of which island is Cagliari, or Calari. The principal ports in Italy are Nice, Oneglia, Finale, Genoa, Lucca, a small republic, the most industrious people in Italy, and extremely jealous of their liberties; Pisa, Leghorn, Piombino, Civita-Vecchia, Naples, Salerno, Rhegio, Squilace, Farento, Ravenna and Venice. In Sicily, Messina, Catania, Syracuse, Trapano, and Polermo the capital. Aetna, the famous volcano, is in Sicily, and Vessuvius, the other is within 7 miles of the city of Naples. The Knights of Malta keep some gallies, and by their vow, are obliged to be at constant war with the Turks, Algerines, &c. The productions of Italy are corn, oil, wine, marble, silk, fruits, cheese, and others. Its population may be about 18,000,000.

Q. 98. Whither next?

A. Across the Venetian gulph to **TURKEY** in Europe,
which

which is about 1000 miles in length, from Chotzim, near the border of Poland, to the southern point of the Morea; and from Oczakow, on the Nieper, to Dalmatia on the Adriatic, nearly as wide. This empire contains the ancient Peleponnesus, now Morea, Achaia, Greece, Macedon, Illyricum, Bulgaria, Wallachia, Moldavia and parts of Tartary. The capital of the whole empire is Constantinople. Its principal cites and ports are Asoph, Kaffa, Precop, Oczakow, Belgorod, Nicopoli, Silistria, Adrianople, Constantinople, Salonichi, Larissa, Athens, Lepanto, Misistra, Corinth, Butrinto, Durazzo and Ragufa. Its chief rivers are the Don, the Nieper, the Neister and the Danube. The Turkish islands are Crete, now Candia, Cyprus, Rhodes, Negropont, Samos, Scio, Mitelene, Lemnos, and many others in the Archipelago. This empire in Asia, contains Asia proper, Pontus, Capadocia, Cilicia, Galatia, Bythinia, Caria, Lydia, Mysia, Syria, its famous ancient capital Antioch, and Judea, its capital Jerusalem now a little town, without the old walls. In Africa it claims Egypt, its capital Grand Cairo, and some other ports on the mouths of the great river Nile. The Turks are Mehometans, but many Christians and Jews among them.

We now turn northwest to *Germany*, which lies east from France, and is about the same dimensions. It is divided amongst perhaps 300 sovereign Princes, of whom the Emperor is Chief; and he is chosen by the votes of eight Electors; three of whom are spiritual and five secular, viz. the Archbishop of Mentz, Treves and Cologne; the Electors of Saxony, its capital Dresden; of Bohemia, its capital Prague, though this has now no vote, as it belongs to the house of Austria; the Elector of Bavaria, its capital Munich; of Brandenburg, who is also king of Prussia, capital city Berlin; of the Palatinate, capital Heidelberg; and of Hanover, whose Elector is also King of England. To these are to be added a number of Princes, Dukes, Marquisses, Counts, Bishops, Abbots, and several free cities and hansetowns, who are all represented in the great Diet of the empire, held at Ratisbon. Vienna is the capital of all Germany; it stands on the Danube, and is the imperial residence. This large and populous country is divided into ten circles: Upper Saxony, Lower Saxony, Westphalia, Upper Rhine, Lower Rhine, Franconia, Bohemia, Austria, Bavaria, and Swabia. As Germany lies in the middle of Europe, it has but few sea-ports; yet it carries on a great trade by its noble rivers, the

Danube, and its numerous branches; the Rhine, which divides it from France; the Moselle, the Weser, the Elbe, and the Oder. On the Danube are the cities of Belgrade, Buda, Presburg, Vienna, Lintz, Ratisbon, Ingolstadt, Augsburg and Ulm. Up the Rhine, from the United Provinces, stand the cities of Cleves, Wesel, Dusseldorp, Cologne, Coblenz, Mentz, Worms, Spire, Strasburg, Brisac. On the river Ems, Enden and Munster. On the Weser, Jade, Bremen, Verden, and Osnaburg. On the Elbe stand Hamburg, Dam, Lunenburg, Magdeburg, Wittenburg, Dresden: and on the Spree, a branch of Elbe, stand Potsdam and Berlin, and betwixt these rivers, the trading cities of Lubec, Wismar, Rostock, and Stralsund. On the Oder, Cammin, Stetin, Custrin, Frankfort, &c. The other Frankfort lies on the Maine, a branch of the Rhine. The population of Germany is about 21,000,000.*

Q. 99. What country comes next in order?

A. A country that claims the attention of all American citizens, the famous Helvetic Union, or Cantons of *Switzerland*; but we must climb to come at them, for their dwelling is among the lofty show-crowned Alps, which they cultivate from bottom to top, with a degree of industry, which nothing but their love of freedom, and their independent spirit could inspire. This brave, hardy, and virtuous people compose thirteen small states, viz. Berne, Zurich, Schaffhausen, Basil, Lucern, Underwalden, Uri, Switz, Friburg, Zug, Soleure, Apenzel and Glaris. The Grisons, Geneva, St. Gall, and some other small republics, are allies of the Switzers. Every man here is bred a farmer or tradesman, but surely a soldier. As gaming and luxury are prohibited among them, their youth go from the war-like exercises of wrestling, running, throwing and shooting, to books; which laudable custom they follow through life, and are a very knowing people. As to religion, some are Papists, but the greatest number are Calvinists. They are so very jealous of their liberties, and so well prepared to defend them, that no nation has given them disturbance for ages past. Neither are they cursed with the spirit of conquest, but perfectly contented with their romantic mountains, and fruitful valleys, both which they have rendered a paradise. Some of their cantons are *Aristocracies*, where the nobles rule; others are *Democracies*, where the people chuse their legislators

* The religion of this empire is Papist, Lutheran, and Calvinists, and many Jews.

slators and rulers, as in the United States; others are a mixture of both these; and some of their small cantons are *Oligarchies*, where every man votes in legislation, and administration. Yet such is the virtue, harmony, equality of fortune, and love of their country that prevails among them, that we hear of no discontent; no pretended friends, or secret foes, to raise a clamour against their government—and if any disputes arise, they are quickly quelled by reason and authority. They have generally kept a number of their youth in foreign service, to have them thoroughly acquainted with the military art. The population of Switzerland is estimated at 2,000,000.

Q. 100. Whither will you descend from this highest ground in Europe?

A. To the very lowest, the seven provinces of the *United Netherlands*, commonly called the States of Holland. They were called Republics, but they had too much of Monarchy in the person of their Stadtholder, and too much of Aristocracy in their high and mighty Lords, the States-General, to deserve that name. The provinces are Holland, chief city Amsterdam; Overysse, chief town Davenport; Guelderland and Zutphen, chief town Nameguen; Friesland, chief town Lewarden; Groningen and Utrecht, towns the same name; and Zealand, chief town Middleburg. These states were part of the seventeen provinces of the Low Countries, that revolted against the oppressions and persecutions of their Sovereign, that gloomy bigot, Philip II, King of Spain; and by the assistance of England, after a long and very severe struggle, secured their independence, while the other ten were again reduced under the Spanish yoke, and so continued till the Duke of Marlborough, in 1706, conquered them for Charles IV, Emperor of Germany. France soon after reduced some of them, and all the remainder in 1794. Their names are Brabant, capital city Brussels; Antwerp, Malines, Limburg, chief town Maestricht; Namur, Hainault, chief town Mons; Luxemburg, Cambresis, chief town Cambray; Artois, chief town Arras; Flanders, chief towns Sluys, Ghent, Bruges, Courtray, Ypress, Tournay, Lisle, Dunkirk, &c. These provinces form the most remarkable country on the globe. Part of them are gained from the sea, by vast banks of earth, raised and kept up at great expence. A large proportion of it was mere swamp, among the mouths of great rivers: they have confined the rivers with dykes, and drained the country with a thousand canals,

canals, which are now their public roads, as they travel chiefly in covered boats. These seven little spots, scarcely the size of seven of our counties, by their bravery, industry, and spirit of adventure, arose to an eminence that astonished the whole world. The fleets they fitted out both for war and commerce, enabled them to form settlements in all parts of the world, and to make head against all the naval power of Britain, in numerous desperate engagements. From their possessing the Molucca and Banda islands, and Ceylon in the East-Indies, they have supplied the world with all the rich spices for ages past; and their possession of Cape Good Hope, the southern point of Africa, enables them to preserve all their eastern settlements. They have made Batavia, in the island of Java, the finest city in Asia. They possess Surinam, in South America; and Curazza, Eustatia, and some other ports in the West-Indies, exceedingly profitable to them; but which no other nation would have thought of improving. One third of the commerce of the world has been in their hands 200 years. Though their taxes are higher than those of any other nation, yet they all lay up money. They are said to catch eight millions sterling worth of herrings annually, on the coast of Scotland, and in the channel. Their soil not being firm enough to build their cities on, they drove numberless trees pointed at one end, into their ground for a foundation; and one single building, the state house in Amsterdam, has more than 13,000 such poles under it. The Dutch in their turns saved England from popery and arbitrary power, by sending over their Stadtholder, William Prince of Orange, with a fleet and army, who drove off the popish King James II, his father-in-law, and had the British crown for his pains. Their population is estimated at two millions and an half, which on so small a spot, makes it five times as populous as so much of England. The Dutch are Calvinists, but all nations and religions are tolerated among them, though only Presbyterians have a share in the Government. Their immense trade has rendered these provinces the emporium of Europe. They have lately expelled their Stadtholder, and declared themselves a Republic. War with Britain must prove extremely pernicious to the Dutch, as their fleets must pass very near to Britain, whether through the channel or north about, before they can arrive at home, from any of their foreign settlements. How they are to get through this year, secure their trade from the British cruisers, and establish their infant republic, America waits with anxiety to know.

Q. 101. Whither steer you next?

A. Due west, and 90 miles of sea will bring us to the coast of England, the southern division of Britain, Scotland being the northern.

England has on the east the German sea, on the south the British channel, on the west St. George's channel and the Irish sea, which separates it from Ireland, and Scotland on the north. Its length 380 miles; its greatest breadth 300; but it narrows all the way north to Berwick. It contains near 50,000 square miles. London the capital, stands on the river Thames, in lat. 51 30, that is 1000 miles north of this state, and more than 3000 east. Since we now have a right by treaty, to enter the British ports, it is of importance to Americans to know them. As you sail up the channel, France on the right and Cornwall on the left, you have Pensance, Falmouth, Penryn, Tregony, Fowey, east and west Looe, and Saltash. In Devonshire are Plymouth, Dartmouth, Totness, Torbay, Exmouth, Topsham and Exeter. In Dorsetshire, Lime, Portland, Weymouth, Dorchester, Wareham and Pool. In Hampshire, Lymington, Southampton, Gosport, the famous harbor of Portsmouth, and some ports in the Isle of Wight. In Sussex, Chichester, Hastings, Winchelsea and Rye. In Kent are Romney, Hyth, Dover, Deal, Sandwich, Chatham, Rochester, Gravesend and Woolwich. In Middlesex, London; and higher up the Thames are Kingston, Hampton, Windsor, Reading, Wallingford and Oxford. In Essex, Malden, Colechester and Harwich. In Suffolk, Ipswich, Aldborough, Dunwich and Lestoff. In Norfolk, great Yarmouth, and Lynn Regis. In Lincolnshire, Boston, Grimsby and Burton. In Yorkshire, Hull, Scarborough and Whitby. In Durham, Hartlepool, Sunderland and Shields. In Northumberland, Newcastle, Morpeth, Alnwick and Tweedmouth. We now follow the line that separates England and Scotland, up the Tweed, and along the Cheviot hills to the Solway frith, the English and Welsh ports on the Irish sea, St. George's channel, and up the river Severn, are Carlyle, Cocker-mouth, Whitehaven, Kirby, Kendall, Lancaster, Preston, Liverpool, Chester, St. Asaph, Bangor, Carnarvan, Har-loch, Cordigan, St. David's, Haverford-West, Milford-Haven, Pembroke, Landaff, Cardiff, Gloucester, Bristol, Bridgewater, Barnstable, Camelford, Padslow and St. Ives. The population of England 6 or 7,000,000.

We now turn to *Scotland*, the northern part of Britain.

Its

Its length 300 miles; its breadth where widest 190. It has England to the south, the German sea to the east, and other parts of the Atlantic to the north and west. Its chief ports on the east are Berwick, Haldington, Leith the port town of Edinburg the capital city, at the mouth of the Clyde; St. Andrews, Dundee, at the mouth of the Tay. Perth 16 miles higher up the river. North from the Tay are Arbroath, Montroses, old and new Aberdeen, Forres, Inverness, Nairn, Dingwall, Dornock. North of Scotland are the islands of Orkney and Shetland. On the west are the islands of Lewis, Skye, Mull, Jura, Isla, Contyre, Arran, and many others, abounding with excellent fishing ports, though but little trade, till you come to the river Clyde, where stands the noted port of Glasgow, other trading towns, and the famous canal, that goes from the Clyde to the Forth. The chief ports on the south are Wigton, Kelly, Kirkudbright and Dumfries. The population of Scotland must exceed two millions.

We now pass to *Ireland*, 60 miles west from England, and 20 miles southwest from Scotland. It is bounded on the north, west and south by the Atlantic, and on the east by the Irish sea and St. George's channel. It is divided into four provinces, Munster on the south, Leinster on the east, Ulster on the north, and Cannaught on the west. Its chief ports on the east, from south to north, are Kinsale, Cork, Cloyne, Lismore, Waterford, Wexford, Wicklow, Dublin the capital, Drogheda, Dundalk, Dundrum, Downpatrick, Belfast, Corrickfergus. On the north, Ballycastle, Colrain, Londonderry. On the west, Donegal, Sligo, Killybegs, Galway, Limerick on the river Shannon, and Dingle. On the south, Bantry, Baltimore and Ross. The exports of Ireland are beef, pork, butter, tallow, hides, wool, woolen yarn, fish, but above all, vast quantities of linen cloth. The Irish assert that their population is three millions. The English church is here established.

The British dominions abroad are numerous and expensive. In North America, Canada, Nova-Scotia, St. John's, Cape Breton, Newfoundland, and some settlements in Hudson's bay. In the West-Indies she owns a number of islands, too well known to need being named. In Spain they hold Gibraltar. Some forts and settlements in Africa. Very extensive dominions in the East-Indies, by conquering the Princes of the country, under various pretences; and it is supposed they have now 15,000,000 of the inhabitants their subjects.

subjects. However, in the late treaty, they have granted to the ships of the United States, access to their ports in that rich and extensive country; for which America has no equivalent to grant. Their chief ports there are Bombay, Pondicherry, Madrass, Calcutta, and many others on the bay of Bengal, and the famous river Ganges; and Bencoolen in the island of Sumatra.

We now cross over the German sea, to *Denmark*, on the east of it. This northern kingdom has Norway on the north, Sweden over the sound on the east, and Germany to the south. It lies at the entrance into the Baltic sea, and receives toll from all ships that pass. Denmark is 240 miles in length, and about 100 broad. Copenhagen the capital, lies in the island of Zealand, and is the residence of the King, and the chief place of trade, though they have many other good ports. Norway belongs to Denmark, and from its chief town Bergen and other ports, it sends abroad vast quantities of all kinds of timber and naval stores. This country owns Tranquebar in the East Indies; St. Thomas's, St. Cruz, and St. John's in the West-Indies; and several islands in the Baltic. It claims a part of Lapland, the islands of Iceland, east and west Greenland, and Spitzbergen; and carries on a considerable trade in the Mediterranean. Denmark figures as a maritime power, and can fit out 50 or 60 ships of war. The population of all the Danish dominions may be estimated at 2,400,000. The religion of Denmark is Lutheran.

Sweden is separated from Denmark on the west, by the sound, and from Norway by impassable mountains. It has Lapland on the north, the Russian empire on the east; and on the south the Baltic sea, and by that arm of it that makes up to Petersburg, in Russia, called the gulph of Finland. Sweden is 800 miles in length, and 500 in breadth; but frozen lakes and mountains render great part of it uninhabitable. It produces not grain sufficient for home consumption. The principal ports in Sweden are Abo, Wasa, Ulea, Torne, Pithea, Sunwald, Stockholm the capital of Christiansand, &c. and Gothenburg; from which they export large quantities of iron, copper, lead, timber for all uses, hides, furs, potash, flax, hemp, cordage, fish, sail cloth, &c. They have ports in the Baltic islands of Rugen, Ocland, Gothland and Alland. Stockholm lies in lat. 60, the same parallel with Petersburg, in Russia, Bergen, in Norway, and Hudson's bay, in N. America; so it is 1600 miles north of this state, and 4000 to the

the eastward. In the reign of that military madman, Charles XII, Sweden lost nearly all her dominions in Germany, while Peter of Russia took from it the fruitful provinces of Livonia, Esthonia, Ingria, Carelia and others. The Swedes have no foreign colonies; but they trade in their own bottoms, and frequently sell ship and cargo. That they have not lost all the martial spirit of their ancestors, appears from their late naval engagements with the Russians; in which, though they lost some ships, to superior numbers, yet they were a dear purchase to their enemies. The population of Sweden does not exceed three millions. The Lutheran religion is here established.

Q. 102. What country will you next describe?

A. *Russia* or *Muscovy*, which is bounded by Sweden and the Baltic on the west, by the frozen ocean on the north, and including Siberia and Russian Tartary, on the east by the eastern ocean, and on the south and southeast by Poland, Turkey, the Euxine sea, Georgia, the Caspian sea, and Chinese Tartary. This mighty empire is as large as all the rest of Europe; but its present Sovereign Catherine II, not content with her immense dominions, has conquered some valuable provinces in Turkey; and to the disgrace of all Europe has divided Poland with two other free-booters, the Emperor of Germany and King of Prussia. She has done many popular things in her own country; and had she confined her great talents to the arts of peace, her memory might have been blessed, could the world ever have forgot her concurring in the murder of her husband, Peter III, and usurping his throne, which he has filled these thirty-three years. Russia has a considerable fleet of ships of war, both in the Baltic and Black seas; which with a mighty army by land, are the terror and annoyance of all her neighbours. This empire carries on a great trade by land to China and other nations; and from the seaports of Archangel, on the White sea, Cola on the North sea; from Wiburg, Petersburg the capital, Narva and Rovel on the gulph of Finland; and from Perneau, Riga and Mittau on the Baltic, they export furs and skins, linen, iron, copper, timber, naval stores, hemp, flax, sail cloth, wax, honey, tallow, linseed oil, potash, train oil, musk, rhubarb, raw silk, &c. The three ports conquered from Turkey, on the Black sea, Kaffa, Precop and Oczakow, are made free ports. Were Russia as populous as Holland or China, half the people on the globe might reside on it; but from 20 to 24,000,000 are its

its estimated population, without including her usurpations in Poland and Lithuania, which must amount to five or six millions more. The religion of Russia is the Greek church.

The last nation not described in Europe, is abandoned, lost and ruined *Poland*, a country more than 600 miles square, containing 14,000,000 of inhabitants. It is called a Republic, because the nobles are every thing there. They own the soil, and the peasants on it, just as they do the cattle. The common people own no property, and are not known in their laws. The Polish nobles however, will have a King, and the Russian Court generally influences their choice, which is made in a full Diet of the nobility; and there must not be a dissenting voice, as the minority are in danger of being instantly cut in pieces. Their present King, Count Poniatowski, they choose from among themselves: he has wore their crown 32 years; to him a crown of thorns, under the title of Stanislaus Augustus; but too limited in his power to do the good he is inclined to. Popery is the established religion of Poland; but they have among them a number of dissenters whom they call Dissidents, who, twenty odd years ago, claimed some privileges, which were denied them on account of their religion. A bloody civil war ensued. Russia and Prussia interposed, and insidiously assisted the Dissidents, till by war, famine and pestilence, three millions of people were cut off, or fled the country; and then Russia, Prussia and Austria very *graciously* determined, that Poland was too large to be governed, and they condescended to divide nearly one half of it among them. In the part left to Poland, the King had influence sufficient to prevail with the princes and noblesse to declare the common people no longer *things*, but *men*, whose lives should no longer be at the mercy of tyrants; but should be known in law, become tenants and own property. This step toward human liberty alarmed the three aforementioned powers, who fearing their drudges might expect equal indulgence, and coveting the remainder of Poland, have actually divided it among them; the Russian tyranness having confined the dethroned King to Grodno, under pretence of keeping him out of harm's way. A vigorous protest of the maritime powers, would have prevented this grand breach of the balance of power in Europe; yet no nation interposed, but the Turks, who greatly suffered for their kindness, by bringing all the vengeance of Russia upon them. It would now appear just, for Heaven to suffer the Russian empire to

subjugate half of Europe; which indeed they seem in a fair way to do; whilst America, safe in her distance from the bloody scene, in the wisdom of her government, and in the unparalleled increase of her population and improvements, views with safety, the catastrophe, and pities human infatuation. Poland carried on a great trade by her rivers, the Devina, the Boristhenes or Neiper, the Bog, the Neister, but especially down the Vistula, to the famous port of Dantzic, which, with the city of Thorpe, the late Frederick of Prussia seized upon, and bought up the immense quantity of grain that came down to them, with base metal, and sold it out for good coin. But kings may do that with impunity, which would hang ten thousand petty rogues. Whether these plunderers will quarrel about the division of their spoils, or whether the Turks, Sweeds and Danes may have power sufficient to restore Poland, is very doubtful; but surely there is a God who rules in the earth, and will, sooner or later, vindicate the cause of oppressed nations. The chief cities of Poland are Warsaw the capital, Cracow, Dantzic a free city, dependent on Poland, Thorne, Guesna, Lemburg, Caminieck, Lucho, Brisici, Bielh, Grodno, Wilna, and Rasiem. Poland being a level and rich soil, abounding with timber, of course exports vast quantities of grain, fleshmeat, and wood for all uses. They have mines of silver, copper, iron and coal; and the wonderful salt mines near Cracow, before the German tyrant seized on them, were the principal support of the crown. Many springs are boiled into salt. The waters of one fountain preserve the lives of the neighbouring inhabitants from 100 to 150 years. The water is as inflammable as the most ardent spirits. The flame does not heat the water; but if neglected, makes sad destruction among the adjoining lands and timber.

Q. 103. Whither turn you next?

A. To *Asia*, the largest quarter of the globe, on which man was first created, and still the most populous. Here the human race were first propagated after the deluge. Here laws were first framed; government was established, and the sciences cultivated, while the other quarters of the globe were the range of wild beasts. Here the Almighty gave to a chosen people, a divine law, and preserved among them that great foundation of all truth—the unity of the Divine Being. In Asia the SON of GOD became incarnate, lived, suffered, died and rose again, and propagated the Christian religion to all nations. The air, the soil, the fruits, and produc-

productions of Asia, both above and below the surface, as well as their manufactories, excel those of all nations. This quarter of the world is about 4500 miles each way, bounded on the west by the Red sea, the Mediterranean and Europe; on the north by the frozen sea; on the east by the eastern; and on the south by the Indian ocean. It contains the extensive countries of Siberia, eastern and western Tartary, and Arabia—the empires of Turkey, Persia, India and China. Its islands are numerous and very large. They are Japan, the Philippines, New-Guinea, Celebes, Borneo, Sumatra, Java, and numerous others. The island of New-Holland is as large as all Europe; to Botony bay in that island, the British banish all their *rogues* and *republicans*. Asia is believed to contain 500,000,000 of souls, which are half the number on the globe; and of these, China is said to contain 200,000,000. Pekin is the capital of China; and its two great trading cities, frequented by Europeans and Americans, are Nankin on the east, and Canton on the south. In Asia are some Christians, some Mahometans; but the greater number are Pagons and gross Idolaters.

Africa offers next, more remarkable for size than for cultivation or improvement. Bounded on the east by the isthmus of Suez, the Red sea and the Indian ocean; on the south by the southern ocean; on the west by the Atlantic, and on the north by the Mediterranean. The kingdoms of Egypt, Syrene, Numidia, and the famous republic of Carthage, made a great figure in ancient history. But the scum of Arabia and Turkey now possess those fertile countries, under the names of Tripoli, Tunis, Algiers and Morocco, so many nests of pirates, who keep all trading nations under contribution; or they will make prizes of their ships, and slaves of their crews. This quarter of the globe extends from the Mediterranean, on the coast Tunis and Algiers, in lat. 37 north, to Cape Good-Hoop, in lat. 34 south, near 5000 miles in length; and from the entrance of the Red Sea on the east, to the mouth of the Niger and Senegal on the west, nearly 4000 miles. Its internal parts are little known, and as yet unexplored by travellers. Most trading nations have forts and factories on the western coast, from whence they procure slaves, gold dust, ivory, gums, &c. Madagascar on the east, is the largest African island; though no European power has settlements on it.

We come in the last place to the freest, happiest, most plentiful part of the globe; and the farthest removed from
tyranny,

tyranny, wars, and those commotions that curse and agitate the nations. We come to a land in all its youthful vigour undebilitated by the luxury, vices and old age of the eastern nations: a country in which the *Laws* rule, and not *men*; where life and property are in perfect security, and where the happy inhabitants may confide in those who legislate, those who rule, and in those who judge; because they can remove them all at their pleasure.—A country in which religion is unrestrained; morality in repute; education promoted; marriage honourable, and age revered.

Q. 104. Pray sir, where lies this terrestrial paradise?

A. Within the limits of the UNITED STATES; and the spot you stand on, makes a part of it. This quarter of the globe was discovered by the adventurous genius of *Christopher Columbus*, and should be called by his name, as he was seven years prior to *Americus Vesputius*. If this change of name should ever take place, the Congress must do it; but I apprehend every state in the union can annihilate those names of place that insult our ears with discarded royalty; reduce them to a true Columbian nomenclature, and let the name and thing sink together. Europe is the mother country of America; but that Britain and Ireland take the lead in its population is evident, from the amazing uniformity with which the English language is pronounced through the whole union; from the mountains to the sea; a thing unknown in any other nation; as a river or a ridge of hills have different dialects on each side of them—and people from distant shires in England can with difficulty understand each other. The middle and southern states were chiefly settled by colonies under proprietors, or the crown: But New-England was settled by real refugees, who sought an asylum from the persecutions of Archbishop Laud, his suffragans and bigots of King Charles I. Wherever Europeans landed, they found the bays and borders of rivers occupied by numerous tribes of hostile Indians, whose very names are forgotten, and whose broken remains are driven to the westward. By cultivating a liberal soil; by the arrival of fresh adventurers, and by exporting their superfluities, the fruits of their honest labour, the colonies grew up towards vigorous youth, although the King and proprietors nominated the Governors, Council, or upper House of Assembly, and the Judges; and although religious establishments, those usurpations of the Divine Prerogative, and chains of conscience and liberal thought, had taken place in most of the colonies.

in made laws to regulate our trade, and secure it to herself, to which no opposition was made; for there were not more loyal people on earth than the inhabitants of the colonies. Laws formed by our representatives, must have the advantage of Britain evidently in their face, or they would not pass the consent of those limbs of royalty, the Council and Governor; and even after their concurrence, must pass the approbation of the King and his Council at Westminster. Thus the crown had three votes in four, for the passing of every law. But not satisfied with the quantities of goods of all kinds, we took off their hands, on which they laid what prices and what duties they pleased; or with their vast gains from the valuable raw materials sent them annually in return, they made an attempt for more direct revenues, by sending in stamp paper, to sell at high price, and on which all business was to be transacted, newspapers printed, &c. To this the colonies made such opposition, that not a single sheet was sold. Parliament repealed the act, but passed a clause in these words, "That Britain had a power and right to bind the colonies by laws of her making, IN ALL CASES WHATSOEVER." When this act, which annihilated our assemblies, and reduced us from subjects to slaves, was attempted to be reduced to practice on an experiment on tea, the cargoes were either sunk in the sea, or suffered to rot in warehouses; and not a single pound was sold. Britain backed her claims with a fleet and army, and the devoted town of Boston felt the first vengeance of offended royalty. O my dear country! never forget your then situation. Without an army; without a General bred in the school of war; without great or small arms to oppose the unconquered forces of Britain; without a treasury; without an ally; without a single frigate, to oppose the first naval power on earth; a power deemed our mother, among whom we had a million of relations, friends, and correspondents—to oppose a King, whom we honoured with idolatry!! At this awful period CONGRESS met, under a cloud of public cares, inconceivable by all but patriots. It seized the helm—it became a center of union and of motion, to the scattered colonists; and made a common cause with Boston. The continent, as by an electrical shock, caught the noble enthusiastic spirit of liberty and resentment. Heaven pointed out GEORGE WASHINGTON, as the instrument by whom it would save his country; at the call of which he hastened to head the brave, but fresh troops collected

lected near Boston, who had driven the British from Lexington, and had made so brave and obstinate a defence at Bunker's-hill, and he drove the enemy from that distressed town. Congress petitioned, remonstrated, protested, and appealed to heaven and earth, with a force and energy our language had never before experienced. But all in vain: King and Parliament were hardened against us. The storm increased: dangers collected on every hand. Powerful fleets wafted over numerous bands of British, and their hirelings. Congress had no resources, but in their own steady fortitude, and the spirit of the inhabitants. Our losses by sea, however, were immense; our trade ruined; our sea-ports possessed by the enemy; our armies defeated in almost every engagement; a civil war raging in our bowels, tory against whig and whig against tory; our slaves by invitation joining the enemy by thousands, and our paper money scarcely worth the hundredth part of its nominal value.— Amidst such a complicated scene of distresses, our public virtue began to flag. The militia had lost their best arms, and were backward to the service. The regulars were badly clothed, and worse paid. But when they saw their beloved Chief, sharing in all their dangers and sufferings, they drew courage from his eye; instruction and confidence from his lips. In this darkest day in the American horizon, GOD, who was incessantly revoked by every thinking inhabitant, gave us credit with some French merchants, who supplied our armies with great and small arms, ammunition and cloathing. But this was not all. HE who intended America for what it now is, and promises to be, would not do his work by halves; but put it into the heart of the King of France, an absolute Sovereign, and at that time ruling a people devoted to him and monarchy, to take by the hand, on the broad basis of equality, a number of colonies, deemed to be in wanton rebellion against their lawful Sovereign; make a common cause with them; send fleets, armies, and all things necessary; and to continue a vigorous co-operation with America, till her independence should be secured. I again call on my country to remark a coincidence of providence never to be forgotten. A plan was concerted betwixt America and France, to entrap Lord Cornwallis in Virginia. A French fleet arrived at Rhode-Island, with all things necessary for a siege; a superiour British fleet lay at New-York. Another French fleet was ordered to Virginia from the West-Indies. General Clinton could have
rein-

reinforced Lord Cornwallis; but was diverted from it by the address of the American General, who threatened to attack New-York. Had the British fleet intercepted the French on their passage from New-Port—had contrary winds prevented DeGrasse's arrival in the Chesapeake—had he not defeated the fleet that was sent to drive him from it—had he not been furnished with ships, to carry the combined army from the head of the bay to James-Town, the whole plan must have miscarried; Britain would have escaped the greatest blow it ever received; the war been protracted, and its issue rendered doubtful. But this surrender, with its attendant losses, had in time the desired effect: the British nation became tired of the war and its enormous expenses. A general treaty took place, in which Britain acknowledged the independence of the American States, which the other nations of Europe did soon after. A constitution was formed by the united wisdom of our country, which after some time was adopted by all the states. Under its happy influence they have flourished ever since in peace, prosperity and reputation—and the population of our western territory has never been equaled since the first ages of the world.

O fortunatos nimium, sua si bona norint

Americanos!

Virgil.

But we have those who know not their happiness, or who knowing, would blast it. I must here bear my testimony against a late production of a malignant pen, who treats the first character of the age with a degree of scurrility, which nothing but malice and envy could dictate; and shall only say of him, what the Spectator does of the author of a *discourse on Freethinking*: "If ever man deserved to be denied the common blessings of *fire* and *water*, it is the writer of a piece signed *Bellisarius*." The boundaries of the states, as fixed by treaty, are as follow: From the mouth of the river St. Croix, in the Bay of Fundy, up the said river, and continue a north course to the ridge that divides the waters that run into the Atlantic, from those of the St. Lawrence; and along the same a southwest direction to lake Champlain; and thence a western course to the river St. Lawrence, the boundary line betwixt the United States and the British dominions in Canada being supposed to run through the middle of the lakes Ontario, Erie, Huron, lake Superiour, and to the lake of the Woods; from whence it takes a western course to the head waters of the Mississippi, and down that river to lat. 31; thence an east course to the mouth of the
river

river St. Mary's, leaving east and west Florida to the south. On the east the United States are everywhere bounded by the Atlantic ocean. As to their extent, the post roads along the eastern coast, measure 1470 miles; but from the north-east corner to the southwest on the Mississippi, must be 1800; and from the mouth of St. Mary's to the northwest corner cannot be less. An east and west line from the mouth of the Delaware to the mouth of the Missouri may be 800 miles. The United States resemble the printed Y—the lower end of the stem, the south line; the Atlantic ocean on the right, Mississippi on the left, and Canada the part cut out betwixt the points, but with a wider angle. *New-England* composes the northeastern division of the United States, New-Hampshire, Massachusets, Vermont, Rhode-Island and Connecticut constitute this division: Maine is considered as the northern part of Massachusets. In length about 550 miles, and 200 in breadth. Bounded on the northeast by Nova-Scotia, on the north by Canada, on the west by New-York, and on the east by the Atlantic. Their rivers are the Penobscot, Kannebeque, Saco, Piscataway, Merimac, Patuxent, Thames and Connecticut. The last river runs through, and is of vast use to the states of New-Hampshire, Massachusets and Connecticut, where it mouths. Their principal bays and harbours are Penobscot, Casco and Piscataway bays—the fine harbours of Boston, West-harbour and Rhode-Island. The chief places of trade and navigation are Penobscot, Halifax and Wiscasset on the Kennebeque, Brunswick, Casco, Wells, York, Piscataway, Portsmouth the capital of New-Hampshire, where that state touches the Atlantic—Salisbury on the Merimac, Ipswich, Salem, Charles-Town, Boston in lat. 42 25, Citate, Plymouth, Sandwich, Barnstable, the island of Nantucket. In Rhode-Island, Newport and Providence. In Connecticut, New-London on the Thames, Lyme and Hartford on the great river, and farther west are New-Haven, Milford, &c. This virtuous and industrious people make a wise and proper use of the advantages their soil and seaports give them. As they abound with fine timber and naval stores of all kinds, they carry on ship-building to a great extent, which enables them not only to export their own numerous productions and manufactures, but to be the carriers for other states, and even for Europe. By this they carry on a most extensive fishery, from the whale to the herring, for thousands of leagues along the coast of North and South America; which fish and oil they send

send to Europe, and sell ship and cargo. Education is much encouraged in those states. The religion of New-England is chiefly Calvinistic and Presbyterian, as might be conjectured from the first inhabitants flying to the *asylum* of frozen forests and Indian savages, from the oppressions of the English church: but religious liberty is the glorious peculiarity of the United States. In the year 1790, the inhabitants of these states amounted to 1,010,000 souls, and not 4000 slaves among them. They send 29 members to the Congress House of Representatives. It has been remarked, that during the very heat of our contest with Britain, the Assembly of Massachusetts passed an act establishing a philosophical society, for the promotion of the study of the natural history, and antiquities of America; and to promote agriculture, commerce, and every art and science, that may promote the honour, interest and happiness of a great and free people.—Boston is defended by a strong castle, at the entrance of their spacious harbour.

New-York offers next, 300 miles in length, extending from the mouth of Hudson to Canada, north and south, and 150 miles in breadth, from New-England on the east, to New-Jersey, Pennsylvania, and the lakes on the west and south-west. This state owns Long-Island and Staten-Island. The city of New-York stands on York-Island, in lat. 40 40, at the mouth of Hudson's river, a noble stream three miles wide at the city; up and down which they carry on a great trade with the city of Albany, 150 miles up; and with many other places towards the lakes and Canada. The productions and exports of this state are nearly the same with those of New-England; large quantities of provisions, naval stores, furs, pot and pearl ashes, &c. The population of New-York is about 340,000, 21,000 of them slaves, which entitles them to ten members in the representation of the United States. Religion in New-York is perfectly free.

New-Jersey follows next, 160 miles in length and 55 in width, bounded on the west by Delaware, on the south and east by the Atlantic, and on the north by Staten-Island sound, Hudson's river and New-York. Its rivers are Delaware, Passaick and Raritan. Its towns are Burlington, twenty miles above Philadelphia on Delaware, north lat. 40 8. Trenton still higher up; and on the east and north-east Doncaster, Amboy; Brunswick and Elizabeth-Town. New-Jersey being a peninsula, is very convenient to navigation.

gation. But New-York on one side and Philadelphia on the other, draw the trade to them. They however export provisions and lumber, and they possess the richest copper mine in the United States. In the year 1746 a College was established with university privileges, first at Newark and now at Princeton. It has greatly flourished under the Presidents Dickinson, Burr, Edwards, Davies, Finlay, Witherspoon, and now does under the presidency of Dr. S. S. Smith, lately and unanimously chosen to that important station. Religion is free in Jersey; and their numbers by the census taken in 1790, were 185,000, slaves making the 17th part. They send five representatives to Congress.

Pennsylvania comes next in course, about 280 miles in length, from Delaware river which separates it from New-Jersey and New-York, on the east, to the lands ceded to the United States by the treaty this year, on the west; and from Maryland on the south, to the Six Nations on the north, 220 miles in breadth. This extensive and fruitful state has much land carriage; but by their fine rivers Delaware, Schuylkill and Susquehanna, they are excellently situated to export their numerous and valuable productions, to wit, ships and provisions of all kinds. The farmers are chiefly cloathed with their own manufactures. Their towns are not so numerous as those of New-England; but German-Town, Chester, York, Lancaster, Carlisle, and some others are populous and thriving. But Philadelphia on the Delaware is the most regular and populous city in America. It lies in the 40th degree of north latitude, and 75 20 west longitude from London; which by my calculation, brings it 3450 miles west, and 800 south of the capital of England. Their population in 1790 were 435,000, of whom the slaves made about the 120th part. No religious establishment ever took place in Pennsylvania. On the basis of civil and religious liberty, did that wise legislator and statesman William Penn, lay the foundation of his infant colony, which drew such multitudes from Europe, especially Presbyterians from the north of Ireland, by whom the western parts of the middle and southern states are chiefly peopled. This state is represented by thirteen members in Congress.

The three counties of Newcastle, Kent, and Sussex, compose a little maritime state by the name of *Delaware*, as they lie to the south-west of the bay of that name. It is bounded by Maryland on the west and south. Its chief town is Wilmington. It is so like Pennsylvania it needs no farther description.

scription. It is in length 90 miles, in breadth 24. Its population 60,000, of which slaves make near 9000; and has one representative in Congress.

Maryland has Pennsylvania on the north, Delaware state and the Atlantic on the east, on the south and south-west it is separated from Virginia by the river Patomac, and has the Apalachian mountains to the west. Its length from east to west 210 miles; its width is very unequal, but where widest 140 miles. The rivers of Maryland are the Sassafrass, Severn, Patuxent, Patomac, and many smaller streams, which with Chesapeake bay piercing it from side to side, renders it, like its neighbour Virginia, but one great harbour. The productions of both states shall be mentioned together. The first settlement of Maryland was by a colony of Roman Catholics, who were brought over by the proprietor Lord Baltimore, who had prudence and moderation enough to grant liberty of conscience to all professions, which drew great numbers to Maryland, who have greatly improved it and built some towns, Annapolis the capital, but Baltimore the chief place of trade. In this state the city of Washington is laid off and building, as the seat of government of the United States. Their population five years ago was 320,000, of which the slaves made nearly one third. They have eight members in the Congress House of Representatives. Religion is free in Maryland; but all who are appointed to lucrative offices must subscribe their belief of the Christian religion.

Virginia is bounded on the north-east by Patomac, on the east by the Atlantic, on the south by North-Carolina, and on the west by Kentuckey. Its length was originally from the Atlantic to the Mississippi 750 miles, but Kentuckey being cut off it may be half that length, and 240 miles wide. The great rivers Patomac, Rappahannock, York and James river, with their numerous branches, and many other streams, render this state as convenient for navigation as if it was an island. The exports of Virginia and Maryland are tobacco, wheat, Indian corn, flour, pork, beef, lumber, naval stores, iron, &c. Sir Walter Raleigh first sent a colony to Virginia, but they were cut off, as were several succeeding adventurers; till Lord Delaware came over in person, with such supplies as established the colony, the first that was settled by Britain in America. Their tobacco rendered this country numerous and wealthy, though all religious professions had to support established Episcopacy, and all
British

British America belonged to the diocese of London. Virginia took a leading part in all the contests of America with Britain; and during the grand struggle, the Assembly though mostly Episcopalians, wisely and generously let down their church to a level with their christian brethren. Their numerous rivers being accessible to shipping an hundred miles up, renders great towns unnecessary in that large state; they however, carry on a great trade from Norfolk, Petersburg, Richmond, Manchester, Fredericksburg and other towns on their fine rivers. The population of Virginia in 1790, was 750,000; in this number the proportion of slaves to whites is as one to two and an half. This state sends nineteen members to the House of Representatives of the United States. Latitude of Richmond about 38° .

North-Carolina has Virginia on the north, by a dividing line in $36^{\circ} 30'$, South-Carolina on the south, and the Atlantic ocean on the east. It extended to the Mississippi, but the Assembly gave up its western territory to the United States. The southern line is in 35° till it turns to the south-east, and extends on the sea coast about 200 miles. Its chief rivers are Pasquotank, Chowan, Roanoak, Tar-river, Neuse and Cape-Fear. Its rivers and extensive coast, render it as convenient for trade as any of its sister states, if the entrance from the ocean were not shallow and sandy; which confines the trade to small vessels; but Cape-Fear admits ships of any burden. The productions of this state are numerous and valuable. It sends by land to Virginia annually, 6 or 7000 hogsheads of tobacco; and exports a number from its own inspections. Its other exports are wheat, flour, pease, beef, pork, butter, cheese, lumber, pitch, tar, turpentine, and I wish I could add to the exports of my country pot and pearl ashes, which it is well calculated to produce. The numerous landings in this state, are also unfriendly to large towns. It has however, some small towns on navigation, as Halifax, Edenton, Washington, Tarborough, Newbern, Fayetteville, and Wilmington, besides some inland towns that are represented in the Assembly. The seat of Government is fixed at the city of Raleigh, in Wake county, in latitude thirty-five and an half, where the Legislature hold their Assemblies, and the officers of Government chiefly reside. A University is established by act of Assembly, in Orange county, with liberal appointments by the state, and numerous benefactions. It is yet in its infancy, has about sixty students, and is under the government of
good

good and learned men, must prove an extensive blessing, as well as an honour to the state. What can more loudly call for the prayers of all good people, than that GOD's blessing may reside on our principal seat of learning, from which fountain are to flow those streams, that must poison, or purify and nourish our country. Its short progress has been rapid; may its success be glorious! The population of this state in 1790, was 394,000, and the proportion of whites to slaves nearly as three to one. North Carolina sends ten representatives to Congress, besides two Senators, which is common to all the states. Religion is here also happily free.

South-Carolina is bounded on the north and north-east by North-Carolina, on the south and south-west by Georgia, and on the east by the Atlantic, with a sea coast about 200 miles, from North-Carolina to the mouth of Savanna river, which separates it from Georgia. My map gives it a frontier to the Mississippi of two degrees in width, but Georgia claims a large part of it. The chief rivers of this state are Pedee, Santee, Cooper, Ashly, Edisto and Savanna. The Carolinas were first granted to proprietors, but the Crown bought them all out, but Lord Granville.

Charleston was the first spot the adventurers pitched on for a residence, and it has grown up to a beautiful city, and a place of great trade. It has some other towns, as Cambridge, Camden, George-Town, and Columbia their seat of Government. The productions of this wealthy state are rice, indigo, wheat, Indian corn, pease, tobacco, cotton, beef, &c. Charleston lies in latitude 32 45. Some attempts have been made to establish seminaries of learning in this state, but with little effect. Education is however encouraged in private academies, and gentlemen's sons finish at some northern college. Five years ago the population of South-Carolina was 250,000, and nearly five whites to two blacks; which gives them a representation of six members in Congress.

Georgia is about 500 miles in length, from the Atlantic ocean on the east, to Mississippi on the west; and from the line that divides the United States from east and west Florida, in latitude 31, to the southern line of North-Carolina, is four degrees or 278 miles on a meridian; but I am yet to learn how much of this Georgia claims. The principal rivers of this state, are Savanna, which separates it on the north-east from South-Carolina; Ogeeche, Altamaha, and St.

St. Mary's which divides it from Florida. These all flow into the Atlantic. On the west it has Apalachicola, Mobile, Pearl river, and others, that flow into the gulph of Mexico; and the Yasoua that runs into Mississippi. The productions and exports of this state are the same with those of South-Carolina. The Altamaha and Savanna rivers make good harbours. Their towns are Savanna, Frederica and Sunbury, on the coast; and Augusta, the seat of Government, a great distance up the Savanna. In the census taken in 1790, the inhabitants of Georgia were 83,000, and the proportion of slaves to the whites as 30 to 53. This state sends two members to the Congress House of Representatives. The South Western Territory contained 36,000, of whom not quite a tenth were slaves.

The United States five years ago contained in round numbers, 4,000,000 of souls; the slaves were 700,000; free people of colour 60,000. The slaves were then to the free as 7 to 33, a little more than one to five. Mr. Hodge's new Almanack will gratify political arithmeticians, not only in the proportion of the sexes, but it will prove the age of sixteen to be a good medium, at which to divide the living numbers of the human race. Of sixteen and upwards, the white males 824,000; under sixteen, 803,000. White females of all ages, 1,560,000. This proclaims a superintending providence over the sexes, as in all ages and nations more males than females are born. With us, the difference is about as 32 to 31. It is sometimes as high as 21 to 20:— A most wise provision for the hazardous occupations of the males by sea and land, in war and peace! If it be granted that we double our numbers in twenty-two years, without any supplies from other nations, I must believe, from the many omissions that must have happened when the numbers were taken; from the vast increase in our healthy inhabitants; and from the numerous arrivals from the despotism of Europe, I must believe, I say, the number of souls within the United States, at the close of 1795, must equal or exceed 5,000,000.

May piety, virtue, honour, truth and justice increase in full proportion; and let all the people say, AMEN.